SPHECIDAE
OF
MADAGASCAR

ARNOLD

NATIONAL
MUSEUM
S. RHODESIA

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American Ent. Soc., F.R.Ent.S., F.Z.S.

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THE SPHECIDAE OF MADAGASCAR

The following work is based on a collection of Madagascan Sphecidae made by Monsieur André Seyrig and belonging to the Muséum National d'Histoire Naturelle, Paris.

I had been requested by M. Seyrig in 1938 to examine the collection and to identify the species, and although I was under the impression at that time that the task would involve no more than the determination of a small number of known species, the pressure of other duties prevented me from undertaking the work. However, on receipt of the collection in 1939 it was plainly apparent that the magnitude of the collection and the numerous new species which it contained would provide material for something larger than a mere list of determinations, in fact, enough for a monographic treatment of the subject.

It is an all too common experience to be asked to work out collections which are poorly preserved, badly pinned and insufficiently labelled in regard to localities, but the Seyrig collection, comprising over 2000 specimens, is not only in a faultless condition but a very large number of the species are accompanied by specimens of the prey taken with them. It is therefore a pleasure and a privilege to work on such a collection, and my sincere thanks are tendered to M. Seyrig for giving me this opportunity. I have also to express my thanks to him for generously allowing the National Museum of Southern Rhodesia to retain half of the collection, excepting of course unica and types.

The Sphecidae of Madagascar were monographed for the first time by Henri de Saussure in 1892, as a part of Grandidier's comprehensive *Histoire de Madagascar*. In that work eighty-one species from Madagascar and the adjacent islands, Réunion and Mauritius, were described, of which sixty-one were regarded by the author as new.* Of these a small proportion have since been proved to be synonyms. Since the publication of Saussure's work up to the present time only eight more species have been added by other authors to the list of Madagascan Sphecidae. It is therefore all the more remarkable that M. Seyrig, by his assiduous collecting and keen powers of observation, has added no less than eighty-eight new species and also several genera which have not hitherto been recorded from the island. A conspectus of the genera and species, and their relationship to those of other zoogeographical regions, may well be deferred as a conclusion to this work, but it may safely be stated now that the collection in no way controverts the conclusions arrived at by De Saussure and expressed in the introduction to his monograph, that the affinities of the Madagascan Hymenoptera are mainly African.

In the following pages the species described by Saussure are not redescribed in full. Saussure's descriptions are for the greater part very detailed in regard to colour and, in a more generalized way, also in regard to superficial characters, but as a rule the far more important structural characters have been omitted in his work. In the following pages these supplementary data have been provided, and all the species have been included in the keys to the species. In the descriptions which follow, I have adhered to the terminology employed in my previous papers on Hymenoptera, and for the information of those readers who may not have access to them, a glossary of the terms used, which in the main conform to those of Kohl, is herewith appended.

* The descriptions of some of these had been previously published in other papers a few years earlier.

MEASUREMENTS

Inferior interocular distance=the greatest width between the bottom of the eyes, which in most cases is also the width of the clypeus.

Superior interocular distance=the interocular distance on the vertex or the least distance between the eyes at that part.

Length of the clypeus. This is taken at its greatest length, down the middle of the median area, and, unless otherwise stated, includes the projecting lobe or teeth, if such are present.

Width of the joints of the flagellum. The proportions of the second joint are of great diagnostic value in most species, and as that joint is usually wider at the apex than at the base, the width is taken at the apex. Contrary to the usage of many authors, the joint which follows the scape is not differentiated as the 'pedicel'; it is treated as the first joint of the flagellum, of which it is functionally just as much a part as the following joints.

Width and length of the pronotal dorsum or collar. The width is not taken along a line tangential to the anterior margin of the mesonotum but along a line joining the posterior corners of the pronotum, adjacent to the tegulae. The length, unless otherwise stated, is the greatest length of the dorsum, i.e. it does not include the sloping anterior face of the collar nor the neck in front of it.

Epinotum (*metanotum* Saussure, *propodeum* or *median segment* of other authors). Morphologically, as is well known, this is the basal segment of the abdomen which has become fused with and become a structural part of the thorax. For this reason, Kohl in his earlier papers referred to the first segment of the abdominal complex lying behind the epinotum as the 'second abdominal segment'. Strictly speaking the terminology is correct, but, nevertheless, very inconvenient, and in accordance with the usage of modern authors, it is termed the first abdominal segment in these pages, as in all my other papers. Nevertheless, on account of its morphological status, the base of the segment is not taken as caudad, i.e. where it joins the abdomen, but cephalad, where it joins the metanotum (postscutellum Saussure). Furthermore, in measurements of the epinotal dorsum the basal width is not taken along a line tangential to the curved posterior margin of the metanotum, but along a line joining the anterior corners of the dorsum, a line which usually cuts across the metanotum. I have used the term 'reticulate-punctate' to describe a form of puncturation which German authors call 'fingerhutartig punktiert', or a condition in which the puncturation is so close that the punctures are almost contiguous or at least so close that the intervening spaces are clearly narrower than the punctures.

It should be noted that in many of Saussure's descriptions the term 'ferrugineux' has been applied in a manner contrary to the sense of the word and to the usage of all other writers, in that it has been used to describe the colour of wings which are yellow, or at least tinged with yellow. This will explain the apparent contradiction between his descriptions of some species and mine.

Except in the case of genera not listed in Saussure's work, generic diagnoses and descriptions of genera and also the synonymy of species have been omitted in the following pages, since they may be found in Saussure's monograph and in mine of the Ethiopian Sphecidae, and even more fully in the works of Kohl and Handlirsch.

In all cases the types of new species are to be deposited in the Paris Museum, and when available, paratypes in the National Museum of Southern Rhodesia.

[The title originally chosen for this work was 'The Sphecidae of *Eastern* Madagascar', since with few exceptions all the species described by Saussure and those of the Seyrig collection were obtained from localities in the eastern half of the island. However, correspondence with M. Seyrig, so long interrupted by the war, has happily been resumed, and in a recent letter he has pointed out to me that the central mountain range extending from Diego Suarez to Fort-Dauphin divides the island into two unequal parts,

that to the east of the range being the narrower, forested, very humid and poor in Sphecidae, whereas the western, larger and drier part includes most of the localities from which his collection was derived and is rich in Sphecids.

This fact will to a certain extent affect the conclusions concerning the Crabroninae expressed on p. 190, and my former belief that many more species await discovery in the humid eastern region, but I have little doubt that when the low-lying and more arid south-western area of the island is thoroughly investigated, many more species will be added to the list and that they will show an even closer relation of the Madagascan Sphecidae with the fauna of the African mainland. (April 1944.)]

Subfamily TRYPOXYLONINAE

Genus **Pison** Jurine

Key to the species

♀♀

(2) 1. Small species, 5·5 mm. long. Clypeus produced in front into a rectangular lobe which is about 2½ times wider than long. (Epinotum without striae.) **lobiferum** Arn. (p. 6)

(1) 2. Larger species 7 mm. or more long. Anterior margin of the clypeus not lobed, but convex or produced into a tooth.

(4) 3. Anterior margin of the clypeus convex. Dorsum of the epinotum obliquely and indistinctly striolate. 7–8 mm. long. **argentatum** Shuck.

(3) 4. Anterior margin of the clypeus produced into an acute tooth, wider at its base than long.

(6) 5. Head, thorax and abdomen coarsely and very sparsely punctured, epinotum without rugae, only punctured. Flagellum slender, the second joint four times longer than wide at the apex. 10–11 mm. long. **Seyrigi** Arn. (p. 3)

(5) 6. Head and thorax fairly closely punctured; epinotal dorsum obliquely rugose. Flagellum short and stout, the second joint not quite three times longer than wide at the apex. 7 mm. long. **humile** Arn. (p. 5)

♂♂

(2) 1. Epinotal dorsum obliquely rugose. **humile** Arn. (p. 5)

(1) 2. Epinotal dorsum punctured.

(4) 3. Head, thorax and abdomen coarsely and very sparsely punctured. First tergite one-fourth longer than wide at the apex, and two-thirds longer than the second. Apical ventral valve tridentate. (Genitalia, Figs. 1 *a*, *b*.) **Seyrigi** Arn. (p. 3)

(3) 4. Head and thorax, excepting the epinotum, and the abdomen finely and closely punctured. First tergite nearly as long as wide at the apex and one-third longer than the second. Apical ventral valve bidentate. (Genitalia, Figs. 2, 2 *a*.) **mimicum** Arn. (p. 4)

Pison Seyrigi n.sp. (Figs. 1, 1 *a*, *b*)

♀. 10–11 mm. long. Black. Palpi ochreous. Wings hyaline, the apex beyond the cells pale fuscous, the veins and pterostigma blackish. Clypeus, sides of the face up to the top of the ocular sinus and a narrow line between the antennal sockets and the temples, covered with a long grey pubescence. The rest of the head, the thorax including the underside, and the tergites with a sparse, erect, long and greyish pilosity, the apical margins of tergites 1–3 also with short whitish pubescence at the sides. Tooth of the clypeus smooth and shining, the rest of the clypeus dull, closely and finely punctured. Face and vertex shining, the face fairly closely and finely punctured below, sparsely and more coarsely in the middle and very sparsely at the top; the ocellar area and the vertex between the posterior ocelli and the eyes very finely punctured, the vertex behind the ocelli finely and sparsely punctured. Temples somewhat dull, shallowly, finely and fairly closely punctured. Mesopleura with a large puncturation, close on the episternum, a little sparser behind it, the interspaces from two to three times wider than the punctures. Metapleura closely and finely punctured above.

The rest of the thorax including the epinotum very sparsely and irregularly punctured; the smallest punctures are on the pronotum and metanotum, those on the other parts as large as those on the mesopleura but shallower. On the mesonotum and scutellum the interspaces are for the greater part four to six times wider than the punctures. First four abdominal segments sparsely punctured and shining, the punctures about as large as those on the epinotum, the fifth more finely punctured, the sixth dull and very finely, closely punctured.

Clypeus convex, 1½ times wider than long, not carinate, the anterior margin produced into a subacute tooth which is about half as long as wide at the base. Face tumid and with a shallow median longitudinal impressed line on its upper half.

Interocular distance on the vertex equal to the length of the first two joints of the flagellum. Posterior ocelli separated from each other and from the eyes by a space equal to about half their own diameter. Flagellum slender, all the joints except the first at least three times longer than wide; the second joint as long as the third and four times longer than wide. Pronotal dorsum half as long as the second joint of the flagellum. Mesonotum five-sixths wider than long. Dorsum of the epinotum twice as wide at the base as long, convex transversely, shallowly impressed lengthwise medially, merging gradually into the oblique declivity; the latter has a deep median longitudinal sulcus and about six transverse rugae on each side at the bottom.

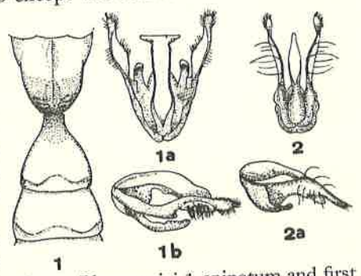


Fig. 1. *Pison seyrigi* ♂, epinotum and first two tergites, × 10; *a*, *b*, genitalia, × 17½. Figs. 2, 2*a*. *Pison mimicum* ♂, genitalia, ×17½.

First tergite twice as wide at the apex as at the base, 1½ times longer than wide at the apex; the second tergite two-thirds as long as the first. The first four tergites are depressed at the apical margin, more narrowly at the sides than in the middle. Second cubital cell petiolate, the petiole nearly as long as the cell is wide on the cubitus; first recurrent vein interstitial with the first transverse cubital vein, the second recurrent entering the third cubital cell slightly beyond the second transverse cubital vein.

♂. 11 mm. long. Colour, pubescence and sculpture as in the ♀, but the puncturation on the vertex is a little closer, and not quite so close on the mesopleura. Lower half of the face with a median longitudinal carina. Flagellum slender as in the ♀; the second joint as long as the third and three times longer than wide at the apex. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus half of the third. First tergite one-fourth longer than wide at the apex and about two-thirds longer than the second, and as in the ♀ more attenuated at the base than in any of the African species. Apical ventral valve parallel-sided, the apical margin bisinuate and bluntly tridentate. The first recurrent vein meets the second cubital cell a little before its middle. Otherwise like the ♀.

Ivondro, 5 ♀♀, 2 ♂♂. December–January.

Pison mimicum n.sp. (Figs. 2, 2 *a*)

♂. 9 mm. long. Black. Very much like *P. Seyrigi* in general appearance, but without the whitish exserted pilosity, except on the epinotum, and with a narrower face and very different genitalia. The decumbent whitish pubescence on the face, temples and tergites is more abundant than in *Seyrigi*. Face and vertex almost dull, closely punctured, the puncturation becoming closer and finer above, the interspaces on the middle of the face about two to three times wider than the punctures and microscopically, closely punctured. Temples less

closely punctured than the vertex, the interspaces impunctate and slightly shining. Thorax shining, more finely and more closely punctured than in *Seyrigi*. On the mesonotum the punctures are a little larger than those on the face, and the interspaces are from two to three times larger than the punctures. The puncturation on the scutellum is a little finer than on the mesonotum, and on the epinotal dorsum a little larger and less close. The puncturation of the mesopleura and of the sides and declivity of the epinotum slightly larger, deeper and a little less close than on the mesonotum. Metapleura very finely punctured. Abdomen fairly shining, finely and closely punctured, the puncturation becoming progressively finer on each succeeding segment; the punctures on the sternites slightly larger than on the tergites.

Clypeus two-thirds wider in front than long, the anterior margin produced into a sharp tooth. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus one-fourth of the third joint, and equal to nine-elevenths of the interocular distance across the base of the clypeus. The second joint of the flagellum is one-fourth longer than the third and a trifle more than three times longer than wide at the apex. Posterior ocelli separated from the eyes by a distance equal to three-fourths of their own diameter. Dorsum of the epinotum 1¾ times wider at the base than long, with a wider median longitudinal impression than in *Seyrigi*, which is indistinctly transversely rugose; the declivity is less oblique than in that species and lacks the transverse rugae at the bottom. First tergite barely wider at the apex than long, one-third longer than the second tergite, less attenuated at the base than in *Seyrigi*; the apical margins of the first four tergites less depressed than in that species. Venation like that of *Seyrigi*, but the first recurrent vein is interstitial with the first transverse cubital vein. The genitalia differ considerably from those of *Seyrigi* (see Figs. 1 *a*, 2).

Perinet, Forêt Côté Est, 1 ♂. February.

Pison humile n.sp. (Fig. 3)

♀. 7 mm. long. Black. Wings hyaline, the apex beyond the cells pale fuscous, the veins and pterostigma black. Face, clypeus and temples with a coarse yellowish silvery pubescence. Thorax and base of the first tergite with a short, sparse, greyish pilosity. Tergites 1–5 with a greyish white pubescence, longer at the apical margins, where it forms transverse fasciae.

Fig. 3. *Pison humile* ♂, genitalia, × 24.

Head dull, closely punctured, the clypeus and lower half of the face very finely so, the punctures fairly small just below the anterior ocellus, large on the middle of the face and on the vertex, the interspaces smaller than the punctures on the middle of the face, and as large on the vertex. Pronotum dull, closely and finely punctured. Mesonotum, scutellum, mesopleura and sides of the epinotum strongly and closely punctured, the largest punctures on the mesonotum a little larger than those on the vertex and with interspaces about twice as wide as the punctures. Dorsum of the epinotum two and a third times wider at the base than long, with a wide median longitudinal groove which is carinate, the carina not reaching the apex, obliquely rugose, the spaces between the rugae outside the median groove with large elongate punctures; the declivity of the epinotum is fairly steep and deeply impressed lengthwise in the middle. Metapleura and metanotum finely and shallowly punctured. The puncturation on the abdomen becomes progressively finer and closer on each succeeding segment. The tergites are finely punctured, the sternites fairly sparsely and more coarsely; the punctures on the first tergite are less than half as large as those on the mesonotum.

Clypeus 1½ times wider than long, the apical margin produced into a tooth in the middle, which is wider at the base than long. Interocular distance between the bottom of the eyes

one-third greater than on the vertex, where it is nearly equal to the length of the first three joints of the flagellum. The latter is short; the second joint is twice as long as the first, barely longer than the third, and not quite three times longer than wide at the apex. Posterior ocelli slightly farther from each other than from the eyes, separated from the latter by a distance equal to their own diameter. Pronotal dorsum very short. First tergite about as long as wide at the apex and half as long again as the second. First abscissa of the radius three times longer than the second, the latter nearly as long as the petiole of the second cubital cell; the first recurrent vein enters the second cubital cell a little beyond its proximal angle, the second is interstitial with the second transverse cubital vein.

♂. 7 mm. long. Colour, sculpture and pubescence as in the ♀, except on the tergites where the pubescence is scantier and does not form distinct apical fasciae.

Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus one-fourth of the fourth joint, and to four-fifths of the inferior interocular distance. Clypeus twice as wide as long, the apical margin produced into a sharp tooth, as in the ♀. Posterior ocelli as far from each other as from the eyes, separated from the latter by a distance equal to their own diameter. Second joint of the flagellum a trifle longer than the third and hardly more than twice as long as wide at the apex. Pronotum raised in the middle and shorter there than at the sides, where it is as long as the fourth joint of the flagellum. Otherwise like the ♀.

Bekily, 2 ♀♀, 2 ♂♂. May.

Pison lobiferum n.sp. (Figs. 4, 4 *a*, *b*)

♀. 5·5 mm. long. Black. Palpi yellowish white. Mandibles and lobe of the clypeus ferruginous. Tarsi brownish black. Wings hyaline, the veins and pterostigma dark brown, the apical margin narrowly and faintly fuscous. Clypeus, face between the antennal sockets and at the sides to a little above the ocular sinus, temples, sides of the thorax and the declivity of the epinotum, with silvery pubescence. The first three tergites have very narrow apical bands of similar pubescence. Head and thorax, excepting the epinotum, dull, very closely and exceedingly finely punctured, the punctures barely visible with a magnification of less than 30 diameters, the interspaces hardly larger than the punctures, except on the scutellum. Epinotum moderately shining, punctured, the punctures not larger than those of the scutellum, but a little farther apart. The anterior third of the sides of the epinotum and the metapleura impunctate. Abdomen slightly shining, microscopically and closely punctured.

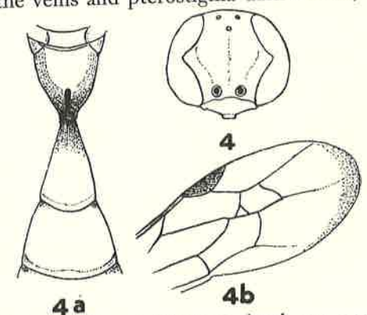


Fig. 4. *Pison lobiferum* ♀, head, × *c.* 24; *a*, epinotum and first two tergites, × *c.* 24; *b*, apical half of wing, × *c.* 24.

Clypeus a little more than twice as wide as long, the apical margin produced into a short, rectangular lobe. Interocular distance at the base of the eyes about one-third greater than on the vertex, where it is equal to the length of the first three joints of the flagellum. Lower half of the face, except at the sides, somewhat tumid, the median longitudinal impression very shallow. Flagellum short, the second joint one-fourth longer than the first and very little longer than the third. Shoulders of the pronotum widely rounded. Dorsum of the epinotum considerably narrowed caudad, twice as wide at the base as long, feebly impressed lengthwise medially, the declivity oblique and with a deep median groove. First tergite 1½ times longer than wide at the apex, fully twice as wide there as at the base, the second

tergite fully two-thirds as long as the first. First abscissa of the radius not quite twice as long as the second. The petiole of the second cubital cell as long as the base of that cell on the cubitus. The two recurrent veins enter the first and third cubital cells near the second cubital cell.

Bekily, 2 ♀♀. November.

The first tergite is much more narrowed cephalad than in any of the other Madagascan or Ethiopian species.

Genus **Trypoxylon** Latr.

Key to the species

♀♀

(10) 1. Face without carinae margining a scutate area.
(7) 2. Body entirely black.
(4) 3. Clypeus produced into a short rectangular lobe in front; first tergite a little longer than the three following tergites united; 13 mm. long.
cataractae Arn. race **madecassum** Arn. (p. 9)
(3) 4. Clypeus without a lobe, its anterior margin convex. First tergite shorter than, or only a little longer than the second and third united. 8 mm. long or less.
(6) 5. Legs entirely black. First tergite as long as, or a little longer than, the second and third united. **hova** Sauss. (p. 9)
(5) 6. Anterior tibiae and tarsi brownish yellow, middle tibiae pale brown, hind tibiae stramineous at the base. First tergite shorter than the second and third united.
luteosignatum Arn. (p. 11)
(2) 7. Body not entirely black, some of the abdominal segments red or reddish yellow.
(9) 8. First tergite as long as the three following segments united. (Mauritian species.)
errans Sauss.
(8) 9. First tergite short, nearly as long as the second plus half of the third.
tuberculifrons Arn. (p. 8)
(1) 10. Face with carinae margining a scutate area.
(12) 11. Head and thorax closely and coarsely punctured; on the mesonotum the punctures are more or less confluent transversely, so that the sculpture there is more or less rugoso-punctate; facial shield incomplete, the lateral carinae incurved above, not meeting the convex upper carina. **punctatissimum** Arn. (p. 11)
(11) 12. Head and thorax more finely punctured, the mesonotum without traces of transverse rugae.
(14) 13. Facial shield not emitting a curved carina into the ocular sinuses.
sinuosiscutis Arn. (p. 13)
(13) 14. Facial shield emitting a very distinct carina into the ocular sinuses.
(16) 15. Mesonotum very shallowly and distantly punctured, the interspaces at the sides and in front about four times wider than the punctures; the length of the facial shield, measured from the apex to the anterior ocellus, is nearly one-fourth greater than the greatest width. 15·5 mm. long. **Seyrigi** Arn. (p. 12)
(15) 16. Mesonotum deeply and more closely punctured, the interspaces at the sides and in front only twice as wide as the punctures; the length of the facial shield, measured from the apex to the anterior ocellus, is equal to the greatest width, or a very little more. **scutifrons** Sauss. (p. 14)

♂♂

(6) 1. Face without carinae margining a scutate area.
(3) 2. Clypeus produced into a short rectangular lobe in front; first tergite as long as the three following tergites united; 13 mm. long.
cataractae Arn. race **madecassum** Arn. (p. 9)
(2) 3. Anterior margin of the clypeus convex, without a lobe; less than 9 mm. long.
(5) 4. Legs entirely black; second abscissa of the radius twice as long as the first.
hova Sauss. (p. 9)

(4) 5. First four joints of the anterior tarsi brownish yellow, basal two-thirds of the middle metatarsi and basal fourth of the hind tibiae stramineous; second abscissa of the radius three times longer than the first. **luteosignatum** Arn. (p. 11)

(1) 6. Face with carinae margining a scutate area.

(8) 7. Sculpture of head and thorax coarse, the mesonotum transversely rugoso-punctate. **punctatissimum** Arn. (p. 11)

(7) 8. Sculpture of head and thorax not coarse, fairly sparse.

(10) 9. Facial shield not emitting a curved carina into the ocular sinuses. 8–10 mm. long. **sinuosiscutis** Arn. (p. 13)

(9) 10. Facial shield emitting a carina into the ocular sinuses. **scutifrons** Sauss. (p. 14)

It should be noted that in this genus the length of the first three tergites may vary within appreciable limits in the species, and also the proportions of length to apical width in each of those segments. The parapsidal sutures of the mesonotum are represented in all species by a short impressed line which lies in front of the tegulae and about half-way between the sides and the middle of the segment. They are referred to in Saussure's descriptions, but they furnish no characters of specific value.

Trypoxylon tuberculifrons n.sp. (Figs. 5, 5 *a–c*)

♀. 9 mm. long. Black. Mandibles and apical margin of the clypeus flavo-ferruginous. Pronotal tubercles and the legs ochreous, the middle and hind tarsi a little darker. Basal two-thirds of the first and third abdominal segments and the basal third of the fourth reddish ochreous, the rest of the abdomen rufo-piceous, the apical margins of the segments translucent and yellow. Antennae reddish yellow. Wings hyaline, the veins and pterostigma pale brown. Clypeus, face including the ocular sinuses, temples, posterior margin of the pronotum, mesopleura and the dorsum and declivity of the epinotum with silvery pubescence, very scanty on the mesopleura and on the epinotum. Abdomen with a short, sparse and yellowish pubescence, the sternites with a few long exserted yellow hairs on the apical margins. Clypeus, face below the antennae, and the ocular sinuses dull, very finely and closely punctured, the rest of the head shining, finely and not closely punctured. Thorax shining, the pro-mesonotum, scutellum and mesopleura very finely and sparsely punctured, the neck of the pronotum somewhat dull and rugulose, the rest of the thorax impunctate. Dorsum of the epinotum with a wide, shallow, median, longitudinal groove which is transversely striate, the declivity with a very deep median triangular pit, extending over its upper two-thirds, the apex of the triangle below.

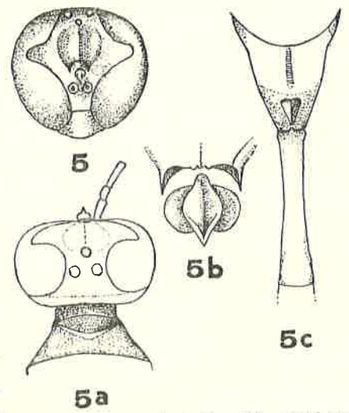


Fig. 5, *a*. *Trypoxylon tuberculifrons* ♀, head and pronotum, × 15; *b*, facial tubercle, × *c*. 112; *c*, epinotum and petiole, × 15.

Clypeus nearly twice as wide as long, its anterior margin convex. Face without carinae or scutate area, but strongly tumid, the tumid part impressed lengthwise medially and deeply, arcuately truncate below. Between the truncate surface and the antennal sockets there is a prominent tubercle, the upper surface of which, viewed from the front, is seen to be produced into a sharp triangular tooth at the apex and, at a lower level, into rounded semicircular lobes on each side. Interocular distance on the vertex equal to the length of the first joint of the flagellum plus nearly the length of the second joint, and twice as great

as the interocular distance across the base of the clypeus. Second joint of the flagellum one-third longer than the following joint and four times longer than wide at the apex. Posterior ocelli separated from the eyes by a distance equal to one-fourth of their own diameter. Dorsum of the pronotum distinctly narrowed cephalad, six times wider behind than long in the middle, the lateral margins rectilinear. Epinotum much narrowed caudad, $3\frac{1}{2}$ times wider at the base than at the apex and three-eighths wider at the base than at the apical margin of the dorsum; the declivity very oblique, the dorsum and declivity in profile forming a low arc. First tergite not distinctly nodose, merely gradually widened caudad, fully four times longer than wide at the apex, and as long as the second tergite plus nearly half of the third. Second abscissa of the radius nearly three times longer than the first; the recurrent vein meets the cubital cell at the beginning of its apical fifth.

Rogez, 1 ♀. January.

Trypoxylon cataractae Arn.

Ann. Transv. Mus. XI, p. 13, ♂, ♀, 1924

subsp. **madecassum** n.st. (Figs. 6, 6 *a–c*)

♀. In this sex the race differs from the type of the species as follows:

Sides of the epinotum less strongly striate. The transverse and horizontal lamella above the antennal sockets is obsolete, being replaced by a low carina, and the median cuneiform protuberance above it is also reduced to a small carina. The median longitudinal impression on the tumid area of the face is deeper and wider. The joints of the flagellum are a little more slender, the second joint being four times longer than wide at the apex ($3\frac{1}{3}$ in the type of the species). The shoulders of the pronotum are rounder and higher. The petiole is more clavate, the length of the segment being $4\frac{2}{3}$ times the width of the node, whereas in the type of the species it is fully six times. The second and third tergites are shorter, the second is one-fourth longer than wide at the apex (twice in the type form) and the third is a little wider at the apex than long (one-third longer in the type form). The first tergite is a little longer than the three following tergites united (in the type of the species as long as the second and third plus one-fourth of the fourth tergite).

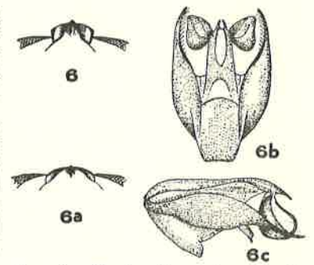


Fig. 6. *Trypoxylon cataractae* ♀, facial tubercle, × 17½; *a*, race *madecassum*, facial tubercle, × 17½; *b*, *c*, ♂, genitalia, × 17½.

♂. Like the type of the species ♂, including the genitalia.

Ranomafana, 13 ♂♂, 5 ♀♀. October.

The figure of the genitalia given in my description of the species was from the ventral aspect. Since the dorsal aspect is more convenient for identification, the genitalia are figured here (Figs. 6 *b*, *c*) again in that position and also from the side, in order to show more clearly the remarkable hemispherical auricular structures which proceed from the underside of the penis and which appear to be unique in this genus.

Trypoxylon hova Sauss. (Figs. 7, 7 *a–d*)

Hist. Madag. XX, p. 525, ♀, 1892

In the Seyrig collection there are 4 ♀♀ and 11 ♂♂ which I ascribe to this species. The ♀♀ do not conform exactly to Saussure's description, but I have little doubt that the identification is correct on account of the presence of the carinae on the sternites which are mentioned

by Saussure. Where they differ from the description is in the sculpture of the head and the sides of the epinotum (=métapleures Sauss.). Of the former Saussure's description is 'finement coriacée, lisse', and of the latter 'lisses et polis'. In these four specimens the face and vertex are dull and microscopically reticulate. However, it is clear from some of his other descriptions that Saussure used the term 'lisse' when the sculpture is so fine as to require a magnification of 40–50 diameters for resolution. On the other hand, it is difficult to reconcile his statement about the sides of the epinotum, which in these specimens are distinctly, although not closely, striate. Saussure's statement, that there is a feeble longitudinal groove on the tergites and on the inside of the posterior femora, is based, I believe, on an optical illusion. There is an appearance of a line on those parts, but it is due to the contrast between the illuminated and shaded parts of a convex surface, since the line changes its position as those parts are revolved along their axis.

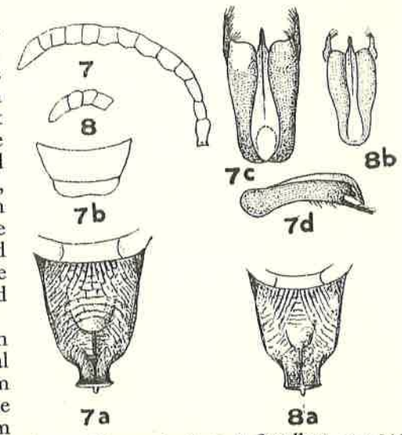


Fig. 7. *Trypoxylon hova* ♂, flagellum, × *c.* 24; *a*, epinotum, × *c.* 24; *b*, apical tergites, × *c.* 24; *c*, *d*, genitalia, × *c.* 24.

Fig. 8. *Trypoxylon luteosignatum* ♂, apical joints of the flagellum, × *c.* 24; *a*, epinotum, × *c.* 24; *b*, genitalia, × *c.* 24.

♀. 7·6–8 mm. long. Clypeus half as wide again as long. Interocular distance on the vertex equal to the length of the first two joints of the flagellum and equal to the interocular distance across the base of the clypeus. Second joint of the flagellum 1½ times longer than the first, nearly three times longer than wide at the apex, and very little longer than the third joint. Mesonotum and scutellum fairly shining, finely punctured, the interspaces about three times wider than the punctures and microscopically reticulate. Median area of the epinotum as long as wide at the base, distinctly delimited in its posterior half by a semicircular carina, rugose, obliquely so at the base, transversely in the middle, and reticulate-rugose at the sides; the rest of the epinotal dorsum and the declivity more finely reticulate-rugose. The whole epinotum is one-third wider at the base than long. First tergite from 3½ to 3¾ times longer than wide at the apex, as long as, or a little longer than, the second and third tergites united; the second is barely longer than the third. Second abscissa of the radius twice as long as the first.

♂. 6·6–7 mm. long (hitherto undescribed). Clypeus twice as wide as long. Interocular distance on the vertex slightly greater than it is across the base of the clypeus, and equal to the length of the first two joints of the flagellum plus one-third of the third joint. Second joint of the flagellum two-fifths longer than the first, very little longer than the third, the third to eighth joints dilated in the middle below, the apical joint moderately curved, twice as long as wide at the base and not quite twice as long as the two preceding joints united. First tergite feebly clavate, four times longer than wide at the apex, slightly shorter than the second and third united, but sometimes as long. Seventh abdominal segment broad, the apical margin of the sternite straight and fringed with fine hairs, the apical margin of the tergite also straight, sometimes with a shallow median sinus. Otherwise like the ♀.

Perinet, Ranomafana and Bekily. October to April.

Trypoxylon luteosignatum n.sp. (Figs. 8, 8 *a*, *b*)

♂. 5–5·7 mm. long. Black. The first four joints of the anterior tarsi pale brownish yellow, the basal two-thirds of the middle metatarsi and the basal fourth of the hind tibiae yellowish white. Wings hyaline, the veins dark brown. Clypeus, lower half of the face, the temples, pleurae, basal corners of the epinotal dorsum and the declivity, covered with silvery pubescence. The tergites have a very scanty whitish pubescence, chiefly at the sides of the apical margins.

The sculpture is like that of *T. hova*, but everywhere finer, and the puncturation on the mesothorax is shallower and a little sparser. The median area of the epinotal dorsum is less distinctly defined and its sculpture consists of a finer, closer and oblique rugosity, without reticulations at the base. Face like that of *T. hova*, moderately tumid above the antennae, without carinae or scutate area. Clypeus twice as wide as long, the apical margin convex. Interocular distance on the vertex very little greater than across the base of the clypeus and equal to the length of the first three joints of the flagellum. Ocular sinus as deep as wide. First and third joints of the flagellum of equal length, the second one-third longer than the third joint and twice as long as wide; third to eighth joints slightly dilated in the middle below, the apical joint as long as the two preceding joints united. Posterior ocelli separated from the eyes by a distance equal to one-third of their own diameter. Mesonotum with a short sulcus on each side in front of, and inwards of the tegulae, as in *hova*. The whole epinotum is one-third longer than wide at the base, its dorsum is one-fourth wider at the base than long. First tergite feebly clavate, from 3 to 3½ times longer than wide behind, and a little shorter than the second and third tergites united. Apical tergite like that of *hova*. Second and third sternites and sometimes also the fourth longitudinally carinate medially, the carinae not reaching the apical margin. The genitalia resemble those of *hova*, but the inferior apical spiniform extension of the stipites is broader at the base and shorter. The second abscissa of the radius is three times longer than the first; as in *hova*, no trace can be seen of the second cubital cell and the second recurrent vein.

♀. 5·2 mm. long. Anterior trochanters, tibiae and tarsi brownish yellow, the middle tibiae pale brown, yellowish at the base; otherwise like the ♂ in colour, sculpture and pubescence. Clypeus three-fourths wider than long. Joints of the flagellum not dilated below, the second joint one-fifth longer than the third, twice as long as wide. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum plus half of the first, and slightly greater than the interocular distance across the base of the clypeus. First tergite three times longer than wide behind and as long as the second tergite plus five-ninths of the third. Otherwise like the ♂.

Behara, 1 ♀, 2 ♂♂; Bekily 5 ♂♂. October to March.

Trypoxylon punctatissimum Arn. (Figs. 9, 9 *a*)

Ann. Transv. Mus. XI, p. 20, ♀, 1924

One ♀ and 2 ♂♂ of this species, originally described from Algoa Bay, are in the collection. The ♀ does not differ in any way from the type form, although a little smaller, 10·5 mm. long.

♂. 11 mm. long. (hitherto undescribed). The sculpture on the mesonotum is stronger than in the ♀; the punctures are confluent transversely, so that the sculpture might be described as transversely rugose and punctured between the rugae. Otherwise like the ♀ in sculpture, colour and pubescence. Clypeus 2⅓ times wider than long. Interocular distance on the vertex nearly half as great again as across the base of the clypeus and equal to the length of the first four joints of the flagellum. First joint of the flagellum a little wider than long, subglobose, the second joint a little longer than the third and twice as long as wide at

the apex, the apical joint four times longer than wide at the base and as long as the four preceding joints united. The whole epinotum is a trifle longer than wide at the base. First tergite six times longer than wide at the apex and as long as the second and third united. Seventh tergite about as long as wide at the base, its apical margin obtusely angular; the apical margin of the seventh sternite transverse. Wings as in the ♀, short, not extending back beyond the hind margin of the second tergite. Second abscissa of the radius twice as long as the first.

Bekily. August.

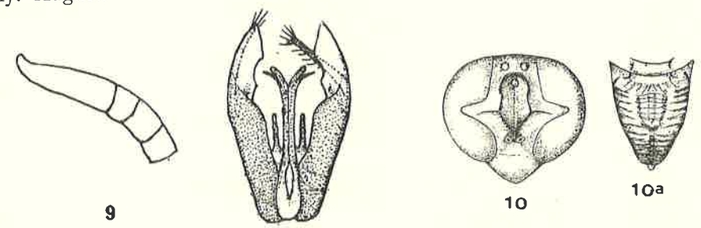


Fig. 9. *Trypoxylon punctatissimum* ♂, apical joints of the flagellum, × 35; *a*, genitalia, × 35.
Fig. 10. *Trypoxylon Seyrigi* ♀, head, × 10; *a*, epinotum, × 10.

Trypoxylon Seyrigi n.sp. (Figs. 10, 10 *a*)

♀. 15·5 mm. long. Black. Palpi pale ochreous, claws and calcaria pale brown, tarsi dark brown. Wings hyaline, the apical margin faintly smoky, the veins and pterostigma dark brown. Clypeus and the face, up to a little below the scutate area, covered with a dense silvery pubescence. Temples and thorax with a sparse, exserted and whitish pilosity, the abdomen with a thin whitish pubescence, the apical sternite and the apical margins of the other sternites with a few long, exserted and black hairs. Face below the shield shining, very finely punctured. The facial shield has a microscopic fundamental reticulate sculpture, on which is superimposed a shallow and fairly large puncturation, the punctures largest in the upper half. Behind the shield, between its hind margin and the posterior ocelli, there are a few large punctures. The rest of the head is somewhat dull, almost impunctate. The depressed posterior part of the pronotal dorsum is slightly shining, the rest of that segment, the mesonotum, mesopleura, scutellum and metanotum dull, very shallowly, sparsely and finely punctured, the punctures smallest on the pronotum, scutellum and metanotum, the interspaces on the mesonotum and mesopleura for the greater part four times as wide as the punctures. Metapleura smooth and shining. Epinotum moderately shining, the median area U-shaped, shallowly and widely grooved lengthwise medially, the sides of the area defined by deeper and narrower grooves, finely and transversely rugose, the sides of the epinotal dorsum obliquely costate, the costae not reaching the margins of the median area, the declivity strongly and transversely costate, deeply sulcate down the middle, the sides of the epinotum shining, their anterior third smooth, the posterior two-thirds obliquely striato-rugose and sparsely punctured between the rugae in the upper part. Abdomen nitidulous.

Clypeus twice as wide as long, the apical margin strongly convex. The face slopes forwards towards the apex of the shield. There is a transverse lamella above the antennal sockets which is connected by a short carina to the apex of the shield. The latter is moderately concave, less so in the middle than above and below, its lower margins straight and forming

an acute angle, the lateral margins slightly incurved, meeting the horseshoe-shaped upper margin a little above the level of the ocular sinuses. At the junction of the inferior and lateral margins a slightly curved carina is emitted on each side into the ocular sinus almost as far as its middle. Posterior ocelli separated from the eyes by a distance equal to half their own diameter. Interocular distance on the vertex equal to a little more than the length of the first two joints of the flagellum and nearly 1½ times greater than the interocular distance across the base of the clypeus. First joint of the flagellum as long as wide, the second joint three times longer than wide at the apex and three-eighths longer than the third joint. Anterior face of the pronotal collar concave transversely, the shoulders rounded. Dorsum of the epinotum three-fourths wider at the base than long.

First tergite from 5 to 6½ times longer than wide at the apex, as long as the second and third united or a little less, the second tergite very little widened behind, 2½ times longer than wide at the apex and not more than one-fourth longer than the third. Second abscissa of the radius 2⅛ times longer than the first. The second cubital cell and the second recurrent vein are faintly indicated, the latter meeting the second cubital cell at the end of its proximal fourth.

Roget, 3 ♀♀; Bekily, 1 ♀; Ivondro, 1 ♀; Ranomafana, 1 ♀.

The facial shield in this species is not unlike that of *punctatissimum*, but its lateral margins are not so incurved as in that species and there is no gap between them and the upper margin. The specimen from Ranomafana is more closely punctured on the mesonotum than the others.

Trypoxylon sinuosiscutis n.sp. (Figs. 11, 11 *a–c*)

♀. 10–12 mm. long. Black. The underside of the anterior tibiae, the apical joint of the anterior tarsi and apical margin of the other joints reddish yellow; the calcaria of all the legs ochreous. Wings hyaline, the apical margin very faintly smoky, the veins and pterostigma blackish. Pilosity and pubescence as in *Seyrigi*. Face and vertex dull, the facial shield with a microscopic reticulation as in *Seyrigi*, but the superimposed puncturation is much finer and very sparse, and the puncturation between the shield and the ocelli is shallower and relatively smaller than in that species. The space between the shield and the upper part of the eyes is also sparsely punctured. The puncturation of the mesonotum is closer and a little larger than in *Seyrigi*, the interspaces being for the greater part three to four times as wide as the punctures; the sides of the epinotum are closely striate over the posterior fourth and just below the upper margin, the rest being finely and sparsely punctured in the middle and impunctate in front. The dorsum and declivity of the epinotum have a sculpture like that of *Seyrigi*, except that the transverse rugae on the median area are closer together and more numerous.

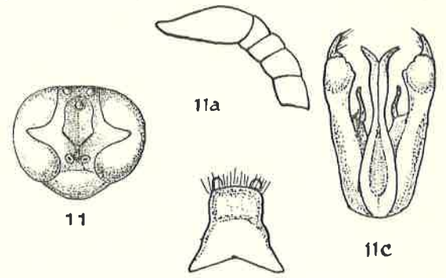


Fig. 11. *Trypoxylon sinuosiscutis* ♀ head, × 10; *a*, ♂, apical joints of the flagellum, × 35; *b*, eighth sternite, × 35; *c*, genitalia, × 35.

Clypeus nearly twice as wide as long, the apical margin feebly convex. The facial shield, measured from the anterior ocellus to the apex below, is a little longer than wide (the width being taken at the point where the lateral and lower margins meet). Its apex is blunt, the carinae forming the lower margins are sharp, but the other margins are rather feeble; the

lateral margins are incurved above and their junction with the lower margins is rounded, and there are no lateral carinae emitted into the ocular sinuses. The supra-antennal lamella is very small and the vertical carina connecting it with the apex of the shield is blunt.

Interocular distance on the vertex equal to a little more than the length of the first two joints of the flagellum, and only a trifle greater than the interocular distance across the base of the clypeus. Posterior ocelli separated from the eyes by a distance equal to a quarter of their own diameter. First joint of the flagellum a little wider than long, the second joint not quite three times as long as wide at the apex and only slightly longer than the third joint. Dorsum of the epinotum very little wider at the base than long, its apex deeply and triangularly depressed. First tergite from $5\frac{1}{2}$ to 6 times longer than wide at the apex, very feebly widened caudad, a little shorter than the second and third tergites united; the second tergite is nearly parallel-sided, about $2\frac{1}{3}$ times longer than wide and about one-fifth longer than the third, the latter about half as long again as wide behind. The second cubital and second discoidal cells are faintly indicated, the second recurrent vein meeting the first cubital cell close to its proximal angle. The second abscissa of the radius is a little more than twice as long as the first.

♂. 8–10 mm. long. Face and mesonotum a little more closely punctured than in the ♀. The hind tibiae brown above, yellowish brown below, ochreous at the extreme base and apex, the joints of the middle and hind tarsi brown, the fourth joint somewhat paler. Otherwise like the ♀ in colour, sculpture, pilosity and pubescence. Clypeus a little more than twice as wide as long, the apical margin less convex than in the ♀.

Interocular distance on the vertex equal to the length of the first three joints of the flagellum. Posterior ocelli separated from the eyes by a distance equal to half their own diameter. Second joint of the flagellum three times longer than wide at the apex, half as long again as the first and very little longer than the third; the apical joint moderately narrowed towards the apex, $2\frac{1}{2}$ times longer than wide at the base and only a little shorter than the four preceding joints united.

First tergite about $5\frac{1}{2}$ times longer than wide at the base, not nodose and not much widened at the apex, about as long as the two following tergites united; the second tergite is hardly wider at the apex than at the base, three times longer than wide at the base and not more than one-fourth longer than the third. The latter is nearly twice as long as wide at the apex. Seventh sternite with two stiff exserted hairs on each side of the apical margin, which is transverse; the eighth sternite is fringed with long pubescence at the apical margin and produced on each side into a short, rounded lobe. The outer paramera of the genitalia have a rostrate process on the outside at the apex and for a short distance behind that process are bullate.

Bekily, 10 ♂♂, 7 ♀♀; Behara, 1 ♂, 1 ♀. October to June.

According to M. Seyrig's observations this is a rubicolous species.

Trypoxylon scutifrons Sauss. (Figs. 12, 12 *a*)

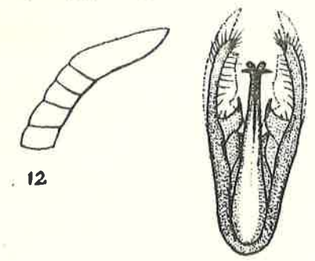
Hist. Madag. xx, p. 523 ♂, ♂, 1892

Of this species Saussure says that the petiole is as long as the second segment plus half of the third. In a long series of both sexes, which I identify with this species, the length of the first segment varies slightly, but in the majority it is equal to the length of the second segment plus two-thirds of the third. In spite of this discrepancy, I have no hesitation in identifying these specimens as *scutifrons*, since in every other particular they agree with Saussure's very exact description.

The genitalia of the ♂ are peculiar in having the outer paramera expanded on the upper surface into an excessively thin transparent membrane which extends beyond the chitinized

ventral part at the apex. The inner margin of the membrane at about the middle of the length of the stipes is so thin that even in Canada balsam preparations it is difficult to see where it ends. According to M. Seyrig's observations this is a terricolous species.

Bekily, Behara and Ivondro, 22 ♂♂, 21 ♀♀. October to March.



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12a

Fig. 12. *Trypoxylon scutifrons* ♂, apical joints of the flagellum, × 35; *a*, genitalia, × 35.

Subfamily PHILANTHINAE

Genus **Philanthus** Fab.

Key to the species

♂♂ and ♀♀

(4) 1. First abdominal segment subconical, longer than wide at the apex, the second segment in the middle twice as wide as the apical margin of the first.

(3) 2. Dorsum of the epinotum polished and impunctate, with a large fovea at its apex and without a clearly defined median area. Colour in greater part varying from ferruginous to castaneous, the abdomen usually darker than the rest of the body. Sulphur yellow markings are present on the head, pronotum, mesopleura, metanotum, epinotum and tergites 1, 2, 4 and 5. **Radamae** Arn. (p. 17)

(2) 3. Dorsum of the epinotum with a triangular area clearly defined by a difference of sculpture from the rest of the segment, the area itself very finely reticulose or areolate and with a greasy lustre. Colour in greater part black or reddish black, the head and pronotum with yellow and the tergites 1, 2 and 4 with yellowish white markings. **Ranavalonae** Arn. (p. 16)

(1) 4. First abdominal segment not subconical, its dorsal surface not much narrower in front than behind, the second segment at its widest much less than twice as wide as the first.

(6) 5. Triangular area of the epinotum coarsely reticulate-rugose, defined from the rest of the segment by a narrow and smooth margin. Thorax and abdomen in greater part black; in the ♀ with yellow marking only on the pronotum, in the ♂ on the pronotum and second tergite. **bimacula** Sauss. (p. 16)

(5) 6. Dorsum of the epinotum without a clearly defined triangular area, the sculpture being uniform all over. Head and thorax dark red and black, with pale yellow markings on the face, pronotum, scutellum and metanotum; abdomen for the greater part reddish yellow. **triangulum** F. (p. 15)

Philanthus triangulum F.

P. diadema F., *Hist. Madag.* xx, p. 534; Schulz, *Hymenopteren-studien*, p. 61, 1905.

In the collection there are 11 ♀♀ and 6 ♂♂ from Fort Dauphin, Bekily and Behara, accompanied by the prey. With one exception all these specimens differ from the form found on the mainland in having the mesonotum of a deep chestnut red colour (Seguy, C.U.C.

rouge 111), excepting sometimes a narrow median longitudinal strip which is black. But the exception, which like many of the other specimens was taken at Bekily, has the mesonotum black, with only the outer margins reddish. Since both forms occur in the same locality it does not seem necessary to give even varietal rank to the rufous one.

The prey consists of *Apis mellifera*, race *unicolor*.

diadema F. is only one of several colour varieties of *triangulum*, and, as Schulz rightly suggests, is a name which may very well be dropped from systematic works.

Philanthus bimacula Sauss. (Fig. 13)

Bull. Soc. Ent. Suisse, VIII, p. 261, ♂, 1891; *Hist. Madag.* XX, p. 535, ♂, 1892

P. immitis Sauss., *Hist. Madag.* XX, p. 537, ♀, 1892; Schulz, *Zool. ann.* IV, p. 173, 1911.

There are in the collection only 1 ♀ and 1 ♂, labelled 'Lab. Ent. Agr. Nanisana'. It is remarkable that a hymenopterologist so competent as Saussure should have failed to recognize the relationship of the sexes and described them as two species, although in his description of the ♂ he expressed the query as to whether they might not be the two sexes of a single species.

The following characters, not mentioned by Saussure, should be noted.

♀. The inferior interocular distance is two-thirds greater than the superior, and the latter is equal to a trifle more than the length of the first four joints of the flagellum. First tergite seven-tenths wider at the apex than long. The wings are hyaline, tinged with yellow, not hyaline-ferruginous as stated in Saussure's description, and the veins are flavo-ferruginous.

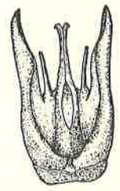


Fig. 13. *Philanthus bimacula* ♂, genitalia, × *c.* 27.

♂. Inferior interocular distance twice as great as on the vertex, where it is equal to the length of the first three joints of the flagellum plus half of the fourth. First tergite two-fifths wider at the apex than long.

By the shape and sculpture of the median area of the epinotal dorsum this species belongs to the *P. rugosus* Kohl group.

Philanthus Ranavalonae n.nov. (Fig. 14)

P. petiolatus Sauss., *Hist. Madag.* XX, p. 538, 1892.*
nec *P. petiolatus* Spin. 1841.

♀. Inferior interocular distance nearly twice as great as across the vertex, where it is equal to the length of the first four joints of the flagellum plus two-thirds of the fifth joint; the inner orbits are therefore widely divergent below. Posterior ocelli two-fifths farther from the eyes than from each other. Second joint of the flagellum three times longer than wide at the apex. First tergite a little more than twice as wide at the apex as at the base, and 1½ times longer than wide at the apex; second tergite twice as wide as long. Pygidial area triangular, the apex rounded, closely and shallowly punctured. Dorsum of the epinotum short, three times wider at the base than long, the triangular area covering the greater part of the dorsum, its lateral margins somewhat raised, clearly differentiated from the rest of the segment by its slightly shining surface and by its microscopically reticulate-rugulose sculpture. Anterior tarsi with six spines on the basal joint; hind tibiae with six serrations on the outer margin.

* By art. 36 International Rules of Zoological Nomenclature this is a primary homonym, even though Spinola's species has been transferred to the genus *Trachypus*.

♂. Posterior ocelli as far from the eyes as from each other. Second joint of the flagellum 2⅓ times longer than wide at the apex and as long as the third and fourth united. Interocular distance on the vertex nearly equal to the length of the first four joints of the flagellum, and only half as great as the inferior interocular distance. Apical margin of the seventh sternite bidentate and arcuately emarginate between the teeth.

Fianarantsoa, 1 ♀; Ankaratra, 1 ♂; Ambositra, 4 ♂♂.

The wings in both sexes are hyaline, tinged with yellow, particularly the radial cell, not ferruginous as stated in Saussure's description.

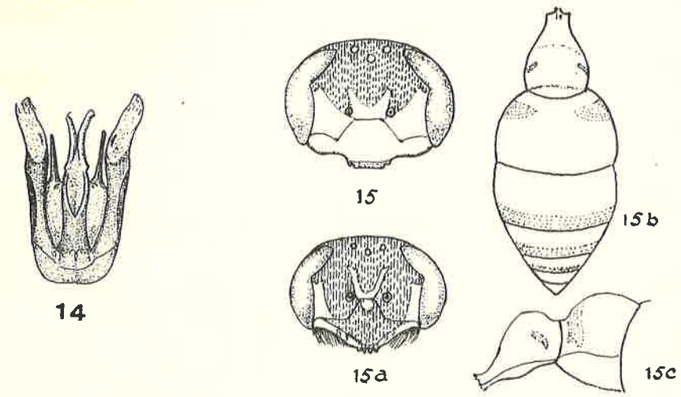


Fig. 14. *Philanthus Ranavalonae* ♂, genitalia, × *c.* 27.

Fig. 15. *Philanthus Radamae* ♀, head, × 9; *a*, ♂, head, × 9; *b*, abdomen, × 9; *c*, first two abdominal segments, lateral view, × 9.

Philanthus Radamae n.sp. (Figs. 15, 15 *a–d*)*

♀. 9–11 mm. long. Chestnut red (Seguy, C.U.C. rouge 126), the vertex and sides of the thorax palest, the dorsum of the epinotum usually darker, sometimes almost fusco-ferruginous, the tergites of a darker shade than the mesonotum. The following parts are sulphur yellow: mandibles excepting the fusco-ferruginous apex, clypeus, lower half of the face (reduced in the middle between the antennae to a V-shaped mark), the inner side of the scapes, a line extending from the cheeks to the hind margin of the occiput, two small spots, sometimes absent, behind the posterior ocelli, pronotal collar, upper half of the pronotal tubercles, a lozenge-shaped macula on the upper part of the mesothoracic episternum, a broad triangular macula on the mesopleura, the scutellum excepting its margins, its cuneoli, the metanotum, the declivity of the epinotum excepting a narrow line in the middle and its lower third, an oblong pre-apical spot on each side of the first tergite, a macula on each side of the base of the second tergite, narrowed mesad and continued laterad and caudad, the apical margin of the third and fourth tergites and a median basal spot on the sixth tergite. The fifth and sixth tergites pale brownish ochreous. A transverse median and sinuous band on the second sternite, the basal half of the third and the whole of the remaining sternites are pale sulphur yellow.

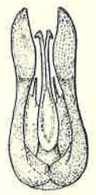
The following parts are yellowish white: a spot on the tegulae, the axillary sclerite, the posterior half of the propleura, the underside of the coxae, apex of the anterior trochanters,

* Radama I, King of the Hova, 1810–28.

underside of the middle and hind trochanters, underside of the anterior femora, the outer and inner sides of the anterior tibiae, the underside of the middle femora and the middle and hind tibiae on the outside. The first three joints of the tarsi are yellowish white, the last two pale ferruginous. Flagellum ferruginous, the sixth to tenth joints fuscous. Wings hyaline, tinged with yellow, the pterostigma and veins ochreous, the costa and subcosta fusco-ferruginous. There is a short and very inconspicuous whitish pubescence on the thorax and abdomen. The hind femora have a row of long white hairs on the underside. Clypeus shining, very sparsely punctured. The yellow parts of the face are also shining, sparsely punctured at the sides, closely and more finely in the middle. The rest of the face, as far as the posterior ocelli, dull, very finely reticulate-punctate, the vertex and temples shining, the former and the upper part of the temples rather coarsely punctured, the lower part of the temples very sparsely and finely punctured. Pronotal dorsum, metanotum and epinotal dorsum impunctate, the sides of the pronotum dull and striolate, mesonotum and meso-pleura sparsely, irregularly and coarsely punctured, the largest punctures, which are on the front of the mesonotum, about one-third of the width of the anterior ocellus. Metapleura punctulate. Sides of the epinotum obliquely striate and fairly dull, the declivity finely punctured at the sides. The whole thorax, excepting the sides of the pronotum and epinotum, shining. First abdominal segment shining, sparsely punctured, the punctures about as large as those of the scutellum, the remaining tergites with a fundamental rugulose sculpture and moderately shining, the second to fourth finely and not closely punctured, somewhat sparsely at their base, the punctures a little smaller than those on the first, the fifth tergite with a few large punctures. Sternites with a sparse and shallow puncturation.

Clypeus a little more than 2½ times wider than long, the median area with a very short rectilinear lobe and a small tooth on each side of it, the extreme apical margin of the clypeus ferruginous. Interocular distance across the clypeus nearly twice as great as on the vertex, where it is equal to the length of the first four joints of the flagellum. Posterior ocelli as far from the eyes as from each other. Second joint of the flagellum 1½ times longer than wide at the apex, and by the same amount longer than the third joint. Dorsum of the epinotum three times wider at the base than long, the median area with an ovoid, shallow and apical fovea; the declivity with a median longitudinal sulcus. First tergite three-eighths longer than wide at the apex, twice as wide there as at the base; second tergite twice as wide as long. Abdomen widest across the third segment. Comb of the anterior tarsi with six spines on the basal joint.

♂. 8–10 mm. long. The ground colour is like that of the ♀ but darker, especially on the vertex and on the second to fifth tergites where it is often almost dark brown. On the face and clypeus the yellow markings are: a narrow apical band, sometimes broken into spots, and a basal spot on the clypeus, a V-shaped mark between the antennae, and a fairly broad streak on the sides of the face as far as the ocular sinus, sometimes reduced to one or two small spots. The yellow markings on the scutellum are sometimes absent, the yellow bands on the sternites are narrower than in the ♀, that of the second sometimes obsolete or reduced to a spot. The apical half of the sixth tergite and the whole of the seventh are reddish ochreous. Otherwise the yellow markings on the body are as in the ♀. The clypeus and lower half of the sides of the face are nearly dull, finely and closely punctured. Vertex dull, nearly as closely punctured as the face, but a little less finely. The puncturation on the mesonotum and mesopleura is slightly larger than in the ♀, on tergites 2–4 larger and closer, the interspaces there being hardly wider than the punctures. Otherwise like the ♀ in sculpture and pubescence, but the hind femora have no long hairs on the underside.



15d

Fig. 15. *d*, ♂, genitalia, × 30.

Median area of the clypeus well defined, a little longer than wide, hexagonal, its apical margin quadridentate. Interocular distance across the clypeus two-thirds greater than on the vertex, where it is equal to the length of the first four joints of the flagellum plus half of the fifth joint. Posterior ocelli a little farther from each other than from the eyes. Second joint of the flagellum three times longer than wide at the apex and nearly 2½ times longer than the third; the apical joint a little longer than wide at the base and obliquely truncate on both sides at its apex. Cheeks as long as the first joint of the flagellum. Dorsum of the epinotum twice as wide at the base as long, the declivity with a much deeper median impression than in the ♀. First tergite one-third longer than wide at the apex. Seventh sternite angularly emarginate at the apex.

Bekily, 11 ♀♀, 17 ♂♂; Behara, 10 ♀♀, 1 ♂. October and November, June and July.

The prey consists of species of *Trigona*, *Halictus* and *Prosopis*.

Subfamily CERCERINAE

Genus **Cerceris** Latr.

This genus is one of the richest in species of the Madagascan Sphecidae. Not counting the insufficiently described *argentifrons* Guérin, Saussure described seventeen valid new species to which can now be added a further ten from the Seyrig collection. There are also 4 ♂♂, representing as many species, which I have not described in the absence of the other sex.

It should be noted that in the following descriptions the number of serrations on the hind tibiae refers only to the unispinose serrations, and does not include the basal multiciliate tubercle nor the multispinose pre-apical expansion (see Fig. 1, Part XV, p. 136, in my monograph of the Ethiopian Sphecidae, *Ann. Transv. Mus.* XIV, 1931). It is evident from some of his descriptions that Saussure included the basal tubercle as a serration.

In the following keys to the species, *argentifrons* Guér. and *spirans* Sauss. have been omitted, as they are not represented in the collection. The key to the ♂♂ is obviously artificial, since it is evident that those species which have the outer paramera of the genitalia armed with a spine on the inner margin are more closely related to one another than to the other species. The ♂♂ of this genus are more difficult to separate on external characters than the ♀♀, and the reader, when using the key, should therefore refer to the figures of the genitalia, which in combination with the other characters will make identification much easier.

Key to the species

♀♀

(2) 1. Median area of the clypeus simple, flat or feebly convex at the base and slightly concave just behind the apical margin, not projecting much beyond the lateral sclerites, its apical margin transverse and entire. **nenitra** Sauss. (p. 42)

(1) 2. Median area of the clypeus not simple.

(10) 3. Median area of the clypeus projecting by about one-third of its length beyond the lateral sclerites, its anterior margin not transverse.

(7) 4. Median area of the clypeus with a conical or angular protuberance.

(6) 5. The protuberance, seen from above, is V-shaped and hollowed out; below it, the anterior margin is bidentate in the middle. Frontal carina produced into a spine. First tergite a little wider than long. **perfida** Sauss. (p. 23)

(5) 6. The protuberance is conical, convex transversely above, somewhat compressed transversely below the upper surface and carinate; the anterior margin below the protuberance is arcuately emarginate in the middle and indistinctly sinuate on each side. Frontal carina triangular in profile. First tergite as wide as long. **Seyrigi** Arn. (p. 27)

(4) 7. Median area of the clypeus without a basal protuberance, but sloping gradually forwards and upwards towards the apex.

(9) 8. Median area of the clypeus distinctly wider at the apex than at the base, its apical margin arcuately emarginate in the middle and sinuate on each side, the lateral sclerites produced into a triangular tooth. First tergite wider than long. **lateridentata** Arn. (p. 26)

(8) 9. Median area of the clypeus not much wider at the apex than at the base, the apical margin obtusely angular in the middle and rounded at the lateral angles; behind the apex there is a shallow triangular excavation in the middle, the lateral sclerites are obtusely bi-angulate. **paleata** Sauss. (p. 24)

(3) 10. Median area of the clypeus projecting by considerably less than one-third of its length beyond the lateral sclerites.

(12) 11. Median area of the clypeus flat at the base and with about two-fifths of its length inflected apically, the upper margin of the inflected part arcuate and ending on each side in a broad, truncate tooth; labrum very large and bidentate. **clypearis** Sauss. (p. 22)

(11) 12. Median area of the clypeus differently formed.

(20) 13. Median area of the clypeus with more or less of its basal part raised and protruding, and overhanging the anterior part; seen from in front it is like a transversely convex plate with a free anterior margin (the pre-apical margin), and seen from the side it is more or less nasiform.

(15) 14. The protuberance is more than twice as wide in front as long, the pre-apical margin with a small median excision; the apical margin is trituberculate. First tergite distinctly wider than long. **Duchesnei** Arn. (p. 31)

(14) 15. The protuberance of the clypeus is as long as wide in front, or longer.

(19) 16. The protuberance is broadly triangular in profile, its ventral surface almost flat. First tergite longer than wide.

(18) 17. The protuberance, seen from above, is rounded at its apex and about as long as wide at the base. First tergite nearly 1½ times longer than wide. **Gallienii** Arn. (p. 32)

(17) 18. The protuberance, seen from above, truncate at the apex and wider at the base than long. First tergite one-fourth longer than wide. **Augagneuri** Arn. (p. 34)

(16) 19. Protuberance of the clypeus, seen in profile, having the shape of a curved, broad-based spine, obliquely truncate at the apex, straight above and concave below. First tergite wider than long. **Rasoherinae** Arn. (p. 29)

(13) 20. Median area of the clypeus without a basal protuberance.

(30) 21. Median area of the clypeus with a very short inflected anterior portion, so that the pre-apical margin is very close to the apical.

(25) 22. First tergite twice as long as wide at its widest and with a more or less triangular yellowish macula near the apex. Lower margin of the temples, and of the occiput, armed with a tooth.

(24) 23. Pre-apical margin of the clypeus with a small median tooth which projects a little beyond the apical margin. Clypeus fusco-ferruginous. **petiolata** Sauss. (p. 38)

(23) 24. Pre-apical margin of the clypeus without a median tooth, divided by two small excisions into three parts. Clypeus yellow. **xanthostigma** Arn. (p. 39)

(22) 25. First tergite much less than twice as long as wide.

(27) 26. Small species, 6·5–7·5 mm. long. Triangular area of the epinotum smooth and shining. Tegulae in greater part yellowish white. **albotegulata** Arn. (p. 40)

(26) 27. Larger species, 7·3–10·5 mm. long. Triangular area of the epinotum not smooth and shining.

(29) 28. Apical margin of the fifth sternite produced in the middle and obtusely bidentate (Fig. 25 *b*). First tergite wider than long. Triangular area of the epinotum coarsely punctured. **dentiventris** Arn. (p. 35)

(28) 29. Apical margin of the fifth sternite simple. First tergite longer than wide. Triangular area of the epinotum longitudinally costate and punctured. **aemula** Arn. (p. 37)

(21) 30. Median area of the clypeus without an inflected anterior part, merely convex lengthwise and transversely; with two small and widely separated teeth at about one-third of its length from the anterior margin. The latter is bluntly dentate on each side. **formidolosa** Sauss. (p. 41)

♂♂

A. Triangular area of the epinotum smooth and shining, grooved down the middle.

(2) 1. Small species, 6–7 mm. long, shining. Second and third tergites with yellow or yellowish white maculae at the sides, the second also with a median transverse macula at the base. **albotegulata** Arn. (p. 40)

(1) 2. Larger species, more than 7 mm. long. Second tergite without a median basal yellow macula.

(4) 3. First tergite 1½ times longer than wide, widest a little caudad of the middle. Outer paramera of the genitalia with a spine on the inner upper margin (Fig. 23 *f*). **Gallienii** Arn. (p. 32)

(3) 4. First tergite one-fourth longer than wide, or as long as wide, or wider than long. Outer paramera of the genitalia without a spine.

(6) 5. Thorax fusco-ferruginous, the pronotum paler, without yellow markings. 12·5–14 mm. long. (First tergite one-fourth longer than wide.) **clypearis** Sauss. (p. 22)

(5) 6. Thorax in greater part black, the pronotum and metanotum, and sometimes also the scutellum and epinotum, with yellow markings.

(8) 7. First tergite one-fourth wider than long; head, seen from in front, considerably wider than long (Figs. 21 *d*, *e*). **Rasoherinae** Arn. (p. 29)

(7) 8. First tergite as long as wide; head, seen from in front, less than one-fourth wider than long (Figs. 22 *d*, *e*). **Duchesnei** Arn. (p. 31)

B. Triangular area of the epinotum longitudinally or obliquely rugose or costate, without distinct punctures.

(2) 1. First tergite with a yellow apical band, the sixth sometimes with a very narrow one, the other tergites without yellow markings. The outer paramera without a spine on the inner upper margin (Fig. 30 *b*). 10·5–14 mm. long. **formidolosa** Sauss. (p. 41)

(1) 2. First and third, or the first three, or the first, third and fourth tergites with yellow markings. Outer paramera of the genitalia with a spine on the inner upper margin.

(4) 3. Third and fourth tergites, excepting the extreme base and apex, chrome yellow. First tergite longer than wide (Fig. 18 *c*). **paleata** Sauss. (p. 24)

(3) 4. Third and fourth tergites with only narrow yellow bands. First tergite about as long as wide.

(6) 5. Tegulae with a curved carina near the outer margin (Fig. 17 *c*). **perfida** Sauss. (p. 23)

(5) 6. Tegulae without a carina. **lateridentata** Arn. (p. 26)

C. Triangular area of the epinotum transversely costate or rugose, punctured in between, its lateral margins not distinctly delimited from the rest of the epinotal dorsum. Second tergite with a yellowish transverse macula near the base. Outer paramera of the genitalia without a spine (Figs. 31 *b*, *c*). **nenitra** Sauss. (p. 42)

D. Triangular area of the epinotum transversely costate at the sides and with two longitudinal costae in the middle, the lateral margins clearly defined. Outer paramera of the genitalia not spined. First tergite longer than wide, widest a little behind the middle (Figs. 26 *a*, *d*). **aemula** Arn. (p. 37)

E. Triangular area of the epinotum striate at the sides, punctured in the middle. First tergite longer than wide. Outer paramera of the genitalia with a spine on the inner upper margin (Figs. 24 *b*, *c*). **Augagneuri** Arn. (p. 34)

F. Triangular area of the epinotum punctured only.

(2) 1. Triangular area of the epinotum closely and coarsely punctured. First tergite barely wider at the apex than at the base. Apical joint of the flagellum acuminate. Outer paramera of the genitalia not spined (Figs. 25 *d*, *e*). **dentiventris** Arn. (p. 35)

(1) 2. Triangular area of the epinotum sparsely and not very coarsely punctured. First tergite clearly wider near the apex than at the base. Apical joint of the flagellum curved and obliquely truncate. Outer paramera of the genitalia with a spine on the inner upper margin (Figs. 20 *d*, *e*). **Seyrigi** Arn. (p. 27)

G. Triangular area of the epinotum dull, very finely coriaceous. First tergite more than twice as long as wide and 1½ times longer than the second tergite. **petiolata** Sauss. (p. 38)

Cerceris clypearis Sauss. (Figs. 16, 16 *a–f*)

Soc. Entom. II, p. 25, ♀, 1887; *Hist. Madag.* XX, p. 541, ♀, 1892

♀. 15–21 mm. long. Basal half, more or less, of the median area of the clypeus nearly flat, the anterior half arcuately inflected. The upper margin of this arcuate area, the pre-apical margin, ends on each side in an obliquely truncated tubercle. The length of the median area is a little shorter than the width between the tubercles (in Fig. 16 it appears greater, which is due to fore-shortening, consequent on the angle at which the drawing is made). Just below the tubercles the apical margin is produced into a tooth on each side. The labrum is very large, not unlike that of *C. multipicta* Smith, and has a short triangular tooth on each side a little above the middle. Interocular distance on the vertex equal to the length of the first five joints of the flagellum plus half of the sixth, and equal to about two-thirds of the inferior interocular distance. Temples as wide as the eyes. Second joint of the flagellum $2\frac{1}{2}$ times longer than wide at the apex and one-fourth longer than the third. Triangular area of the epinotum one-fourth wider at the base than long. First tergite as long as wide behind, slightly wider there than at the base. Pygidial area seven-ninths longer than wide, slightly narrowed at the base, the apical margin moderately convex. Comb of the anterior tarsi short, the basal joint with eight or nine spines. Hind tibiae with eight serrations. Mesopleura with one small tooth.

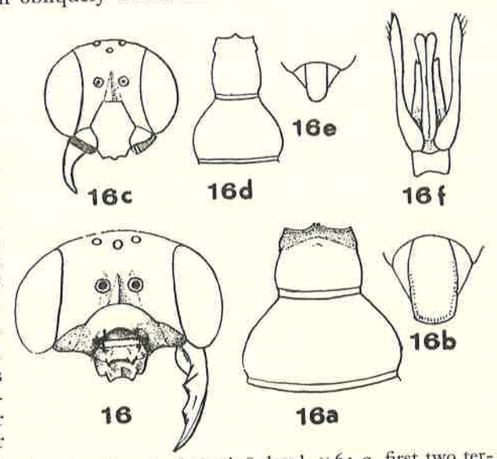


Fig. 16. *Cerceris clypearis* ♀, head, × 6; *a*, first two tergites, × 6; *b*, pygidium, × *c.* 14; *c*, ♂, head, × 6; *d*, first two tergites, × 6; *e*, pygidium, × 6; *f*, genitalia, × *c.* 14.

♂. 12·5–14 mm. long. (hitherto undescribed). Clypeus, frontal triangle and sides of the face yellow. The rest of the head, the thorax, first abdominal segment and base of the second, burnt sienna red (Seguy, C.U.C. rouge 81), the pronotum usually paler than the rest. Abdominal segment 2–5 dark brown, sometimes brownish black, in which case the thorax, or at least the mesonotum, is also of the same colour. Sixth and seventh abdominal segments varying from flavo-ferruginous to ferruginous, at least paler than the thorax. Tergites 2–5 with narrow yellow apical bands. Legs burnt sienna red. Upper side of the flagellum of the same colour as the vertex, paler below, especially the last two joints. Wings not like those of the ♀ but hyaline, tinged with yellow, slightly smoky at the apex. Pygidium sparsely and coarsely punctured, the tumid areas of the sternites shining, with a sparse and shallow puncturation, otherwise the sculpture is like that of the ♀, but the tergites, relatively to the size, are more coarsely punctured. Median area of the clypeus subhexagonal, one-third longer than wide, the lateral margins of the anterior half incurved, the apical margin tridentate. Second joint of the flagellum not quite three times longer than wide at the apex and one-third longer than the third joint; the apical joint curved, twice as long as wide and truncated at the apex. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth. Temples half as wide as the eyes. First tergite one-fourth longer than wide. Posterior tibiae with six feeble serrations. The inner paramera of the genitalia lie ventrad to the penis and appear to be fused at their base, at least they cannot be separated from the penis under pressure.

Behara, Bekily and Antanimora, 15 ♀♀, 12 ♂♂. December and January.

The prey consists of various Curculionid beetles.

Cerceris perfida Sauss. (Figs. 17, 17 *a–d*)

Mitt. Schweiz. Ent. Ges. VIII, p. 262, ♀, ♂, 1891

C. spinifrons Sauss., *Mitt. Schweiz. Ent. Ges.* VIII, p. 262, ♂, 1891; *Hist. Madag.* XX, p. 549, ♀, 1891.

♀. 5–13·5 mm. long. Saussure's very detailed description applies only to the largest examples, but even in them the thorax is not quite black, but shows a reddish tinge. In some slightly smaller specimens the thorax is dark reddish brown, and sometimes also the abdomen, but usually the epinotum, excepting its triangular area, is paler than the rest of the thorax, or ferruginous. The triangular area varies in colour from reddish brown to black. However, it is on the face that there is the greatest range of variation in colour. In the smallest specimens the basal part of the mandibles, the clypeus except at the margins, the frontal triangle and narrow lines adjacent to the eyes are a dull straw yellow, while in specimens of intermediate size, that colour is more or less absent from the anterior half of the clypeus. Correlated with a decrease in size is a shortening of the pre-apical tooth of the median area of the clypeus, which is also less acute than in the larger specimens. Saussure omitted to mention that the pronotal dorsum, metanotum and the underside of the fore and middle femora are pale yellow.

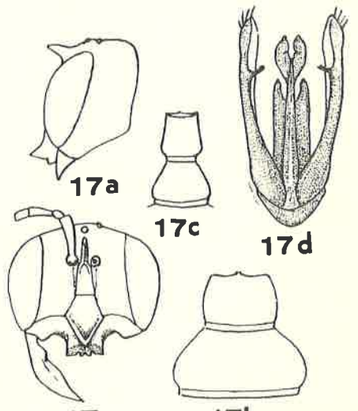


Fig. 17, *a*. *Cerceris perfida* ♀, head, × *c.* $7\frac{1}{2}$; *b*, first two tergites, × *c.* $7\frac{1}{2}$; *c*, ♂, first two tergites, × *c.* $7\frac{1}{2}$; *d*, genitalia, × 30.

Interocular distance on the vertex nearly equal to the length of the first five joints of the flagellum. The degree of divergence on the inner orbits is slightly variable; in some specimens the inferior interocular distance (across the base of the clypeus) is equal to the superior, in others it is slightly greater. The median area of the clypeus is three-eighths longer than wide at the apical margin. The latter has two small and blunt teeth below the pre-apical tooth, and its outer angles are rectangular. The antennae are inserted rather high up on the face; the second joint of the flagellum is three times longer than wide at the apex and half as long again as the third. Temples obtusely angular at their widest point and a little wider there than the eyes. In the smaller specimens this angle is less pronounced. Triangular area of the epinotum not quite twice as wide as long, longitudinally or slightly obliquely costate, transversely so at the apex. First tergite slightly wider than long. Pygidial area subelliptical, twice as long as wide. Mesopleura with a small tooth, the crest in front of the middle coxae subdentate. Metapleura feebly and transversely rugose and punctulate. Basal joint of the anterior tarsi with six spines on the outer margin; the posterior tibiae with five serrations.

♂. 7·5–10 mm. long. The colour is even more variable than in the ♀. As a matter of convenience I describe as the typical form that one which most closely resembles the type

of the species, although it is not in the majority amongst the twenty-five specimens in the collection:

(*a*) Clypeus, frontal triangle and carina, pale yellow, the rest of the head fusco-ferruginous, the vertex in front of the anterior ocellus almost black. Pronotum above and the seventh abdominal segment fusco-ferruginous, the first three tergites and the second and third sternites with narrow pre-apical yellow bands, the rest of the thorax and abdomen black. Anterior and middle tibiae and tarsi and the posterior tarsi fusco-ferruginous, the rest of the legs entirely black. Antennae black above, fusco-ferruginous below. Wings hyaline, slightly tinged with brown, the costa and pterostigma ochreous, the other veins brown.

The following are other colour varieties:

(*b*) Like (*a*) but the second to seventh abdominal segments are fusco-ferruginous.

(*c*) Like (*a*) but only the last two abdominal segments ferruginous; sides of the face sometimes with yellow markings.

(*d*) The head, thorax and abdomen ferruginous, the latter darker than the thorax, the triangular area of the epinotum more or less black.

Clypeus and the whole of the face up to a little above the antennal sockets, the underside of the fore and middle femora, coxae and spots on the middle of the sternum pale yellow, or yellowish white. Fore and middle metatarsi whitish. The first six tergites with narrow apical yellow bands.

Lateral sclerites of the clypeus very finely and closely punctured, the median area shallowly and less finely so, the triangular area of the epinotum as in the ♀, the metapleura a little more strongly rugose than in the ♀. Tumid areas of the sternites shining, shallowly, very finely and sparsely punctured. Otherwise the whole body, excepting the face and last three tergites, is strongly, deeply and closely punctured. Mandibles with a blunt tooth near the base of the inner margin. Inner orbits equally divergent above and below. Median area of the clypeus subhexagonal, nearly twice as long as wide, the apical margin tridentate. Interocular distance on the vertex nearly equal to the length of the first four joints of the flagellum. The second joint of the flagellum is nearly three times longer than wide at the apex. Frontal carina not produced into a porrect spine like that of the ♀, merely acutely angular. Tegulae with a curved carina near the outer margin. First tergite as long as wide, the sides parallel or feebly convex. The stipites have a rounded spine on the inside at about one-third of their length from the apex.

Bekily and Fort Dauphin, 13 ♀♀; Antsirabé, Behara and Bekily, 25 ♂♂. October to January. The darker coloured ♂♂ are all from Antsirabé.

Cerceris paleata Sauss. (Figs. 18, 18 *a–d*)

Mitt. Schweiz. Ent. Ges. VIII, p. 262, ♀, 1891; *Hist. Madag.* XX, p. 543, ♀, 1892

C. carnaria Sauss., *Hist. Madag.* XX, p. 545, ♂, 1892.

As Saussure suspected, *carnaria* is undoubtedly the ♂ of *paleata*. There is a pair of this species in the collection, and although the ♀ differs in colour from that of the type, I have no doubt that it is correctly identified, on account of the structural characters. I append, however, a full description of this specimen, which differs from Saussure's type only in having no yellow on the vertex and occiput and no yellow band on the third tergite.

♀. 12·5 mm. long. Mandibles fusco-ferruginous brownish yellow on the outside at the base. Head black with a reddish tinge at the sides of the face on the vertex between the ocelli and eyes and on the base of the temples. Frontal triangle yellow. First three joints of the antennae fusco-ferruginous, the rest black. Thorax black, the pronotal collar, scutellum and metanotum pale chrome yellow. Abdomen brownish black, a pre-apical band and the

sides of the first tergite yellow. Coxae, trochanters and femora black, the tibiae and tarsi fusco-ferruginous. Wings hyaline, tinged with brownish yellow, the pterostigma, costa and subcosta reddish ochreous. Clypeus slightly shining, punctulate, the median area with a few larger punctures. Face dull and closely punctulate, with a sparse, shallow and larger puncturation superimposed. Vertex and temples dull, closely punctured, the punctures about one-fourth as wide as the anterior ocellus. Thorax dull. Dorsum of the pronotum, scutellum and metanotum rather sparsely punctured, the punctures a little larger than those of the vertex, metapleura sparsely and transversely rugulose, the triangular area of the epinotum longitudinal costate, and transversely rugose in its apical angle, the rest of the thorax reticulate-punctate, more coarsely on the epinotum than elsewhere, the punctures on the mesonotum and scutellum nearly half as wide as the anterior ocellus. Tergites 1–5 and the tumid areas of the sternites dull, with a close and fine fundamental puncturation on which is superimposed on the tergites, a larger one, which becomes progressively shallower and less close caudad; this puncturation is largest on the first two tergites. Pygidial area vermiculate-rugose.

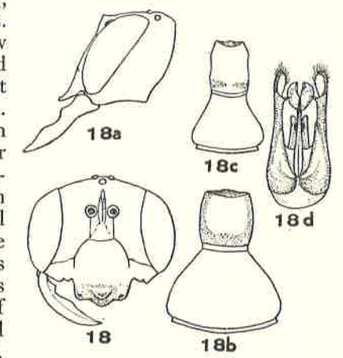


Fig. 18, *a*. *Cerceris paleata* ♀, head, × 8; *b*, first two tergites, × 8; *c*, ♂, first two tergites, × 8; *d*, genitalia, × 17½.

Median area of the clypeus one-fourth longer than wide at the anterior margin, extending by about one-third of its length beyond the lateral sclerites, flat for the greater part of its length but rising upwards towards the apex, the apical margin obtusely angular in the middle, its lateral angles acute, and with a triangular depression behind the apex. Inferior interocular distance one-fifth greater than on the vertex, where it is equal to the length of the first five joints of the flagellum. Frontal carina triangular in profile, flattened above, and when viewed from above having the appearance of a spine between the antennae. The latter are slender, the second joint of the flagellum 2⅜ longer than wide. Posterior ocelli three-fifths farther from the eyes than from each other. Temples broad, at their widest nearly twice as wide as the eyes, their posterior margin obtusely angular at about the middle. Shoulders of the pronotum oblique. Triangular area of the epinotum twice as wide at the base as long. Mesopleura armed with a very small tooth below. First tergite slightly longer than wide, barely narrowed cephalad, the sides feebly convex, somewhat flattened above. Pygidial area twice as long as wide, the lateral margins feebly convex, the apical margin rounded. Basal joint of the anterior tarsi with six spines on the outer margin, the posterior tibiae with five serrations. Third cubital cell long, nearly twice as long on the cubitus as high.

♂. 10·5 mm. long. Mandibles with a tooth on the inner margin near the base. Median area of the clypeus distinctly convex, subhexagonal, nearly 1½ times longer than wide, the apical margin almost straight, very feebly angular in the middle. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth. The second joint is 2½ times longer than wide at the apex and not quite one-third longer than the third; the apical joint is obliquely truncate below and not longer than the preceding joint. Triangular area of the epinotum slightly wider at the base than long. First tergite nearly half as long again as wide, the sides slightly sinuate in the middle. Posterior tibiae with five serrations.

Rogez, 1 ♀; Perinet 1 ♂.

Cerceris lateridentata n.sp. (Figs. 19, 19 *a–d*)

♀. 14–15 mm. long. Black. The head very dark ferruginous, with the lower part of the face adjoining the clypeus, the frontal triangle and carina, a band on the vertex across the ocellar area and the posterior half of the temples, black.

The pronotal dorsum except its middle, sometimes the pygidium, the tibiae, tarsi, scapes and tegulae fusco-ferruginous. Mandibles reddish, yellow at the base. First tergite with a pre-apical yellow band which extends along the sides to the base. Wings pale flavo-hyaline, the fore wing faintly smoky in the medial cell and at the extreme apex, the veins and pterostigma reddish yellow. Lateral sclerites of the clypeus dull, very finely and closely punctured, the median area slightly glossy, rugulose-punctate and with a few larger punctures behind the anterior margin. The rest of the head dull, sparsely punctured on the face, very closely elsewhere, the punctures about one-fourth as wide as the anterior ocellus, the interspaces punctulate. Thorax dull. Anterior face of the pronotum transversely, arcuately rugose, the metanotum finely and sparsely punctured, the metapleura transversely rugulose, the triangular area of the epinotum longitudinally costate, the rest of the thorax strongly reticulate-punctate, the punctures largest on the epinotum where they are about half as wide as the anterior ocellus. Tergites 1–4 dull, a little less closely and less deeply punctured than the mesonotum, the fifth tergite shallowly, sparsely and more finely punctured than the basal tergites. Pygidial area dull, vermiculate-rugose. Sternites very finely punctured, the basal areas with a few large punctures at the sides.

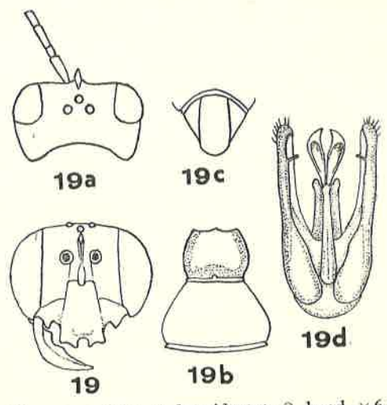


Fig. 19, *a*. *Cerceris lateridentata* ♀, head, ×6; *b*, first two tergites, ×6; *c*, pygidium, ×6; *d*, ♂, genitalia, ×24.

The median area of the clypeus extends beyond the lateral sclerites by about one-third of its length and is fairly flat over the greater part of its length but is slightly raised anteriorly; the apical margin is deeply excised in the middle and its outer corners are subrectangular, and the lateral sclerites are produced into a stout triangular tooth on the anterior margin. Inner orbits moderately divergent below. Interocular distance on the vertex equal to the length of the first four joints of the flagellum. The flagellum is fairly slender, the second joint is three times longer than wide at the apex and nearly half as long again as the third. The frontal carina forms a transversely compressed and triangular tooth, its dorsal surface flattened and lanceolate. Posterior ocelli one-fourth farther from the eyes than from each other. Temples at their widest a little wider than the eyes, their posterior margin obtusely angular. Mesopleura with a small tooth below. Triangular area of the epinotum twice as wide at the base as long. First tergite a trifle wider than long, widest behind the middle, the sides convex, not much narrowed in front. Second tergite a little longer than the first, twice as wide at the apex as at the base. Pygidial area subelliptical, twice as long as wide, the apical margin convex. Comb of the anterior tarsi short, the basal joint with seven spines on the outer margin; posterior tibiae with seven serrations.

♂. 10·5–11 mm. long. Black. The following parts pale yellow: clypeus and bottom of the face as far as the antennal sockets, a streak on each side of the pronotal dorsum, the metanotum, the posterior and lateral margins of the first tergite, an apical transverse band on the third tergite, a basal one on the third sternite, an apical band on the sixth tergite,

sometimes absent, the underside more or less of the femora and of the middle and hind coxae and trochanters. Fore and middle tarsi straw yellow, the apex of each joint reddish, the hind tarsi pale brown. Tegulae, and sometimes the seventh abdominal segment and the apical half of the sixth, fusco-ferruginous. Wings very pale fuscous, darker at the apex and on the radial cell than elsewhere.

Clypeus and yellow parts of the face dull and sparsely punctured; median area of the epinotal dorsum obliquely costate at the base, transversely so in the apical angle. Otherwise the sculpture is like that of the ♀. Mandibles with a small tooth at the base of the inner margin. Median area of the clypeus feebly convex, half as long again as wide, subhexagonal; there is a fuscous transverse impression behind the straight anterior margin and the lateral sclerites are simple, not produced into a tooth as in the ♀. Frontal carina not dentiform. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth. Antennae slender as in the ♀ and fairly long, the second joint $2\frac{1}{2}$ times longer than wide, one-third longer than the third joint, the apical joint obliquely truncate below, twice as long as wide at the base and a little longer than the preceding joint. Temples two-thirds as wide as the eyes. Shoulders of the pronotum angular. Mesopleura unarmed.

First tergite as long as wide. Pygidial area sparsely and coarsely punctured, the lateral margins feebly convex, the apical margin transverse. The stipites of the genitalia, as in the preceding species, are semi-cylindrical, with only the dorsal half chitinized; the inner margin of that part is produced at a short distance behind the apex into a short, thin rod.

Ivondro, Perinet and Rogez, 2 ♀♀, 5 ♂♂. December to March.

Cerceris Seyrigi n.sp. (Figs. 20, 20 *a–e*)

♀. 11·5 mm. long. Apical third of the mandibles fusco-ferruginous, the basal two-thirds yellow. Clypeus, excepting the extreme apical margin and the apex of the median conical protuberance which are reddish, and the face up to the level of the antennal sockets and the frontal carina, chrome yellow, the rest of the head pale ferruginous (Seguy, C.U.C. rouge 111). Dorsum of the pronotum, the tegulae, excepting the margins, metanotum and a small spot at the bottom of the sides of the epinotum, chrome yellow. Sides of the pronotum in front, the mesonotum and scutellum ferruginous (Seguy, C.U.C. rouge 116), the rest of the thorax black. First tergite over the anterior two-thirds and at the extreme hind margin black, the sides yellow, the rest of the segment black. Second and third tergites ferruginous, the third with a yellow apical band moderately dilated laterad, the remaining tergites brownish black. First sternite pale yellow, the base blackish, second sternite pale yellow, the sides and apical margin ferruginous, third sternite fusco-ferruginous and with a large pale yellow macula on each side of the tumid area, the remaining sternites brownish black. Flagellum ferruginous below, reddish brown above. Femora blackish, the fore and middle pairs with a yellow streak on the outside below the apex, the tibiae and tarsi ferruginous. Wings pale flavo-hyaline, the pterostigma and costa yellowish red, the other veins pale reddish brown, the apex slightly fuscous.

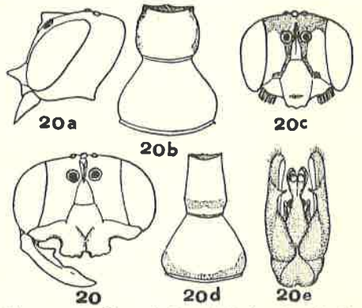


Fig. 20, *a*. *Cerceris Seyrigi* ♀, head, ×8; *b*, first two tergites, ×8; *c*, ♂, head, ×8; *d*, first two tergites, ×8; *e*, genitalia, ×17½. (In Fig. 20 *c* stippled parts are black, and in Figs. 20 *b*, *d*, they are yellow.)

Clypeus and yellow parts of the face dull and with a very fine fundamental puncturation, with a sparse and larger one superimposed on the face. The rest of the head dull, closely

punctured, reticulate-punctate to about the level of the posterior ocelli, less close on the rest of the head, where the interspaces are fully as wide as the punctures. Pronotal dorsum and metanotum with the same puncturation as the yellow parts of the face. Metapleura transversely rugose; triangular area of the epinotum obliquely costate, the apical third of the triangle transversely costate, the rest of the thorax coarsely and deeply reticulate-punctate, the punctures largest on the mesopleura and epinotum, where they are about two-thirds as wide as the anterior ocellus, the reticulations on the mesopleura prominent. Tergites dull, the first two closely punctured, the punctures slightly smaller than those of the mesonotum. Tergites 3 and 4 as strongly punctured as the first two, but a little more closely, the fifth shallowly and rather sparsely, the pygidium transversely rugose on the dorsal face and coarsely punctured at the sides. Sternites slightly shining, the tumid areas with a few large punctures at the sides, the first sternite strongly carinate at the base, the sixth deeply, arcuately emarginate and bidentate at the apex.

Inner margin of the mandibles with a stout tooth near the base. The median sclerite of the clypeus extends beyond the lateral ones by about one-third of its length. Its anterior margin is arcuately excised medially and indistinctly sinuate on each side; at about the middle of its length the median area is produced into a pyramidal tooth. The frontal carina is prominent, flattened above and triangular in profile. The inner orbits are about equally divergent above and below. Temples produced below into a blunt and flat tooth. Interocular distance on the vertex nearly equal to the length of the first five joints of the flagellum. The latter is slender, the second joint is $2\frac{1}{2}$ times longer than wide at the apex and fully one-third longer than the third joint. Posterior ocelli half as far again from the eyes as from each other.

Pronotal dorsum nearly as long in the middle as the second joint of the flagellum, its anterior margin convex. Triangular area of the epinotum twice as wide at the base as long. First tergite as wide at the base as at the apex and about as wide as long, the sides feebly convex. Pygidial area slightly widened from base to apex, a little more than twice as long as wide at the apex, the lateral and apical margins feebly convex. Basal joint of the anterior tarsi with eight spines; posterior tibiae with five serrations. Mesopleura with a small tooth.

♂. 11 mm. long. It is with some hesitation that this ♂ is ascribed to the species since the sculpture of the triangular area of the epinotum hardly ever differs to any great extent in the two sexes. However, the puncturation and the yellow markings of the legs and face suggest that the identification is probably correct.

Ferruginous; the vertex, anterior margin of the mesonotum and mesosternum, blackish. The following parts are pale chrome yellow: clypeus excepting the extreme anterior margin, sides of the face up to a little beyond the antennal sockets, the frontal carina and triangle, the outer half of the tegulae, metanotum, a spot on the mesopleura, the upper half of the sides of the epinotum, a narrow pre-apical band on the first tergite, a median longitudinal streak on the first sternite, narrow apical bands, slightly dilated laterad, on the second to fifth tergites, the sixth tergite excepting the base and sides, the basal half of the seventh tergite, apical bands abruptly dilated laterad on the second and third sternites, a spot on each side of the fourth sternite, the outer half of the anterior coxae, the outside of the anterior tibiae, the apical two-thirds of the anterior femora, an elongate spot on the outside of the middle femora, and the middle and hind coxae and trochanters. Basal joint of the fore and middle tarsi yellowish white. Wings as in the ♀ but the veins a little darker.

Puncturation of the head and thorax relatively a little larger and deeper than in the ♀, the interspaces somewhat shining, and less close on the epinotum, where the interspaces are half as wide as the punctures. The triangular area of the epinotum is grooved down the middle, shallowly and sparsely punctured. First tergite slightly shining, the other tergites dull. The puncturation of the tergites is larger and less close than in the ♀, on the first and last three the interspaces are for the greater part as wide as the punctures, a little less on the second to fourth, the punctures on the third as large as those on the epinotum. Pygidial area

coarsely punctured, short, widest in the basal half and as wide there as long, the lateral margins strongly convex basad, the apex transverse.

Mandibles edentate. Median area of the clypeus subhexagonal, two-fifths longer than wide, the apical margin feebly tridentate. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth. Second joint of the flagellum fully twice as long as wide at the apex, the apical joint slightly curved, truncate at the apex, barely longer than the preceding joint. Triangular area of the epinotum nearly twice as wide at the base as long. First tergite moderately narrowed cephalad, widest a little in front of the hind margin, one-third longer than wide. Hind tibiae with seven feeble serrations.

Rogez, 1 ♀; Bekily 1 ♂. January–February.

A second ♀ from Rogez represents a variety in which the colour, excepting the yellow areas of the head and thorax, is almost black. The apical band on the third tergite is very faint and yellowish brown.

Cerceris Rasoherinae n.sp. (Figs. 21, 21 *a–g*)*

♀. 11·5–14 mm. long. Varying from burnt sienna red to dark brown (Seguy, C.U.C. between rouge 126 and 116), the anterior part of the mesonotum, the first, fourth and fifth tergites usually darkest. The following parts are pale chrome yellow: the anterior third of the median area of the clypeus, narrow lines on each side of the face attenuated dorsad, a narrow line on the temples margining the outer orbits and rectangularly bent caudad above, a band, interrupted in the middle on the pronotal dorsum, the greater part of the tegulae, a spot on each side of the scutellum, the metanotum, a large oval macula on the sides of the epinotum, triangular apical maculae on the first tergite, apical bands slightly dilated laterad on tergites 2–5, wide on the fifth, narrow and sometimes interrupted in the middle on the others, and transverse lateral maculae on sternites 2–4. These yellow markings are sometimes absent from the head and scutellum. The fore and middle metatarsi, spots of variable size, and sometimes obsolete, on the underside of the hind coxae, base of the middle tibiae and the base and apex of the hind femora are yellowish white. Mandible yellowish at the base, fuscous at the apex. Wings hyaline, slightly tinged with yellow, the pterostigma ochreous, the veins brown, the apex beyond the cells faintly smoky. Pubescence and pilosity whitish and not dense. Metanotum, triangular area of the epinotum and the sternites fairly shining, the rest of the body dull. Sides of the clypeus very finely punctured, the median area and the face below the level of the antennal sockets shallowly and fairly closely punctured. Sides

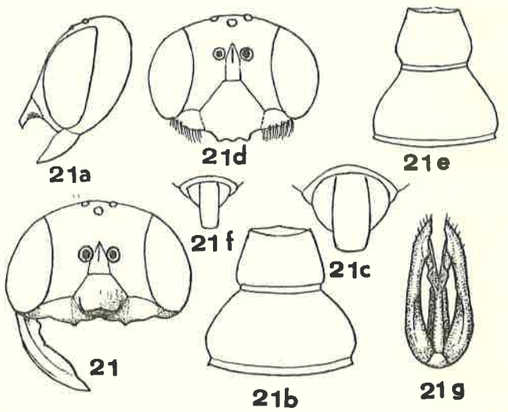


Fig. 21, *a*. *Cerceris Rasoherinae* ♀, head, × *c*. 10; *b*, first two tergites, × *c*. 10; *c*, pygidium, × *c*. 10; *d*, ♂, head, × *c*. 10; *e*, first two tergites, × *c*. 10; *f*, pygidium, × *c*. 10; *g*, genitalia, × *c*. 24.

* Rasoherina, Queen of Madagascar, 1863–5.

of the pronotum rugose, metapleura costate, dorsum of the pronotum and the metanotum finely and not closely punctured, triangular area of the epinotum impunctate, grooved down the middle, the rest of the head and thorax deeply reticulate-punctate; the largest punctures are on the epinotum and are about half as wide as one of the posterior ocelli. Tergites 1–4 reticulate-punctate, the punctures a little larger than those on the epinotum, the fifth tergite more shallowly punctured, the interspaces as large as the punctures, the pygidial area coarsely vermiculate-rugose. Tumid areas of the sternites with a sparser puncturation than the tergites, closer at the sides than in the middle, the fifth and sixth closely and finely punctured, the sixth deeply and angularly emarginate on the apex.

Median area of the clypeus raised and protruding free in front, overhanging the apical margin, the transversely convex plate so formed having its anterior margin obtusely emarginate. The apical margin below it is sinuate in the middle and feebly dentate on each side. Interocular distance across the base of the clypeus one-fifth greater than across the vertex, where it is equal to the length of the first five joints of the flagellum plus half of the sixth. Second joint of the flagellum three times longer than wide at the apex. Posterior ocelli as far from the eyes as from each other. First tergite slightly wider than long, moderately narrowed cephalad. Pygidial area twice as long as wide, the sides feebly convex, the apical margin nearly straight. Comb of the anterior tarsi with six spines on the basal joint; posterior tibiae with eight serrations.

♂. 10–12 mm. long. Clypeus, sides of the face, the frontal carina, a spot, sometimes absent, on the upper part of the temples, the dorsum of the pronotum except in the middle, the metanotum and a spot, sometimes absent, on each side of the epinotal declivity, pale chrome yellow; the rest of the head and thorax black. Tergites 1–6 black, the second to sixth sometimes ferruginous, with apical yellow bands, the seventh tergite and all the sternites ferruginous, the second to fourth with lateral yellow spots. Fore and middle tibiae pale yellow above, ferruginous below. The hind trochanters, a basal spot on the underside of the hind tibiae and the fore and middle metatarsi, pale yellow; the rest of the tarsi ferruginous. Antennae dark brown above, ferruginous below. Wings as in the ♀. Sculpture, pubescence and pilosity as in the ♀.

Median area of the clypeus subhexagonal, one-sixth longer than wide, the apical margin tridentate. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus four-fifths of the fifth joint. The second joint of the flagellum is twice as long as wide at the apex and barely longer than the third; the apical joint is curved, obliquely truncate and not much longer than wide at the base. First tergite one-fourth wider at the apex than at the base and one-fourth wider than long. Pygidial area parallel-sided, twice as long as wide.

Bekily and Behara, 10 ♀♀, 7 ♂♂; Ambovombi, 1 ♂. November–December.

Cerceris Rasoherinae var. **debilis**, n.var.

♀. 10·5 mm. long. The ground colour of the head and thorax is as in the type of the species; first five tergites brownish black, the sixth ferruginous, the sternites ferruginous, the first two somewhat darker. The yellow markings on the head are reduced to a very narrow line adjacent to the eyes and a small spot on the upper part of the temples. On the epinotum the yellow is reduced to a small spot on each side near the bottom of the declivity. The first tergite has large lateral yellow maculae, more attenuated mesad than in the type of the species, but on the other tergites the yellow maculae are confined to the fourth in one specimen, and fourth and fifth in the other, and are very thin. The puncturation on the epinotum is much less close, the interspaces being shining and, for the greater part, twice as wide as the punctures. On the tergites the puncturation is also less coarse than in the type. The protruding basal plate of the clypeus is more convex lengthwise and transversely,

and the pre-apical margin is convex, not angularly emarginate. The first tergite is shorter, being one-third wider behind than long, and the sides of the pygidial area are more convex. The posterior tibiae have only six serrations.

♂. 10 mm. long. Black. The yellow markings on the clypeus and face are as in the type of the species ♂. The sides of the upper half of the face, a curved band behind the posterior ocelli, the upper part of the temples, the pronotum and two longitudinal bands on each side of the middle of the mesonotum, fusco-ferruginous. Tegulae ferruginous. The base of the sixth and the whole of the seventh abdominal segment, ferruginous. The yellow band on the second tergite is reduced to a short streak on each side. This sex differs from the ♂ of the type in the same way as its ♀, the puncturation of the epinotum and tergites being like that of the ♀. The first tergite is shorter than in the type of the species ♂.

Bekily, 2 ♀♀, 1 ♂. December.

Cerceris Duchesnei n.sp. (Figs. 22, 22 *a–f*)*

♀. 10 mm. long. Colour variable. Excluding the pale areas the face up to the posterior ocelli is black, the vertex, occiput and temples ferruginous. Mandibles excepting the fuscous apex, clypeus excepting the ferruginous part below the median lamina, the lower half of the face excepting the middle third, a spot on the upper part of the temples and a streak on their lower part, very pale yellow. Pronotum ferruginous, the dorsal face pale yellow on each side. Pro- and mesosternum, mesonotum and mesopleura in greater part black, the upper third of the mesopleura and the posterior fourth of the mesonotum fusco-ferruginous. Tegulae pale yellow in front. Scutellum ferruginous, the metanotum pale yellow Epinotum varying from ferruginous to black in the middle, the sides with a lanceolate pale yellow macula behind, ferruginous in front. First tergite black, ferruginous at the sides and with a pale yellow apical macula on each side. The rest of the abdomen varies from reddish brown to dark ferruginous, paler on the underside than above, the second to fifth tergites with apical yellow bands, very narrow in the middle and dilated laterad on the second to fourth, wider on the fifth. The tumid areas of the third and fourth sternites, and sometimes narrow apical bands on the second and fifth, very pale yellow. Legs pale ferruginous, with the following parts pale yellow or yellowish white: the upper side of the anterior and middle tibiae and metatarsi, the middle and hind trochanters, diffuse marks on the middle and hind coxae, the hind femora below and at the base above and the underside of the hind tibiae. Hind tarsi dark brown. Wings hyaline, the apex of the fore wing slightly smoky, the costa, subcosta and pterostigma ochreous, the veins pale brown.

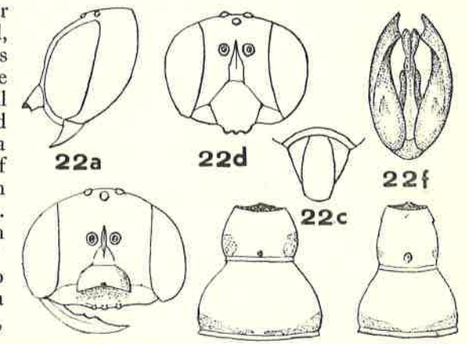


Fig. 22, *a. Cerceris Duchesnei* ♀, head, × *c.* 10; *b*, first two tergites, × *c.* 10; *c*, pygidium, × *c.* 10; *d*, ♂, head, × *c.* 10; *e*, first two tergites, × *c.* 10; *f*, genitalia, × *c.* 24.

Lateral sclerites of the clypeus and the lower corners of the face with short silvery pubescence, elsewhere the pubescence and pilosity are whitish and sparse. The part of the

* General Duchesne, Governor-General of Madagascar, 1895.

clypeus below the projecting lamina, excepting the apical margin, is sparsely punctured and shining, the first four sternites are nitidulous, the rest of the body is dull. Lateral sclerites of the clypeus and the lamina of the median area closely and finely punctured, the yellow areas of the face shallowly and fairly sparsely punctured, the rest of the head closely punctured, the punctures increasing in size dorsad; the upper part of the face is almost reticulate-punctate. Pronotum closely and finely punctured in the middle of the dorsum, more sparsely laterad, the lower parts of the sides rugose. Mesonotum fairly closely punctured cephalad, less closely caudad, the punctures there larger than those in front but smaller than those on the vertex, the interspaces about twice as wide as the punctures. The puncturation of the scutellum is like that of the posterior part of the mesonotum, and of the mesopleura a little larger and closer. Metanotum finely and shallowly punctured. Median area of the epinotal dorsum microscopically reticulate, sparsely punctured at the base, grooved down the middle; the rest of the epinotum has a puncturation somewhat larger and less close than that of the vertex. Metapleura obliquely and closely striate. The puncturation of the first five tergites is fairly large and close, deeper and larger than that of the vertex; pygidial area coarsely reticulate-rugose. Tumid areas of the sternites finely and closely punctured, their posterior corners with a few larger punctures, the fifth and sixth sternites closely punctured.

Mandibles with two indistinct teeth on the inner margin. The median area of the clypeus has a wide protruding lamina arising from its base, similar to that of *C. Nephthys* Arn. and *C. bicolor* Smith, but not so convex transversely; it is $2\frac{1}{3}$ times wider in front than long, and its moderately convex free margin is narrowly excised in the middle. The apical margin below the lamina is indistinctly trituberculate. Inner orbits very slightly divergent below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum plus half of the sixth. Second joint of the flagellum a little more than twice as long as wide at the apex. First tergite $1\frac{1}{2}$ times wider behind than long, moderately narrowed cephalad, the sides convex.

Pygidial area twice as long as wide, distinctly narrower at the base than at the apex, the lateral margins convex. Posterior tibiae with five serrations.

♂. 9·5–11 mm. long. Fore and middle tibiae almost entirely yellow, head, thorax, first six tergites and the first four sternites black or brownish black, the fifth and sixth sternites and the whole of the apical abdominal segment ferruginous. The yellow markings are as in the ♀, but the scutellum sometimes has a small yellow spot on each side. Puncturation like that of the ♀ but everywhere a little larger, and on the vertex, shallower. Pygidium slightly shining, sparsely and coarsely punctured. Mandibles edentate on the inner margin. Median area of the clypeus a little longer than wide, its apical margin tridentate. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus one-third of the fifth joint. Second joint of the flagellum twice as long as wide at the apex, not longer than the third, the ninth to eleventh joints slightly swollen, the apical joint curved and truncate at the apex. First tergite about as wide as long, the sides moderately convex, not much narrowed towards the base. Otherwise like the ♀.

Antananarivo, 2 ♀♀; Bekily and Ambovombi, 2 ♀♀, 12 ♂♂. November to February.

Cerceris Gallienii n.sp. (Figs. 23, 23 *a–f*)*

♀. 11 mm. long. Black. Tegulae, apices of the femora, tibiae and apical abdominal segment, ferruginous. The anterior tibiae on the inside yellow, the anterior tarsi and the middle metatarsi, straw yellow, the rest of the middle tarsi brown. Antennae brownish black above, fusco-ferruginous below, including the whole of the apical joint. The following

* General Gallieni, Governor-General of Madagascar, 1896.

parts are pale yellow: basal half of the mandibles, clypeus excepting the pale ferruginous pre-apical margin and the teeth on the apical margin, the sides of the face, the frontal carina and triangle, a narrow line on the temples margining the eyes, a band widely interrupted in the middle on the pronotum, the metanotum, apical lateral spots on the first tergite, an apical band dilated laterad on the third tergite, apical half of the first sternite, lateral triangular maculae on the third sternite, a narrow apical band on the fifth sternite and the underside of the hind trochanters. Wings hyaline, the apex including the radial cell, fuscous, the veins dark brown, the pterostigma yellow. Clypeus and yellow parts of the face with short silvery pubescence. On the rest of the body the pilosity and pubescence are short and white. The median part of the clypeus below the basal projection, shining, finely and sparsely punctured, the rest of the clypeus dull, closely and very finely punctured. The yellow areas of the face dull and with a sparse puncturation. On the rest of the head, excepting a smooth area just above the antennae, the puncturation is strong and deep, larger on the vertex than on the face, the interspaces on the face a little wider than the punctures, on the vertex behind the ocelli narrower; the punctures on that part nearly half as wide as one of the posterior ocelli. Pronotum strongly and sparsely punctured above, the sides punctured dorsad and rugose ventrad. Metanotum finely punctured and shining, the mesopleura nearly smooth dorsad, rugulose ventrad, the triangular area of the epinotum shining, feebly grooved medially, its lateral margins closely and transversely costate; the rest of the thorax and the first five tergites deeply and coarsely punctured, the epinotum reticulate-punctate, the mesonotum with an indistinct longitudinal rugosity between the punctures. The largest punctures, which are on the mesonotum and tergites, are about two-thirds as wide as the anterior ocellus. Sternites 2–4 finely and sparsely punctured in the middle, coarsely at the sides of the tumid areas, the fifth sternite closely and coarsely punctured on its apical half. Pygidial area not quite dull, finely and transversely rugose. Mandibles with a large tooth on the inner margin between the middle and the apex. Median area of the clypeus raised from the base to the middle, forming a conical protuberance which is about one-fourth wider at the base than long, rounded at the apex and almost flat underneath, not excavated as in *Duchesnei*. The apical margin below it is bluntly bidentate. Interocular distance across the base of the clypeus very little greater than across the vertex, where it is equal to a little more than the length of the first four joints of the flagellum. The second joint of the flagellum is $2\frac{1}{2}$ times longer than wide at the apex and one-fourth longer than the third. First tergite widest a little behind the middle, nearly $1\frac{1}{2}$ times longer than wide; the second tergite $2\frac{1}{2}$ times wider at the apex than at the base. Pygidial area subelliptical, twice as long as wide in the middle. Anterior metatarsi with six spines on the outer margin, posterior tibiae with six serrations.

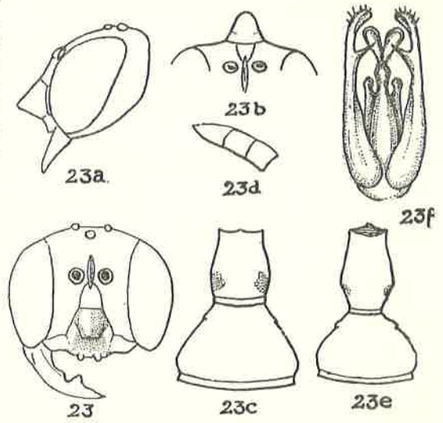


Fig. 23, *a*. *Cerceris Gallienii* ♀, head, ×12; *b*, clypeus, dorsal view, ×12; *c*, first two tergites, ×12; *d*, ♂, last three joints of the flagellum, ×*c*. 14; *e*, first two tergites, ×12; *f*, genitalia, ×30.

♂. 8–10 mm. long. Black. Median area of the clypeus, frontal carina and triangle and a narrow line on each side of the face, lemon yellow. Sixth tergite with an apical yellow

band. Pygidium fusco-ferruginous; otherwise the colour is as in the ♀. Puncturation like that of the ♀ but deeper and larger, less close on the epinotum, on the tergites 2–5 coarsely reticulate-punctate. Median area of the clypeus ovoid, convex, half as long again as wide. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth and equal to the inferior interocular distance. Second joint of the flagellum nearly 2½ times longer than wide at the apex, the apical joint acuminate and twice as long as wide. Median area of the epinotum like that of the ♀. First tergite 1½ times longer than wide, widest a little behind the middle. Pygidial area about twice as long as wide, narrower at the base than at the apex, coarsely punctured. Posterior tibiae with five serrations. The outer paramera of the genitalia bear a strong spine on the inner margin some distance behind the apex; the sagittae are spoon-shaped at the apex.

Fort Dauphin, Rogez, Perinet and Ivondro, 10 ♀♀, 12 ♂♂. December to April.

Cerceris Gallienii, var. **bekiliensis** n.var.

♀. This variety differs from the typical form as follows. The sides of the epinotum have a round yellow spot near the declivity, otherwise the yellow markings of the head and thorax are as in the type, but the ground colour is ferruginous instead of black, and the head, pronotum and mesopleura are paler than the dorsum of the thorax. Abdomen very dark reddish brown, the apical yellow bands on the third and fifth tergites wider. The puncturation is everywhere a little smaller, e.g. the largest punctures on the third tergite are nearly three-fifths as wide as the anterior ocellus, whereas in the type of the species they are four-fifths. The first tergite is distinctly wider, being only one-seventh longer than wide.

♂. Colour and sculpture as in the ♀, and as in that sex the puncturation is smaller than in the corresponding sex of the type form. The first tergite is also wider, being very little longer than wide.

Bekily and Antananarivo, 8 ♀♀, 13 ♂♂. The length is the same as in the type of the species, but one ♀ from Bekily is smaller, or only 8 mm. long.

Cerceris Augagneuri n.sp. (Figs. 24, 24 *a–c*)* = gallienii according to Ledoux, 1932b: 211.

♀. 8 mm. long. Black. Antennae, apical half of the clypeal protuberance, the lower half of the sides of the face, more narrowly above than below, the sixth abdominal segment excepting the base, and the tibiae and tarsi excepting the yellowish white middle metatarsi, ferruginous. Mandibles ferruginous, the basal third of the upper side, pale yellow. Frontal triangle and carina pale yellow. The first, third and fifth tergites with apical bands of yellowish white, that of the third dilated laterad; the underside of the hind trochanters and an oblong macula on each side of the third sternite, also yellowish white. Wings hyaline, tinged with brown, the apex darker, the costa and pterostigma ochreous, the other veins brown.

The clypeus below the protuberance, the base of the first tergite and the first five sternites moderately shining, the rest of the body dull. Clypeus and lower part of the face finely and closely punctured, the rest of the head closely and deeply punctured, the largest punctures, which are on the vertex, about one-fourth the width of the anterior ocellus. Sides of the pronotum and the metapleura feebly rugose, the metanotum sparsely and finely punctured. The median area of the epinotal dorsum grooved down the middle, obliquely rugose on each side and transversely rugose in the apex of the angle. The rest of the thorax deeply, closely and coarsely punctured, almost reticulate-punctate, except on the scutellum. First tergite sparsely punctured, the second and basal half of the third reticulate-punctate, the punctures a little larger than those on the mesonotum and about half as wide as the anterior

* M. Augagneur, Governor-General of Madagascar, 1905.

ocellus. The puncturation on the fourth and fifth tergites shallower and less close than on the third, the pygidial area shallowly rugoso-punctate. The tumid areas of the sternites with a few shallow and large punctures in the posterior corners and on their apical margins.

Mandibles like those of *C. Gallienii*; the protuberance of the clypeus is also like that of *Gallienii* but is shorter, being 1½ times wider at the base than long; its apex is truncate and the ventral surface concave. The apical margin of the median area is tridentate, the middle tooth small. The antennae in the unique specimen are defective, only the scape and two basal joints of the flagellum being present. The interocular distance on the vertex is slightly greater than it is across the clypeus, and is nearly equal to four times the length of the second joint of the flagellum. First tergite one-fourth longer than wide, like that of *Gallienii*, but a little less narrowed cephalad. Pygidial area as in *Gallienii*. Posterior tibiae with five serrations.

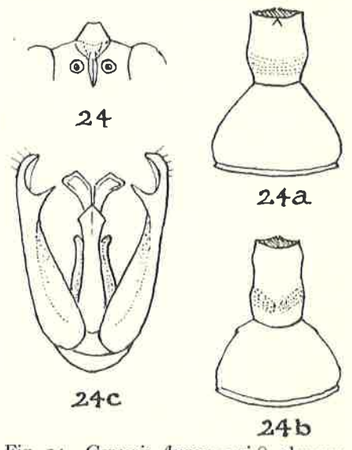


Fig. 24. *Cerceris Augagneuri* ♀, clypeus, dorsal view, ×16; *a*, first two tergites, ×16; *b*, ♂, first two tergites, ×16; *c*, genitalia, ×60.

♂. 7·5–8 mm. long. Clypeus, excepting the posterior margins of the lateral sclerites, a spot on the tegulae and apical bands on the first, third and sixth tergites, yellowish white, otherwise like the ♀ in colour and sculpture, but the puncturation is everywhere a little coarser, especially on the epinotum and tergites. Median area of the clypeus oval and convex, three-sevenths longer than wide, the apical margin feebly tridentate. Interocular distance on the vertex nearly equal to the length of the first six joints of the flagellum. The apical joint of the flagellum like that of *Gallienii* ♂. First tergite shorter and less narrowed cephalad than in *Gallienii* ♂; the pygidial area nearly parallel-sided, the apical margin feebly convex. The genitalia hardly differ from those of *Gallienii* except in the apical dilatation of the sagittae, which is truncate instead of convex. Antsirabé, 1 ♀, 3 ♂♂. November.

Cerceris dentiventris n.sp. (Figs. 25, 25 *a–e*)

♀. 7·3–10·5 mm. long. Very dark brown with a reddish tinge, and across the vertex almost black. Clypeus and lower angles of the face straw yellow, mandibles ochreous over the basal two-thirds, the rest piceous. Apical bands, dilated laterad, on the third and fourth tergites and the whole of the fifth tergite, pale chrome yellow. The underside of the scapes and the first five joints of the flagellum, and the pygidium, dark ferruginous. Fore and middle tarsi, hind metatarsi, the inner side of the fore and middle tibiae and streaks or spots on the upper side of the middle and hind tibiae, yellowish white. Wings hyaline, slightly fuscous on the radial cell and at the apex, the costa and pterostigma ochreous. Clypeus and lower half of the face with a fairly dense, white pubescence. Sides of the clypeus closely and finely punctured, the median area sparsely and coarsely. Metapleura transversely and closely costate, the rest of the thorax and the head reticulate-punctate, including the sides of the pronotum and the triangular area of the epinotum. The punctures are largest on the epinotum, where they are fully half as wide as the anterior ocellus, and smallest on the metanotum. Tergites 1–5 and the tumid parts of sternites 2–4 reticulate-punctate, the punctures on the tergites as large as those of the mesonotum. The second sternite with a

flattened, impunctate and median triangular area. Fifth sternite closely and finely punctured, with a transverse lamella highest in the middle and excised at that point so as to form two blunt teeth; the posterior margin densely fringed with long hairs. Sixth sternite deeply bifurcate, the rami 2½ times longer than wide. Pygidial area subelliptical, vermiculate-rugose and wider at the base than at the apex.

Median area of the clypeus feebly convex, its anterior margin with a tooth on each side, 1½ times wider in front than long. Just behind the anterior margin there is a short transverse crest terminating on each side in a blunt and small tooth. Inner orbits distinctly divergent below. Head wide, a little more than 1½ times wider than high. Interocular distance on the vertex nearly equal to the length of the first six joints of the flagellum. Second joint of the flagellum twice as long as wide at the apex, very little longer than the third. Posterior ocelli one-third farther from the eyes than from each other. Dorsum of the pronotum short, about as long in the middle as the second joint of the flagellum. Triangular area of the epinotum 1½ times wider at the base than long. First sternite widest behind the middle, half as wide again as long. Second tergite twice as long as the first. Basal joint of the anterior tarsi with seven spines on the outer margin; posterior tibiae with five serrations. The coxae of the fore legs have a small tooth on the outer anterior corner.

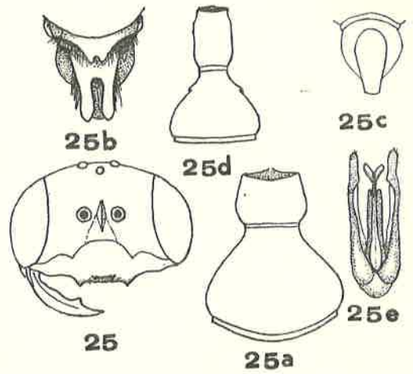


Fig. 25. *Cerceris dentiventris* ♀, head, ×*c.* 10; *a*, first two tergites, ×*c.* 10; *b*, last two sternites, ×*c.* 10; *c*, pygidium, ×*c.* 10; *d*, ♂, first two tergites, ×*c.* 10; *e*, genitalia, ×*c.* 24.

♂. 7·5–9·5 mm. long. Black, the pronotal dorsum, metanotum and pygidium, ferruginous. In some specimens, however, the whole of the pronotum, the sides of the epinotum and the abdomen, or at least the first two segments, are more or less dark ferruginous. Clypeus, sides of the face up to the level of the antennal sockets, a narrow apical band, slightly dilated laterad, on the third tergite, a very narrow apical transverse line on the fifth tergite, the sixth tergite and lateral maculae on the third sternite, pale chrome yellow. Coxae, trochanters and femora reddish brown, fore and middle tibiae pale yellow, stained with pale brown on the inside, the hind tibiae reddish brown, the basal third yellowish white. Tarsi yellowish white, the last three joints tinged with brown, the apical joint of the hind tarsi blackish. Wings as in the ♀. Clypeus and face with white decumbent pubescence, the thorax with fairly long, erect and greyish white pubescence. Sculpture like that of the ♀, but relatively a little coarser, especially on the face. Second sternite with large and elongate punctures. Median area of the clypeus broadly oval, very little longer than wide, convex, the apical margin feebly tridentate. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum. Second joint of the flagellum twice as long as wide, the apical joint acuminate, half as long again as the penultimate joint. Dorsum of the pronotum a little shorter in the middle than the second joint of the flagellum. First tergite 1½ times longer than wide, almost parallel-sided. Pygidial area sparsely and coarsely punctured, parallel-sided, 2⅓ times longer than wide, the apical margin convex. Posterior tibiae with five serrations.

Bekily, Ivondro and Behara, 7 ♀♀, 16 ♂♂. October–February.

Allied to *C. inconspicua* Arn. from Nyasaland and Rhodesia, from which it differs in the ♀ by the colour, sculpture of the median area of the epinotum and by the shape of the fifth

and sixth sternites. It is also not unlike *C. placida* Arn. from Nigeria, but the anterior coxae are only dentate on the anterior angle and the median area of the clypeus is differently formed. It is also deceptively like the following species, *aemula*.

Cerceris aemula n.sp. (Figs. 26, 26 *a–e*)

♀. 10 mm. long. Superficially very much like *dentiventris*, and with substantially the same puncturation, but the dark parts of the head and thorax are entirely black, without any tinge of red. Head black, the clypeus and face up to the level of the upper margin of the antennal sockets, whitish yellow, a small area below each socket black, the extreme apical margin of the clypeus ferruginous. Mandibles pale yellowish at the base, becoming gradually darker to fuscous at the apex. The antennae ferruginous, the eighth to tenth joints and basal half of the apical joint, fuscous. Thorax black, the pronotal dorsum and the metanotum ferruginous. Tegulae ferruginous, with a yellowish streak in front. Abdomen dark reddish brown (C.U.C. rouge 56), the apex of the first tergite and the sternites paler, the third tergite with an apical band dilated laterad, and the fifth with a narrower band, pale yellow. Triangular area of the epinotum 1½ times wider at the base than long, with about six longitudinal costae, rendered rather indistinct by the large punctures between them, the lateral margins of the area indistinct. Second sternite very coarsely punctured all over excepting a small semicircular area at the extreme base, the punctures over the middle third elongated. Pygidial area coarsely and closely punctate-rugose over the basal two-thirds, the apical third nearly smooth. Otherwise the puncturation is like that of *dentiventris*. Inner margin of the mandibles edentate. Median area of the clypeus as long as wide in front, very feebly convex, its anterior margin with a small tooth on each side; behind the anterior margin there is a short transverse crest (below which the clypeus is inflected) which is feebly and angularly emarginate in the middle. The hind margin of the median area is strongly arcuate. The head is not so broad as in *dentiventris*, being only two-fifths wider than high. Second joint of the flagellum slightly more than twice as long as wide at the apex, very little longer than the third. Interocular distance on the vertex equal to the length of the first six joints of the flagellum.

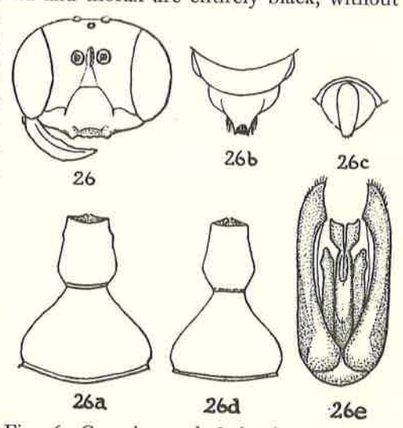


Fig. 26. *Cerceris aemula* ♀, head, ×12; *a*, first two tergites, ×12; *b*, last two sternites, ×12; *c*, pygidium, ×12; *d*, ♂, first two tergites, ×12; *e*, genitalia, ×45.

First tergite one-fifth longer than wide at its widest, which is at the posterior fourth, moderately narrowed cephalad, very slightly so caudad. Pygidial area narrowly ovate, twice as long as wide. Basal joint of the anterior tarsi with eight spines, the posterior tibiae with seven serrations. Fifth sternite simple, sixth sternite considerably narrowed caudad, the apex arcuately and not deeply excised.

♂. 8–8·5 mm. long. Flagellum becoming gradually darker to the apex, so that the last six joints are black. Metanotum pale yellow, sometimes black. First tergite dark ferruginous, blackish at the base. Third tergite with a yellow band as in the ♀, sixth tergite, except at the base of the sides, yellow. Pygidial area coarsely punctured. Otherwise like the ♀ in colour

and sculpture. Face and clypeus less coarsely punctured than in *dentiventris* ♂, the clypeus less convex, the yellow colour of those parts paler, and on the face more extensive than in *dentiventris*, the whole of the face up to the antennal sockets being yellow, excepting only a small triangular spot below each socket. Median area of the clypeus subhexagonal, about one-fifth longer than wide, the apical margin feebly tridentate. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum. The second joint of the flagellum is twice as long as wide and barely longer than the third, the apical joint acuminate and not longer than the preceding one. First tergite 1½ times longer than wide, widest at the posterior third. Pygidial area nearly half as long again as wide at the base, wider there than at the apex, which is feebly convex, like the sides. Posterior tibiae with six feeble serrations. Genitalia clearly distinct from those of *dentiventris* (cf. Figs. 25 *e*, 26 *e*).

Bekily, 4 ♀♀, 8 ♂♂; Ivondro, 1 ♀. November–April.

Cerceris petiolata Sauss. (Figs. 27, 27 *a–c*)

Mitt. Schweiz. Ent. Ges. VIII, p. 271, ♂, 1891; *Hist. Madag.* XX, p. 555, ♂, 1892

There are two ♀♀, one from Fianarantsoa and the other from Rogez, either of which might be the ♀ of this species. As a rule in the genus, when the metanotum is yellow in the ♀, as it is in the Rogez specimen, it is similarly coloured in the ♂. As Saussure does not describe his two ♂♂ as having the metanotum yellow, I therefore prefer to assume that the specimen from Fianarantsoa is the corresponding ♀.

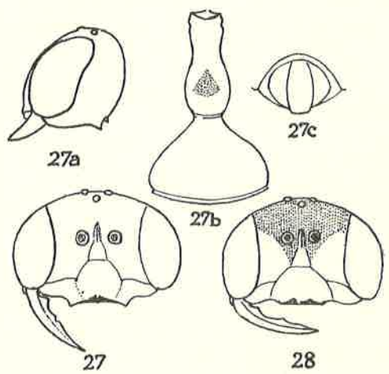


Fig. 27, *a*. *Cerceris petiolata* ♀, head, ×12; *b*, first two tergites, ×12; *c*, pygidium, ×12.
Fig. 28. *Cerceris xanthostigma* ♀, head, ×12.

♀. 9·5 mm. long. Black, with a tinge of dark brown, the clypeus, face, temples, occiput, scutellum and metanotum dark reddish brown, the sixth abdominal segment ferruginous. Mandibles ferruginous, darker at the tip. A narrow line adjacent to the eyes on the lower two-thirds of the face, the frontal carina, a triangular macula near the apex of the first tergite, an apical band dilated laterad on the third tergite and a very narrow apical band on the fifth tergite, yellowish white. Tibiae and tarsi dark ferruginous. Wings like those of the ♂. Face and clypeus with a sparse silvery pubescence. The whole body, excepting the sternites, is dull, due to a fundamental, microscopic and close puncturation. Superimposed on this is a larger puncturation except on the metanotum, metapleura and the triangular area of the epinotum. The punctures on the clypeus and face are shallow and sparse, elsewhere about one-third as wide as the anterior ocellus, fairly close except on the scutellum and first tergite, where the interspaces are more than twice as wide as the punctures, and on the epinotum and tergites 2–4, where they are fully as wide. Pygidial area shining, feebly rugose. Sternites 2–6 nitidulous, rugulose, the second with a coarse and sparse puncturation, the rest finely and sparsely punctured. Mandibles without a distinct tooth on the inner margin. Median area of the clypeus subhexagonal, feebly convex, armed with a small tubercle which projects beyond the anterior margin, the lateral sclerites subdentate, the whole margin between the teeth shallowly concave.

Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum. Posterior ocelli 1¾ times farther from the eyes than from each other. Second joint of the flagellum nearly three times as long as wide at the apex and a little more than half as long again as the third joint. The junction of the occiput and mentum is carinate and ends in a flattened tooth, in front of which, at the bottom of the temples, there is a larger and acute tooth. Triangular area of the epinotum grooved down the middle, twice as wide at the base as long. First tergite widest at the posterior fourth, twice as long as wide there, and a little longer than the second tergite, which is fully three times wider behind than at the base. Pygidial area twice as long as wide in the middle, the sides convex, the apical margin straight. Basal joint of the anterior tarsi with seven spines on the outside, the posterior tibiae with five serrations.

The collection contains no specimens which could be identified as the ♂♂ of this species.

Cerceris xanthostigma n.sp. (Fig. 28)

♀. 10·5 mm. long. Deceptively like the preceding species, *petiolata*, in general appearance and in the shape of the petiole and in the dentiferous temples, but easily distinguished by the shape of the clypeus, the sculpture and the colour of the face and clypeus. Black. An oval macula at the top of the temples, tegulae, scutellum, the sides of the first tergite posteriorly, the sides of the second tergite and sternite, the apical margins of the second to fourth tergites, the apical half of the fifth and sixth tergites and sternites, dark ferruginous. Clypeus, lower half of the face, pronotal dorsum, metanotum, a subtriangular spot on the node of the petiole, a narrow apical band on the third tergite, large maculae on each side of the third sternite and a very narrow apical band on the fifth tergite, pale chrome yellow. Basal third of the mandibles yellow, the rest ferruginous. Flagellum blackish above, fusco-ferruginous below. Extreme apices of the femora and the tibiae ferruginous, the tarsi fusco-ferruginous. Wings hyaline, the radial cell and the apex of the fore wing smoky, the stigma ochreous, the veins brown. The puncturation is considerably larger and deeper than in *petiolata* ♀, and although the interspaces on the thorax and abdomen are also microscopically punctured, the insect is not so dull as *petiolata*.

Clypeus and yellow parts of the face dull, the larger puncturation sparse and shallow. On the upper part of the face and on the vertex and temples the punctures are about one-fourth as wide as the anterior ocellus and the interspaces as large as the punctures. Pronotal dorsum sparsely punctured, metanotum shining, sparsely and very finely punctured, metapleura and anterior third of the sides of the epinotum coriaceous, the triangular area of the epinotum nitidulous, rugulose-punctate, and feebly grooved down the middle; the rest of the thorax coarsely punctured, sparsely so on the scutellum, closely or reticulate-punctate elsewhere, the largest punctures on the mesonotum and epinotum about two-thirds as wide as the anterior ocellus. The puncturation of the petiole is less close and smaller than on the following segment, which, like the third and fourth tergites, has a puncturation less close but hardly smaller than that of the mesonotum; the puncturation of the fifth and of the sides of the sixth tergite shallower and smaller than on the fourth. Tumid areas of the second to fifth sternites rugulose and sparsely, coarsely punctured, the second sternite shining. Pygidial area coriaceous, dull, subelliptical, about as wide at the base as at the transverse apex. Median area of the clypeus narrowly inflected at the anterior margin; above the latter there is a very short lamella divided into three parts by two small excisions, the middle part the wider. Joints of the flagellum, divergence of the inner orbits and the distance of the posterior ocelli from the eyes as in *petiolata*. There are also two teeth on the inferior margin of the temples as in that species. The petiole is a little narrower behind, being nearly 2⅓ times longer than wide at its widest, but otherwise very much like that of *petiolata*.

Basal joint of the anterior tarsi with seven spines on the outer margin, tibiae with five serrations.

Rogez, 1 ♀. March.

This cannot be a variety of *petiolata*, in spite of the similarity of the petiole and the teeth on the temples, as the structure of the clypeus is clearly different.

Cerceris albotegulata n.sp. (Figs. 29, 29 *a–d*)

♀. 6·5–7·5 mm. long. Black. Face, clypeus and temples dull, the rest of the body shining. The following parts are yellowish white: clypeus, excepting the extreme anterior margin, frontal carina and triangle, the face, excepting a small area above and below the antennal sockets, the underside of the scapes, the pronotal dorsum at the sides, the tegulae, excepting the inner margin, the metanotum, a median transverse macula near the base and lateral apical maculae on the second tergite, large apical maculae on each side of the third tergite connected by a narrow and sometimes broken apical line, a sinuous apical band on the fifth tergite and the apical third to half of the fore and middle femora on the underside. The sternites and last two tergites vary from ferruginous to fusco-ferruginous. When the fifth tergite is ferruginous the apical yellowish band is usually obsolete or nearly so. Mandibles yellowish white, piceous at the base and apex. Flagellum ochreous below, dark brown above. Fore and middle tibiae pale yellow, the underside more or less fuscous, fore and middle tarsi brownish ochreous. Basal half of the hind tibiae yellowish white, the apical half brown, the hind tarsi dark brown. Wings hyaline, tinged with fuscous, the veins and pterostigma brown. Clypeus and yellow parts of the face with a sparse and shallow puncturation, the upper part of the face up to the ocelli fairly closely punctured, the interspaces punctulate and longitudinally striolate. Vertex, except in the middle, reticulate-punctate, the punctures one-third as wide as the anterior ocellus; temples punctate-striolate. The somewhat swollen yellowish white parts of the pronotum and the metanotum sparsely, finely punctured. Sides of the pronotum and the metapleura obliquely rugose; triangular area of the epinotum smooth, shining and grooved down the middle. The rest of the thorax coarsely punctured, the mesopleura reticulate-punctate, the mesonotum with the punctures elongated, reticulate-punctate in front, less closely punctured in the middle, the epinotum with round and shallow punctures which are about half as wide as the anterior ocellus and interspaces as wide as the punctures. First tergite sparsely punctured, the punctures smaller than those of the epinotum. Second to fifth tergites with punctures about as large as those of the epinotum, but less close, the interspaces being for the greater part wider than the punctures. Pygidial area dull, transversely and irregularly rugose. Tumid areas of the second to fourth sternites shining, sparsely and coarsely punctured at the sides, the fifth and sixth sternites dull and coriaceous. Inner margin of the mandibles excised a little beyond the middle, and therefore feebly bidentate. Median area of the clypeus slightly raised anteriorly and then inflected near the anterior margin, the pre-apical margin so formed obtusely angular and excised in

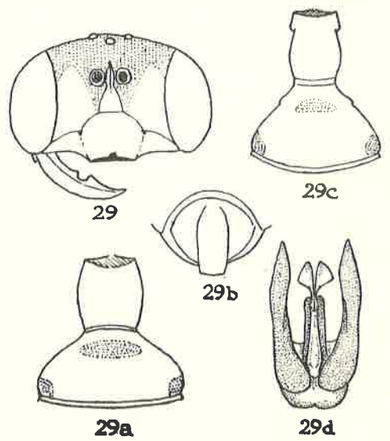


Fig. 29. *Cerceris albotegulata* ♀, head, × 15; *a*, first two tergites, × 15; *b*, pygidium, × 15; *c*, ♂, first two tergites, × 15; *d*, genitalia, × 45.

the middle; the median area is slightly wider in front than long. Interocular distance on the vertex equal to the length of the first seven joints of the flagellum and one-sixth greater than the inferior interocular distance. Flagellum short, the sixth to ninth joints wider than long, the second 3½ times longer than wide at the apex and two-fifths longer than the third. Triangular area of the epinotum very convex, 1½ times wider at the base than long, the apex with a deep fovea. First tergite a trifle longer than wide, widest in the middle and as wide in front as behind. Second tergite longer than the first, twice as wide behind as at the base and from two-fifths to three-fourths wider behind than long. Pygidial area twice as long as wide, slightly widened caudad, the apex transverse. Basal joint of the anterior tarsi with six spines on the outer margin, posterior tibiae with six serrations. Radial cell widely rounded at the apex, third cubital cell very little longer on the cubitus than high.

♂. 6–7 mm. long. Face and clypeus lemon yellow, the anterior half of the lateral sclerites black, basal half of the hind tibiae yellow. Hind metatarsi yellowish white with the apical third brown, otherwise like the ♀ in colour and sculpture, but the puncturation is a little larger. Mandibles edentate on the inner margin. Median area of the clypeus subhexagonal, a little longer than wide in front, the apical margin feebly tridentate. Interocular distance on the vertex equal to the length of the first six joints of the flagellum plus half of the seventh. First tergite 1½ times longer than wide, the second tergite nearly three times wider behind than at the base and as long as the first. Pygidial area about as long as wide, the sides feebly convex, coarsely punctured. Posterior tibiae with six serrations.

Bekily, 10 ♀♀, 14 ♂♂; Antanimora, Ivondro and Behara, 1 ♀ each. November–December.

The prey consists of Chrysomelidae and Buprestidae.

Cerceris formidolosa Sauss. (Figs. 30, 30 *a–c*)

Bull. Soc. Ent. Suisse, VIII, p. 261, ♀, 1891; *Hist. Madag.* XX, p. 547, ♀, 1892

♀. 13–16 mm. long. Wings hyaline, tinged with yellow (not ferruginous as stated in Saussure's description), the veins ochreous. Eyes strongly divergent below, the interocular

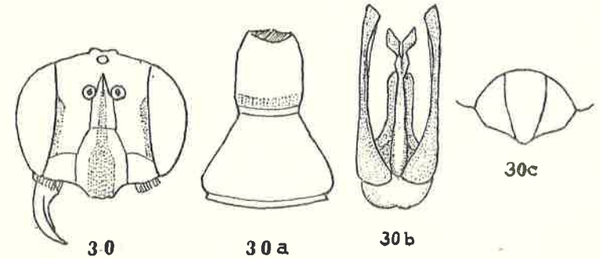


Fig. 30. *Cerceris formidolosa* ♂, head, × 9; *a*, first two tergites, × 9; *b*, genitalia, × 20; *c*, ♀, pygidium, × 9.

distance between the bottom of the eyes three-sevenths greater than across the vertex, where it is nearly equal to the length of the first four joints of the flagellum. The latter is slender and fairly long, the second joint is 2½ times longer than wide at the apex and three-sevenths longer than the third. Median area of the clypeus subhexagonal, wider above than below, as long as wide across the middle. First tergite very little longer than wide, a little narrower at the base than at the apex, the sides moderately convex. Pygidial area V-shaped, rounded at the apex, a little more than twice as long as wide at the base. Basal joint of the anterior tarsi with seven spines on the outer margin. Mesopleura with one denticle.

♂. 10·5–14 mm. long (hitherto undescribed). The frontal carina and the middle of the frontal triangle and a pyriform spot on the median area of the clypeus, a narrow line on each side of the face (sometimes absent), pale yellow. In a few specimens the lateral sclerites of the clypeus are also partially yellow. Apical half of the sixth, and the whole of the seventh abdominal segment, ferruginous. Otherwise like the ♀ in colour, sculpture and pubescence, but in some specimens the ground colour is darker than in the ♀, or almost brownish black. Median area of the clypeus convex, subhexagonal, wider in the lower half than in the upper, nearly one-third longer than wide, the apical margin feebly tridentate. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth. Second joint of the flagellum one-fourth longer than the third, the apical joint barely longer than the penultimate, moderately curved and obliquely truncate. First tergite very little narrower at the base than at the apex, nearly half as long again as wide, the posterior two-thirds of the sides almost parallel. Pygidial area rectangular, twice as long as wide, finely punctured. The posterior angles of the sixth sternite are produced into ciliate teeth. Posterior tibiae with six or seven serrations. Otherwise like the ♀.

Behara, Rogez, Bekily and Antanimora, 6 ♀♀, 24 ♂♂. October–April.

In a few specimens there is a broken and very narrow apical yellow band on the sixth tergite in the ♂.

Cerceris nenitra Sauss. (Figs. 31, 31 *a–c*)

Soc. Entom. II, p. 25, ♀, ♂, 1887; *Hist. Madag.* XX, p. 551, ♀, ♂, 1892

♀. 7·5–10 mm. long. To Saussure's detailed and accurate description of this species there is nothing to add except that the petiole in the ♀ is not longer than wide, but as long. This is based on micrometer measurements of the twelve specimens in the collection.

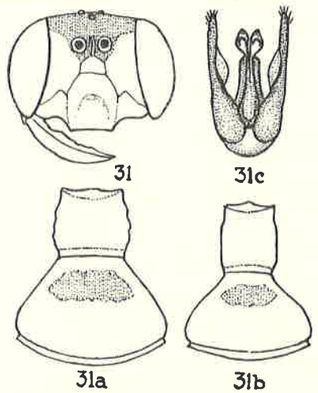


Fig. 31. *Cerceris nenitra* ♀, head, × 12; *a*, first two tergites, × 12; *b*, ♂, first two tergites, × 12; *c*, genitalia, × *c.* 27.

♂. 7·3–9·5 mm. long. The length of the petiole is slightly variable, but out of eleven specimens the petiole at its longest is barely 1¼ times longer than wide, not 1½ times as stated by Saussure.

Bekily, Antanimora, Antsirabé and Behara.

The prey consists of Nomiine bees.

Subfamily ASTATINAE

The collection contains three species of the genus *Astata*, of which two are new species and one a new subspecies of the African *ruficaudata* Turn. There are, however, no examples of *A. blanda* Sauss. described by Saussure from two specimens taken at Anosibé.

In my monograph of the Ethiopian Sphecidae (*Ann. Transv. Mus.*), I omitted to mention the following generic characters in *Astata*. In the ♂, the joints of the flagellum, excepting the first two, are moderately transversely compressed. In both sexes, the fused episternum and epimerum of the metapleura are more distinctly defined from the metasternum than in other Sphegidae. The former are raised above the surface of the metasternum, or inferior portion of the metapleura, are margined below by a carina which is continued over the basal (anterior) corners of the epinotal dorsum and have a sculpture different from that of the metasternum but resembling that of the epinotal dorsum. In fact, to judge by the sculpture alone, one might suppose that this part was an extension, laterad and cephalad, of the epinotal dorsum.

Genus **Astata** Latr.

Key to the species

♀♀

(2) 1. Head and thorax black, abdomen and hind femora pale ferruginous. 7–9 mm. long. **rufofemorata** Arn. (p. 44)
(1) 2. Head, thorax and abdomen black, the pygidial area fusco-ferruginous.
(4) 3. Larger species 12–14 mm. long. Legs black. **minax** Arn. (p. 43)
(3) 4. Smaller species, 7–8 2 mm. long. Tibiae and tarsi fusco-ferruginous. **ruficaudata** Turn. subsp. **hova** Arn. (p. 46)

♂♂

(4) 1. Head and thorax black, abdomen pale ferruginous.
(3) 2. Anterior margin of the median area of the clypeus with a small excision and a tooth on each side of the same. **blanda** Sauss.
(2) 3. Anterior margin of the median area of the clypeus produced into a triangular tooth. **rufofemorata** Arn. (p. 44)
(1) 4. Abdomen black, the apical segment fusco-ferruginous.
(6) 5. Larger species, 10·5–12 mm. long. Fourth sternite with a dense patch of decumbent yellow hairs which extend over the apical margin of the fifth sternite. **minax** Arn. (p. 43)
(5) 6. Smaller species, 7–9 mm. long. Fourth sternite without a patch of decumbent hairs. **ruficaudata** Turn. subsp. **hova** Arn. (p. 46)

Astata minax n.sp. (Figs. 32, 32 *a*, *b*)

♀. 12–14 mm. long. Black. Middle of the mandibles ferruginous. Wings hyaline, the apical three-sevenths, from the middle of the first cubital cell outwards, pale fuscous. Head, excepting the vertex, and the thorax, excepting the dorsal surface, with a fine, outstanding and grey pilosity. Mandibles with a tooth between the middle and the apex. Head shining, the clypeus and face very shallowly, finely and fairly closely punctured, a space between the posterior ocelli and the eyes impunctate. Vertex and temples very sparsely and irregularly punctured, the punctures a little larger than those of the face. Pronotum transversely rugulose and nitidulous. Mesonotum, scutellum and metanotum shining, the anterior third of the mesonotum shallowly and fairly closely punctured, the posterior part and the scutellum very sparsely punctured, the metanotum finely and indistinctly punctured. Mesopleura shining, the puncturation shallow, a little larger but not so close as on the front of the mesonotum. Metapleura and anterior fourth of the sides of the epinotum shining and

impunctate. Dorsum of the epinotum obliquely rugose with strong transverse anastomoses, shining between the rugae, the sides and declivity reticulate-rugose, somewhat closely on the declivity. Abdomen, excepting the pygidium, shining and very sparsely punctured. Pygidial area dull, very finely coriaceous. Median area of the clypeus produced in front and tridentate. Face nearly twice as wide below as across the vertex. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus two-thirds of the third joint. Flagellum slender, all the joints, excepting the first, much longer than wide, the second joint three times longer than wide at the apex and slightly longer than the third. Dorsum of the epinotum a little more than twice as wide at the base as long. Pygidial area elongate triangular. Radial cell obliquely truncate, third cubital cell barely shorter on the radius than on the cubitus, higher than long. Anterior tarsi with a well-developed comb, the basal joint with four spines on the outer margin.

♂. 10·5–12 mm. long. Tarsi varying from dark brown to pale reddish brown, otherwise the colour is as in the ♀, but the fuscous area of the wings is much paler. The grey pilosity of the face longer and more abundant. Fourth sternite in the middle of its apical margin with a dense patch of pale yellow and decumbent hairs which extend over the whole length of the fifth sternite, the latter with a fringe of exserted hairs on each side of the area covered

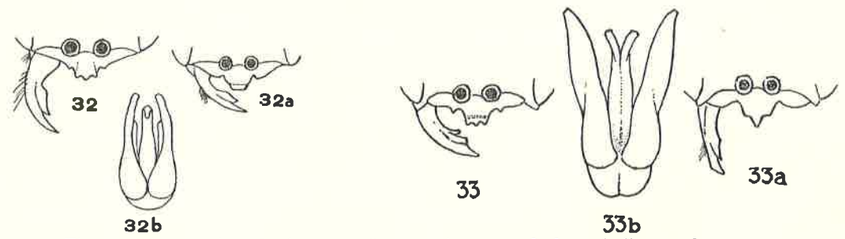


Fig. 32. *Astata minax* ♀, clypeus, ×8; *a*, ♂, clypeus, ×8; *b*, genitalia, ×17½.
Fig. 33. *Astata rufofemorata* ♀, clypeus, ×12; *a*, ♂, clypeus, ×12; *b*, genitalia, ×45.

by the hairs arising from the fourth sternite. Mesonotum, excepting a small area on the middle of the posterior half which is somewhat sparsely punctured, closely and finely punctured. First tergite closely and finely punctured, the interspaces about as large as the punctures, except near the posterior margin where they are two or three times as large. Otherwise the sculpture is like that of the ♀. Median area of the clypeus produced into a short, transverse lobe. Joints of the flagellum, excepting the first two, slightly transversely compressed, the second joint one-fourth longer than the third.

Bekily, 9 ♀♀, 5 ♂♂. October–January.

This species is peculiar in having the female larger than the male, contrary to the usual condition in the genus.

Astata rufofemorata n.sp. (Figs. 33, 33 *a*, *b*)

♀. 7–9 mm. long. Black. Abdomen and hind femora pale ferruginous, the rest of the legs piceous, the anterior tibiae somewhat paler on the inside. Posterior half of the pronotal tubercles and a triangular macula on the inner half of the tegulae, creamy white. Wings hyaline, the apical half of the fore wing slightly tinged with brown, the pterostigma and veins brown. Head and thorax with a short, sparse and greyish pilosity, the pygidial area margined laterally with a blackish fimbria. Median area of the clypeus shining, with a few

large punctures, the lateral areas and the lower half of the face dull, coriaceous-punctate, the rest of the face moderately shining and with a fine, shallow puncturation which becomes sparse above; temples and vertex shining, very sparsely punctured. Pronotum in front transversely rugulose and dull, the sides shining, with a few oblique rugae in front. Anterior third of the mesonotum closely punctured in the middle, less closely and more coarsely at the sides, the posterior two-thirds and the scutellum shining and with a few large punctures. Mesopleura, excepting the epimerum, closely and strongly punctured, metapleura and metanotum smooth and shining, dorsum and declivity of the epinotum sharply and widely reticulate, the dorsum with a median longitudinal carina, the sides strongly and obliquely rugose, the rugae fading away cephalad; the declivity has a deep, shining and triangular fovea above. Pygidial area microscopically reticulate and dull, the rest of the abdomen moderately shining, the sternites with a few small punctures.

Median area of the clypeus produced into a short tridentate lobe and with a transverse groove behind the lobe, the lateral sclerites with a rounded tooth at their junction with the median area. Interocular distance across the base of the clypeus 1¾ times greater than across the vertex, where it is equal to a little more than the length of the first two joints of the flagellum. The second joint of the flagellum is three times longer than wide at the apex and very little longer than the third joint. Posterior ocelli 1½ times farther from each other than from the eyes. Dorsum of the epinotum not much narrowed caudad, two-thirds wider at the base than long, the posterior angles rounded. First abscissa of the radius nearly twice as long as the second, two-thirds as long as the third. Third cubital cell much narrower above than below, sometimes twice as long on the cubitus as on the radius. Comb of the anterior tarsi composed of thin flattened spines, of which there are four on the basal joint.

♂. 8–9·5 mm. long. The whole of the tegulae, the axillary sclerite and the extreme base of the upper side of the anterior tibiae, creamy white; the basal third of the first tergite and the first sternite, excepting the apical margin, black. Otherwise coloured like the ♀. The greyish white pilosity is longer and more abundant than in the ♀, expecially on the face, and is also present on the first tergite and on all the sternites.

Median area of the clypeus shining at the base, the anterior part coriaceous. A triangular area adjacent to the antennal sockets on each side of the face is smooth and shining, the rest of the face and the lateral sclerites of the clypeus are dull, shallowly reticulate-punctate. Mesothorax and metanotum almost dull, closely reticulate-punctate, but the anterior half of the scutellum, excepting the lateral margins, is shining and very sparsely punctured. Dorsum of the epinotum more closely reticulate-rugose than in the ♀, its lateral margins clearly defined by a depressed line, the declivity slightly shining, sparsely and irregularly punctured and rugose, the sides of the epinotum closely and obliquely rugose. The fovea on the declivity is not so deep as in the ♀. Tergites nearly dull, transversely and microscopically rugulose, the sternites nitidulous, very shallowly, finely and sparsely punctured. Median area of the clypeus produced into a triangular tooth which is about as long as wide at its base. Second joint of the flagellum nearly four times longer than wide at the apex and one-fourth longer than the third. Dorsum of the epinotum twice as wide at the base as long. Radial cell three times longer than wide at its widest; the third cubital cell twice as long on the cubitus as on the radius.

Bekily and Behara, 23 ♀♀, 16 ♂♂. September–June.

The prey consists of various species of Hemiptera of the families Coreidae and Berytidae. In a few specimens of the ♀ the last three abdominal segments are slightly infuscated. The species resembles *A. melanaria* Cam. in the shape of the clypeus in the male, but differs considerably in colour and sculpture.

Astata ruficaudata Turner

Ann. Mag. Nat. Hist. XIX, no. 112, p. 318, ♀, 1917; Arnold, *Ann. Transv. Mus.* X, p. 39, ♀, 1923; Arnold, *Ann. Transv. Mus.* XI, p. 35, ♂, 1924

subsp. **hova** n.subsp. (Fig. 34)

♀. 7–8·2 mm. long. This race differs from the type of the species mainly in colour and to a slight extent in the sculpture of the epinotum. Coxae, trochanters and femora black, the tibiae and tarsi darker than in the specific form, or fusco-ferruginous. Lobe of the clypeus black. Antennae black above, rufescent black below. Dorsum of the epinotum longitudinally rugose and with transverse anastomoses, the rugae a little more widely spaced and much stronger than in the specific form, and with the interspaces shining. Otherwise like the type of the species in colour, sculpture and pilosity. The posterior angles of the epinotal dorsum are a little less rounded, and the radial cell is shorter than in the type of the species.

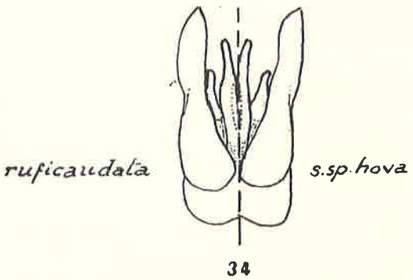


Fig. 34. Genitalia, left side *Astata ruficaudata*, right side subsp. *hova*, ×60.

♂. 7–9 mm. long. Tibiae and tarsi fusco-ferruginous, abdomen either entirely black or with the last two segments ferruginous, otherwise like the specific form in colour and pilosity. The rugae on the dorsum of the epinotum are more distinct, the flagellum is a little longer, and the genitalia differ slightly in having the outer paramera a little blunter at the apex. Otherwise like the ♂ of the type.

Bekily and Behara, 16 ♀♀, 9 ♂♂. March–May.

Subfamily NYSSONINAE

Before proceeding to the description of the species of this subfamily a short discussion on its classification is called for. Handlirsch, in Schröder's *Handbuch der Entomologie*, 1925, divides the Sphecidae into subfamilies 'nicht ganz scharf geschieden', and prefaces the key to them with the remark that 'in this group it is exceedingly difficult to distinguish well-defined subfamilies and tribes'. It is probable that he made this division, not from any conviction that it represented a natural arrangement, but merely to conform to the plan of the systematic part of Schröder's *Handbuch*, since in his introduction to the *Monographie der mit Nysson und Bembex verwandten Grabwespen*, 1887, Handlirsch emphatically expressed his agreement with Kohl that the Sphecidae cannot be split into subfamilies.

In view of our present-day knowledge of the family, this view cannot be maintained, since there is not the slightest difficulty in sharply defining subfamilies such as Trypoxyloninae, Astatinae, Cercerinae, Oxybelinae, etc. But in regard to the subfamily now under consideration, there is, in the opinion of the writer, no doubt that it constitutes a purely artificial assemblage of genera, of which it can be said that they show in one or more characters a greater affinity to one another than they do to any of the genera belonging to the other subfamilies. On the other hand, a searching tabulation of all the characters of generic value has not enabled me to find a single one which is common to them all.

V. S. L. Pate, in a recent paper on Nyssonine wasps (*Trans. Amer. Ent. Soc.* LXIV, p. 118, 1938), has proposed a most remarkable, and in my opinion a very artificial, classification, placing as tribes in the Nyssoninae the subfamilies Bembecinae, Stizinae and Ampulicinae,

together with the Alyssonini, Nyssonini and Gorytini. This he has done on the grounds that 'they all agree practically without exception in having the mesonotum expanded laterally and more or less overhanging the base of the tegulae'. To this structure, which is frequently squarely or obliquely truncate and declivous posteriorly, he has given the name of the *mesonotal lamina*. However, it is not correct to say that it is present practically without exception. There is no sign of such a reflexed margin in *Alysson fuscatus* Panz. and in the two Madagascan species of the same genus, and in the genus *Ammatomus* A. Costa (which I formerly treated as a subgenus of *Gorytes*) it is very poorly developed in many species. A similar condition of the lateral margins of the mesonotum also occurs in some genera of the Pompilidae, but as a guide to the classification in that family it is useless on account of its variable degree of development, and as an indication of natural affinities it is altogether misleading. The characters pertaining to the mouthparts, venation and ocelli, and, in the males, to the apical tergite and genitalia, show that the Bembecinae and Stizinae are far removed from all the genera formerly placed in the Nyssoninae. As for the Ampulicinae, which Pate places tentatively in the subfamily, the peculiar shape of the clypeus and the antennal carinae in *Ampulex* and the antennal plate in *Dolichurus*, not to mention the transversely compressed apical abdominal segments in *Ampulex*, are quite sufficient to prove that there is no close relationship between them and the Nyssoninae. Furthermore, Pate states that the Gorytini, Alyssonini and Ampulicini possess a vertical suture or suturiform impression, the *omaulus*, running ventrad from below the pronotal tubercles. This groove, which is not a true suture, is directly related to the presence of the epicnemium, being no more than the depression which is formed by the cariniform elevation of the hind margin of the epicnemium in front and of the mesopleuron behind. In genera such as *Ammatomus*, in which there are only the beginnings of an epicnemium, this groove is absent, but in other Sphecid genera in which there is a well-developed epicnemium, the groove is necessarily present; such genera are *Psen*, *Psenulus*, *Crabro* excepting the species-group *Rhopalum*, and *Oxybelus*. Between these genera and the Nyssoninae and Ampulicinae no recent authors at least have suggested that there is any relationship, and one may rightly conclude that the presence of the *omaulus* is of very doubtful value as a proof of affinity in a natural classification. The other characters mentioned by Pate as being common to all the genera placed in his Nyssoninae, such as the length of the anal lobe of the hind wing (=basal lobe, Kohl, Arnold et auct.) and the position of the transverse cubital vein, appear to me to be of secondary importance and certainly no proof of a natural relationship. Furthermore, it should not be overlooked that a very well-defined character is to be found, on the one hand, in the reniform eyes in the genera *Pison* and *Trypoxylon*, and in *Philanthus* on the other, yet no one would suggest that those three genera should be placed on that account in the same subfamily.

In this artificial subfamily I include the following tribes:

Mellinini	*Mellinus*
Gorytini	*Gorytes* (=*Arpactus*) and *Ammatomus*
Heliocausini	*Heliocausus*
Nyssonini	*Nysson*, *Acanthostethus*, *Brachystegus*, *Zanysson*, *Metanysson*, *Nippononysson*, *Foxia*, *Cresson* and *Hovanysson**
Alyssonini	*Entomosericus*, *Alysson*, *Didineis*, *Bothynostethus* and *Scapheutes*

The Mellinini and Heliocausini have not been found up to the present in Africa or Madagascar, and of the other tribes only the following genera occur in Madagascar: *Gorytes*, *Ammatomus*, *Nysson*, *Hovanysson* and *Alysson*. The genus *Brachystegus* will probably be found in the island on further investigation, and I have therefore included it in the following key.

* Some of these should perhaps be considered subgenera of Nysson.

Key to the genera and subgenera

(8) 1. Second cubital cell stalked. Epicnemium present. Dorsum of the epinotum with the posterior angles dentate or spinose.

(7) 2. Pterostigma small. Pronotum short.

(6) 3. Hind femora produced apically below on the outside into a curved dentate process. Face with a short median carina above the antennae or with a short porrect tooth.

(5) 4. Hind tibiae irregularly serrate. Second cubital cell receiving both recurrent veins.
Brachystegus A. Costa

(4) 5. Hind tibiae unarmed. The first recurrent vein enters the second cubital cell, and the second enters the third cubital cell. Cubitus of the hind wing postfurcal, i.e. arising well beyond the end of the submedial cell. (Anterior margin of the dorsal face of the first tergite raised in the middle to form a transverse crest.)
Brachystegus, subgen. **Hovanysson** Arn. (p. 52)

(3) 6. Hind femora without an apical process. Hind tibiae unarmed. Face without a carina. Second cubital cell receiving both recurrent veins. Cubitus of hind wing arising before the end of the submedial cell, or (subgen. *Epinysson*) far beyond. **Nysson** Latr. (p. 51)

(2) 7. Pterostigma large. Pronotum elongated and narrowed cephalad. (Face without a carina; anterior and middle trochanters two-jointed, the basal joint very small.)
Alysson Jur. (p. 48)

(1) 8. Second cubital cell sessile and receiving both recurrent veins. Epicnemium absent (*Ammatomus*), or distinct and with its hind margin bounded by a carina.* Dorsum of the epinotum without teeth or spines at the posterior angles, the median triangular area not markedly different from the rest of the dorsum by coarse sculpture, its lateral margins indicated by faint impressed lines or crenulate grooves.

(10) 9. Occiput flat, its upper margin close to the tops of the eyes. Flagellum strongly clavate. The facets of the lower inner half of the eyes greatly enlarged in the ♀, and sometimes also in the ♂. Hind tibiae irregularly serrate. Hind tarsi very long, the first three joints united much longer than the tibia. First abdominal segment petioliform, or at least much narrower than the second segment, as long as wide behind, or longer.
Ammatomus A. Costa (p. 58)

(9) 10. Occiput rounded, its upper margin not close to the tops of the eyes. Flagellum not clavate. The facets of the eyes normal. Hind tibiae not serrate, at the most with a few thin and widely separated spines. Hind tarsi not unusually long. First abdominal segment not much narrower behind than the second, rarely as long as wide behind. In the ♂ only six ventral segments are visible. **Gorytes** Latr. (p. 54)

Apart from *Ammatomus*, which appears to me to merit generic rank, I have followed Kohl and Handlirsch in the view that *Lestiphorus* Lep., *Euspongus* Lep. and *Hoplisoides* Grib. are at the most merely species-groups and should be sunk as synonyms of Gorytes.

The position of *Kohlia* Handl., known from two African species, seems to me to be very doubtful. Handlirsch places it in the Gorytini, but in the structure of the clypeus and in the venation it shows some relationship to *Sphecius* and might be placed with that genus in the Stizinae.

Genus **Alysson** Panz.

Krit. Rev. Insektenf. Dtsch. II, p. 169, 1806

CHARACTERS. Head wider than the thorax; eyes reaching the base of the mandibles, their inner margins parallel or nearly so, the face feebly convex and without a median carina. Labrum as wide as long, clypeus transverse and feebly convex. Mandibles not excised on the outer margin. Maxillary palpi six-, labial palpi four-jointed. Flagellum filiform, the apical joint in the ♂ curved. Pronotum narrower than the mesonotum, and not much lower, elongated, narrowed cephalad, the neck and lower part of the sides wider than the dorsum and clearly visible from above. Epicnemium present, its hind margin not very clearly defined. Scutellum flat, separated from the mesonotum by a crenulate suture. Epinotum

* With a few exceptions, e.g. *G. monstrosus* Handl.

longer than wide, its dorsum with a clearly defined elongate triangular median area, its posterior angles produced into spines. Pygidial area in the ♀ subtriangular and distinct. In the ♂ the seventh sternite is covered by the sixth, and the eighth is feebly chitinized and bidentate. The cardo of the genitalia is elongated, only about one-third shorter than the stipites. Fore wing: bifasciated; pterostigma large, radial cell wide. First cubital cell longer than the second and third united, the second stalked, the third higher than wide. The position of the basal vein in respect to the nervulus is variable. First submedial cell much longer than the second. Hind wing: the cubitus originates before the apex of the submedial cell.

Trochanters of the fore and middle legs two-jointed, the apex of the hind femora produced on the outside below into a curved flattened tooth. Middle tibiae with two spurs, one of which is very small. In the ♀ the apical joint of the anterior tarsi, and also its pulvillus, are much enlarged, the basal joint with a feebly developed comb.

Fourteen species of this genus have been described from the Palaearctic and Nearctic Regions, and four from India and Ceylon. The discovery of two species in Madagascar is of the greatest interest, since until recently none was known from the Ethiopian Region.* The prey consists of Homopterous insects.

Alysson Seyrigi n.sp. (Figs. 35, 35 *a–e*)

♀. 7 mm. long. Black. Basal half of the mandibles (the apical half ferruginous), clypeus, lower third of the sides of the face, a triangular area between the clypeus and the antennal sockets, the underside of the scapes, the underside of the anterior femora and the apical two-thirds of the ventral surface of the anterior coxae, pale yellow. Tarsi brown, the hind pair darker. Anterior tibiae brown, dirty yellow above; fore and middle femora and the middle tibiae brownish black. Wings hyaline, bifasciated. There is a sparse greyish pubescence on the head and legs and some long white hairs on the mandibles, clypeus and vertex. The whole body is fairly shining.

Head and thorax, excepting the epinotum, very finely and not closely punctured, the punctuation on the mesopleura almost obsolete. Median triangular area of the epinotum sharply marginate, one-third longer than wide at the base, reticulate-rugose, the rugae emphasized obliquely on the basal two-thirds, and transverse in the apical third. Outside the median area the dorsum of the epinotum is obliquely and more strongly rugose. The declivity is reticulate-rugose, sparsely so above, and has a strong median longitudinal carina and a small

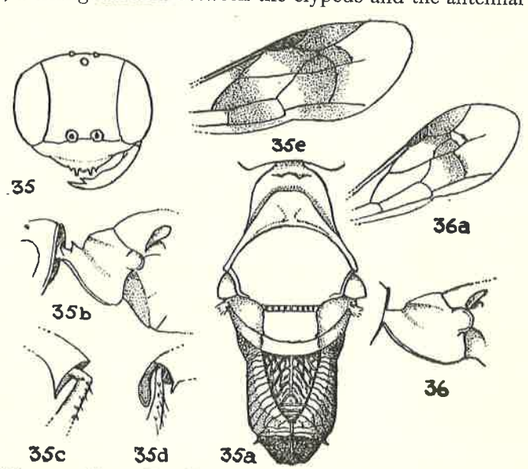


Fig. 35. *Alysson Seyrigi* ♀, head, × 15; *a*, thorax, × 15; *b*, pronotum, lateral view, × 15; *c*, *d*, apex of hind femur, seen from the side and from behind, × 27; *e*, fore wing, × 12.

Fig. 36. *Alysson madecassus* ♀, pronotum, lateral view, × 15; *a*, fore wing, × 15.

* A new and as yet undescribed species from Basutoland has recently come to my notice.

tooth on each side at the upper corners. The sides of the epinotum are obliquely striate except in the middle below. Abdomen impunctate, the pygidial area subtriangular, widely rounded at the apex and covered with a dense dark brown pubescence.

Clypeus a little more than four times wider than long in the middle, the apical margin slightly depressed and quinquedentate in the middle, the median tooth and the outer pair of teeth very small. Inner orbits parallel below, slightly divergent above. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth joint. The second joint of the flagellum is fully four times longer than wide, nearly twice as long as the first and half as long again as the third. Posterior ocelli nearly twice as far from the eyes as from each other. Vertex and temples separated from the occiput by a sharp carina. Dorsum of the pronotum twice as wide behind as long or as wide in front, its anterior margin convex; the neck of the pronotum has a transverse crest in front. Mesonotum a little wider than long; the dorsum of the epinotum for the greater part parallel-sided and one-fourth wider at the base than long. First tergite about as long as wide. For the venation see Fig. 35 *e*.

Perinet, 1 ♀. February. Differs from the three Indian species and *ruficolle* Cam. from Ceylon in colour.

Alysson madecassus n.sp. (Figs. 36, 36 *a*)

♀. 5·8 mm. long. Black. Basal two-thirds of the mandibles pale ochreous, the apical third fuscous. Anterior two-thirds of the median area of the clypeus, the underside of the scapes and a narrow line adjacent to the lower part of the inner orbits, pale yellow. Anterior tibiae and tarsi brownish ochreous, the middle and hind tarsi dark brown. There is a scanty, short and brownish grey pubescence on the head and thorax; the declivity of the epinotum with whitish pubescence on its lower half. First tergite with a small patch of longer whitish hairs on each side near the hind margin, the remaining tergites and sternites with a sparse pubescence and a few long whitish hairs. The pygidium is densely covered with dark brown pubescence.

Median area of the clypeus shining, sparsely and coarsely punctured, the temples shining, sparsely and microscopically punctured. The rest of the head fairly dull, closely and finely punctured. The puncturation of the pronotal dorsum, mesonotum and scutellum is about as large as that of the vertex, but more scanty on the scutellum. Sides of the pronotum fairly strongly punctured, mesopleura closely and finely punctured in front, obliquely rugulose behind. Sides of the epinotum dull, obliquely rugulose, the upper anterior corner sparsely rugose. The sculpture of the dorsum of the epinotum resembles that of *A. Seyrigi*, but is weaker, the rugae less close and thinner, the apical portion of the median area without transverse rugae, the median area itself narrower, or four-fifths longer than wide at the base. The teeth at the upper corners of the declivity are less acute than in *Seyrigi*. The third to fifth tergites and sternites, and also the sixth sternite, are very distinctly and fairly closely punctured. Median area of the clypeus half as wide again as long, feebly convex, the anterior margin obtusely tridentate. Inner orbits slightly convergent below. Posterior ocelli nearly twice as far from the eyes as from each other. Interocular distance on the vertex equal to the length of the first four joints of the flagellum. The proportions of the first three joints of the flagellum as in *Seyrigi*. Neck of the pronotum without a transverse crest; the posterior raised part of the pronotum is less narrowed cephalad than in *Seyrigi*, being only one-third wider behind than in front. Dorsum of the epinotum as wide at the base as long, slightly widened caudad so that the lateral margins are feebly convex and not parallel and straight as in *Seyrigi*. First tergite one-fifth wider at the apex than long. Wings hyaline, the veins brown; a faint brownish cloud covers the radial and second cubital cell, the upper angle of the first cubital cell and the outer third of the second discoidal, but there is no inner fascia

as in *Seyrigi*. The third cubital cell is much narrower than in that species, it is higher than wide on the cubitus and twice as wide there as on the radius. The recurrent veins meet the first and second cubital cells a little distance before their distal angles.

Behara, 1 ♀. January.

Genus **Nysson** Latr.

Nysson albibarbis n.sp. (Figs. 37, 37 *a–d*)

♀. 7–7·5 mm. long. Black. The thorax ferruginous, excepting the underside and the lower third of the mesopleura, which are black. The median area of the epinotum and its declivity sometimes slightly fuscous. First four tergites with lateral ivory white maculae, those on the first two narrow mesad and abruptly dilated laterad, on the third and fourth much smaller, oblique and oblong. Extreme apical margins of the third to fifth tergites and the pygidial area rufescent. Base of the mandibles dull yellow, apex of the scapes testaceous below. Legs reddish brown, the tarsi darker. Head with a decumbent pale golden pubescence, dense and obscuring the sculpture everywhere except on the vertex and occiput. Underside of the thorax, coxae, femora, mesopleura and the second sternite covered with a fairly dense, adpressed and silvery tomentum. The dorsum of the epinotum outside the median area and the brow of the first tergite with yellowish white tomentum. Tibiae, tarsi and tergites with a short and very fine, greyish pubescence. As in the majority of the Nyssonids, the tergites have a false apical margin formed by a very narrow translucent lamina arising just behind and overhanging the true apical margin;* this lamina is fringed by minute silvery scale-like hairs.

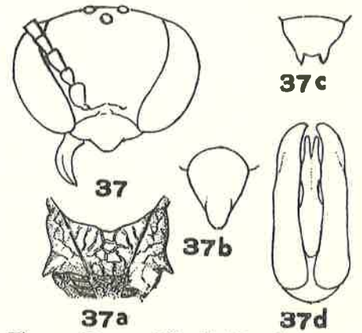


Fig. 37. *Nysson albibarbis* ♀, head, × *c.* 14; *a*, epinotum, × *c.* 14; *b*, pygidium, × *c.* 14; *c*, ♂, pygidium, × *c.* 14; *d*, genitalia, × 24.

Head between the posterior ocelli and the occiput, where the pubescence is less dense, very finely and closely punctured, and with a few larger scattered punctures superimposed. Anterior face of the pronotum closely and finely punctured, its sides transversely clathrate, its very short dorsum and the mesonotum and the scutellum with large and deep punctures, the interspaces punctulate and not much wider than the large punctures. The sculpture of the mesopleura is obscured by the pubescence but consists apparently of a wide and coarse reticulation, the epicnemium shining and finely punctured.

The epimerum has a horizontal lamelliform crest below the tegulae. Metapleura and lower half of the sides of the epinotum smooth and shining. Median area of the epinotum widely reticulate-rugose, more strongly in the middle than at the sides, the lateral areas of the dorsum sparsely and irregularly rugose, the upper half of the sides of the epinotum coarsely reticulate. The hind angles of the dorsum have a spine which is a little longer than wide at the base. The declivity of the epinotum has a median area coarsely reticulate-rugose and on each side of the same a narrower area which is transversely costate; between the latter and the lateral margins the sculpture is again reticulate-rugose. Tergites finely and closely punctured, the puncturation on the first twice as large as on the second, the interspaces on both as large as the punctures; the anterior half of the first tergite has a sparse and larger puncturation superimposed. The puncturation on the third to fifth tergites becomes progressively finer caudad. Sixth tergite with a puncturation nearly as large as

* This is the condition to which Pate applies the term 'margin double'.

that of the first, but elongated; its marginate apical part, forming the pygidial area, is semi-elliptical. Sixth sternite shining and smooth in the middle and at the sides as strongly punctured as the first tergite.

Clypeus nearly twice as wide as long in the middle, the median area produced into a rounded lobe. Eyes strongly convergent below, the interocular distance on the vertex equal to the length of the first five joints of the flagellum plus half of the sixth, and twice as great as the interocular distance across the base of the clypeus. Second joint of the flagellum as long as the third and a little shorter than the fourth. Posterior ocelli a little less than half as far from the eyes as from each other. Temples narrow, one-fourth as wide as the eye. The anterior margin of the pronotal dorsum is strongly convex, raised in the middle into a blackish, transverse crest which is a little wider than the anterior ocellus. Scutellum as long as wide, its lateral margins raised. Dorsum of the epinotum $4\frac{1}{2}$ times wider at the base than long, the median area subtrapezoidal and two-thirds wider in front than behind. Petiole of the second cubital cell as long as the third abscissa of that cell on the cubitus. The cubital vein of the hind wing arises far beyond the end of the submedial cell.

♂. 7 mm. long. The whole of the first and second tergites have a larger, scattered punctuation superimposed on the finer fundamental puncturation. The pubescence on the clypeus is longer than in the ♀ but not so dense, and is of a silvery colour. The basal half of the mandibles, the mesosternum and the underside of the anterior coxae with a long, dense and white pilosity. Otherwise like the ♀ in colour, sculpture and pubescence. Median area of the clypeus less produced than in the ♀, the anterior margin of the lobe less convex. Second joint of the flagellum not quite twice as long as wide at the apex and a little longer than the third; the apical joint moderately curved and half as long again as the preceding joint. Seventh tergite coarsely and closely punctured, the apical angles produced into triangular teeth, the margin between them arcuate caudad. Otherwise like the ♀.

Bekily, 2 ♀♀, 3 ♂♂; Antananarivo, 1 ♀. November–January.

This species, having the cubitus of the hind wing arising well beyond the end of the submedial cell, comes within the subgenus *Epinysson* Pate.

Subgenus **Hovanysson** n.subg.

CHARACTERS. This subgenus of *Brachystegus* differs only in the few following characters:

Face with a low transverse crest above the antennal sockets, which is produced medially into a porrect, curved tooth. Scapes less ovoid than in *Brachystegus*, the flagellum more slender, not incrassate apically, the fourth and following joints clearly longer than wide. Epicnemium pubescent, not glabrous as in most species of *Brachystegus* s.str., its posterior margin not clearly defined. Scutellum convex lengthwise, its lateral margins not reflexed. Hind tibiae neither serrate nor spinose; the apex of the hind femora produced at the apex below into a curved dentate process, as in *Brachystegus*. Abdomen lanceolate, broadest across the second segment. The first recurrent vein enters the second cubital cell and the second enters the third. Otherwise the characters of *Brachystegus* Costa (sensu Pate, nec auct.).

An additional character, which may be generic, is the peculiar formation of the first abdominal segment in the ♀. The declivity of the tergite is vertical in front and only feebly convex transversely; above, at its junction with the dorsum, it is raised into a transverse crest, indented in the middle and ending abruptly laterad, or almost dentate.

Subgenotype, *Hovanysson camelus*.

Brachystegus, subgen. **Hovanysson camelus** n.sp. (Figs. 38, 38 *a–f*)

♀. 9–11 mm. long. Black. Wings pale fuscous, the veins black. Face, clypeus, the fore and middle coxae below, pronotal dorsum, mesosternum, mesopleura excepting the epimerum, outer thirds of the epinotal declivity and the lateral margins of the first four tergites covered with a dense, decumbent, sericeous and silvery white pubescence; on the face and pronotum it is sometimes somewhat yellowish. The rest of the body, excepting the pygidium, metapleura and sides of the epinotum with a less dense, shorter and greyish pubescence. Clypeus dull, coarsely and sparsely punctured. Upper part of the face, vertex, occiput, temples, dorsum of the pronotum and the mesothorax punctured, the punctures on the upper part of the mesopleura largest, about one-third as wide as the anterior ocellus and a little larger than those on the mesonotum; those on the head and pronotum half as large as those on the mesonotum, the interspaces punctulate and for the greater part twice to three times as wide as the punctures. On the scutellum the interspaces are no wider than the punctures. Sides of the pronotum obliquely costate. Metanotum rugoso-punctate, metapleura and anterior half of the sides of the epinotum smooth and shining. Median area of the epinotum subtrapezoidal, grooved on the side of the lateral margins and with about ten oblique costae which are branched caudad; the lateral areas with a coarse and very open reticulation. The median area does not reach the posterior margin of the dorsum; the declivity has a shining median area, gradually attenuated ventrad, and on each side of the same a wide marginate depression. Between the latter and the lateral margins the surface is reticulate-rugose. The posterior half of the sides of the epinotum is coarsely punctured, and the apical teeth are compressed from front to back. First five tergites shining and punctured, the puncturation becoming progressively smaller on each succeeding segment, that of the first not quite so large as on the mesonotum. Pygidial area shining, semi-elliptical, with a close and small fundamental puncturation on which are superimposed a few elongate punctures. Sternites dull; first sternite bicarinate medially, the second sparsely and more coarsely punctured than its tergite, the third to fifth finely and closely punctured at the base, sparsely and more strongly on the apical halves. Sixth sternite with a puncturation like that of its tergite but closer.

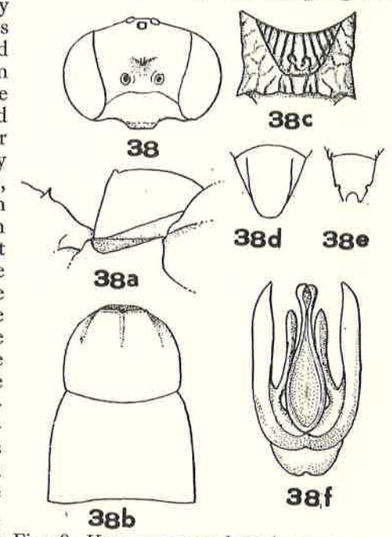


Fig. 38. *Hovanysson camelus* ♀, head, × *c.* 10; *a*, first tergite, × *c.* 10; *b*, first two tergites, × *c.* 10; *c*, epinotum, × *c.* 10; *d*, pygidium, × *c.* 10; *e*, ♂, pygidium, × *c.* 10; *f*, genitalia, × 24.

Clypeus $2\frac{1}{3}$ times wider than long in the middle, the median area slightly produced and depressed in front, its anterior margin straight. Face slightly protruding in the middle below, the upper margin of the protuberance with a wide V-shaped carina, in the middle of which is a short tooth, curved ventrad. Interocular distance on the vertex equal to the length of the first six joints of the flagellum, and $1\frac{1}{3}$ times greater than the interocular distance across the base of the clypeus. Posterior ocelli twice as far from the eyes as from each other. First joint of the flagellum subovoid, twice as long as wide and as long as the second, the latter two-fifths longer than wide, the remaining joints, excepting the last, of equal width,

the apical joint slightly acuminate, 2⅔ longer than wide at the base. Dorsum of the pronotum as long in the middle as the first joint of the flagellum, its shoulders rounded.

Mesonotum with a narrow median longitudinal groove, the mesonotal lamina squarely truncate behind. Dorsum of the epinotum five-sevenths wider at the base than long, the median area four-fifths wider at the base than long. First tergite not quite 1½ times wider behind than long, its anterior face vertical, its junction with the dorsal face raised, except at the sides, into a ridge which is shallowly depressed in the middle. Second tergite two-fifths wider than long and one-fourth longer than the first. Petiole of the second cubital cell as long as the second abscissa of the radius, or nearly so; the third cubital cell three times as long on the cubitus as on the radius.

♂. 11 mm. long. Puncturation of the tergites a little stronger than in the ♀. Sixth tergite with a blunt tooth on each side of the apical margin. Seventh tergite scutate, the apex arcuately emarginate, the lateral margins more or less excised just behind the apical teeth. Interocular distance on the vertex equal to the length of the first seven joints of the flagellum. First tergite without a transverse ridge in front, the junction of the anterior vertical and the dorsal faces being rounded. In the middle, the dorsal face is somewhat flattened. Otherwise like the ♀.

Bekily and Behara, 12 ♀♀, 9 ♂♂; Fort Dauphin, 2 ♂♂; Ivondro, 1 ♂. November–March.

In both sexes the position of the recurrent veins on the cubitus is slightly variable, but as a rule the first recurrent vein meets the second cubital cell at its proximal fourth, and the second meets the third cubital cell at its proximal fifth.

Genus **Gorytes** Latr.

Nouv. Dict. Nat. XXIV, p. 180, 1804

Arpactus Jur., Arnold, *Ann. Transv. Mus.* XIII, p. 229, 1929.

Gorytes Ranosahae* n.sp. (Figs. 39, 39 *a*, *b*)

♀. 19 mm. long. Black. Pronotum, anterior corners and lateral margins of the mesonotum and the upper half, more or less, of the mesopleura, dark ferruginous. Apical segment of the abdomen brownish black above, fusco-ferruginous below. The underside of the scapes and of the hind tibiae except the base, straw yellow. Wings pale flavo-hyaline, the veins ochreous. Head and thorax with a decumbent greyish pubescence, scanty on the epinotum which has also on its declivity a sparse yellowish pilosity. The clypeus has some stiff and longer hairs intermixed with the pubescence. Pubescence on the second to fifth tergites yellowish grey, dense and decumbent. Anterior third of the clypeus shining, sparsely and coarsely punctured, the basal two-thirds dull, finely and closely punctured and with a few larger punctures interspersed. Face and vertex dull, with a fine, sparse and irregular puncturation, the temples nitidulous and finely punctured. The sculpture of the thorax is like that of *G. natalensis* Smith, but a little stronger and closer on the mesonotum, which is dull. The sides of the epinotum are more coarsely punctured than in *natalensis*. The de-

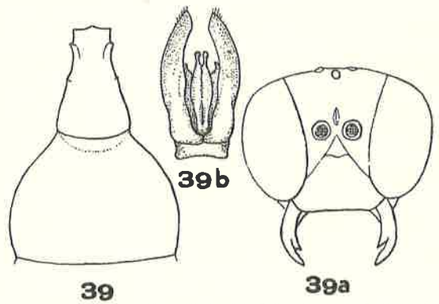


Fig. 39. *Gorytes Ranosahae* ♀, first two tergites, ×6; *a*, ♂, head, ×*c.* 10; *b*, genitalia, ×*c.* 14.

* Ranosaha, one of the several native collectors employed by M. Seyrig.

clivity of the epinotum has five transverse rugae at the bottom. The mesopleura, as in *natalensis*, have above the middle coxae a short transverse carina which does not connect with the extension caudad of the carina bounding the epicnemium. First tergite shining, with a sparse piligerous puncturation, tergites 2–5 dull, very finely and closely punctured, the fourth and fifth with a few larger punctures caudad, the pygidium elongate triangular, longer than wide at the base, nitidulous and with a few elongate punctures at the sides. First and second sternites longitudinally carinate in the middle, as in *natalensis*, the second shining and sparsely punctured except at the posterior corners, which are dull and closely punctured. Sternites 3–6 smooth and shining on the basal half, finely and closely punctured on the apical half, and with a few larger punctures interspersed.

The clypeus is nearly twice as wide as long, as in *natalensis*, but is more convex lengthwise than in that species. Interocular distance on the vertex nearly 1½ times greater than across the base of the clypeus and equal to a little more than the length of the first three joints of the flagellum.* The second joint of the flagellum is nearly half as long again as the third. First tergite one-half longer than wide at the apex, the second nearly one-third wider than long and therefore wider than in *natalensis*, in which it is only one-fourth wider. Otherwise like *natalensis*, including the venation.

♂. 14–15 mm. long. A narrow line on each side of the lower half of the face, and the underside of the scapes, pale yellow. Apical margins of the fourth and fifth tergites and the whole of the sixth and seventh, brownish ochreous; the hind tibiae entirely black. Otherwise like the ♀ in colour. Sides of the thorax and the sternites very shining, the rest of the body moderately so. Clypeus finely and not very closely punctured and with a few larger punctures superimposed. Scutellum a little more strongly punctured than in the ♀. Otherwise like the ♀ in sculpture, pilosity and pubescence. Clypeus half as wide again as long. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus nearly half of the fourth and nearly five-sixths greater than the interocular distance across the base of the clypeus. Second joint of the flagellum one-fourth longer than the third. First tergite about three times longer than wide behind, and a little more than twice as wide there as at the base. Otherwise like the ♀.

Rogez, 1 ♀, type; Ivondro, 1 ♂, type; Ambositra, 1 ♂. December-January.

Although very different in colour, the near relationship to *natalensis* Smith is very evident.

Gorytes bipustulatus n.sp. (Figs. 40, 40 *a*, *b*)

♀. 9 mm. long. Closely allied to *G. aglaia* Hndl. Black, with a tinge of chocolate brown or very near C.U.C. 671 violet. The head somewhat paler, the apical abdominal segment and the fifth tergite brownish yellow, the latter sometimes with a transverse brownish band across the middle. Clypeus pale brownish red, margined all round with pale ochreous. A line on the face and temples, margining the eyes, ochreous, that of the face widened below. Mandibles ochreous, the apical third piceous. A narrow line on the underside of the scapes pale ochreous. Posterior margin of the pronotum ochreous. First and second tergites with narrow apical bands of pale chrome yellow, the fourth and fifth with narrower apical bands of a duller yellow. Legs dark ferruginous, the underside of the fore and middle tibiae pale yellow, the apical joint of the fore tarsi ochreous. Flagellum fusco-ferruginous above, ferruginous below, excepting the last three joints, which are blackish. Wings hyaline, the pterostigma and the veins behind it ochreous, the veins distad of the pterostigma brown, the radial, second cubital and the upper part of the third cubital cell suffused with yellow. The whole body is covered with a microscopic pubescence, greyish except on the median area of the epinotum and on the tergites where it is of a pale brownish yellow colour. Clypeus

* In *natalensis* the width across the vertex is half as great again as across the clypeus, not two-thirds as erroneously stated in my description in *Ann. Transv. Mus.* XIII, p. 233, 1929.

with a few coarse, white and exserted hairs. Calcaria and spines on the legs pale yellowish white. Sternites and pygidial area moderately shining, the rest of the body dull. Upper half of the face and the vertex coriaceous-punctate, the interspaces about as wide as the punctures. Temples, occiput and pronotal collar nearly impunctate. Mesonotum more closely punctured than in *aglaia*, the punctures twice as large as those on the vertex, the interspaces not much wider than the punctures.

The puncturation on the mesopleura, scutellum and metanotum as large as on the mesonotum, but sparser, the interspaces except on the front of the mesopleura three to four times as wide as the punctures. The carina margining the epicnemium is continued backwards between the mesopleura and mesosternum as far as the metapleura, as in *aglaia*. Median triangular area of the epinotum with twelve to fourteen longitudinal carinae, not so strong as in *aglaia*, the interspaces dull and not shining as in *aglaia*. The rest of the epinotum punctured, sparsely at the sides, the punctures a little smaller than those of the mesonotum. Tergites 1–4 finely punctured in the middle, more coarsely at the sides, the punctures much smaller and farther apart than in *aglaia*, the fifth tergite coriaceous, the pygidial area scutate, strongly and sparsely punctured. Second sternite with a large, sparse and oblique puncturation, larger than that of the mesonotum, the remaining sternites sparsely and more finely punctured.

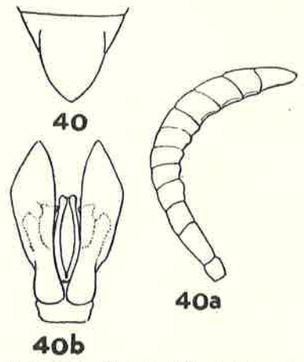


Fig. 40. *Gorytes bipustulatus* ♀, pygidium, ×*c.* 24; *a*, ♂, flagellum, ×*c.* 24; *b*, genitalia, ×*c.* 24.

Clypeus 2⅔ wider than long, flatter than in *aglaia*, the apical third not inflected as in that species, the apical margin straight. Inner orbits slightly convergent below. Interocular distance on the vertex nearly equal to the length of the first six joints of the flagellum. Posterior ocelli a little nearer to the eyes than to each other. Second joint of the flagellum two-thirds longer than the third joint. Triangular area of the epinotum twice as wide at the base as long in the middle. First tergite like that of *aglaia*, and as long as wide at the apex. Pygidial area scutate, the lateral margins evenly convex, not abruptly inflected basad as in *aglaia*.

♂. 7–8 mm. long. Face and vertex less closely punctured than in the ♀, the interspaces two to three times wider than the punctures. The second to fourth joints of the posterior tarsi dirty white at the base, otherwise like the ♀ in colour, sculpture and pubescence. Clypeus three times wider than long and with a thin pencil of curved hairs at each corner, as in *aglaia* ♂. Inner orbits more convergent below than in the ♀, the interocular distance on the vertex being one-fourth greater than across the clypeus and equal to the length of the first seven joints of the flagellum. Second joint of the flagellum four-fifths longer than the third, the fourth to eighth feebly dilated below distad, the ninth to eleventh arcuately excavated on the underside. Second sternite with a low broad tubercle or pustulate swelling on each side near the apex. Fifth and sixth sternites as in *aglaia*, with a median fimbria of curved hairs at the extreme base, which are concealed beneath the preceding segments in the natural condition and visible only when the segments are pulled far apart. Seventh tergite more or less hidden under the sixth, triangular, rounded at the apex and smooth and shining. Otherwise like the ♀.

Bekily, 6 ♀♀, 8 ♂♂; Behara, 10 ♀♀. December–April.

The prey consists of small Fulgorids, of which no less than nine were found in one nest.

Very closely allied to *G. aglaia* Hndl., which is almost certainly a synonym of *intricans* Gribodo, on which Gribodo erected the genus *Hoplisoides*, chiefly on account of the seventh

tergite being hidden. The degree of exposure of that segment is variable, and even the presence of the fimbriae on the fifth and sixth sternites and one or two other minor characters do not, in my opinion, justify Pate's resuscitation of Gribodo's genus (see Pate, *Trans. Amer. Ent. Soc.* LXII, pp. 49–56, 1936).

Gorytes histrio Sauss. (Figs. 41, 41 *a–c*)

Harpactes histrio, *Hist. Madag.* XX, ♀, p. 530, 1892; Handlirsch, *Sitzber. Akad. Wiss. Wien*, CIV, p. 907, ♂, 1895.

♀. In Saussure's description no mention is made of the maculae on the first tergite; furthermore, the French text contradicts the Latin diagnosis, in which it is wrongly stated that the fourth segment is orange. The first tergite has a transverse macula, narrowed laterad, on each side, of a pale whitish yellow colour but deepening to orange cephalad; the fifth tergite is also whitish yellow. The pygidial area has a dirty ochreous spot near the base. Clypeus three times wider than long. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth. The second joint is twice as long as wide and only a trifle longer than the third. Posterior ocelli twice as far from each other as from the eyes. The triangular area of the epinotum is somewhat variable in length, but usually about one-fourth wider at the base than long. In some specimens the longitudinal rugae do not extend the whole length of the area, the apical angle being transversely rugose.

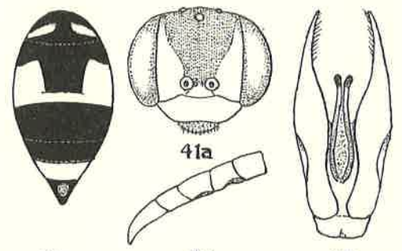


Fig. 41. *Gorytes histrio* ♀, abdomen, ×12; *a*, ♂, head, ×15; *b*, apical joints of the flagellum, ×27; *c*, genitalia, ×27.

♂. 5·3–6 mm. long. Clypeus, underside of the scapes, frontal triangle and the sides of the face chrome yellow, a much deeper yellow than in the ♀. The yellow markings on the sides of the face, narrowed abruptly dorsad, are much wider than in the ♀. Mandibles black at the base, pale yellow in the middle, fusco-ferruginous at the apex. Flagellum reddish brown above, dull yellow below. A short streak on the upper side of the hind tibiae at the base, dirty white. The maculae on the first tergite narrower, and those on the second smaller and less quadrate than in the ♀; the fifth tergite whitish yellow only on the apical half. Otherwise like the ♀ in colour. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth. Second joint of the flagellum slightly shorter than the third, two-thirds longer than wide at the apex, the ninth and tenth joints excavated below, the apical joint curved, distinctly narrowed towards the apex and nearly twice as long as the preceding joint. The puncturation of the second tergite is shallower and much more sparse than in the ♀.

Behara, 1 ♀; Bekily, 10 ♀♀, 8 ♂♂. January–March.

Closely allied to *G. rufithorax* Brauns, from which it differs in having the head and the triangular area of the epinotum red, and in the shorter and less strongly rugose epinotum. It is very probable that *rufithorax* is no more than a race of the European *laevis* Latr., but as I have no specimens of the latter available for examination the question cannot be settled at present.

Genus **Ammatomus** A. Costa

Faun. Regn. Napoli Imen. Aculeat. p. 36, 1859

CHARACTERS. Temples obsolete or nearly so, the head being vertically truncate behind, so that the occiput is nearly flat and its upper margin close to, or touching the eyes. Flagellum strongly clavate. Clypeus trapezoidal. Eyes nearest together at about the middle of the face, their inner margins divergent above and below, more strongly so above; the facets on the inner lower half of the eyes greatly enlarged in the ♀, and sometimes so also in the ♂. Frontal triangle elongate. Epicnemium absent, mesopleura without a longitudinal carina below, the mesosternum therefore not defined from the episternum and epimerum. Median triangular area of the epinotum not defined laterad by crenulate grooves. First abdominal segment sessile, or petiolate or subpetiolate, and at its greatest width much narrower than the second segment, the latter distinctly narrowed cephalad. Anterior tarsi without a comb. Posterior tarsi long and thin, often as long as the femur and tibia united, the first four joints much longer than wide. Posterior tibiae strongly spinose on the outside. Pulvilli, especially of the front legs, swollen and not much shorter than the claws. Calcaria of the hind tibiae short, the inner one broad, concave below, obliquely truncate apically, the outer one spiniform and flat below. In the ♀ the pygidial area is marginate, and covered with stiff pubescence as in the genus *Tachytes*. ♂ with seven visible tergites and six visible sternites, the eighth dorsal segment forked, the eighth ventral with a long spinous process, the fifth and sixth sternites with a transverse fimbria of curved hairs at the extreme base, visible only when those segments are fully drawn out. Fore wing: radial cell much longer than wide, both recurrent veins enter the second cubital cell. The first transverse cubital vein is angulated below and from the angle a short stump is emitted basad which is continued as a fold, hardly a *vena spuria*, towards the base of the pterostigma. The vena postica has also a similar stump (see Fig. 42 *d*). Hind wing: transverse anal vein postfurcal, i.e. the cubitus originates before the end of the submedial cell.

Genotype, *Gorytes coarctatus* Spin.

The sexes in this genus are very much alike in structure as well as in colour; the chief differences, which are slight, lie in the clypeus, length of the joints of the club of the flagellum and the width of the tergites. The venation is very constant and affords no specific characters. In all the species the body is covered with a very fine, sericeous and adpressed pubescence, in addition to which the clypeus has some long, stiff and exserted hairs. The labrum is partially exposed and in all the species there is a short median longitudinal impression on the face below the anterior ocellus. The sculpture on the thorax consists of a fundamental, close and microscopic puncturation, on which is superimposed a larger one, in the majority of the species sparse and shallow.

Key to the species

♀♀

(6) 1. First tergite more or less trapezoidal, widest at the apical margin, as wide there as long or nearly so.

(5) 2. Posterior corners of the mesonotum immaculate; second tergite half as wide again as the first.

(4) 3. Puncturation of the mesonotum fairly close; fourth joint of the flagellum nearly twice as long as wide at the apex. First tergite not quite twice as wide at the apex as at the base. **Seyrigi** Arn. (p. 59)

(3) 4. Puncturation of the mesonotum very sparse; fourth joint of the flagellum two-thirds longer than wide at the apex. First tergite 2⅓ times wider at the apex than at the base. **fallax** Arn. (p. 61)

(2) 5. Posterior corners of the mesonotum with yellow spots. Second tergite three-fourths wider than the first. (Puncturation of the mesonotum fairly sparse, fourth joint of the flagellum two-thirds longer than wide.) **biguttatus** Arn. (p. 62)

(1) 6. First tergite petioliform, widest a little behind the middle, not much wider at the extreme apex than at the base and half as long again as wide, or longer.

(8) 7. Thorax black, mesonotum strongly and fairly closely punctured. First tergite 1⅛ times longer than its greatest width. **madecassus** Schult. (p. 64)

(7) 8. Thorax in greater part brownish red, mesonotum sparsely punctured. First tergite two-thirds longer than its greatest width. **rubicundus** Arn. (p. 65)

♂♂

(4) 1. First tergite elongate trapezoidal, widest at the posterior margin.

(3) 2. Thorax brownish black, metanotum immaculate. First tergite 1½ times longer than wide at the apex. Middle tibiae ferruginous above. **Seyrigi** Arn. (p. 59)

(2) 3. Thorax dark ferruginous, the metanotum with a transverse, yellow band. First tergite 1¼ times longer than wide at the apex. Middle tibiae yellow above. **fallax** Arn. (p. 61)

(1) 4. First tergite petioliform, widest a little behind the middle.

(8) 5. First tergite 1½ times longer than its greatest width and from one-fourth to one-third wider at the apex than at the base. Thorax black. Posterior angles of the mesonotum with yellow spots.

(7) 6. Mesonotum finely and sparsely punctured; pronotal tubercles ferruginous. **biguttatus** Arn. (p. 62)

(6) 7. Mesonotum closely and strongly punctured; pronotal tubercles yellow. **madecassus** Schult. (p. 64)

(5) 8. First tergite nearly twice as long as wide at its widest, not wider at the apex than at the base; the second tergite 3¼ times wider at the apex than at the base. Thorax in greater part ferruginous. **rubicundus** Arn. (p. 65)

Ammatomus Seyrigi n.sp. (Figs. 42, 42 *a–d*)

♀. 11–13 mm. long. Closely allied to *A. fuscipes* Arn. Dark chocolate brown (C.U.C. brun-rouge no. 706), the flagellum, excepting the ferruginous underside of the last two joints, the coxae, trochanters and femora of the middle and hind legs, black. The following parts are pale yellow: clypeus, face below the antennal sockets and a pyriform extension above them adjacent to the inner orbits, the underside of the scapes, the dorsal edge of the pronotum, a transverse lanceolate macula on each side of the first tergite near the apical margin, an apical band, gradually widened laterad and extending over on to the sternite, on the second tergite, a thin apical line on the third tergite and narrow lines on the underside of the fore and middle femora. The apical margins of the abdominal segments are brown. Fore and middle tarsi fusco-ferruginous, becoming gradually paler towards the apex; hind metatarsi pale brown at the base and becoming yellowish towards the apex, the second and third joints stramineous, the fourth pale brownish ochreous, the fifth brown. Spines on the legs white, the calcaria yellowish brown. Wings hyaline, the cells from the costa to the median, basal and cubital veins tinged with yellow, the pterostigma ochreous, the veins testaceous. Pygidial area densely clothed with a dark golden pubescence, the apical margins of the fourth and fifth tergites with yellowish exserted hairs, the sternites with a pre-apical row of similar hairs, the rest of the body with a microscopic, decumbent and grey pubescence. Clypeus with a sparse white pubescence and pilosity. Clypeus and yellow parts of the face slightly shining, the rest of the face and the vertex dull and impunctate, excepting the space between the ocelli which has a few large punctures. Thorax dull, excepting the metapleura and the anterior half of the sides of the epinotum. Mesonotum, scutellum and metanotum with a microscopic, close and fundamental puncturation, on which shallow and larger punctures are superimposed, the interspaces between the larger punctures about three or four times as wide as the punctures.

The puncturation of the mesopleura and posterior half of the sides of the epinotum is a little smaller and less close than that of the mesonotum. The metapleura and anterior half of the sides of the epinotum are impunctate. The dorsum of the epinotum, outside the median area, has a puncturation a little larger but much sparser than that of the mesonotum; the declivity, excepting a triangular median and impunctate part, is more finely punctured. The median area of the epinotal dorsum has a few large punctures in the basal angles. The puncturation of the tergites is very sparse and shallow, very fine on the first two, a little larger on the third to fifth, that of the sternites nearly as sparse but larger than on the tergites, the sixth tergite fairly closely punctured.

Clypeus 1½ times wider in front than long, the anterior margin feebly convex. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum, and twice the interocular distance across the base of the clypeus. Second joint of the

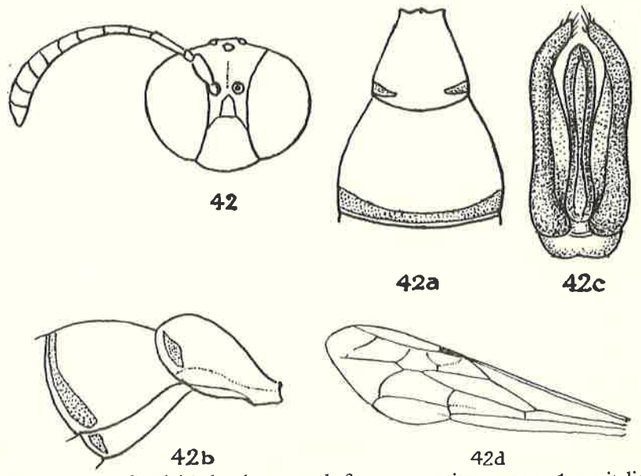


Fig. 42. *Ammatomus Seyrigi* ♀, head, × 9; *a*, *b*, first two tergites, × 9; *c*, ♂, genitalia, × 36; *d*, ♀, fore wing, × 6.

flagellum four times longer than wide, two-thirds longer than the third joint, the fourth joint nearly twice as long as wide, the seventh as long as wide, the eighth to tenth wider than long, the apical joint as long as wide at the base. Posterior ocelli 2½ times farther from each other than from the eyes. Face with a shallow median impressed line extending from behind the antennal sockets to the anterior ocellus. Epinotum strongly convex transversely and lengthwise, the triangular area twice as wide at the base as long, the declivity with a thin impressed median line. First tergite almost twice as wide at the apex as at the base and very little longer than wide, the second tergite half as wide again and as long as the first, 1½ times wider behind than long and 1½ times wider at the apex than at the base. Pygidial area triangular, one-third longer than wide at the base, the apex less rounded than in *A. fuscipes* Arn. Radial cell seven times longer than wide, the third cubital cell as long on the cubitus as the first and about one-fourth longer than the second.

♂. 9–11 mm. long. The yellow line on the underside of the middle femora usually wider and longer than in the ♀. Fourth, fifth and sixth tergites with very narrow pre-apical

transverse bands of yellow, often absent, the seventh tergite sometimes with a dull yellow spot. Anterior tibiae pale ferruginous, the anterior tarsi stramineous. The mesonotum and first two tergites sometimes paler than in the ♀, or fusco-ferruginous. Otherwise like the ♀ in colour, sculpture and pubescence.

Clypeus as long as wide in front. The eighth to eleventh joints of the flagellum are of about equal length and are as long as wide, the apical joint is one-fourth longer than wide at the base and a trifle longer than the eleventh joint. First tergite 1½ times longer than wide at the apex, twice as wide there as at the base, the second tergite a little shorter than the first and one-third wider behind than long. Metatarsus of the hind leg five-sevenths as long as the tibia. Otherwise like the ♀.

Bekily, 10 ♀♀, 6 ♂♂; Antanimora, 2 ♂♂. January.

Closely allied to *A. fuscipes* Arn. from which it may be distinguished in the ♀ by the longer second joint of the flagellum, by the wider first tergite and by the colour.

Ammatomus fallax n.sp. (Figs. 43, 43 *a–d*)

♀. 12 mm. long. Deceptively like the preceding species, *A. Seyrigi*, but the ground colour is a shade paler or castaneous (C.U.C. brun, no. 696). The yellow markings are similar, but on the head a little darker. In addition, the posterior half of the tegulae, the posterior half of the metanotum and a streak on the underside of the hind femora are also pale yellow. The yellow bands on the third and fourth tergites are not so narrow as in *Seyrigi*. Middle and hind tarsi stramineous, the fifth joint of the posterior pair fuscous in its apical half. Otherwise like *Seyrigi* in colour and pubescence. The puncturation of the head is like that of *Seyrigi*, but of the mesonotum and scutellum much more sparse and barely half as large; the anterior third of the mesonotum is impunctate and on the rest of that part and on the scutellum the interspaces are from six to eight times as large as the punctures.

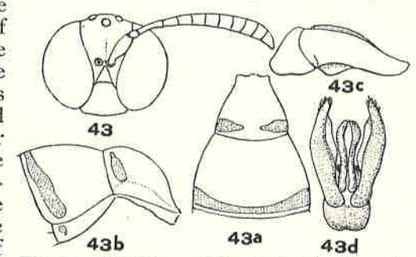


Fig. 43. *Ammatomus fallax* ♀, head, × 8; *a*, *b*, first two tergites, × 8; *c*, *d*, ♂, genitalia, × 18.

The triangular area of the epinotum has three or four small punctures on each side and on the rest of that segment the punctures are even more widely spaced than on the mesonotum. The puncturation of the mesopleura is a little closer and deeper than on the mesonotum, but less close and shallower than in *Seyrigi*. On the abdomen the puncturation is similar to that of *Seyrigi* but a little deeper and closer on the sternites and on the fifth tergite.

Clypeus 1½ times wider in front than long, as in *Seyrigi*, but it is three times wider in front than at the base, whereas in the other species it is four times. The frontal triangle is almost equilateral, but in *Seyrigi* the sides are longer than the base. Interocular distance on the vertex nearly equal to the length of the second, third and fourth joints of the flagellum and twice as great as the interocular distance across the base of the clypeus. The second joint of the flagellum is four times longer than wide at the apex and very nearly twice as long as the third; the fourth joint is two-thirds longer than wide, the seventh as long as wide, the eighth to tenth wider than long, the apical joint as long as wide at the base and barely longer than the penultimate joint. Posterior ocelli three times farther from each other than from the eyes. First tergite broader than in *Seyrigi*, as wide at the apex as long and 2½ times wider there than at the base; the second tergite is as long as and half as wide again as the first and two-fifths wider at the apex than at the base. Otherwise like *Seyrigi* ♀.

♂. 10 mm. long. Ground colour of the thorax and of the first abdominal segment paler than in the ♀ or dark ferruginous, the fourth to sixth tergites also with pre-apical transverse yellow bands. All the tarsi stramineous, the fifth joint of the hind pair fuscous apically. Fore and middle tibiae pale yellow above, reddish yellow below. The femora with a wide streak of pale yellow below which does not reach the base. Otherwise like the ♀ in colour and pubescence. The sculpture is almost the same as in the other sex, but the epinotum is almost impunctate and the fourth to seventh tergites are more delicately punctured.

Clypeus nearly one-third wider in front than long and three times wider there than at the base. Face narrower below than in the ♀, the interocular distance on the vertex being nearly $2\frac{1}{4}$ times greater than across the base of the clypeus. Posterior ocelli four times farther from each other than from the eyes. Second joint of the flagellum four times longer than wide at the apex and nearly twice as long as the third; the seventh and eighth joints are a little longer than wide, the ninth barely longer than wide, the tenth and eleventh wider than long, the apical joint one-fourth longer than wide at the base and three-eighths longer than the penultimate joint. First tergite narrower than in the ♀, one-fourth longer than wide at the apex, the second half as wide again as the first and one-quarter longer and one-fifth wider behind than long. Posterior metatarsi seven-tenths as long as the tibiae. The genitalia differ distinctly from those of *Seyrigi*, the outer paramera in their more heavily chitinized portion being wider and shorter and the penis shorter and less slender.

Bekily, 2 ♀♀, 2 ♂♂. December.

Ammatomus biguttatus n.sp. (Figs. 44, 44 *a–d*)

♀. 9–11 mm. long. Head and thorax black, the abdomen in greater part black, the sides of all the tergites and of the second sternite rufescent caudad, the apical margin of the fifth tergite and of the second to fifth sternites and the whole of the last sternite ferruginous. Mandibles, labrum and extreme apical margin of the clypeus ferruginous. Flagellum fusco-ferruginous above, ferruginous below. Tegulae, lateral margins of the mesonotum and a small spot on the mesopleura below the tegulae, ferruginous. The following parts are pale chrome yellow: clypeus, underside of the scapes, the lower half of the sides of the face, but not including the frontal triangle, the very narrow dorsal edge of the pronotum, a small oval macula at the posterior angles of the mesonotum, a transverse band, not reaching the lateral margins, on the metanotum, pre-apical lateral maculae on the first tergite, a pre-apical transverse band on the second tergite (abruptly dilated laterad and often narrowly interrupted mesad) and pre-apical transverse bands, narrowed mesad on the third and fourth tergites. Fore and middle femora and tibiae pale ferruginous, the hind ones dark ferruginous; the anterior and middle femora on the underside excepting the base, pale yellow, the fore and middle tibiae with small yellow spots above at the base and apex. Metatarsi of the fore and middle legs stramineous, the remaining joints pale testaceous, the first two joints of the hind tarsi stramineous and slightly fuscous apically, the third and fourth testaceous, the apical joint testaceous at the base and fuscous at the apex. Wings hyaline,

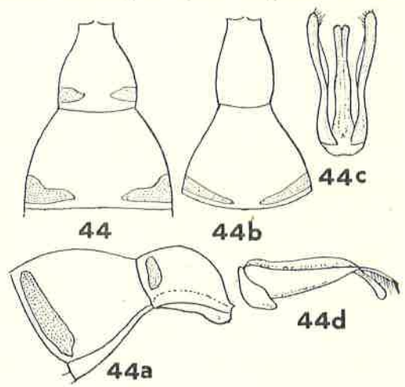


Fig. 44, *a*. *Ammatomus biguttatus* ♀, first two tergites, ×*c*. 10; *b*, ♂, first two tergites, ×*c*. 10; *c*, *d*, genitalia, ×*c*. 30.

faintly smoky, the radial cell darker, the veins and pterostigma brown. Clypeus, face below the antennae and the lower half of the median facial groove with yellowish silvery pubescence, the rest of the body with a microscopic pruinose pubescence. Vertex with a few large punctures between the anterior and posterior ocelli, otherwise the vertex and face are smooth. Metapleura and epinotum nitidulous, the rest of the thorax dull. Mesonotum, scutellum, metanotum and epinotal dorsum outside the triangular area with a sparse, small and somewhat oblique puncturation, the interspaces about four to five times as wide as the punctures; the mesopleura have a slightly larger and closer puncturation, the interspaces being only two to three times as wide as the punctures. Metapleura and sides of the epinotum impunctate.

The triangular area of the epinotum has a group of small but deep punctures on each side. First five tergites and the second to fifth sternites with a puncturation like that of the mesonotum and also with a row of larger punctures in front of the apical margin; sixth sternite closely punctured. Pygidial area triangular, densely covered with brownish golden hairs, the apex rounded.

Clypeus three-fifths wider in front than long, the apical margin straight. Interocular distance on the vertex equal to a little more than the length of the first three joints of the flagellum and about $2\frac{1}{3}$ times greater than the inferior interocular distance. Posterior ocelli $2\frac{1}{2}$ times farther from each other than from the eyes.

Second joint of the flagellum four times longer than wide at the apex and a little more than half as long again as the third, the apical joint one-fourth longer than the preceding joint, the other joints as in *A. fallax*. First and second tergites very similar to those of *fallax* but the first is more convex above and narrower, or one-fifth longer than wide at the apex. Second tergite three-quarters wider and a little longer than the first and nearly one-third wider behind than long. Metatarsus of the hind legs not quite six-sevenths the length of the tibia. Radial cell six times longer than wide.

♂. 8·7 mm. long. Only the extreme basal angles of the face are yellow; flagellum black above, dark reddish brown below. Dorsal edge of the pronotum not yellow, the maculae on the posterior corners of the mesonotum small, first tergite without yellow maculae, apical margin of the fifth tergite ochreous, that of the sixth and the whole of the seventh flavo-ferruginous. Middle tibiae entirely ferruginous. Otherwise like the ♀ in colour, sculpture and pubescence, but the puncturation of the tergites is relatively finer and shallower.

Clypeus nearly one-third wider in front than long, the apical margin feebly concave in the middle. Interocular distance on the vertex equal to the length of the first three joints of the flagellum and $2\frac{1}{3}$ times greater than the interocular distance across the base of the clypeus. Posterior ocelli twice as far from each other as from the eyes. Second joint of the flagellum fairly four times longer than wide at the apex and five-eighths longer than the third, the third to ninth joints longer than wide, the tenth as long as wide, the eleventh a little longer than wide, the apical joint nearly twice as long as wide at the base and one-third longer than the eleventh. First tergite slightly wider behind the middle than at the apex, half as long again as its greatest width and one-third wider at the apex than at the base. Second tergite twice as wide as the first, one-fifth wider than long and barely longer than the first.

Stipites long and narrow. Otherwise like the ♀.

Behara, Ivondro, Bekily and Antanimora, 4 ♀♀; Bekily and Behara, 2 ♂♂. November–January.

Ammatomus madecassus Schult. (Figs. 45, 45 *a–d*)

Neue Beit. z. system. Insektenkunde, I, p. 99, ♀, 1918

I identify with this species a series of both sexes from Bekily. Schulthess does not give any exact comparative measurements of the interocular distance, the first two tergites and other parts, but as far as the description goes it seems to fit the ♀♀ of this series in every respect except that the yellow spots on the posterior corners of the mesonotum are not mentioned therein. As the other two species, *biguttatus* and *rubicundus*, have ferruginous pronotal tubercles, the description of *madecassus* cannot apply to them.

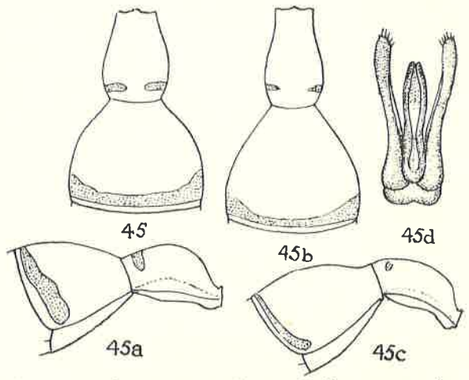


Fig. 45, *a*. *Ammatomus madecassus* ♀, first two tergites, × 12; *b*, *c*, ♂, first two tergites, × 12; *d*, genitalia, × 33.

♀. 8·3–9 mm. long. Black, the second to fifth tergites at the sides and just in front of the yellow bands, and the sides of the sternites, more or less dark ferruginous, the sixth abdominal segment also of that colour. Pronotum fusco-ferruginous in front. Mandibles fusco-ferruginous, the base dirty yellow. Scapes yellow below, reddish yellow above, flagellum black above, ferruginous below. The following parts are pale yellow; clypeus, face below the antennae, a spot on each side above the antennae and adjacent to the eyes, tegulae, a small oblong spot at the posterior corners of the mesonotum, a transverse band, not reaching the lateral margins, on the metanotum, transverse pre-apical maculae on each side of the first tergite, pre-apical bands on the second to fourth tergites, those on the second and third dilated laterad, on the fourth and fifth attenuated laterad, and a median spot on the fifth. Trochanters and femora ferruginous, the middle femora sometimes with a small yellow apical spot on the underside; fore and middle tibiae pale yellow above, ferruginous below, the hind tibiae fusco-ferruginous and with a narrow yellow streak above extending from the base to near the apex. Tarsi yellowish white, the apices of the joints reddish, the apical joints of the middle and hind pair fuscous, except at the base.

Wings hyaline, the veins and pterostigma dark brown. Pubescence pruinose, somewhat silvery in some lights, fairly dense on the clypeus, lower part of the face, mesopleurae and sternites. Pygidial area with a pale golden pubescence. Face and vertex dull, fairly closely and deeply punctured in front of and behind the ocellar area, sparse elsewhere. Mesonotum and scutellum moderately shining, deeply and closely punctured, the punctures larger than those of the face and vertex, the interspaces on the mesonotum finely punctulate and about two to three times as wide as the punctures laterad, somewhat wider caudad and on the scutellum. Mesopleura dull, the puncturation as large and as close cephalad as on the anterior part of the mesonotum, sparse caudad. Metanotum and metapleura closely and very finely punctured. On the dorsum of the epinotum the puncturation is smaller and more sparse than on the scutellum, almost absent from the base and apex of the median area; the sides of the epinotum finely and very sparsely punctured. The whole epinotum somewhat shining. First two tergites slightly shining, the rest dull; the puncturation on them is fine, shallow and sparse and becomes progressively smaller caudad, except at the sides of the second to fourth, where there is a sparse and large puncturation. On the first tergite the punctures are about half as large as those on the epinotum. Sternites nearly dull, the puncturation on the second larger but more sparse than that of the tergite, the other sternites more closely and more finely punctured on their apical halves.

Clypeus nearly one-third wider in front than long. Interocular distance on the vertex equal to the length of the first four joints of the flagellum and about three times greater than the interocular distance across the base of the clypeus. Posterior ocelli three times farther from each other than from the eyes. Second joint of the flagellum a little more than three times longer than wide at the apex and twice as long as the third, the seventh to tenth joints wider than long, the apical joint three-fifths longer than the tenth and very little longer than wide at the base.

Triangular area of the epinotum 1½ times wider at the base than long. First tergite widest a little behind the middle, half as long again as wide and nearly one-fourth wider at the apex than at the base. Second tergite one-fifth wider behind than long and twice as wide there as the first. Posterior metatarsus two-thirds as long as the tibia. Pygidial area triangular, a little longer than wide, the apex widely rounded.

♂. 7–9 mm. long. Clypeus stained with reddish yellow in the middle. Sixth and seventh tergites with ill-defined median maculae. The maculae on the first tergite are sometimes very small or obsolete. The puncturation is shallower and less close than in the ♀, otherwise like that sex in colour and sculpture.

Clypeus as wide in front as long. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth. Seventh to eleventh joints of the flagellum wider than long, the eighth and ninth widest, or three-fifths wider than long, the apical joint barely longer than the penultimate and nearly as long as wide at the base. First tergite 1½ times longer than its greatest width, but more distinctly petioliform than in the ♀, being only one-fourth wider behind than in front. The second tergite is twice as wide as the first, as long as wide behind, fully 2½ times wider there than at the base. Posterior metatarsi seven-tenths as long as the tibia. Otherwise like the ♀.

Bekily, 10 ♀♀, 11 ♂♂; Behara, 4 ♂♂. December–April.

The type, from Diego Suarez, is in the Berlin Museum. The colour pattern is very much the same as in *biguttatus*, from which species this one can easily be distinguished by the strong puncturation and the more petioliform first tergite. The genitalia of the ♂♂ are very similar, but in *madecassus* the stipites are broader at the apex and shorter in proportion to their width. This species is allied to *elongatulus* Turner, but in that species the puncturation of the thorax is even stronger and the first tergite is more barrel-shaped.

Ammatomus rubicundus n.sp. (Figs. 46, 46 *a*, *b*)

♀. 9·3–11 mm. long. Clypeus and face below the antennae, a small streak on each side adjacent to the inner orbits and above the level of the antennal sockets, and the underside of the scapes, whitish yellow; the rest of the head black. Thorax and abdomen in greater part dark burnt sienna red (C.U.C. between brun 692 and 696), the dorsal edge of the pronotum and the pronotal tubercles whitish yellow, an ill-defined triangular area on the mesonotum with its base caudad and the epinotum, excepting the lateral dorsal areas, black. The base of the abdominal segments is darker or almost black. First tergite with a very small dull yellow macula on each side near the apical margin, tergites 2–5 with pre-apical yellow bands, those on the second and third dilated laterad, on the fourth and fifth attenuated laterad. Mandibles fusco-ferruginous, dull yellow near the base. Upper side of the scapes flavo-ferruginous, the flagellum blackish above, ferruginous below. Coxae and trochanters, anterior tibiae and femora and the middle tibiae, more or less ferruginous, but darker above than below; the middle and hind femora and the hind tibiae fusco-ferruginous. Tarsi white, the apices of the joints darker, the last three joints of the anterior pair yellowish. Wings

hyaline, the pterostigma dark ochreous, the veins dark brown. Pubescence greyish white, the clypeus and face below the antennae with silvery pubescence; pygidial area covered with a coarse and pale golden pubescence. The puncturation is very much the same as in *biguttatus* but on the mesonotum, scutellum and sides of the epinotum it is a little larger and deeper. The ocellar area is only sparsely punctured.

Clypeus 1⅓ times wider in front than long. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus two-thirds of the fourth joint and three times greater than the interocular distance across the base of the clypeus. Posterior ocelli three times farther from each other than from the eyes. Second joint of the flagellum nearly twice as long as the third and about five times longer than wide at the apex; the sixth joint as long as wide, the seventh to tenth wider than long, the apical joint a little longer than the tenth and as wide at the base as long. First tergite distinctly petioliform, widest a little behind the middle and two-thirds longer than wide there and slightly wider at the apex than at the base. Second tergite as long as wide behind and twice as wide as the first at its widest. Pygidial area triangular, as long as wide at the base, the apex rounded. Posterior metatarsi four-fifths as long as the tibiae.

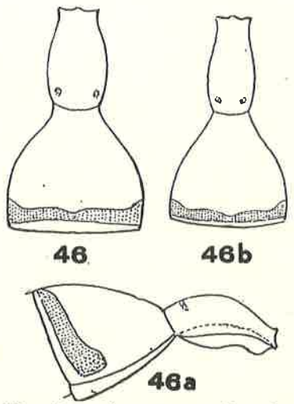


Fig. 46, *a*. *Ammatomus rubicundus* ♀, first two tergites, ×*c*. 10; *b*, ♂, first two tergites, ×*c*. 10.

♂. 8·5–9 mm. long. Second to sixth tergites with yellow pre-apical transverse bands, that of the third narrowest, those of the fourth and fifth attenuated laterad; seventh sternite ferruginous. Puncturation finer, and on the first two tergites sparser than in the ♀. Vertex somewhat shining, otherwise like the ♀ in colour, sculpture and pubescence. Clypeus two-ninths wider in front than long, the apical margin concave in the middle. Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth joint. Second joint of the flagellum four times longer than wide at the apex and twice as long as the third, the sixth joint a little longer than wide, the seventh as long as wide, the eighth to eleventh joints wider than long, the apical joint a little longer than the penultimate. First tergite widest behind the middle, not wider at the apex than at the base and nearly twice as long as wide at its widest. Second tergite not quite one-sixth longer than the first, as long as wide at the apex, 3¼ times wider there than at the base. Posterior metatarsi seven-ninths as long as the tibiae. Otherwise like the ♀.

The outer paramera of the genitalia are slightly broader at the apex, but otherwise hardly distinguishable from those of *madecassus*.

Bekily, 4 ♀♀, 9 ♂♂. November.

Subfamily STIZINAE

Genus **Sphecius** Dhlb.

Hymen. Eur. I, p. 154, 1843; Rohwer, *Proc. U.S. Nat. Mus.* LIX, p. 403, 1921; Pate, *Bull. Brooklyn Ent. Soc.* XXXI, p. 198, 1936

The American authors have placed this genus in the Nyssonids (Gorytini), a step which appears to the writer quite unjustified. Pate declares that it is 'unquestionably a Gorytine and according to the structure of the mesopleurae and head is related to *Tanyoprymnus* Cam. albeit rather remotely'. In the African *S. milleri* Turn. and in *S. Grandidieri* Sauss. of Madagascar there is a suturiform impression in the upper part of the episternum, indicating the posterior boundary of what might become with further development a distinct epicnemium. Apart from this feature the mesopleura do not differ in any way from those of *Stizus* of the *fasciatus* group. *Sphecius* resembles that group also in the structure of the epinotum, having the triangular area of the dorsum extending well over the declivity, and the latter is more or less flat transversely and not much narrowed ventrad. In the Gorytini on the other hand, the whole epinotum is narrowed caudad, the declivity is clearly narrowed ventrad, and the median area of the dorsum extends very little over the posterior margin of the dorsum. Again, the male genitalia resemble those of the *fasciatus* group in having the stipites more strongly chitinized in the basal half or two-thirds than in the remaining and dilated portion, whereas in the Gorytini the stipites are strap-like throughout their length. *Sphecius* differs from the *fasciatus* group of *Stizus* chiefly in the shape of the clypeus, the venation and the long antennae of both sexes. The shape of the clypeus in *Sphecius* is peculiar, being protuberant, flattened in the middle and bevelled off at the sides; in the ♂ the flattening in the middle is less pronounced than in the ♀. The first cubital cell is much shorter than in the *fasciatus* group and the cubitus is bent downwards in the second cubital cell.

Pate has divided the genus into three subgenera, *Sphecius*, *Nothosphecius* and *Sphecienus*, comprising respectively the Nearctic, African-Malagasy-Australian and Palaearctic species. The characters on which the distinction is based seem rather slender, being chiefly slight differences in the tarsi, last segment of the flagellum of the ♂ and the structure of the calcaria in the ♀. These do not appear to the writer to be of greater value than, e.g. the presence of a fovea on the scutellum in some species of *Stizus*, and yet no one has considered it necessary to place the *ruficornis* group of *Stizus* in a separate subgenus. Pate states that one of the characters of *Nothosphecius* is that the last two joints of the flagellum in the ♂ are abruptly thinner than the preceding segments. This is incorrect in regard to the African and Madagascan species, in which only the apical joint is abruptly thinner.

Sphecius Grandidieri Sauss. (Figs. 47, 47 *a*, *b*)

Stizus Grandidieri, Soc. Entom. II, p. 9, ♀, 1887; *Hist. Madag.* XX, p. 463, ♀, ♂, 1892.

Sphecius Freyi Handl., *Jahresb. Trencsin Comit.* XIII, p. 27, 1892.

♀. 25–31 mm. long. Saussure's description is sufficiently full, but the wings are not ferruginous hyaline as stated therein. They are hyaline, and, except at the outer and posterior margins, deeply tinged with yellow; the veins are flavo-ferruginous. The interocular distance on the vertex is equal to the length of the second joint of the flagellum. The latter is half as long again as the third. The second sternite has its basal third depressed, and the part behind it just above the depressed area is raised to form a low, transverse hump in the middle.

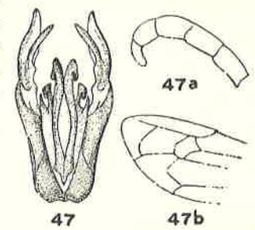


Fig. 47. *Sphecius Grandidieri* ♂, genitalia, ×8; *a*, apical joints of the flagellum, ×8; *b*, apical half of the fore wing, ×2½.

♂. 20–22 mm. long. Second joint of the flagellum one-fifth longer than the third, the apical joint strongly curved. Second sternite like that of the ♀. Stipites bifid in the apical and less chitinized part, the inner ramus membranous and widened distad, the outer ramus membranous on the inner side, curved, lanceolate and, in its natural position, lying ventrad of the inner one. The inner paramera are thick, short and uncinate. In both sexes the abdominal segments, excepting the last, have a wide and smooth apical border, and the punctured part in front of the border is margined by a row of short stiff spines.

Bekily, 4 ♀♀; Behara, 1 ♀, 1 ♂; Perinet, 1 ♀. November–January.

The prey taken with these specimens are two large species of Cicadas.

Genus **Stizus** Latr.

Saussure recorded under the name of *Stizolarra* four species of this genus from Madagascar. Of these, two are Mediterranean or southern Palearctic species, *ruficornis* F. and *tridentatus* F. These are not represented in the Seyrig Collection, and I am in agreement with the view expressed by Handlirsch that although Saussure's identification was probably correct, some mistake had been made as to the provenance of the specimens before him, a view strengthened by the fact that Saussure recorded them without any precise indication of the locality. It is most improbable that these two species could have been even imported into Madagascar. Of the two other species, *cyanipennis* Sauss. is represented by 9 ♀♀ and 6 ♂♂, but no specimens agree entirely with the description and figures of the remaining species, *spinicornis* Sauss. The species described herein as *S. varians* might be the same, but it is improbable that an entomologist so careful as Saussure would have failed to observe and mention the carina on the seventh sternite which is present in *varians*.

In view of the remarkable variation in the colour pattern of some Madagascan species of the *tridens* group and allied groups, no conclusions can be drawn by a comparison of those species with the figure given by Saussure on Plate 11. Only a comparison of the genitalia can settle the question, and since the unique specimen of *spinicornis* is in the Paris Museum, access to which cannot be obtained at the present time, the matter must remain in abeyance. The genitalia furnish an unfailing specific distinction in the males, even of closely allied species, and given a long series and using the genitalia as a guide, it is clearly shown that characters derived from the colour and its distribution, the shape of the second cubital cell and the excision and teeth on the lateral margins of the epinotal declivity, are all subject to an appreciable degree of variation within a species and are not too reliable. Unfortunately the help afforded by the genitalia is lacking in the females, and with a number of closely allied species it is sometimes difficult to correlate the sexes and one has to rely on similarity of puncturation, the shape of the clypeus, the colour pattern and the pubescence. The deceptive similarity in the colour pattern between distinct species is clearly illustrated by the ♀♀ of *S. assentator* and some of the forms of *S. mirus*, two new species which are described below. A remarkable phenomenon, which would probably not be recognized but for the evidence afforded by the genitalia, is exhibited in three of the new species and consists of a xanthochroism which increases pari passu with the size of the insect, but more developed in the males than in the females. It is also seen in the African *S. proteus* Arn. of the *peregrinus* group, but not developed to such an extent as in *mirus*. The latter, and *assentator*, do not fall within any of the groups mentioned in Handlirsch's monograph but come nearest to *inermis* Handl. of the Australian Region, from which they differ in having the seventh sternite carinate.

Key to the species

♂♂

(4) 1. Large species, 13–17 mm. long.
(3) 2. Wings fuscous, with a violaceous lustre; body fusco-ferruginous and black. **cyanipennis** Sauss. (p. 77)
(2) 3. Wings hyaline, tinged with yellow; body ferruginous and black, abdomen with pale yellow bands. **Berlandi** Arn. (p. 76)
(1) 4. Smaller species, not exceeding 11 mm. in length.
(8) 5. Flagellum filiform, the joints cylindrical, the tenth not spined. (Colour varying from black with yellow markings to completely yellow.)
(7) 6. Genitalia, Fig. 48 *f*. **mirus** Arn. (p. 69)
(6) 7. Genitalia, Fig. 49 *b*. **assentator** Arn. (p. 72)
(5) 8. Tenth joint of the flagellum spined, the eleventh curved and arcuately emarginate below, the apical joint curved and abruptly acuminate.

(10) 9. Colour varying from black with yellow markings to yellow with some black on the head, thorax and first tergite. (Seventh sternite with a median longitudinal carina, sometimes raised and lamelliform, forming a triangular tooth when seen in profile; seventh tergite broadly rounded at the apex.) Genitalia, Fig. 50 *c*. **varians** Arn. (p. 73)
(9) 10. Colour mainly black, the abdomen with narrow, transverse yellow bands. (Seventh sternite with only a median longitudinal carina, the seventh tergite transversely truncate at the apex.) Genitalia, Fig. 51 *b*. **hirtiusculus** Arn. (p. 74)

♀♀

(4) 1. Large species 16–22 mm. long.
(3) 2. Wings fuscous, with a violaceous lustre; body in greater part black. **cyanipennis** Sauss. (p. 77)
(2) 3. Wings hyaline, tinged with yellow; head and thorax mainly ferruginous, abdomen black, the base of the first tergite ferruginous. **Berlandi** Arn. (p. 76)
(1) 4. Smaller species, 6·3–11·5 mm. long.
(6) 5. Interocular distance on the vertex 2½ times wider than the interocular distance across the base of the clypeus; lateral margins of the epinotal dorsum convex outwardly. **hirtiusculus** Arn. (p. 74)
(5) 6. Interocular distance on the vertex not more than twice as great as the interocular distance across the base of the clypeus.
(8) 7. Lateral margins of the epinotal dorsum straight. **rectilateralis** Arn. (p. 75)
(7) 8. Lateral margins of the epinotal dorsum convex outwardly. (Colour varying from black with yellow markings to mainly yellow.) **mirus** Arn. (p. 69)

Stizus mirus n.sp. (Figs. 48, 48 *a–k*)

♂. 7·5–10·5 mm. long. The blacker forms, with little or no yellow lateral margins and no median yellow bars on the mesonotum and the abdomen more black than yellow are 7·5–8 mm. long; specimens having the lateral margins of the mesonotum yellow, with or without median streaks and the abdomen not entirely yellow, are 8·7–8·9 mm. long; specimens with the abdomen entirely yellow and the rest of the body more yellow than black are 8·5–10·5 mm. long.

As there is an almost unbroken gradation from the small and melanic form to the all yellow one, it will serve no useful purpose to describe every stage and therefore only the extreme stages and a few intermediate ones are described hereunder. It is to be noted that the yellow colour of the abdomen becomes increasingly deeper with an increase in size and reduction of the black. In the smallest and darkest the pale markings of the abdomen are almost whitish yellow and that of the largest and unicolorous specimens is orange (C.U.C. orange 211).

A. *Small melanic form*. Black. Palpi, base of the mandibles, labrum, clypeus, a band narrowed dorsad on each side of the lower half of the face, pale lemon yellow. Sometimes the frontal triangle and a median spot on the clypeus are black. Antennae black above, ochreous below. Pronotal tubercles whitish yellow. First six tergites with whitish yellow apical bands, slightly dilated laterad and mesad; first six sternites with whitish yellow apical bands narrowed or widely interrupted mesad. These bands may be absent on the fifth and sixth segments. Legs lemon yellow, the upperside of the anterior femora, the middle femora excepting the underside and the whole of the hind femora black, tibiae more or less black on the underside, the hind metatarsus and apical tarsal joint somewhat fuscous. Wings hyaline, the veins black. This form grades into,

B (Figs. 48, 48 *a*). Posterior margin of the pronotum, tegulae on the outside, a short and narrow streak opposite the tegulae on the mesonotum, the posterior corners of the latter, a quadrate spot on each side of the scutellum, the hind margin of the metanotum and the posterior lateral angles of the epinotal dorsum, lemon yellow. Coxae lemon yellow, the black markings on the legs somewhat reduced, the apical bands on the abdominal segments wider and of a deeper yellow.

C (Fig. 48 *b*). The yellow markings become more extensive and new ones appear. The middle of the face above the antennae is yellow, the sides and declivity of the pronotum are more or less yellow, the anterior part of the mesopleura has spots of the same colour, the

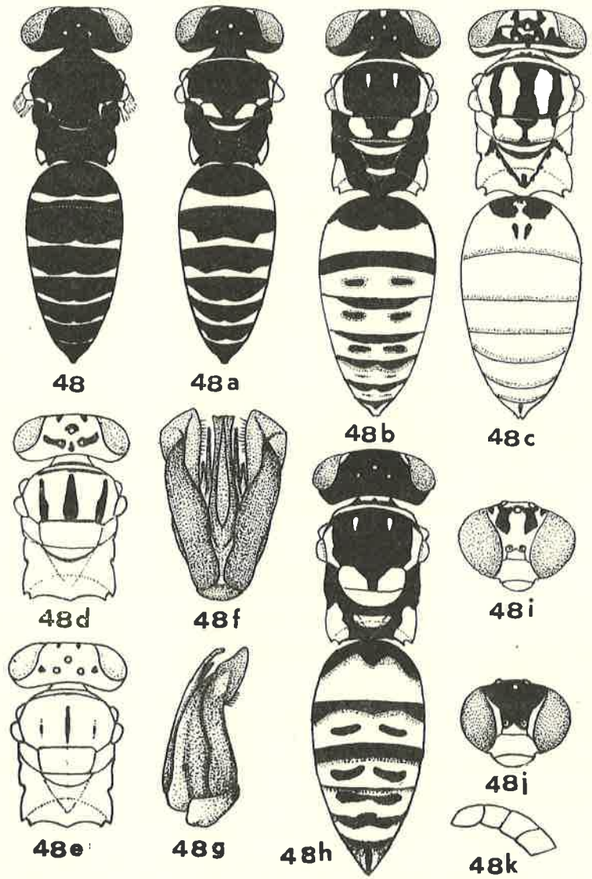


Fig. 48, *a–e*, *Stizus mirus* ♂, × *c.* 6; *f*, *g*, genitalia, × 20; *h*, *j*, ♀, × *c.* 6; *i*, face of *c*, × *c.* 6; *k*, ♂, last four joints of the flagellum, × 18.

middle of the epinotum is yellow and the yellow bands on the abdomen are much wider, the black being restricted to the base of the segments and to median spots.

D (Fig. 48 *c*). The yellow colour becomes gradually deeper, from chrome to orange yellow. On the head the black becomes broken up into spots and bands, not always symmetrical, and the sides of the thorax, excepting a black spot here and there on the meso-

pleura, are all yellow. On the dorsum of the thorax the black is reduced to three broad longitudinal lines on the mesonotum and to narrow areas on the scutellum and base and sides of the epinotal triangle. On the abdomen only the base of the first tergite and two clavate spots on its dorsum and a median spot on the seventh tergite are black.

E (Fig. 48 *d*, *e*). Apart from black spots on the face and vertex, the anterior margin of the mesonotum and three longitudinal lines on the same segment and the extreme base of the epinotal triangle, the whole body is orange yellow.

F. In this stage, represented by the largest specimens, the whole body is orange yellow, excepting only the extreme base of the joints of the flagellum, which is black.

Sculpture of all forms. The whole body is somewhat glossy, the sternites more so than the rest. Face and vertex with a very sparse, fine and very shallow puncturation, the punctures nearly round. Mesopleura with somewhat larger and closer puncturation, metapleura and sides of the epinotum smooth, the rest of the thorax with a microscopic semi-puncturation, barely visible under a magnification of less than 35 diameters.

Seen at certain angles this sculpture looks like a close and transverse rugulosity. The tergites and sternites have a fairly close oblique puncturation, stronger on the sternites than on the tergites, finer and closer than in *S. Braunsii* Hndl. and much smaller than in *S. tridens* F. Clypeus and face below the antennae with short and silvery pubescence; on the rest of the body the pubescence is fine, fairly sparse, greyish and decumbent. The vertex, temples and epinotum have a few erect and longer hairs.

Clypeus two-thirds wider in front than behind, a little more than twice as wide in front as long, the apical margin feebly concave. Inner orbits strongly convergent below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum. Posterior ocelli as far from each other as from the eyes. Second joint of the flagellum 2½ times longer than wide and one-fourth longer than the third, the tenth joint not excised below nor spined at the apex, the apical joint nearly twice as long as wide and a little longer than the eleventh. Lateral margins of the epinotal declivity excised and bidentate, as in the *tridens* group. Seventh sternite with a low median longitudinal carina which is attenuated caudad, not reaching the apical margin. Seventh tergite with the sides feebly sinuate, the apex narrowly truncate. The stipites of the genitalia (Figs. 48 *f*, *g*) become rather abruptly membranous apically, and that portion is curved downwards and its anterior margin is angular at the apex.

♀. 6·3–9 mm. long. The increase in the yellow colour runs on the same lines as in the ♂, but in a series of thirty-six specimens there is not so great a development of xanthochroism as in the ♂; the most yellow form is shown in Fig. 48 *h*. The puncturation of the sternites is a little weaker than in the ♂ and on the sixth is distinctly sparse. The longer, erect pubescence is more abundant on the head and mesopleura than in the ♂, and the decumbent pubescence is a little more dense.

Clypeus 2½ times wider in front than long in the middle. Vertex wider than in the ♂, the interocular distance there being twice as great as the interocular distance at the base of the clypeus.

Second joint of the flagellum nearly four times longer than wide at the apex and three-eighths longer than the third joint. Comb of the anterior tarsi composed of pale stramineous cilia, of which there are five on the basal joint. Sixth sternite without a median carina. Posterior ocelli very slightly nearer to each other than to the eyes. Otherwise like the ♂.

The shape of the second cubital cell is slightly variable in both sexes; in the majority the two transverse cubital veins are slightly separated on the radius, in a lesser number they are contiguous and in a very few they meet below the radius, forming a very short stalk.

Behara, 27 ♂♂, 14 ♀♀; Bekily, 28 ♂♂, 22 ♀♀; Amboasary, 1 ♂. October–March.

The majority of the smaller melanic specimens are from Behara but the intermediate and largest forms were taken in all three localities. The males which are entirely yellow appear

to have the clypeus and the mesonotum narrower than in the other kinds, but measurements with a micrometer eyepiece prove that this is an optical illusion. In the series retained by the Paris Museum a pair of the small and melanic form (from Behara) has been labelled as types and a representative selection of the other colour forms has been labelled as paratypes. The prey from the nest of one specimen consists of a small Homopteron.

Stizus assentator n.sp. (Figs. 49, 49*a*, *b*)

This species, represented in the collection by 3 ♂♂, bears a remarkably close and superficial resemblance to *S. mirus*, and like that species also has xanthochroic forms.

♂ (type). 7–8 mm. long. The yellow markings are all of a pale chrome yellow and the pattern differs only slightly from that of *mirus* as shown in Fig. 48. The hind margin of the pronotum is yellow, the maculae on the scutellum larger, the transverse apical bands on the tergites are less angular in the middle and the sixth tergite has two median spots instead of a complete band. There is hardly any appreciable difference in the puncturation and pubescence of the two species except on the sternites, where the punctures in *assentator* are slightly smaller and farther apart. Clypeus nearly twice as wide in front as behind and a little less than twice as wide in front as long in the middle, the apical margin feebly concave. Interocular distance on the vertex equal to the length of the first five joints of the flagellum plus a third of the sixth joint. Posterior ocelli as far from each other as from the eyes. Second joint of the flagellum nearly three times longer than wide at the apex and three-sevenths longer than the third, the apical joint as long as wide at the base and not longer than the preceding joint. The excisions on the lateral margins of the epinotal declivity are a little wider and shallower than in *mirus*. Seventh sternite with a median carina, rising caudad and abruptly truncate, so that seen in profile it forms a triangular tooth. The seventh tergite has the apex rounded, not narrowly truncate as in *mirus*. The wings are hyaline, the veins blackish, and the venation like that of *mirus*.

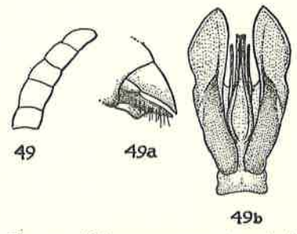


Fig. 49. *Stizus assentator* ♂, apical joints of the flagellum, × 24; *a*, apical tergite and sternite, × *c.* 24; *b*, genitalia, × 24.

The stipites of the genitalia are heavily chitinized in the basal half, dilated and membranous in the apical, and differ entirely from those of *mirus*; the penis and the inner paramera, however, do not differ very much from those of *mirus*.

Another specimen, 8 mm. long, differs from the type as follows. Face with two yellow spots, one below the other, between the anterior ocellus and the antennal sockets. Pronotum yellow over the upper half, a line on each side of the mesonotum near the lateral margins and not reaching the anterior margin and a small streak on each side of the middle in front (Fig. 48 *b*), yellow. The yellow maculae on the scutellum are larger, the transverse bands on the tergites are wider and more angular in the middle, and the bands on the sternites extend over the whole width of their apical margins. The seventh tergite is black at the sides and in the middle, the rest dark yellow. The apex of that tergite is broader and the cariniform tooth on the seventh sternite is larger, but the genitalia are exactly alike.

The third, and most xanthochroic, specimen measures 9·5 mm. in length and hardly differs in the colour pattern from that of *mirus* as shown in Fig. 48 *c*, except that the first tergite is black only at the extreme base and the margins of all the abdominal segments are reddish yellow. The joints of the flagellum are fuscous in the middle on the first two joints and reddish brown on the remaining joints, but on the underside they are all deep chrome yellow like the rest of the body. The legs are yellow excepting narrow lines on the upper side of the anterior femora and tibiae, on the middle tibiae and on the hind tibiae near the apex. The middle and hind femora have a reddish brown spot on the upper side at the apex. The third sternite has a low median tubercle at the base, longer than wide and obtusely angular when seen in profile. The median carina on the seventh sternite is longer and not so sharply declivous caudad as in the type. Genitalia as in the type.

Bekily, type, November; intermediate form, September, xanthochroic form, February. All three specimens in the Paris Museum.

Tridens group

Stizus varians n.sp. (Figs. 50, 50 *a–c*) = spinicornis (de Saussure, 1867)

Like *S. mirus* and *S. assentator* this species also has xanthochroic forms, but as the collection contains only seven specimens the gradual increase of the yellow colour is not so evident as in *mirus*, although no doubt a long series would prove that it follows on the same lines as in that species. The darkest or most melanic form has been chosen as the type.

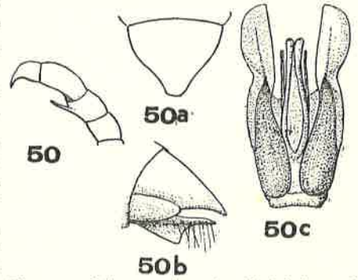


Fig. 50. *Stizus varians* ♂, apical joints of the flagellum, × 20; *a*, apical tergite, × *c.* 14; *b*, apical tergite and sternite, × *c.* 14; *c*, genitalia, × 20.

♂. 9 mm. long. Black. The following parts lemon yellow: basal two-thirds of the mandibles, palpi, labrum, clypeus, frontal triangle, sides of the face, hind margin of the pronotum and the pronotal tubercles, posterior angles of the mesonotum, tegulae, a small spot on each side of the scutellum, a narrow line, interrupted in the middle, on the metanotum, posterior angles of the epinotal dorsum, transverse bands on tergites 1–6 and on sternites 2–5, the tibiae and tarsi and the fore and middle femora on the underside. The middle and hind tibiae have black maculae on the inside near the apex. The colour pattern differs from that of *mirus* (Fig. 48) only in having the yellow maculae on the scutellum and epinotum a little larger, and in the apical bands on the sternites which are wider and more strongly dilated laterad. Clypeus with a sparse setigerous puncturation. Lower half of the face almost smooth, the upper half, as far as the anterior ocellus, with a small and shallow puncturation, the interspaces from two to three times as wide as the punctures, the rest of the head with a sparse semi-puncturation. Mesonotum, scutellum and metanotum moderately shining, with an oblique puncturation arranged more or less in transverse lines, stronger than in *S. Braunsii* Hndl. and about as strong as in *S. tridens* F. but closer. Mesopleura with round punctures, a little larger than those of the mesonotum, the interspaces about three to four times as wide as the punctures. Metapleura impunctate. The puncturation of the epinotum is a close semi-puncturation, smaller on the median triangular area than elsewhere, with the interspaces not much wider than the punctures; on the sides and declivity of the epinotum the puncturation is much finer. The first six abdominal segments have an oblique puncturation which is larger than in *S. Braunsii*, *mirus* and *assentator*; on the first six tergites the interspaces are about three times as wide as the punctures, and on the seventh as wide. On the sternites the punctures are closer than, and twice as large as, on the tergites, but on the seventh sternite the puncturation is round, close and deep. Clypeus with silvery pubescence, the rest of the head and thorax with a fine greyish and decumbent pubescence intermixed with longer and erect hairs on the vertex, mesopleura and epinotum. Abdomen with a short, grey and decumbent pubescence, the apical margins of the sternites with a few erect hairs.

Clypeus nearly twice as wide in front as behind or as long, the apical margin feebly concave. Interocular distance on the vertex equal to the length of the first five joints of the

flagellum and a little more than twice as great as the interocular distance across the base of the clypeus. Second joint of the flagellum 2½ times longer than wide and one-fourth longer than the third, the tenth joint a trifle wider than long and produced into a spine on the inside near the apex, the eleventh joint strongly curved, emarginate below and twice as long as the apical joint, the latter also strongly curved, rostrate and abruptly acuminate apically. Posterior ocelli as far from the eyes as from each other. The lateral margins of the epinotal declivity with a wider excision than in *S. Braunsii* and with the inferior angle of the excision much more acute, forming a sharp spine. Seventh tergite with the apical half of the sides feebly sinuate and the apex rather widely rounded. Seventh sternite with a median lamelliform and triangular tooth.

Two other specimens, 10 mm. long, have the colour pattern hardly different from the form of *S. mirus* shown in Fig. 48 *a*, but there is a median yellow line on the face below the anterior ocellus. In both of the specimens the seventh sternite is like that of the type.

The next stage in the development of the yellow colour is seen in three specimens, 8 mm. long, which have the distribution of the yellow on the thorax very similar to that of *mirus* shown in Fig. 48 *c*, and of the head and abdomen as in Fig. 48 *b*. In these, however, the tooth on the seventh sternite is reduced to what is little more than a median carina, slightly higher in the middle than at the base and apex.

At the end of the series comes one specimen, 10 mm. long, which hardly differs from Fig. 48 *c* except that the median longitudinal black line on the mesonotum is wider behind than in front and the lateral ones widest in the middle. In this example the seventh sternite is like that of the type. It is evident that the development of the tooth on this sternite is subject to considerable variation. The first and second transverse cubital veins in six of the specimens are slightly separated on the radius, and in the remaining one they are contiguous.

Bekily, 7 ♂♂. October–February.

This species does not appear to be allied to any of the African species of the *tridens* group, but the genitalia are more like those of *S. Braunsii* than of the others.

Stizus hirtiusculus n.sp. (Figs. 51, 51 *a*, *b*)

♂. 7·5–8·5 mm. long. Black. The yellow markings on the thorax as in the melanic form of *mirus* (Fig. 48), and of the abdomen intermediate between Figs. 48 and 48 *a*. The underside of the flagellum pale ochreous. The yellow bands on the sternites are somewhat variable. The punctuation on the whole is similar to that of *S. varians* but the median triangular area of the epinotum is more strongly punctured than the lateral areas and the puncturation of the abdomen is slightly less close than in that species. The exserted greyish pubescence on the head and thorax is longer and more abundant than in *varians* and the pubescence on the abdomen is longer and less decumbent; this is particularly evident on the sternites. Clypeus twice as wide in front as behind and nearly twice as wide in front as long in the middle. Interocular distance on the vertex equal to a little more than the length of the first five joints of the flagellum and 2½ times greater than the interocular distance across the base of the clypeus. Second joint of the flagellum 2½ times longer than wide at the apex and not quite half as long again as the third joint. The last three joints of the flagellum differ from those of *varians* only in having the tenth joint as long as wide. The excision on the sides of the epinotal declivity as

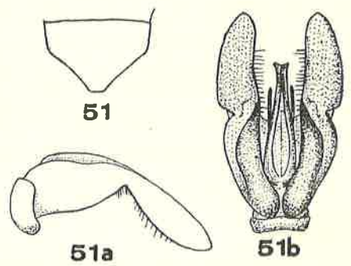


Fig. 51. *Stizus hirtiusculus* ♂, apical tergite, ×*c.* 14; *a*, *b*, genitalia, lateral and dorsal views, ×*c.* 24.

in *varians*. Seventh tergite broader than in *varians*, the apex narrowly truncate and transverse, the seventh sternite with a low median longitudinal carina. The two transverse cubital veins are slightly separated on the radius.

♀. 7·5–8·5 mm. long. Sixth tergite entirely black, closely and obliquely punctured, the puncturation of the sternites smaller than in the ♂, the sixth with only a slight puncturation at the base and a few large and scattered punctures elsewhere. Clypeus as in the ♂. Interocular distance on the vertex equal to the length of the first six joints of the flagellum and 2½ times greater than the interocular distance across the base of the clypeus. Posterior ocelli slightly nearer to each other than to the eyes. Second joint of the flagellum 2½ times longer than wide and one-fourth longer than the third.

Bekily, 1 ♂, 1 ♀; Antanimora, 2 ♂♂, 1 ♀.

The position of the recurrent veins on the radius is variable; in the type of the ♂ they are separated by a distance equal to the third abscissa of the second cubital cell on the cubitus and in one of the ♀♀ they are contiguous.

Allied to *varians* but the stipites of the genitalia are clearly different.

Stizus rectilateralis n.sp. (Figs. 52, 52 *a*, *b*)

♀. 8–11·5 mm. long. Black. The following parts pale lemon yellow, or on the abdomen sometimes whitish yellow; palpi, labrum, clypeus, face at the sides and below the antennal sockets, excepting a median black stripe which sometimes extends over the hind margin of the clypeus, hind margin of the pronotum and the pronotal tubercles, a spot on the tegulae, a macula of variable extent on each side of the scutellum, a thin transverse line, sometimes broken in the middle, on the metanotum, posterior angles of the epinotal dorsum, transverse apical bands dilated laterad on the first five tergites, that of the first sometimes interrupted in the middle and of the second to fifth angularly dilated cephalad in the middle, and triangular maculae on each side of the second to fourth sternites. Mandibles black, sometimes suffused with yellow in the middle, scapes and flagellum black above, the former lemon yellow below, the flagellum ochreous below. Coxae and trochanters more or less lemon yellow apically, the basal joint of the anterior tarsi lemon yellow and black on the outer margin, the remaining joints ochreous. Fore and middle femora black above, yellow below, fore and middle tibiae black above and behind and yellow in front, the middle and hind tarsi fuscous, their last two joints somewhat reddish, hind femora black, hind tibiae black on the inside, yellow outside and below. Wings hyaline, very faintly smoky, the veins blackish. Clypeus with a sparse silvery pubescence; on the rest of the body the pubescence and exserted pilosity are greyish white and not very conspicuous.

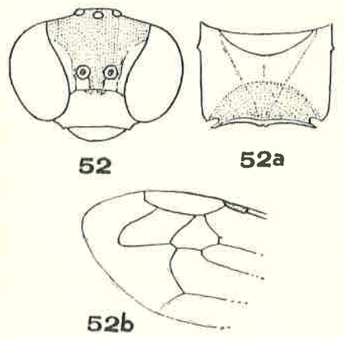


Fig. 52. *Stizus rectilateralis* ♀, head, ×*c.* 10; *a*, meta- and epinotum, ×*c.* 10; *b*, apical half of fore wing, ×*c.* 10.

The primary puncturation of the clypeus is close and microscopic, and on it are superimposed a few larger setigerous punctures. The lower part of the face is fairly smooth, the upper third is dull, obliquely and closely punctured, the interspaces twice as wide as the punctures, and the rest of the head is almost smooth. The puncturation of the rest of the body, excepting the sixth tergite, is like that of *S. Braunsii* but proportionately larger. The sixth tergite is dull, closely and obliquely punctured all over; the first five tergites and all the sternites are slightly glossy, the thorax dull.

Clypeus $2\frac{1}{3}$ times wider in front than long and not quite twice as wide in front as behind. The inner orbits are less convergent towards the base of the clypeus than in *S. Braunsii* and the other species of the *tridens* group allied to it, the interocular distance on the vertex being a little less than twice as great as the distance across the base of the clypeus, and equal to the length of the first six joints of the flagellum. The second joint of the flagellum is $2\frac{2}{5}$ longer than wide at the apex and one-third longer than the third joint; the apical joint is curved and not much longer than the penultimate. Posterior ocelli slightly nearer to the eyes than to each other. The epinotum differs from that of *varians*, *hirtiusculus* and the African species of the *tridens* group in that the lateral margins of the epinotal dorsum, when seen from above, are almost parallel and straight, curving inwards only close to the posterior angles. The transverse cubital veins are slightly separated on the radius and the radial cell is rather widely truncate at the apex.

Bekily, 5 ♀♀; Antanimora and Ranomafana, 1 ♀ each. October–February.

Fasciatus group

Stizus Berlandi n.sp.* (Fig. 53)

♀. 17–20 mm. long. Head and thorax, basal three-fourths of the first tergite, sides of the second tergite at the base, all the sternites, the legs and antennae, ferruginous. Sometimes there are yellow maculae on the second and third tergites, as in the ♂, but in the majority of the specimens the second to fifth are black, the sixth dark brown and covered with short reddish golden setae. Apex of the mandibles black. Two diffuse spots in front of the posterior ocelli and the lower half of the face are reddish ochreous. The hind margin of the pronotum and the metanotum are whitish yellow. The extreme base of the epinotum black. Wings hyaline, the fore wing faintly tinged with yellow, the radial, second and third cubital cells very faintly fuscous, the veins pale ferruginous. Pubescence and pilosity greyish, on the scutellum dense and yellowish. Sternites not quite dull, the tergites shining, the rest of the body dull. Labrum and clypeus closely and finely punctured, the face sparsely and shallowly punctured, the vertex almost impunctate. Thorax with a fine and shallow puncturation, oblique on the mesonotum, round elsewhere. On the mesonotum and mesopleura the interspaces are about twice as wide as the punctures; on the scutellum the puncturation is microscopic, and on the epinotum dense, or almost reticulate-punctate. On the tergites the puncturation is dense and oblique, increasing in size laterad and caudad, and largest on the sixth. Sternites with a few small punctures. Clypeus $2\frac{1}{3}$ times wider than long in the middle, the apical margin concave, the anterior half slightly inflexed, the posterior half feebly carinate in the middle. Inner orbits a little divergent in the upper third and divergent

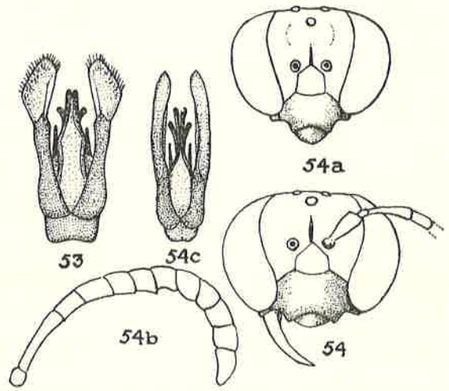


Fig. 53. *Stizus Berlandi* ♂, genitalia, × 12.

Fig. 54. *Stizus cyanipennis* ♀, head, ×*c.* 7; *a*, ♂, head, ×*c.* 7; *b*, antenna, × 12; *c*, genitalia, × 9.

* M. Lucien Berland, the distinguished hymenopterologist and arachnologist of the Muséum National d'Histoire Naturelle, Paris.

again below the base of the clypeus. Interocular distance on the vertex equal to a trifle more than the length of the first three joints of the flagellum. Posterior ocelli nearly twice as far from each other as they are from the eyes. Second joint of the flagellum almost five times longer than wide at the apex and nearly twice as long as the third, the apical joint very little longer than the penultimate joint. Dorsum of the epinotum three-fourths as long as the scutellum, its hind margin, over the median area, convex and somewhat overhanging the declivity. Apex of the sixth tergite narrowly rounded. Comb of the anterior tarsi long, the basal joint with six spines on the outer margin.

♂. 13–16 mm. long. Labrum, clypeus, face below the antennae and at the sides nearly to the level of the anterior ocellus, and the underside of the scapes, pale yellow. A spot in front of each posterior ocellus ochreous, the rest of the head ferruginous, the flagellum somewhat paler below. Pronotum, sides of the mesonotum, upper part of the mesopleura and the lateral areas of the epinotal dorsum ferruginous; the posterior margin of the pronotum, the metanotum and the posterior margin of the median area of the epinotum yellow, the rest of the thorax black or brownish black. Basal two-thirds of the first tergite, the sides of the second tergite basad and the sternites, ferruginous. The apical third of the first tergite and the following tergites are blackish, becoming gradually paler caudad, so that the last two or three are almost fusco-ferruginous. First tergite with a diffuse yellow spot on each side of the ferruginous area, second tergite with a large transverse yellow macula on each side and covering about two-fifths of the segment, the third and fourth, and sometimes also the fifth tergite, with narrow basal yellow bands, narrowed in the middle. Puncturation of the thorax stronger and closer than in the ♀, on the mesonotum almost reticulate-punctate and stronger on the scutellum than on the mesonotum. Otherwise like the ♀ in sculpture, pilosity and pubescence. Wings as in the ♀.

Clypeus nearly twice as wide as long in the middle, convex transversely and lengthwise, the anterior part not flattened and inflected as in the ♀. Second and third joints of the flagellum as in the ♀, the apical joint feebly arcuate, obliquely truncate at the apex and one-third longer than the preceding joint. Posterior ocelli twice as far from each other as from the eyes. Apex of seventh tergite narrowly rounded. The genitalia hardly differ from those of *S. chrysorrhoeus* Hndl., but the dilated apical part of the stipes is shorter.

Bekily, 13 ♀♀, 6 ♂♂; Ranomafana, 3 ♀♀. October.

A difference of colour pattern in the two sexes of the *fasciatus* group is unusual, but in one of the ♀♀ the coloration resembles that of the males. The species is more closely allied to *S. chrysorrhoeus* and *S. rubroflavus* Turner than to the other species of the *fasciatus* group. The prey taken with some specimens consisted of various species of grasshoppers.

Tridentatus group

Stizus cyanipennis Sauss. (Figs. 54, 54 *a–c*)

Stizolarra, *Soc. Entom.* II, p. 9, ♀, 1887; *Hist. Madag.* XX, p. 470, ♀, 1892.

♀. 16–22 mm. long. The following characters, not mentioned in Saussure's description, should be noted. In some specimens the apex of the fore wing beyond the radial and third cubital cells is paler than the rest of the wing, but not so sharply paler as in *funebris* Hndl. From that species *cyanipennis* can be easily distinguished, apart from colour differences, by the wider face, the differently shaped clypeus and the more divergent inner orbits.

Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus one-third of the fourth joint and one-fourth greater than the least interocular distance across the clypeus. Second joint of the flagellum fully four times longer than wide at the apex and nearly $2\frac{1}{2}$ times longer than the third. Clypeus strongly convex transversely, nearly twice as wide as long in the middle, the apical margin concave and forming an acute

angle with the lateral margins. As usual in the *tridentatus* group, the temples are very narrow, the occiput being nearly flat. The second sternite has a large basal semicircular area which is dull and densely pubescent; this is present in *S. fenestratus* Smith but not in *S. funebris* Hndl., to which this species is most nearly related.

♂. 15–17 mm. long. The first tergite, which has a basal longitudinal carina as in the ♀, has only a slightly reddish tinge, so that all the tergites may be described as black. The vertex near the eyes and the posterior ocelli is diffusely infuscated, the lateral margins of the mesonotum are dark ferruginous, and the seventh tergite is less closely but more strongly punctured than the sixth and is fairly shining; otherwise like the ♀ in colour, sculpture and pubescence.

Clypeus two-thirds wider than long in the middle. Interocular distance on the vertex equal to the length of the first three joints of the flagellum and nearly one-fifth greater than the least interocular distance across the clypeus. Second joint of the flagellum 2⅓ times longer than the third joint and about five times longer than wide at the apex, the seventh joint excavated posteriorly, the apical joint twice as long as wide at the base, slightly curved, and rounded at the apex. Posterior ocelli three-fifths farther from each other than from the eyes. Temples linear. Abdomen fusiform, nearly three times longer than wide. Otherwise like the ♀.

Most nearly related to *S. funebris* Hndl., but differing from that species in the ♂ by the much shorter triangular area of the epinotum, by the shallower and less close puncturation of the thorax and by the genitalia, in which the stipites are longer and more parallel-sided. The ♀ differs from *funebris* not only by the wider face but also in the finer puncturation and the colour.

Bekily, 4 ♀♀, 4 ♂♂; Behara, 4 ♀♀; Fort Dauphin, 1 ♀; Ivondro, 2 ♂♂. November–March.

Subfamily BEMBICINAE

Genus **Bembix** Fab.

Saussure listed four species of *Bembix* as occurring in Madagascar, but of these *B. mediterranea* Hndl. (=*olivacea* F. et Sauss.) certainly does not belong to that island's fauna, and Handlirsch was no doubt correct in concluding that Saussure included it merely on the testimony of Snellen. Of the other three, two, *hova* Sauss. and *militaris* Sauss., are mixed species, the ♂ described by Saussure under the former name being the ♂ of *madecassa* and the varieties A–D described under *militaris* are without doubt forms of *madecassa*. It remains therefore necessary only to establish the identity of the ♀ given in the main description of *hova*. On comparing this description with that of *militaris* ♀ it will be observed that the differences are well within the limits of variation of colour which may occur in the majority of the species of *Bembix*.

The only marked difference between the two is that in the description of *hova* there is no mention of black maculae on the clypeus, and as that description appears to have been based on a single specimen it may have been assumed that their absence is due to an individual variation. Handlirsch, however, states that there are such maculae. For this reason, *militaris*, described two pages after *hova*, should be sunk as a synonym. It is regrettable that Saussure based his descriptions entirely on colour, since the structural characters would have made the identification of his species a simple matter. Unfortunately the confusion does not end here, since the evidence provided by the colour pattern and the puncturation of the thorax seems to prove that Saussure's type of *hova*, examined and recognized as such by Handlirsch, is the ♂ of *madecassa*, and similarly that the ♂, labelled *militaris*, and sent by Saussure to Handlirsch, was wrongly ascribed by the latter to *madecassa*. The identity of the ♀♀ is not in doubt; both were figured by Saussure, but the figure of *militaris* is actually that of *hova*.

My reason for reversing the types of the ♂♂ may briefly be stated. The descriptions of the type of '*hova*' (Saussure and Handlirsch) conform more to the ♀ of *madecassa* than to that of *hova* ♀, in having the thorax in greater part black and also in the puncturation of the mesonotum which is like that of *madecassa* ♀, which is more dense than in *hova* ♀. The pale transverse bands on the abdomen are lemon yellow throughout on the tergites and sternites in *hova* ♀, whereas in *madecassa* ♀ they are glaucous or greyish white at the sides of the tergites and on the sternites, which is the colour they have in the ♂ described as *hova* by both Saussure and Handlirsch. It is true that neither author mentions this difference in the colour of the abdominal bands in the two sexes, but the figures of the antennae and genitalia and the seventh tergite of '*hova*' given in Handlirsch's work proves that these ♂♂ with greyish white bands are the same insect. In passing it may be mentioned that in the specimens before me the width of the membranous apical margin of the seventh tergite and the depth of its excision are somewhat variable. In fact in some specimens the segment resembles the figure of the seventh tergite of *B. trepanda* Dahlb. as shown in Handlirsch's Fig. 20, Plate V, far more than that of his Fig. 21 of *hova*. But although *trepanda* has been recorded from Mauritius those specimens cannot be identified with that species on account of the shape of the antennae and the genitalia. Both Saussure and Handlirsch relied to a certain extent on the shape of the second cubital cell to distinguish the species, but as the proportions of that cell are variable within the species no reliance can be placed on such a character.

Key to the species

♀♀

(4) 1. Larger species, 12–17 mm. long.
(3) 2. 13–17 mm. long. Mesonotum black, the lateral margins behind the tegulae and the posterior corners sometimes yellow, the mesopleura black. Pale bands of the tergites yellow medially, greyish white at the sides. **madecassa** Sauss. (p. 79)
(2) 3. 12–15·5 mm. long. Mesonotum with wide yellow lines near the lateral margins and a median U-shaped yellow macula; mesopleura mainly yellow; pale bands of the tergites yellow throughout. (Sixth sternite finely and closely punctured at the base, sparsely and coarsely elsewhere.) **hova** Sauss. (p. 81)
(1) 4. Smaller species, 10·5 mm. long. Colour pattern similar to that of *hova*. Sixth sternite with a large and shallow puncturation all over. **latebrosa** Kohl (p. 82)

♂♂

(4) 1. Second sternite with a median lamelliform tooth or carina; middle femora dentate or finely serrate below.
(3) 2. Lamelliform tooth of the second sternite high, rounded at the apex behind. Middle femora with a row of about eight teeth on the lower edge. **madecassa** Sauss. (p. 79)
(2) 3. Second sternite with a carina, rising and becoming lamelliform caudad, the apex angular; middle femora with the lower edge finely and irregularly serrate. **hova** Sauss. (p. 81)
(1) 4. Second sternite simple, without a carina. **latebrosa** Kohl (p. 82)

Bembix madecassa Sauss. (Figs. 55, 55 *a–h*)

Mitt. Schweiz. Ent. Ges. VIII, p. 260, ♀, 1891; *Hist. Madag.* XX, p. 456, ♀, 1892

B. militaris Sauss. pars, var. *a–d*, *Hist. Madag.* XX, ♀, p. 460, 1892.
B. hova Sauss. ♂, nec ♀, *Hist. Madag.* XX, p. 458, 1892.
B. hova ♂, nec ♀, Handlirsch, *Sitzber. Akad. Wiss. Wien*, CII, p. 734, 1893.

♀. 13–17 mm. long. To Saussure's detailed description of the colour the following notes should be added. The colour of the labrum and clypeus is a glaucous white, like that of *B. massaica* Cam., becoming yellowish towards the apex on the labrum. The transverse bands on the tergites are also usually of this colour at the sides, and also the pale markings on the sternites. The basal, and more or less trilobed, black mark on the second and third

tergites is sometimes broken up into three separate spots, as in Fig. 55 *b*. The erect, yellowish grey pilosity on the head, thorax and base of the first tergite is dense, particularly on the epinotum, where it is also longest. The black markings on the clypeus and labrum are variable in extent. The puncturation of the thorax is slightly oblique, strongest on the scutellum and dense, much more so than in *hova*, the interspaces being hardly wider than the punctures. The sixth tergite is fairly dull and almost reticulate-punctate, the punctures somewhat elongated, but a narrow median space near the apex is only sparsely punctured. The puncturation of the shining sternites is fine and close near the sides and coarse and sparse in the middle, and larger on the second sternite than on the others.

Clypeus a little more than twice as wide in front as long in the middle, subcarinate medially, the apical margin strongly concave. Interocular distance on the vertex equal to a little more

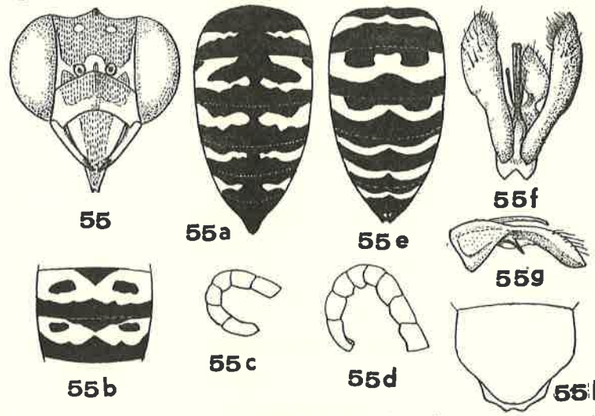


Fig. 55. *Bembix madecassa* ♀, head, ×6; *a*, abdomen, ×4; *b*, variety, second and third tergites, ×4; *c*, apical joints of the flagellum, ×*c.* 14; *d*, ♂, apical joints of the flagellum, ×*c.* 14; *e*, abdomen, ×4; *f*, *g*, genitalia, dorsal and lateral views, ×*c.* 10; *h*, seventh tergite, ×*c.* 10.

than the length of the first four joints of the flagellum. The second joint is about $4\frac{1}{2}$ times longer than wide and about half as long again as the third; the apical joint moderately curved, $2\frac{2}{5}$ longer than wide and half as long again as the tenth joint. Comb of the anterior tarsi composed of long ferruginous and flattened spines, of which there are six on the basal joint.

♂. 12·5–15 mm. long. Two contiguous triangular maculae on the face, the vertex excepting a small yellow macula laterad of the posterior ocelli, and the occiput, black; all the rest of the head lemon yellow. Pronotum yellow, with a more or less bilobed black mark on the neck. Sides and ventral surface of the thorax yellow, with variable black maculae adjacent to the sutures and on the base of the coxae, the upper side of the thorax black but with the following parts varying from pale yellow to glaucous white, any of which may be obsolete: a line near the lateral margins of the mesonotum and two longitudinal lines on each side of its middle in front, maculae on the sides of the scutellum and a pre-apical line joining them, the hind margin of the metanotum and an irregular line margining the median area of the epinotum and extending over the upper half of the declivity. The transverse bands on the tergites are greyish white and the first six sternites are lemon yellow, more or less marked with black in the middle and at the sides. The puncturation of the sternites as in the ♀.

Clypeus three-fourths wider in front than long in the middle. Interocular distance on the vertex equal to the length of the first four joints of the flagellum. The second joint of the latter is $3\frac{1}{2}$ times longer than wide at the apex and not quite half as long again as the third joint; seventh to eleventh joints excavated below, the eighth to tenth feebly angular on the inside, the apical joint curved, nearly three times longer than wide and abruptly truncate. Second sternite with a high transversely compressed tooth, of the same shape as in *B. ochracea* Hndl.; the sixth has a subtriangular platform, its apex caudad, and the seventh is compressed at the apex to form a gutter-shaped mucro. The seventh tergite is broad at the base, narrowed caudad, the sides sinuate behind; beyond the sinus the margin is depressed and membranous, and angularly excised at the apex. Middle femora with an irregular row of eight teeth on the lower margin, some of the inner ones bifid. Middle tibiae with one spur and produced at the apex below into a short spine.

Behara, 22 ♀♀; Bekily, 5 ♀♀, 12 ♂♂; Fort Dauphin, 1 ♂. October–March.

This species belongs to the *mediterranea* group but is not closely related to any of the African species.

Bembix hova Sauss. (Figs. 56, 56 *a–e*)

Hist. Madag. XX, p. 457, ♀, ♂, 1892

B. militaris Sauss. pars, *Mitt. Schweiz. Ent. Ges.* VIII, p. 260, ♀, 1891.
B. militaris Sauss., *Hist. Madag.* XX, p. 459, ♀, 1892.
B. madecassa Hndl. ♂ nec ♀, *Sitzber. Akad. Wiss. Wien*, CII, p. 734, 1893.

♀. 12–15·5 mm. long. The ♀ of this species is easily distinguished from that of *madecassa* as follows. Labrum without any black colour, entirely yellowish white. The black maculae on the clypeus are much smaller, the pale markings on the lower part of the face are more extensive and distinctly yellow, there is a large transverse ochreous bar below the anterior ocellus and there is a yellow macula on each side behind the posterior ocelli. The sides of the thorax are in greater part yellow, and on the dorsum the yellow bands are wider and in addition the mesonotum has a median U-shaped yellow mark. The shape of the transverse bands on the tergites is not very different from that of *madecassa* but they are bright lemon yellow throughout, as are also the bands on the sternites. The sixth tergite has a median ochreous spot, whereas in *madecassa* that segment is entirely black. The puncturation of the mesonotum is less close and more oblique, at least lengthwise, since in both species the punctures are arranged in wavy transverse lines. In this species the interspaces between those lines are fully three times wider than the punctures. The puncturation of the sternites is sparse as in the other species, but relatively larger, and the sixth tergite is shining and very sparsely punctured in its apical half. The interocular distance at the bottom of the eyes is a little greater than on the vertex, whereas in *madecassa* it is the same there as on the vertex. The rounded apex of the sixth tergite is distinctly wider than in *madecassa*, but the joints of the flagellum do not differ.

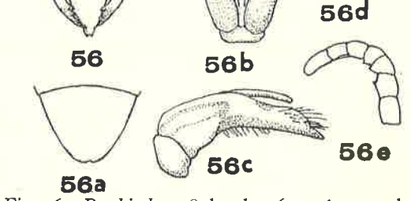


Fig. 56. *Bembix hova* ♀, head, ×6; *a*, ♂, seventh tergite, ×*c.* 10; *b*, *c*, genitalia, dorsal and lateral views, ×*c.* 14; *d*, second sternite, lateral view, ×*c.* 10 (the dotted line shows the shape of the segment in *madecassa*); *e*, apical joints of the flagellum, ×14.

♂. 12–14 mm. long. Clypeus entirely lemon yellow. The mesopleura and mesosternum

black, with a vertical yellow line below the tegulae, the sides of the epinotum black in front and down the middle, the other parts yellow. The legs are less marked with black than in the ♀, and the middle and hind femora and tibiae are lemon yellow excepting short streaks on the underside of the femora near the base. In three of the four specimens in the collection the mesonotum has the U-shaped yellow mark reduced to two streaks in front, but in the remaining specimen the mark is the same as in the ♀. The sternites are in greater part black, the yellow being reduced to narrow apical bands with small triangular dilatations at the sides. Otherwise the colour is very much the same as in the ♀, but the yellow bands on the first two tergites are wider. Second sternite closely punctured, except on the part close to the median carina; seventh tergite shining, more closely punctured than in the ♀. Clypeus twice as wide in front as long in the middle. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first five joints of the flagellum. The second joint of the flagellum is $3\frac{1}{3}$ times longer than wide at the apex and nearly half as long again as the third; the seventh joint is dentate, the ninth to eleventh are excavated below, the eighth to tenth wider than long and the apical joint is slightly curved, rounded at the apex and not quite half as long again as the preceding joint. The second sternite has a median longitudinal carina rising caudad and sharply truncate; its height is variable, but lower than in *madecassa* and acute at the apex, not rounded as in that species. The sixth sternite has a raised triangular platform, not so high as in *madecassa* but more acute at the apex. The seventh sternite is broad and has a median longitudinal carina. The seventh tergite is broadly rounded at the apex and is without a depressed membranous border. The femora of the middle pair of legs are irregularly and finely serrate along the whole of their lower edge. Middle tibiae not produced into an apical spine. The outer paramera of the genitalia differ from those of *madecassa* by being longer, without a tooth on the underside and rather abruptly attenuated at the apex. The inner paramera are narrower than in that species.

Bekily, Antanimora and Fort Dauphin, 23 ♀♀; Bekily, Bas Mandrari, Antanimora and Behara, 4 ♂♂. October–March.

Bembix latebrosa Kohl (Figs. 57, 57 *a*, *b*)

Voeltzkow's *Reise*, II, p. 373, ♂, ♂, 1909

♂. 12·5 mm. long. The colour pattern of the head is like that of *hova* ♀, except that the clypeus is entirely yellow and the yellow transverse macula on the face is wider, connecting with the yellow lines on the sides of the face. On the thorax the colour pattern is also like that of *hova* ♀, but the transverse bands on the scutellum, metanotum and epinotum are greyish white instead of yellow. The apical transverse bands on the first five tergites are greyish white becoming lemon yellow at the sides as on the sternites. The band on the sixth tergite and two small spots on the seventh are lemon yellow. The sides of the thorax are lemon yellow, with black lines on the sutures and an oval macula on the lower part of the mesopleura. The sternites are moderately shining and rather coarsely punctured; on the second the puncturation is fairly close, except near the carina, the interspaces being not much wider than the punctures. Seventh tergite shining,

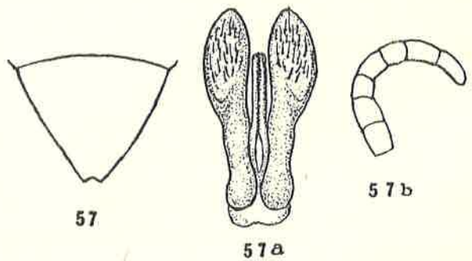


Fig. 57. *Bembix latebrosa* ♂, seventh tergite, ×20; *a*, genitalia, ×20; *b*, apical joints of the flagellum, ×20.

closely punctured with round punctures except near the apex which is more sparsely punctured; its apex is shallowly and arcuately emarginate. The carina on the second sternite is like that of *hova* ♂, but the triangular platform on the sixth is narrower and not so high as in that species. The seventh sternite has a feeble median longitudinal carina and a widely rounded apical margin. Clypeus strongly convex transversely, nearly two-thirds wider in front than long in the middle, the basal half subcarinate lengthwise. Inner orbits equally divergent above and below. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus one-third of the fifth joint; the eighth to eleventh joints are slightly excavated below, the apical joint is curved, a little more than twice as long as wide, about one-third longer than the preceding joint and rounded at the apex. Wings short, little more than twice as long as the width of the mesonotum at the level of the tegulae. Middle femora not dentate nor serrate below, middle tibiae not produced into an apical spine. Stipites of the genitalia spatulate, with a blunt black tooth below at about the middle of their length.

♀. Of this sex Kohl says that the second sternite has no fine puncturation, only a coarse and scattered one. There is one specimen in the collection which I assign to this species, although it has fine puncturation at the sides of the second sternite, as in the ♂. The livery on the whole differs very little from that of *hova* ♀ on the head, thorax and tergites, but the sternites are all lemon yellow, except the base of the sixth which is black. In *hova* ♀ the sixth is either entirely black or black with a very narrow yellow margin near the apex. The sixth sternite in this specimen has a sparse, large and shallow puncturation all over, whereas in *hova* ♀ it is finely and closely punctured over the basal third and sparsely and coarsely over the apical two-thirds. The black spots on the clypeus are much smaller than in *hova* and oval. The length, 10·5 mm., is too small for it to be a specimen of *hova*.

Bekily, 1 ♂; Behara, 1 ♀. March.

Kohl's types were taken at Tulear, south-west Madagascar.

Subfamily AMPULICINAE

Of the African genera belonging to this subfamily, *Ampulex* and *Dolichurus*, only the latter has been found in Madagascar. This is somewhat surprising in view of the fact that Saussure records two species of *Ampulex* from the neighbouring Mascarene Islands.

Genus **Dolichurus** Latr.

Dolichurus secundus Sauss. (Figs. 58, 58 *a–d*)

Hist. Madag. XX, p. 450, ♀, 1892

D. tertius Sauss., *Hist. Madag.* XX, p. 452, ♀, 1892; Kohl, *Ann. naturh.* (*Mus.*) *Hofmus., Wien*, VIII, p. 512, ♀, 1893.

The collection contains 27 ♀♀ and 32 ♂♂ which had been arranged by M. Seyrig into what he believed were three species, together with a few specimens *incert. sedis*. Of these species two were correctly identified with Saussure's *D. secundus* and *D. tertius*, but the sorting of the specimens had evidently been based on a combination of two characters, the size and the sculpture, the former varying between wider limits than the latter. Judging by external characters alone, it would be difficult to decide where these supposedly distinct species begin and end. However, an examination of the male genitalia furnishes an answer to this problem, proving that the fifty-nine specimens all represent a single species. The structure of the genitalia is the same in all, their size alone being variable and in proportion to the size of the insect. In both sexes, the structural characters, such as the interocular width, length and width of the antennal joints and of the pronotal dorsum, etc., are alike for all, and it is only in the sculpture that there is any difference. By arranging the specimens

according to size it is seen that in both sexes with a decrease in size there is a corresponding reduction in size, depth and number of the punctures on the head and thorax, and of the size and number of rugae on the mesopleura and epinotum. In the largest females the arrangement and number of rugae and carinae on the epinotal dorsum is very variable, even in specimens of the same size. The puncturation of the abdomen in the females is very scanty and fairly constant, but in some of them, and independent of the size, the tergites have a close and microscopic puncturation at the sides which in others is entirely absent. In the males the puncturation of the abdomen is strong and close, and remains constant. The largest females have the wings slightly tinged with fuscous, but in the medium and smallest sized specimens they are almost clear hyaline. In no other Sphecid known to me is there such a wide range of variation in the sculpture and size as in this species, *D. secundus*.

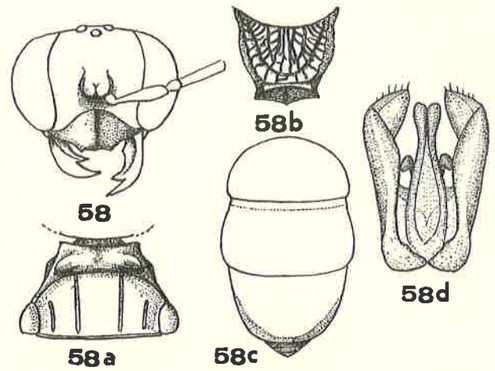


Fig. 58. *Dolichurus secundus* ♂, head, × 40; *a*, pro-mesonotum, × *c.* 14; *b*, epinotum, × *c.* 14; *c*, abdomen, × *c.* 14; *d*, genitalia, × *c.* 14.

The prey consists of immature Blattids, and it is highly probable that the size of the imago is conditioned by the size of the prey provided for it during larval life.

♀. 5·5–11·5 mm. long. To Saussure's very full description of the sculpture the following notes on structural characters may be added. Interocular distance at the bottom of the eyes nearly one-third greater than across the vertex, where it is equal to the length of the second joint of the flagellum plus half of the third. Clypeus like that of *D. ignitus* Smith, about twice as wide at its widest as long in the middle, the median portion produced into a lobe which is as long as the part behind it; the latter with a median longitudinal carina. Second joint of the flagellum a little longer than the third and about four times longer than wide. Mandibles with three teeth on the inner margin. Posterior ocelli a little farther from the eyes than from each other. Pronotal dorsum nearly three times wider in front than long in the middle. Dorsum of the epinotum half as wide again at the base as long.

The size varies within wide limits, the largest specimens being twice as long as the smallest. In the latter the puncturation of the face is somewhat obliterated, and between the supra-antennal plate and the eyes is replaced by a rugulose sculpture. In the largest specimens the mesopleura are strongly and obliquely rugose and punctured between the rugae. As the size decreases, the punctures become shallower until in the smallest specimens there is little left on the mesopleura but rugae. In some specimens the mandibles and apex of the clypeus are ferruginous, and the tibiae and tarsi fusco-ferruginous.

♂. 3·4–6·5 mm. long (not including the supra-antennal plate). Black. Apical two-thirds of the mandibles ferruginous. In the smallest specimens the flagellum, tibiae and tarsi are more or less brownish. Sometimes, and more frequently in the smallest specimens, there is a small ivory white spot on the apex of the posterior tubercles of the pronotum. Pubescence greyish white, long on the clypeus and lower half of the face, shorter and exserted on the thorax, very fine and decumbent on the abdomen.

(Maximum size specimens.) Clypeus and face below the supra-antennal plate finely punctured, the temples fairly strongly punctured below, more finely above. Face above the supra-antennal plate to about the level of the anterior ocellus strongly rugose, here and there

reticulate-rugose, the rugae extending over the basal third of the supra-antennal plate; from the anterior ocellus to the occipital margin the head is sparsely and fairly coarsely punctured. Anterior face of the pronotum vertical, the dorsal face produced on each side behind into a decumbent conical tubercle the apex of which is directed outwards; between the tubercles and the anterior margin the dorsum is closely, finely and transversely striato-rugose. The sides of the pronotum extend back as far as the tegulae and, excepting two or three oblique costae in front, are smooth. Mesonotum and scutellum punctured, more closely laterad than mesad, the interspaces about twice as wide as the punctures. Mesopleura rugulose in front, behind the epicnemial crest strongly and obliquely rugoso-punctate. Metapleura smooth and shining, metanotum coriaceous, sides of the epinotum transversely rugose, sometimes almost costate. The dorsum and declivity of the epinotum are like those of the ♀ but the carinae are less sharp and less regular. Tergites 1–3 closely punctured, the punctures decreasing in size on each segment, the interspaces about twice as large as the punctures. The fourth and following abdominal segments are usually telescoped under the third, but sometimes are partially visible. First sternite rugose, its apical margin depressed, second and third sternites punctured like their tergites, but the depressed apical margin of the third is very finely punctured. The third tergite and sternite are depressed caudad, more widely on the sternite than on the tergite, and the apical margin of the sternite is thickened and raised. As indicated in the introductory paragraph, with a decrease in size of the insect there is a gradual reduction in size of the puncturation and of the rugae on the head and epinotum, so that in the smallest specimens there are hardly any distinct rugae on the head and the anastomoses of the rugae on the epinotum are almost obsolete.

Clypeus 2½ times wider than long in the middle, carinate lengthwise medially, the apical margin arcuately emarginate. Mandibles with one large tooth on the inner margin. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus nearly half of the third. Posterior ocelli nearly 1½ times farther from the eyes than from each other. Second joint of the flagellum nearly four times longer than wide and not longer than the third. Pronotum about three times wider behind (measured between the apices of the posterior tubercles) than long in the middle. First tergite a little more than 1½ times wider than long, the second fully twice as wide as long and a little shorter than the first. Epinotal dorsum moderately narrowed caudad, three-fifths wider at the base than long.

Bekily, Rogez, Ivondro, Ranomafana and Fort Dauphin, 27 ♀♀, 32 ♂♂. October–May.

Subfamily SPHECINAE Hndl.

Genus **Sceliphron** Ill.

Saussure lists three species of this genus from Madagascar, viz.: *madecassum* Grib. (=*violaceum* Sauss. nec Fab.), *hemipterum* Fab. and *Spinolae* Lep. The Seyrig collection contains examples only of the first two. According to Kohl (*Ann. naturh. (Mus.) Hofmus., Wien*, XXXII, p. 82, 1918), the specimens referred by Saussure to *S. Spinolae* Lep. are not that species and he therefore renamed them as *S. Saussurei*.

The three species, and *S. bengalense* Dhlb. which has been recorded from Mauritius and may be found in Madagascar, can be distinguished as follows:

A. Body metallic blue. Third cubital cell narrowed on the radius. Clypeus distinctly convex, in the ♀ with three to five small teeth or lobes on the anterior margin, in the ♂ with three small teeth. Subgenus **Chalybion** Dhlb.

(*a*) Sides of the epinotum transversely rugose. Petiole long, as long as the first joint of the hind tarsus plus half of the second. Colour purplish blue. **madecassum** Grib.

(*b*) Sides of the epinotum punctured. Petiole as long as the first joint of the hind tarsus. Body greenish blue. **bengalense** Dhlb.

B. Body bluish black. Petiole yellow, legs black and yellow. Third cubital cell only slightly narrowed on the radius, the second very much narrowed there. Clypeus convex, without lobes or teeth on the anterior margin.
Subgenus **Hemichalybion** Kohl, **Saussurei** Kohl

C. Body without any metallic lustre. ♀ dull black, ♂ with the pro-mesonotum fusco-ferruginous, the abdomen sometimes rufescent black. Wings pale flavo-hyaline. Clypeus feebly convex, the anterior margin with two large rounded lobes.
Subgenus **Pelopoeus** Latr., **hemipterum** Fab.

Sceliphron madecassum Grib.

Ann. Mus. Civ. Genova, XVIII, p. 263, ♂, ♂, 1892

S. violaceum Sauss., *Hist. Madag.* XX, p. 449, ♂, ♂, 1892.

Rogez, 2 ♀♀. January and April. According to a note attached to one specimen this species preys chiefly on Theridiidae.

Sceliphron hemipterum Fab.

Entom. System. Suppl. p. 244, nos. 11–12, 1798; *Hist. Madag.* XX, p. 446, ♀, ♂, 1892

Ankaratra, 1 ♂; Rogez, 1 ♀; Bekily, 2 ♂♂. According to a note attached, this species preys on spiders of the families Thomisidae, Argiopidae and Salticidae.

Genus **Sphex** Linn. 1758

Ammophila Kirby, *Trans. Linn. Soc.* IV, p. 195, 1798.

Of the five species described by Saussure as Madagascan, two, *laevigata* Smith and *erythrocephala* Fab., belong to the old Romand collection in which it is evident that not a few specimens have been wrongly labelled as to locality. Both are species of the Oriental Region and their occurrence in Madagascar is most doubtful, but perhaps less in respect of *erythrocephala* than *laevigata*, since I am of the opinion that *cyaneipennis* Lep., a West African insect, is no more than a race of Fabricius's species. This, however, can be determined only by a comparison of the genitalia. Of the other species, *imerinae* Sauss. is the ♂ of the species identified by Saussure as *rubiginosa* Lep., also represented in the collection by 1 ♀. However, in both sexes these are identical with *tenuis* Pal. Beauv. Whether *rubiginosa* is synonymous with the latter it is impossible to decide from Lepeletier's altogether insufficient description. Unless the type can be re-examined and re-described, it will be far better to allow the name *rubiginosa* to sink into obscurity.

However, a further complication arises in regard to the validity of *tenuis* Pal. Beauv. In a revision of the South African species of the genus *Sphex* (*Proc. Rhod. Sci. Ass.* XVIII, p. 40, 1919–20) I said that I could see no difference in the genitalia of *tenuis* and *beniniensis* Pal. Beauv. (=*lugubris* Gerst.), and that the former differed from the latter chiefly in colour and the sculpture of the pronotum. A re-examination of all the specimens at my disposal confirms the former statement, but the supposed differences in sculpture prove to be due only to an arbitrary sorting of the specimens according to size, neglecting the intermediate sizes. When the latter are taken in consideration the supposed differences in the sculpture of the pronotum disappear, and as no differences can be found in the other structural characters one is obliged to place *tenuis* in synonymy with *beniniensis*. [In this connexion I take the opportunity to point out that the form which I described as variety *calvus* (loc. cit. supra, p. 38) should be raised to specific rank. The sagittae of the genitalia in *beniniensis* have on the underside a stout spine directed obliquely outwards and proceeding from the inner inferior margin. In *calvus* this spine is absent, the underside having only an oval ring of minute denticles; see Fig. 59 *c*.]

Another species common in Madagascar and represented in the Seyrig collection is one which Saussure referred to *capensis* Lep., which is only a race of *tydei* Guill. and which Kohl has elevated to specific rank under the name of *madecassa*. However, this step is not justified since the genitalia of the Madagascan and South African forms are absolutely indistinguishable. The former should therefore be considered an insular race of the widely distributed *tydei*.

Key to the species, ♀♀ and ♂♂

(4) 1. First tergite subdilated behind, more or less funnel-shaped or conical, the petiole proper one-jointed and composed only of the first sternite.

(3) 2. Stigmata of the first tergite situated at, or a little behind, the middle of the segment. Claws bidentate. Third cubital cell usually more or less barrel-shaped.
(Subgenus **Parapsammophila** Tasch.) **erythrocephala** F.

(2) 3. Stigmata of the first tergite placed in the anterior half of the segment, or almost at the middle. Claws unarmed, rarely unidentate.
(Subgenus **Podalonia** Spin.) **tydei** Guill. race **madecassa** Kohl (p. 87)

(1) 4. First tergite elongate, hardly wider than the first sternite which is anterior to it, the two together forming a two-jointed petiole. Stigmata of the first tergite placed behind the middle of the segment or sometimes at the middle. Claws unarmed.
(Subgenus **Sphex** L.) **beniniensis** P.B. (p. 87)

Sphex erythrocephala F.

Ent. System. II, p. 204, 1793

As already suggested, it is improbable that this species can really be included in the fauna of the island, but should it eventually be found there collectors should have no difficulty in recognizing it, as it is much larger than the other species in the island, being over 30 mm. long.

Sphex tydei Guill. race **madecassa** Kohl

Ann. Soc. Ent. France, X, p. 319, ♀, 1841

Saussure, *S. capensis* Lep., *Hist. Madag.* XX, p. 438, ♀, ♂, 1892.
S. madecassa Kohl, Voeltzkow's *Reise Ost Afr.* II, p. 372, ♀, ♂, 1909.

♀. 15–17 mm. long. ♂. 10–13 mm. long.

Kohl's elevation of this form to specific rank, chiefly on slight differences of puncturation and on the narrower face, is not justified, since the genitalia are indistinguishable from those of *tydei*. It may be considered a subspecies, differing from the variety *capensis* as follows.

Puncturation of the head and pro-mesothorax stronger and closer, intermediate between that of *capensis* and *S. Sheffieldi* Turner. Second joint of the flagellum in the ♀ shorter than in *capensis*, not quite half as long again as the third joint. The posterior ocelli as in that variety. In the ♂ the dorsum of the epinotum is reticulate-rugose, rather than transversely rugose as in *capensis*.

Imerina, Perinet and Bekily, 3 ♂♂; Fort Dauphin, 1 ♀.

Sphex beniniensis P.B. (Figs. 59, 59 *a*, *b*)

Insect. rec. en Afr. et Amér. p. 48, 1837

Saussure, *Ammophila rubiginosa* Lep., *Hist. Madag.* XX, p. 435, ♀, ♂, 1892.
Saussure, *Ammophila imerinae*, *Hist. Madag.* XX, p. 435, ♂, 1892.

This variety is represented in the collection by 1 ♀ and 4 ♂♂. Apart from such unimportant differences as the absence of black maculae on the vertex and fewer and sharper rugae on

the pronotum, these specimens do not differ in any way from *tenuis* P.B. which, for reasons given on a previous page, should be sunk as a synonym of *beniniensis*.

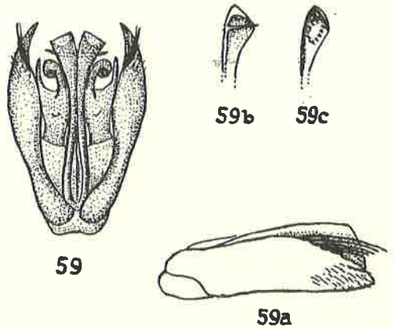


Fig. 59, *a*. *Sphex beniniensis* ♂, genitalia, dorsal and lateral views, × 20; *b*, apex of right sagitta, ventral view, × 20; *c*, *S. calvus* ♂, apex of right sagitta, ventral view, × 20.

Ambohimanga, 1 ♂; Bekily, 3 ♂♂. Other localities listed by Saussure are Imerina, Antananarivo and Anosibé.

Genus **Chlorion** F.

Syst. Piez. p. 217, 1804

Sphex L., *Syst. Nat.* ed. 12, p. 941, 1770.

Of the seven species included in Saussure's work as being Madagascan it is almost certain that three of them have been erroneously recorded. In the case of *C. splendidus* F. (=*forficula* Sauss.) the faulty labelling of the old Romand collection is responsible (Kohl, *Ann. naturh.* (*Mus.*) *Hofmus., Wien*, x, p. 43, 1895). In regard to *lobatus* F. and *aurulentus* F. Saussure gives no locality in the island, merely saying 'Madagascar, belonging to the Indian fauna', and I have no hesitation in excluding these three species from the faunal list. According to Kohl, another species of the Ethiopian Region, *aegyptium* Lep., has been taken in Mauritius, and for that reason it is included in the subjoined key to the species, although the Seyrig collection contains no examples.

Key to the species, ♀♀ and ♂♂

A. Second cubital cell narrow, higher than wide on the cubitus. Claws with two to five teeth at the base. Epinotum without a stigma groove. Stigmata of the first tergite situated behind the middle of the segment. Tarsal comb well-developed.
Subgenus **Harpactopus** Sm.
Large black species, ♀ 26–34 mm. long, ♂ 22–28 mm. long. Wings flavo-hyaline, the apex pale fuscous. **aegyptium** Lep.

B. Second cubital cell as wide on the cubitus as high, or wider, rhomboidal or more or less rectangular. Petiole short. Epinotum without a stigma groove. Anterior tarsi without a comb. Nests made in reeds or hollow twigs. Subgenus **Leontosphex** Arn.
A large species, the ♀♀ usually smaller than the ♂♂. Black. Face with pale brassy pubescence. Epinotum with a dense reddish ochreous pubescence and pilosity, obscuring the sculpture. Anterior legs and middle and hind tarsi fusco-ferruginous, the middle and hind tarsi orange. **leoninum** Sauss. (p. 90)

C. Petiole short, rarely much longer than the second joint of the hind tarsus. Epinotum with a stigma groove. Anterior tarsi with a well-developed comb. Nests made in the ground.
Subgenus **Proterosphex** Fern.

(2) 1. Wings reddish orange, the apical margin beyond the cells fuscous (metanotum bituberculate). **torridum** Smith (p. 90)

(1) 2. Wings flavo-hyaline, the apical margin pale fuscous.

(4) 3. ♂. Metanotum simple. Face and clypeus with pale golden pubescence. Clypeus, and at least the anterior third of the thorax, more or less fusco-ferruginous. ♀. Metanotum simple. Clypeus, sides of the face and maculae on the prothorax, upper part of the mesopleura and the anterior angles of the mesonotum, fusco-ferruginous. **malagassum** Sauss. (p. 89)

(3) 4. ♂ and ♀. Lower half of the face and clypeus with whitish pubescence, intermixed with black pilosity in the ♀ and yellowish black in the ♂. Metanotum bituberculate. Posterior femora in the ♀ ferruginous, in the ♂ ferruginous only on the underside. The basal half of the posterior tibiae on the upper side ferruginous in the ♂. **umbrosum** Chr. var. **Voeltzkowi** Kohl (p. 89)

Chlorion umbrosum Chr. var. **Voeltzkowi** Kohl (Fig. 60)

Voeltzkow's *Reise Ost. Afr.* p. 370, ♀, ♂, 1909

This variety is closely related to the vars. *Taschenbergi* Magr. and *rufipennis* F. Like the latter, it has the wings pale flavo-hyaline, with the apical border faintly fuscous. It differs from it in having, in the ♀, the hind femora dark ferruginous on the inside and below and the hind tarsi rufescent black. In the ♂ the hind femora are dark ferruginous only on the underside and the hind tibiae have the basal half of the upper side fusco-ferruginous. In the ♀ the second joint of the flagellum is a little shorter than in the var. *metallicum* Tasch., being only half as long again as the third, instead of five-ninths longer. The underlying pubescence of the face and clypeus is greyish silvery and sparse, whereas in *metallicum* it is bright silvery white and very dense. As in that variety and in var. *rufipennis* the coarse pilosity on the clypeus and face is yellowish and black intermixed, not white as in the typical form of the species. In the ♀ there is a feeble excision in the middle of the anterior margin of the clypeus, as in *C. nigripes* Sm., but in both sexes the metanotum is distinctly bituberculate, so that it cannot be considered a variety of *nigripes*, in which the metanotum is simple. Furthermore, the genitalia do not differ in any way from those of *umbrosum-metallicum*; the seventh sternite has a brush of yellowish pubescence and the eighth is convex, whereas in *nigripes* ♂ there is a dense brush of pubescence on both the seventh and eighth sternites and the eighth is compressed, almost plough-shaped.

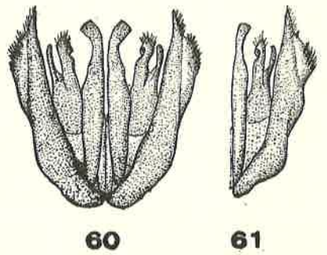


Fig. 60. *Chlorion umbrosum* var. *Voeltzkowi* ♂, genitalia, × *c.* 14.

Fig. 61. *Chlorion torridum* ♂, genitalia, × *c.* 14.

Behara, 5 ♀♀, 2 ♂♂. November–January.

Kohl does not mention the reddish colour of the femora but otherwise these specimens agree well with his description of the variety, the types of which were collected at Tamatave.

Chlorion malagassum Sauss.

Mitt. Schweiz. Ent. Ges. VIII, p. 259, ♀, ♂, 1891; *Hist. Madag.* XX, p. 427, ♀, ♂, 1892; Kohl, *Ann. naturh.* (*Mus.*) *Hofmus., Wien*, x, p. 67, ♀, ♂. (Tab. IV, fig. 6, Tab. V, figs. 25–26), 1895

♀, 25 mm. long; ♂, 19–22 mm. long. This species bears a strong resemblance to *umbrosum* var. *Voeltzkowi* but is smaller and the wings are less strongly tinged with yellow. Kohl has

supplemented Saussure's description with notes on the structural characters which therefore need not be repeated here.

Apart from these characters this species can be distinguished from the var. *Voeltzkowi* by the sculpture of the epinotal dorsum which is dull, much more narrowed caudad, closely and finely and transversely rugose and with coriaceous interspaces, whereas in *umbrosum* and its varieties the sculpture consists of straight transverse ridges with the interspaces smooth and somewhat shining. Furthermore, the pilosity and decumbent pubescence of the epinotum in *malagassum* is yellowish grey, whereas in *Voeltzkowi* it is black. The genitalia of the two species are quite different.

Rogez, 1 ♀, 3 ♂♂; Fort Dauphin, 1 ♂; Ranomafana, 1 ♀.

Chlorion torridum Sm. (Fig. 61)

Ann. Mag. Nat. Hist. XII, p. 291, ♀, 1873; Saussure, *Hist. Madag.* XX, p. 426, ♀, ♂, 1892; Kohl, *Ann. naturh.* (*Mus.*) *Hofmus., Wien*, X, p. 56, ♂, 1895

This species is unmistakable by the colour of the wings, which are reddish orange, with the apical border fuscous.

♀, 23–32 mm.; ♂, 26 mm. long. As remarked by Kohl, this is a distinct species although closely related to *umbrosum*. The face in the ♂ is narrower, and although the genitalia are very similar, there is yet a clear difference in the outer paramera. On the outer ventral margin of the stipites and behind the apex, there is in *umbrosum* a fringe of numerous stiff setae in two or three irregular rows, whereas in *torridum* there are in the same place only two rows of about ten stout spines. The sagittae are slightly narrower at the apex than in *umbrosum*.

Bekily and Antananarivo, 4 ♀♀; Behara, 1 ♂. October–April.

Chlorion leoninum Sauss. (Fig. 62)

Mitt. Schweiz. Ent. Ges. VIII, p. 259, ♂, 1891; *Hist. Madag.* XX, p. 431, ♀, ♂, 1892

This large and very handsome species cannot be mistaken for any other member of the genus. The face and the dorsum of the pronotum have a decumbent golden pubescence; in addition, those parts, the whole of the thorax, the petiole and the posterior surface of the anterior femora have a dense and erect pilosity. This pilosity is bright yellow or almost pale golden on the head, sides of the thorax and anterior femora, pale ochreous on the dorsum of the thorax and reddish ochreous on the epinotum. On the latter the pilosity is so dense as to obscure the sculpture. Saussure's description was based on only one specimen of each sex, the ♂ being larger than the ♀. However, this is not invariably the case, as in the Seyrig collection one of the three ♀♀ is as large as the two ♂♂, or 31 mm. long, while the other two are 22 mm. long. These two ♂♂ are below the maximum size, which Saussure gives as 37 mm. long. Although the species can be recognized without reference to the genitalia, nevertheless a figure of those organs is appended herewith on account of their unusual shape and the extraordinary complexity of the penis (sagittae). These are curved upwards apically and expanded into a horizontal plate; taken together the two halves may be said to form a lamella, bifurcate in front and behind, of which the posterior portion is horizontal and the anterior oblique and reflected at the apical margin. The outer paramera or stipites are enormously swollen and globose, and abruptly produced caudad-ventrad into an acute, rostrate ramus. The upper surface of the cardo is almost vertical. These genitalia do

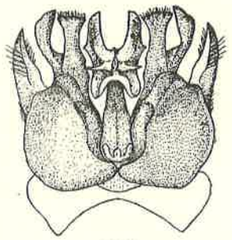


Fig. 62. *Chlorion leoninum* ♂, genitalia, × *c.* 14.

not in the least resemble those of the other species of the subgenus *Isodontia*, and in view also of the shape of the petiole, which is much shorter than in *Isodontia*, this species may very well form the type of a new subgenus for which the name *Leontosphex* is appropriate.

Behara, 1 ♀, 1 ♂; Ivondro, 1 ♂; Bekily, 1 ♀; Ranomafana, 1 ♀.

The prey consists of various species of immature Gryllidae.

Subfamily LARRINAE Börn.

Tribe *LARRINI* Börn.

Genus **Lyroda** Say

Lyroda madecassa n.sp. (Figs. 64, 64 *a–c*)

♀. 8·3–11 mm. long. Closely related to *L. aethiopica* Kohl (Figs. 63, 63 *a*, *b*), from which it differs by the colour of the apical abdominal segments, the finer puncturation of the head and pro-mesothorax and the different sculpture of the epinotum. Black. Mandibles ferruginous, black at the apex; anterior tarsi dark brownish red. Wings hyaline, faintly fuscous, more so in the apical than in the basal half. Pygidial area covered with very dark brown pubescence and a few long whitish setae. Otherwise the pubescence is like that of *aethiopica* but a little less dense and on the first four tergites forming less distinct apical fasciae. The puncturation of the head and pro-mesothorax, barely visible under a magnification of less than 25 diameters, is as close as in *aethiopica*, but a little finer and shallower, and the interspaces are slightly shining, not dull as in the other species. Dorsum of the epinotum with a strong median longitudinal carina, dull, closely rugose, the rugae transverse and strong in the middle, finer and oblique beyond the middle and then, on the posterior half, thickened again laterad. The sides of the epinotum are finely and closely striate anteriorly, the sculpture becoming gradually stronger caudad, so that the posterior third is almost vertically and evenly rugose; the declivity is strongly and not closely rugose, the rugae arcuate in the upper part, transverse in the middle on each side of the deep median groove and vertical over the lower fourth. (In *aethiopica* the dorsum is distinctly reticulate-rugose and the declivity more closely and finely rugose.) Mandibles with two small teeth on the inner margin near the base. Clypeus shorter than in *aethiopica*, five times wider in front than long in the middle (four times in *aethiopica*), the anterior margin with two slightly separated, blunt and parallel-sided teeth in the middle and three similar ones on each side (these are too small to be shown in Fig. 64*a*).

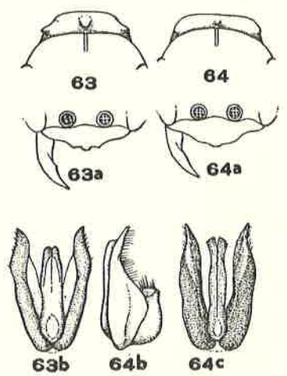


Fig. 63. *Lyroda aethiopica* ♀, pronotum, × 10; *a*, ♂, clypeus, × 10; *b*, genitalia, × 30.

Fig. 64. *Lyroda madecassa* ♀, pronotum, × 10; *a*, ♂, clypeus, × 10; *b*, *c*, genitalia, lateral and dorsal views, × 30.

The inner orbits are slightly convergent above and the face is a little wider than in *aethiopica*, the width measured across the hind margin of the clypeus being two-fifths greater than the height, measured from the clypeus to the anterior ocellus (one-fifth in *aethiopica*). Posterior ocelli one-fifth farther from each other than from the eyes. Interocular distance across the vertex equal to the length of the first three joints in the flagellum, as in *aethiopica*. Dorsum of the pronotum shorter and much less convex in front than in *aethiopica*, six times wider behind than long in the middle ($4\frac{1}{2}$ times in *aethiopica*), the median tubercle less prominent, the lateral and reclinate ones more rounded at their apex, or almost obsolete.

The lateral margins of the epinotal dorsum are less convex behind the middle than in *aethiopica*.

♂. 7·3–8·5 mm. long. Black. Mandibles pale ferruginous, darker at the apex. Anterior tarsi brownish yellow, the middle and hind tarsi brown, the joints paler at the base and apex. Anterior tibiae dark brown, reddish at the base and apex. The pubescence on the last two tergites is brownish yellow, otherwise like the ♀ in colour, sculpture and pubescence. The clypeus is longer than in *aethiopica*, being only three times wider in front than long in the middle (four times in *aethiopica* ♂), and the anterior margin of the median area is more convex and without the distinct teeth which are present in the other species.

As in the ♀, the tubercles on the dorsum of the pronotum are much less developed than in *aethiopica*. The outer paramera of the genitalia are more abruptly attenuated apically than in *aethiopica*, and the sagittae are longer and broader at the apex.

Bekily and Behara, 13 ♀♀, 15 ♂♂. November–April.

The prey consists of small Tettigidae and Acrydiidae.

Apart from one Australian species and the widely distributed but rare Ethiopian species, all the members of the genus are American. Although closely allied to *aethiopica* and probably derived from it, *madecassa* is clearly a distinct species on account of the sculpture, the shorter pronotum and the form of the genitalia.

Genus **Gastrosericus** Spin.

Eparmatostethus Kohl, *Verh. zool.-bot. Ges. Wien*, p. 176, 1907; Arnold, *Ann. Transv. Mus.* XII, p. 116, 1927.

Gastrosericus madecassus Kohl (Figs. 65, 65 *a*)

♀. 6–7·5 mm. long. To Kohl's description little need be added, but in his Fig. 1 the lateral projections of the clypeus are somewhat exaggerated.

♂. 4·5–5·7 mm. long (hitherto undescribed). Anterior half of the clypeus pale straw yellow, otherwise the colour of the head and thorax is like that of the ♀. The abdomen is darker than in that sex, or brownish red, and in the smallest specimens the last three segments are often dark brown. The pale yellow colour on the apices of the femora is more extensive than in the ♀. Sculpture and pubescence as in the ♀. The small tooth at the bottom of the temples, the lateral processes of the prosterna and the tooth at the base of the anterior coxae which characterize the ♀ are lacking in this sex. The clypeus is four times wider than long in the middle and differs from that of the ♀ in having the median area moderately produced and feebly angular, instead of being truncate. Interocular distance on the vertex equal to the length of the first four joints of the flagellum plus half of the fifth joint. The flagellum is fairly short, the second joint is one-fourth longer than the first, a little shorter than the third and two-thirds longer than wide. Seventh tergite trapezoidal. Eighth sternite parallel-sided, the apical margin arcuately excised. Otherwise like the ♀.

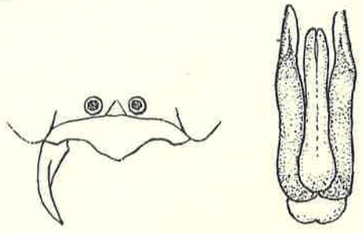


Fig. 65. *Gastrosericus madecassus* ♂, clypeus, × 20; *a*, genitalia, × 60.

Fort Dauphin (type); Bekily, 18 ♀♀, 12 ♂♂; Behara, 1 ♀. January.

Two specimens are accompanied by their prey; one of these is a larval grasshopper and the other a small Cercopid.

Elsewhere I have shown that Kohl's genus cannot be sustained on the characters on which it was based. The projections of the prosterna and the clypeus, and the petiolate second discoidal cell, are to be found in varying degrees of development in other members of the genus *Gastrosericus*.

Genus **Parapiagetia** Kohl

Parapiagetia longicornis n.sp. (Figs. 66, 66 *a*, *b*)

♀. 7·5–10 mm. long. Black. Mandibles, excepting the piceous apex, scapes and legs ferruginous, the coxae and trochanters black, the hind femora infuscated above. The apical

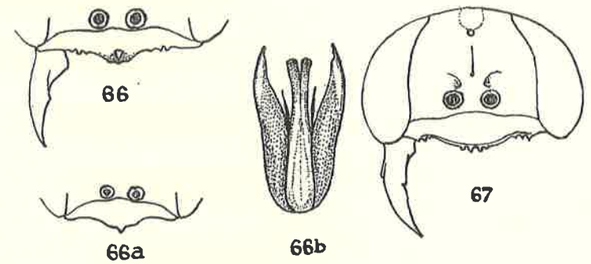


Fig. 66. *Parapiagetia longicornis* ♀, clypeus, × 16; *a*, ♂, clypeus, × 16; *b*, genitalia, × 36.
Fig. 67. *Parapiagetia pluridentata* ♀, head, × 16.

margins of the abdominal segments testaceous, the pygidial area fusco-ferruginous. Wings hyaline, slightly tinged with yellow, the tegulae flavo-ferruginous. Clypeus, lower half of the face and the temples with a long, rather coarse and silvery pilosity. The thorax with a similar but somewhat yellowish pilosity, very short and scanty on the mesonotum excepting the anterior corners. Tergites with a decumbent, very fine and dull yellow pubescence, more dense at the sides and on the apical margins than elsewhere. Pygidial area with a sparse and coarse, setigerous puncturation, the setae whitish.

Clypeus finely and sparsely punctured and shining, the median area with a few larger punctures. The rest of the head shining, the lower half of the face finely and fairly closely punctured, the upper part and the vertex less closely and less finely so. Mesonotum, scutellum and metanotum shining, closely punctulate, the mesopleura shining and a little less finely punctured than the mesonotum, the mesosternum sparsely and finely punctured. Epinotum shining, closely striate, transversely so on the dorsum and declivity, vertically on the sides, the declivity with a deep median impression which is widest above. Tergites 1–5 impunctate and nitidulous, sternites shining, feebly and very sparsely punctured. Median area of the clypeus slightly and rectangularly produced and with a short conical tooth just behind the middle of the anterior margin; the lateral sclerites feebly tridentate. Flagellum fairly long, all the joints excepting the first at least twice as long as wide, the second joint two-thirds longer than the first and barely shorter than the third (in *P. capensis* and its variety *rhodesianum* all the joints excepting the second and last are distinctly less than twice as long as wide). Eyes convergent above, the interocular distance across the base of the clypeus one-third greater than across the vertex, where it is equal to the length of the first four joints of the flagellum. First tergite a little wider than long. Pygidial area triangular, one-third longer than wide at the base.

♂. 7–8 mm. long. Middle and hind femora black, except at the apex, the anterior femora infuscated below. Pubescence of the abdomen scanty and greyish white. Declivity of the epinotum finely punctured, not striate, the interspaces about three times as wide as the

punctures. Otherwise like the ♀ in colour, sculpture, pilosity and pubescence. Very much like the ♂ of *P. capensis*, var. *rhodesianum*, from which it may be distinguished by the transversely striate epinotal dorsum and by the following characters. Median area of the clypeus less produced, the median tooth on the apical margin much shorter. Flagellum longer, the second joint one-fifth longer than wide at the apex, the third joint half as long again as the second, the sixth to twelfth twice as long as wide. In *rhodesianum* the second is one-third longer than wide, the third one-fourth longer than the second and the sixth to twelfth about 1½ times longer than wide. First tergite one-fourth longer than wide (*rhodesianum* two-fifths longer). The seventh tergite is semi-elliptical, whereas in *rhodesianum* it is trapezoidal. The inner orbits are less convergent above than in the ♀, the interocular distance across the base of the clypeus being only one-fifth greater than across the vertex. Otherwise like the ♀. The genitalia are very similar to those of *rhodesianum*.

Behara, 21 ♀♀, 15 ♂♂. March.

The prey consists of immature Acrydiidae. The width of the cubital cells on the radius is very variable in the genus, and affords no reliable specific characters.

Parapiagetia pluridentata n.sp. (Fig. 67)

♀. 8·3 mm. long. Black. Mandibles and legs, excepting the coxae and trochanters, ferruginous. Apical margins of the first five abdominal segments testaceous, sixth tergite dark brown. Wings hyaline, the costa brown, the other veins and the pterostigma brownish ochreous, the tegulae flavo-ferruginous. Clypeus, face and temples with a pale golden pubescence. On the thorax the pubescence and exserted pilosity are yellowish grey and scantier than in *longicornis*. The pubescence on the tergites is yellowish grey and on the apical margins is denser, forming indistinct fasciae. Head fairly dull, closely and finely punctured, the punctures barely visible under a magnification of less than 25 diameters, the vertex less closely punctured than the face, the clypeus with a few larger punctures superimposed. Mesonotum, scutellum and metanotum dull, closely and microscopically punctured, much more finely than the face; mesopleura shining, as finely punctured as the mesonotum but less closely. Epinotum nitidulous, the dorsum transversely, the sides obliquely and finely striate, the declivity very finely and sparsely punctured and with a wide median longitudinal groove. Tergites 1–5 impunctate and feebly shining, the pygidial area elongate triangular, rounded at the apex, coarsely and closely punctured and with whitish setae. Sternites 3–6 with a few punctures on the apical margins, otherwise impunctate and shining; the second sternite closely and finely punctured and almost dull. Inner orbits widely divergent below, the interocular distance at the bottom of the eyes being five-sevenths greater than on the vertex, where it is equal to the length of the first three joints of the flagellum plus three-fourths of the fourth joint.

The flagellum is short and stout, the second joint is twice as long as wide at the apex and one-fourth longer than the third, the third to tenth joints are all about half as long again as wide, and the apical joint is twice as long as wide. Dorsum of the epinotum short, 2⅔ wider at the base than long. Abdomen broadly ovate, the first tergite much less narrowed at the base than in *longicornis*, one-sixth wider at the apex than long. Venation as in *longicornis*.

Bekily, 1 ♀. October.

Apparently related to *P. odontostoma* Kohl from Tor, Arabia, from which it differs by the colour of the legs, the number of teeth on the clypeus and the close puncturation of the head and mesothorax.

Genus **Tachysphex** Kohl

This is a large and cosmopolitan genus of which about 270 species have been described. Of these sixty-five have been recorded from the Ethiopian Region alone, and without doubt

further search will reveal many more new species. At least four of these are found also in Madagascar, but the rest, including the two described by Saussure, are peculiar to the island, although some of them are closely related to African species.

In regard to those characters which are more important for the separation of the species, the reader is referred to the remarks on this genus in my monograph of the Ethiopian species (*Ann. Transv. Mus.* XI, p. 43, 1924). For the purpose of identification the African and Madagascan species may be divided into several and somewhat artificial groups as follows:

1. *punctatus* Sm. group. Species with dark fuscous wings.
2. *syriacus* Kohl group. Species with abundant pilosity on the epinotum, obscuring the sculpture.
3. *sericeus* Sm.-filicornis Kohl group. Species with hyaline or only faintly coloured wings and black abdomen.
4. *Panzeri* v.d.L. group. Species with the abdomen more or less red, with fine puncturation and, usually, with hyaline wings.
5. *Turneri* Arn. group. Species with the abdomen more or less red, with strong puncturation, even on the abdomen.

The first group appears to be absent from Madagascar.

The puncturation of the head and pro-mesothorax is often of two kinds, the larger or primary, and the smaller or secondary on the interspaces between the larger punctures. In the following descriptions the minimum magnification required to resolve clearly these two kinds of puncturation is stated in brackets thus (×20 diam.). The superior interocular distance is measured along the shortest distance between the eyes on the vertex, and the inferior interocular distance is measured along a line joining the anterior corners of the clypeus. The shape of the genitalia varies very little throughout the genus, unlike the allied genus *Tachytes*, and affords little help in the identification of the species. As in *Tachytes*, the cardo in its natural position lies ventrad to the stipites and is not visible from the dorsal aspect.

Key to the species

♀♀

(14) 1. Abdomen black.

(3) 2. Head and thorax with a rather dense, erect pilosity on the epinotum, obscuring the sculpture. **bruneiceps** Arn. (p. 97)

(2) 3. Pilosity on the epinotum not dense enough to obscure the sculpture.

(7) 4. Claws asymmetrical, the outer claw bent downwards and shorter than the inner one; fourth joint of the hind tarsi very short, subhemispherical.

(6) 5. Length 9·5–10·5 mm. Dorsum of the epinotum three-fourths wider at the base than long. **suavis** Arn. (p. 97)

(5) 6. Length 6–6·5 mm. long. Dorsum of the epinotum 2¼ times wider at the base than long. **scaurus** Arn. (p. 98)

(4) 7. Claws not asymmetrical; fourth joint of the hind tarsi triangular and deeply bifid.

(9) 8. Mesonotum dull, closely and strongly punctured all over; median area of the clypeus fairly flat and twice as wide as long. **micromegas** Sauss. (p. 102)

(8) 9. Mesonotum shining, not closely punctured all over.

(11) 10. Median area of the clypeus narrow, only two-ninths wider than long. (Inferior interocular distance nearly three times greater than the superior. Mesonotum very shining, very finely and sparsely punctured. 9·5 mm. long.) **Seyrigi** Arn. (p. 99)

(10) 11. Median area of the clypeus wider, at least 1⅓ times wider than long.

(13) 12. Mesonotum very shining and finely punctured. Apex of the wings beyond the cells distinctly fuscous. Second joint of the flagellum short, a little less than twice as long as wide at the apex. Dorsum of the epinotum shining, obliquely rugose over the basal third, transversely rugose in the middle between base and apex. **halictiformis** Arn. (p. 100)

(12) 13. Mesonotum moderately shining, fairly strongly punctured, sparingly so in the middle. Apex of wings not fuscous. Second joint of the flagellum a little more than twice as long as wide. Dorsum of the epinotum dull, closely reticulate-rugose.
anceps Arn. (p. 102)

(1) 14. Abdomen ferruginous, the extreme base sometimes black.

(16) 15. Median area of the clypeus produced into a broad tooth, truncate at the apex. Dorsum of the epinotum closely reticulate, the declivity and greater part of the sides strongly transversely rugose, the rest of the body closely and strongly punctured.
Turneri Arn. race **sacalava** Arn. (p. 106)

(15) 16. Median area of the clypeus not produced into a tooth. Puncturation of the head and thorax fine, of the abdomen microscopic.

(22) 17. Second joint of the flagellum more than twice as long as wide.

(21) 18. Interocular distance on the vertex equal to a little more than the length of the second joint of the flagellum. Median area of the clypeus nearly twice as wide as long.

(20) 19. Anterior third of the median area of the clypeus flattened. Pubescence of the face silvery. Hind femora black.
dimidiatus Sauss. (p. 103)

(19) 20. Median area of the clypeus convex over its whole length. Pubescence of the face pale golden. Hind femora in greater part red.
dimidiatus var. **excisus** Arn. (p. 104)

(18) 21. Interocular distance on the vertex equal to very little less than the length of the first two joints of the flagellum. Median area of the clypeus 1½ times wider than long.
insulsus Arn. (p. 104)

(17) 22. Second joint of the flagellum only twice as long as wide.
crassicornis Arn. (p. 105)

♂♂

(14) 1. Abdomen black.

(7) 2. Mesonotum dull, the fundamental sculpture consisting of a reticulate puncturation (35 diameters), on which is superimposed a larger primary puncturation.

(4) 3. The primary puncturation sparse, the interspaces four or five times wider than the punctures. Face below the anterior ocellus with a dense, erect and brown pilosity. (In fresh specimens the dorsum of the epinotum is covered with a dense whitish pilosity, somewhat obscuring the sculpture; third sternite simple, not fimbriated.)
bruneiceps Arn. (p. 97)

(3) 4. The primary puncturation on the mesonotum close, the interspaces not much more than twice as wide as the punctures. Face without an exserted brown pilosity.

(6) 5. Primary and secondary puncturation of the mesonotum shallow, the primary large. Clypeus and face with golden pubescence. Interocular distance on the vertex narrow, equal to the length of the second joint of the flagellum plus half of the first. Third sternite with a patch of dense ochreous pubescence on its apical third.
fluctuatus Gerst. var. **flavofimbriatus** Arn. (p. 97)

(5) 6. Primary puncturation on the mesonotum small and not shallow. Clypeus and face with silvery pubescence. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus half of the third joint. Third sternite without a pubescent patch.
subcoriaceus Arn. (p. 98)

(2) 7. Mesonotum not entirely dull and without a recognizable secondary puncturation.

(9) 8. Median area of the clypeus about as wide as long.
Seyrigi Arn. (p. 99)

(8) 9. Median area of the clypeus wider, at least 1½ times wider than long.

(11) 10. Dorsum of the epinotum twice as wide at the base as long, obliquely rugose at the base and transversely so between the base and apex. Median area of the clypeus 1½ times wider than long, produced into a short lobe. Second joint of the flagellum one-fourth longer than wide.
halictiformis Arn. (p. 100)

(10) 11. Dorsum of the epinotum not transversely rugose in the middle.

(13) 12. Mesonotum strongly punctured. Dorsum of the epinotum coarsely reticulate-rugose, three-fourths wider at the base than long. Second joint of the flagellum one-fourth longer than wide.
micromegas Sauss. (p. 102)

(12) 13. Mesonotum finely punctured. Dorsum of the epinotum finely reticulate-rugose, 2¼ times wider at the base than long. Second joint of the flagellum twice as long as wide.
scaurus Arn. (p. 98)

(1) 14. Abdomen ferruginous, or at least the first three tergites of that colour.

(16) 15. Clypeus produced into a broad tooth, truncate at the apex. Puncturation of the whole body strong and close.
Turneri Arn. race **sacalava** Arn. (p. 106)

(15) 16. Clypeus not produced into a median tooth. Puncturation of the head and thorax fine, of the abdomen microscopic.

(20) 17. Fifth and sixth sternites with fimbriae of long curved hairs.

(19) 18. Anterior femora not excised below near the base. Hind femora black.
dimidiatus Sauss. (p. 103)

(18) 19. Anterior femora distinctly excised below at the base. Hind femora in greater part pale ferruginous.
dimidiatus var. **excisus** Arn. (p. 104)

(17) 20. Fifth and sixth sternites without fimbriae.

(22) 21. Abdomen entirely ferruginous. Flagellum slender, the second joint twice as long as wide at the apex. Interocular distance across the clypeus a little more than three times greater than across the vertex.
insulsus Arn. (p. 104)

(21) 22. First three tergites ferruginous, the rest brownish or black. Flagellum fairly thick, the second joint only two-thirds longer than wide. Interocular distance across the clypeus 2⅓ times greater than across the vertex.
crassicornis Arn. (p. 105)

Tachysphex bruneiceps Arn.

Ann. Transv. Mus. IX, p. 153, ♀, ♂, 1922

Bekily, Behara and Fort Dauphin, 9 ♀♀, 7 ♂♂. Indistinguishable from African specimens except that the ♂♂ are on the average slightly smaller. The prey consists exclusively of Mantidae, mostly immature.

Tachysphex fluctuatus Gerst.

Mber. Akad. Wiss. Berl. p. 510, ♀, 1857

T. sericeus Smith, Arnold, *Ann. Transv. Mus.* IX, p. 154, 1922.

This species was wrongly synonymized by me with *sericeus* Smith, from which it is quite distinct on account of the different sculpture of the vertex, mesonotum and scutellum; these are more finely and more closely punctured and dull, the interspaces reticulate-punctate. The ♂ resembles that of *sericeus* in having a dense fimbria of brownish hairs on the middle part of the apical margin of the third sternite. In both sexes the colour is like that of *sericeus*.

In the Seyrig collection there is a single ♂ representing a variety of this species.

fluctuatus, var. **flavofimbriatus** v.n.

♂. 9·5 mm. long. This variety differs from the typical form from Africa in having the legs black and the dense patch of hairs on the third sternite pale ochreous. Otherwise identical.

Bekily. March.

Tachysphex suavis Arn.

Ann. Transv. Mus. XIII, p. 385, ♀, 1929

♀. 9·5–10·5 mm. long. There are three specimens in the collection which differ from the type only in their smaller size and in having the apex of the pygidial area less acute, or very narrowly truncate.

Bekily and Behara. November and April.

The prey taken with one specimen is an immature cockroach.

Tachysphex subcoriaceus n.sp. (Figs. 68, 68 *a*, *b*)

♂. 7·5–8·3 mm. long. Black. Eyes pale ochreous green. Middle of the mandibles ferruginous. Tarsi and apices of the tibiae reddish yellow. Wings hyaline, very faintly smoky, the pterostigma and veins blackish. Clypeus and face with a dense silvery pubescence, the rest of the head and the thorax with a thin whitish one. On the abdomen the very fine and decumbent pubescence is pale brown. Spines on the legs whitish.

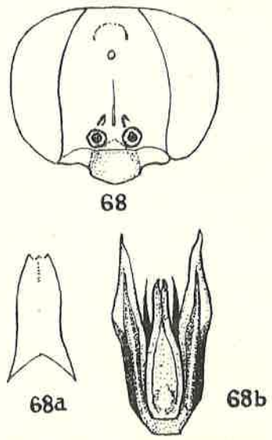


Fig. 68. *Tachysphex subcoriaceus* ♂, head, × 16; *a*, eighth sternite, × 35; *b*, genitalia, × 35.

Head and thorax dull, and, excepting the dorsum and declivity of the epinotum, with a puncturation similar to that of *T. fluctuatus* Gerst., but much finer; the punctures (16 diameters) are separated by interspaces about three times as wide as the punctures on the head and mesopleura, and about twice on the rest of the thorax; the interspaces are microscopically reticulate (50 diameters). The sides of the epinotum have a similar sculpture but near the anterior margin are also striate. The dorsum of the epinotum is closely and finely reticulate-rugose, the rugae somewhat stronger lengthwise at the base, the interspaces very finely reticulate. The declivity is strongly and transversely striate and not quite dull. Abdomen dull, closely and microscopically punctured.

Median area of the clypeus about 1½ times wider in front than long, the anterior margin feebly convex. Supra-antennal tubercles small but fairly prominent, but not so much so as in *T. bituberculatus* Arn. Interocular distance across the clypeus 2⅓ times greater than on the vertex, where it is equal to the length of the first two joints of the flagellum plus half of the third. The flagellum is fairly short, the second joint not quite twice as long as wide and a trifle shorter than the third. Dorsum of the epinotum 2¼ times wider at the base than long in the middle, its hind margin arcuate caudad and bounded by a carina. Anterior femora strongly excised at the base below. Seventh tergite trapezoidal, eighth sternite feebly tridentate at the apex. The third cubital cell extends a little beyond the end of the radial cell. The fourth tarsal joint of the hind legs is subtriangular, wider at the apex than long, as in *T. hippolyta* Arn. and *T. suavis* Arn.

Ranomafana, 4 ♂♂. October.

Perhaps related to *T. suavis* Arn. but it is improbable that it can be the male of that species on account of the difference in the puncturation of the head and thorax.

Tachysphex scaurus n.sp. (Figs. 69, 69 *a*, *b*)

♀. 6–6·5 mm. long. Black. Palpi ochreous, mandibles ferruginous in the middle. Tarsi brownish or reddish yellow, the basal joint brown. Wings clear hyaline, the veins and pterostigma blackish. Tegulae pale testaceous. Head and thorax with whitish pubescence, decumbent on the face, short and exserted on the thorax, very scanty on the dorsum of the epinotum and confined to its basal half and the sides. On the first four tergites the depressed apical margins are covered with a whitish pubescence, forming indistinct transverse fasciae. Sternites shining, the rest of the body moderately so, excepting the face and epinotum which are almost dull. Median area of the clypeus finely punctured at the base, sparsely and coarsely in front, the lateral sclerites of the clypeus and the face very finely and closely punctured, the vertex and temples more sparsely punctured. The puncturation of the mesonotum is

stronger than that of the vertex but very fine, the interspaces smooth and shining, about four times as wide as the punctures in the middle, distinctly less at the sides and in front. The mesopleura and scutellum are a little more finely punctured than the mesonotum, and the metanotum and metapleura are microscopically punctured. Dorsum of the epinotum rugose, the rugae radiating outwards from the base and attenuated caudad, reaching the lateral but not the posterior margin; sides of the epinotum obliquely, the declivity transversely striate. Tergites 1–5 closely and microscopically punctured, the sixth tergite shining, sparsely and coarsely punctured. Sternites impunctate, excepting the second which has a microscopic puncturation at the sides and at the base. Median area of the clypeus twice as wide as long, transversely impressed behind the anterior margin; the latter straight and feebly bidentate at the outer angles. Interocular distance across the clypeus twice as great as on the vertex, where it is equal to the length of the first two joints of the flagellum plus half of the third joint. The second joint is twice as long as wide at the apex and slightly shorter than the third. Dorsum of the epinotum 2¼ times wider at the base than long. Pygidial area elongate triangular, twice as long as wide at the base, the apex narrowly truncate. Claws of all the legs asymmetrical, the fourth joint of all the tarsi reversed cupuliform and very short, as in *T. hippolyta* and *T. suavis*. The comb of the anterior tarsi is composed of long cilia, not spines. The third cubital cell extends well beyond the end of the radial cell.

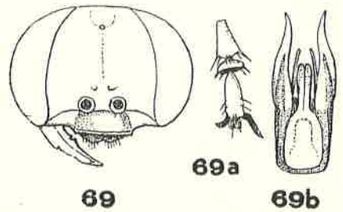


Fig. 69. *Tachysphex scaurus* ♀, head, × *c.* 14; *a*, last three joints of right hind tarsus, × 24; *b*, ♂, genitalia, × 40.

♂. 6 mm. long. Veins and pterostigma brownish ochreous, otherwise like the ♀ in colour, sculpture and pubescence. The inferior interocular distance slightly greater than in the ♀, being 2⅓ times greater than across the vertex, where it is equal to the length of the first three joints of the flagellum. All the joints of the flagellum are longer than wide, and the third is two-fifths longer than the second. The claws of all the legs are a little less asymmetrical than in the ♀, but the fourth joint of the tarsi, although short as in the ♀, is feebly bifid. Otherwise like the ♀. The second abscissa of the radius is, as in the ♀, about as long as the third, but in the specimen from Bekily, with brown veins and pterostigma, the first and second transverse cubital veins are contiguous on the radius. In other respects, however, including the genitalia, it is identical with the allotype.

Bekily, 6 ♀♀, 1 ♂; Ihosy (allotype), 1 ♂.

Allied to *T. hippolyta* and *T. suavis*, but smaller and with finer puncturation on the face than in the former, and a much closer puncturation on the mesonotum than in *suavis*.

Tachysphex Seyrigi n.sp. (Figs. 70, 70 *a*, *b*)

♀. 9·5 mm. long. Black. Mandibles ferruginous in the middle, the underside of the last three joints of the tarsi brown, the comb of the anterior tarsi composed of brownish yellow cilia, the spines of the legs black. Wings hyaline, faintly tinged with brown. Clypeus and sides of the face with a greyish silvery, decumbent pubescence; on the face this pubescence ends abruptly along a diagonal line which reaches the inner orbits a little below the level of the anterior ocellus (the dotted line shown in Fig. 70). On the thorax the erect and whitish pubescence is short and scanty, on the abdomen it is decumbent, forming indistinct apical fasciae, interrupted in the middle, on the first three tergites.

Clypeus and face as far as the posterior ocelli dull, very finely and closely punctured, the anterior third of the median area of the clypeus shining, sparsely and coarsely punctured;

vertex, mesothorax and metanotum shining, finely punctured, the punctures smallest on the metanotum (20 diameters), and the largest on the mesopleura where they are twice as large as those on the mesonotum, the interspaces for the greater part three to four times as wide as the punctures. Sides of the pronotum feebly and vertically rugose. Dorsum of the epinotum dull, with a fairly wide and sharp reticulation on which are superimposed straight rugae which radiate fan-wise from the base and become obsolete a little beyond the middle. Sides of the epinotum and the declivity nearly dull, and transversely striate. Abdomen shining, the sternites impunctate, the first five tergites microscopically punctured (50 diameters), the pygidial area with a large and scattered puncturation.

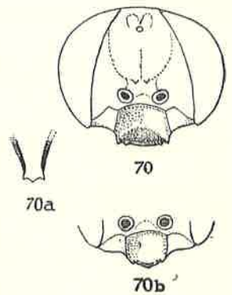


Fig. 70. *Tachysphex Seyrigi* ♀, head, ×*c.* 10; *a*, apex of pygidium, ×24; *b*, ♂, clypeus, ×*c.* 10.

Interocular distance across the clypeus three times greater than across the vertex, where it is equal to a little less than the length of the first two joints of the flagellum. Median area of the clypeus long, only two-ninths wider in front than long, its apical margin bidentate at the anterior angles. Second joint of the flagellum three times longer than wide, barely shorter than the third. Dorsum of the epinotum twice as wide at the base as long, distinctly narrowed caudad, being five-ninths wider at the base than at the hind margin. Pygidial area narrow and triangular, the apical margin shallowly bisinuate.

♂. 8 mm. long. Black. Tarsi brown. The pubescent fasciae on the first four tergites are less distinct than in the ♀. On the face the upper boundary of the dense silvery pubescence is as sharp as in the ♀, but the space between it and the anterior ocellus also has a short and sparse pubescence.

Clypeus and face finely and very closely punctured, a little more strongly than in the ♀. Vertex nearly dull, a little more strongly but less closely punctured than the face. Mesonotum, scutellum and metanotum nitidulous, the puncturation strongest on the mesonotum but not much larger than that of the vertex, the interspaces about twice as large as the punctures. Mesopleura dull, as strongly punctured as the mesonotum, but less closely. Epinotum sculptured as in the ♀, but the radiating rugae are shorter and less distinct. Tergites a little more strongly punctured than in the ♀, the puncturation of the sternites like that of the tergites. Median area of the clypeus about as wide as long, the anterior margin convex and with a tooth on each side. Interocular distance across the clypeus 2½ times greater than on the vertex, where it is equal to the length of the first two joints of the flagellum plus a quarter of the third. Flagellum fairly slender, all the joints except the first at least twice as long as wide, the second joint one-fifth shorter than the third. Dorsum of the epinotum a little more narrowed caudad than in the ♀. Eighth sternite parallel-sided, the apical margin feebly tridentate. Anterior femora deeply excised at the base below. Otherwise like the ♀.

Bekily, 1 ♀, 1 ♂. October–May.

Allied to *T. crassipes* Arn.

Tachysphex halictiformis n.sp. (Figs. 71, 71 *a–c*)

♀. 8 mm. long. Black. Tegulae brownish yellow. Wings smoky hyaline, the apex beyond the cells distinctly fuscous. Pubescence on the head silvery, fairly long and decumbent, becoming golden on the upper part of the face; on the thorax erect and somewhat scanty, except on the epinotum. On the first four tergites the pubescence is greyish white, forming fairly conspicuous fasciae on the apical margins.

Apical third of the median area of the clypeus shining and with a row of large punctures behind the pre-apical transverse impression, the rest of the clypeus and the face dull, finely and closely punctured, the interspaces about two to three times as wide as the punctures in the middle of the face but much less at the sides. Ocellar area punctured like the face but not quite dull. Vertex and temples shining, sparsely punctured, the punctures a little smaller than those of the face. Thorax shining, the mesonotum and mesopleura with a puncturation as large as that of the middle of the face but not so close, the scutellum and metanotum more finely punctured than the mesonotum. The latter has on each side a longitudinal impressed line, half way between the middle and the lateral margins and not reaching the level of the tegulae. Dorsum of the epinotum with rugae radiating fan-wise from the base over the basal third of its length, the remaining part closely and transversely rugose; there is a shallow median fovea in front of the hind margin. The sides of the epinotum are very shallowly striate and the declivity is coarsely and transversely rugose. Abdomen shining, tergites 1–5 and the basal half of the second sternite microscopically punctured, the rest of the sternites impunctate, the pygidial area with a few large punctures. Median area of the clypeus nearly twice as wide as long, the apical margin almost straight and bidentate on each side; behind it there is a deep transverse impression. Interocular distance across the clypeus 2⅓ times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum plus half of the third. Flagellum short, the second joint not quite twice as long as wide at the apex, three-fourths as long as the third. Dorsum of the epinotum flat in the middle but sloping strongly laterad, twice as wide at the base as long and half as wide again at the base as at the convex hind margin. Pygidial area triangular, narrow, fully twice as long as wide at the base. Comb of the anterior tarsi composed of long brownish cilia. Fourth joint of the hind tarsi feebly bifid, wider than long; the claws slightly asymmetrical, the outer claw curved downwards.

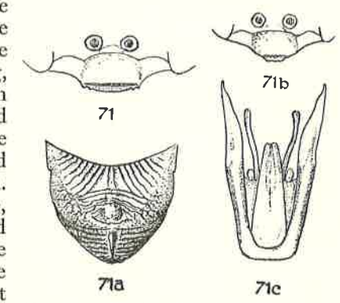


Fig. 71. *Tachysphex halictiformis* ♀, clypeus, × 14; *a*, epinotum, × 14; *b*, ♂, clypeus, × 14; *c*, genitalia, ×40.

♂. 7 mm. long. Last four tarsal joints brownish red; mesopleura almost impunctate, otherwise like the ♀ in sculpture, colour and pubescence. Median area of the clypeus produced into a short transverse lobe.

Interocular distance across the clypeus twice as great as across the vertex, where it is equal to the length of the first three joints of the flagellum. The flagellum is short, all the joints, excepting the last two, less than twice as long as wide, the second joint about one-fourth longer than wide and very little longer than the first. Abdomen elongate, fusiform. Apical margin of the eighth sternite feebly concave. Anterior femora deeply excised at the base below. Third cubital cell barely extending beyond the end of the radial cell (distinctly beyond it in the ♀).

Bekily, 2 ♀♀, 2 ♂♂. November–February.

The sculpture of the epinotal dorsum and the fusiform abdomen in the ♂ are not unlike those of some Halictine bees. The sculpture of the epinotum resembles that of *T. egregius* Arn. but that species has clear hyaline wings, a wider vertex, more slender antennae and a finer and sparser puncturation of the face.

Tachysphex micromegas Sauss. (Fig. 72)

Hist. Madag. xx, p. 481, ♀, ♂, 1892

♀. 5·7–8 mm. long. Allied to *T. filicornis* Kohl and *T. Hermia* Arn. It differs from both in this sex by the narrow vertex and finer puncturation of the head and thorax, from *Hermia* by the colour of the tarsal joints and more slender flagellum and from *filicornis* by the shorter epinotum.

Interocular distance across the clypeus 2⅜ wider than across the vertex, where it is equal to the length of the first two joints of the flagellum. Median area of the clypeus twice as wide as long. Second joint of the flagellum a little more than three times longer than wide, very little shorter than the third. Dorsum of the epinotum twice as wide at the base as long, three-fifths wider at the base than at the hind margin.

72

73

Fig. 72. *Tachysphex micromegas* ♀, clypeus, × 14.

Fig. 73. *Tachysphex anceps* ♀, clypeus, × 14.

♂. 4·2–6·5 mm. long. This sex differs from that of *filicornis* in the wider median area of the clypeus, shorter joints of the flagellum and coarser rugosity of the epinotum. From *Hermia* ♂ it differs by the colour of the tarsi, the quite differently shaped median area of the clypeus and finer puncturation of the head and thorax.

Median area of the clypeus not quite twice as wide as long, the anterior angles subdentate. Interocular distance across the clypeus slightly less than twice as great as across the vertex, where it is equal to the length of the first three joints of the flagellum plus a quarter of the fourth. The second joint is as long as the first, one-fourth longer than wide and a little shorter than the third. Dorsum of the epinotum three-fourths wider at the base than long and two-fifths wider there than across the hind margin.

Bekily, Behara and Ranomafana, 41 ♀♀, 12 ♂♂. January–March.

The prey consists of immature crickets and grasshoppers.

Tachysphex anceps n.sp. (Fig. 73)

♀. 7·5 mm. long. Black. Colour, pilosity and pubescence as in *T. micromegas*, for which it might easily be mistaken, but differing, inter alia, by the shape of the clypeus and by the puncturation.

Face, clypeus, excepting the anterior half of the median area, dull, closely punctured, more finely so than in *micromegas*, the punctures discrete, not merging into one another and producing a transverse rugulosity as in *micromegas*; as in the latter species the interspaces have a microscopic secondary puncturation. The anterior half of the median area of the clypeus is shining, with a few large and scattered punctures. The punctures on the mesonotum are of about the same size as in *micromegas*, but less close, especially round the centre; on the other hand, the puncturation of the mesopleura is larger. The dorsum of the epinotum is dull, closely and finely reticulate-rugose, whereas in *micromegas* it is longitudinally, coarsely and not closely rugose, with transverse branches which do not form a very evident reticulation and with shining interspaces. The sides of the epinotum and the declivity are dull, evenly, closely and finely striate all over; in *micromegas* the sides are coarsely rugose in front, finely behind and the declivity is coarsely rugose. Puncturation of the abdomen like that of *micromegas*. Median area of the clypeus strongly convex lengthwise (fairly flat in *micromegas*), 1½ times wider than long, the apical margin bidentate at the corners.

Inner orbits more divergent below than in *micromegas*, the interocular distance across the clypeus being 2¾ times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum plus one-third of the third joint. Second joint of the flagellum a little shorter than the third and slightly more than twice as long as wide. Scutellum fairly

flat (distinctly convex in *micromegas*). Dorsum of the epinotum four-fifths wider at the base than long, and two-fifths wider there than at the hind margin. Posterior tarsi less slender than in *micromegas*, the basal joint three-fifths longer than the second (nearly twice as long in *micromegas*).

Bekily, 1 ♀. April.

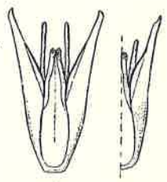
Tachysphex dimidiatus Sauss. (Figs. 74, 74 *a*, *b*)

Hist. Madag. xx, p. 483, ♂, 1892

The collection contains a long series which I identify with this species. Saussure's description, based on a single specimen from Anosibé, is a very full one, and the ♂♂ in the collection agree with that description in every way except in two particulars, the colour of the legs and the presence of fimbriae on the fifth and sixth sternites. Of the latter Saussure makes no mention, but it is a character which can easily be overlooked if the segments are contracted.

74

74a



74b 74c

Fig. 74. *Tachysphex dimidiatus* ♀, clypeus, × 10; *a*, ♂, clypeus, × 10; *b*, genitalia, × 30; *c*, var. *excisus*, × 30.

♂. 6·5–9 mm. long. Tarsi and the posterior tibiae above and on the inside at the base, more or less reddish. In some specimens the fore and middle tibiae are also of that colour. (The type is described as having the legs black, the tarsi becoming reddish apically.) Fifth and sixth sternites with fimbriae of long, curved and brown hairs at the base. Interocular distance across the clypeus a little more than 2½ times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum. Median area of the clypeus distinctly convex, one-third wider in the middle than long, the apical margin transverse, very feebly excised in the middle; its anterior angles acute. Second joint of the flagellum twice as long as the first, about twice as long as wide at the apex and a trifle shorter than the third.

Scutellum with a feeble median longitudinal impression, barely visible in the smaller specimens. Dorsum of the epinotum about three-sevenths wider at the base than at the hind margin, and twice as wide at the base as long. Seventh tergite broad, its apical margin shallowly concave. Apical margin of the eighth sternite concave, the angles subdentate.

♀. 8·5–11 mm. long (hitherto undescribed). Colour, sculpture and pubescence as in the ♂. Median area of the clypeus nearly twice as wide in front as long, the anterior half somewhat flattened and sparsely, coarsely punctured, transversely impressed behind the apical margin, which is more distinctly excised in the middle than in the ♂. Interocular distance across the clypeus a little more than three times greater than across the vertex, where it is equal to very little more than the length of the second joint of the flagellum. The latter is 2½ times longer than wide at the apex and slightly shorter than the third. Dorsum of the epinotum two-thirds wider at the base than long and three-sevenths wider at the base than at the hind margin. Sternites without fimbriae. Pygidial area with a few small punctures, narrow and triangular, 1½ times longer than wide at the base. Comb of the anterior tarsi composed of long testaceous spines. Third cubital cell very long, extending by half its length beyond the end of the radial cell.

Bekily and Behara, 22 ♀♀, 30 ♂♂. November–April.

The prey consists of grasshoppers. The species belongs to the *T. Schoenlandi* Cam. group, in which the males have fimbriae on some of the sternites.

dimidiatus, var. **excisus** n.var. (Fig. 74 *c*)

♀. 6·7–8·3 mm. long. Tibiae and tarsi, the hind femora excepting the basal third of the underside and the apices of the fore and middle femora, flavo-ferruginous. Pubescence on the face and clypeus pale golden, the pubescence on the thorax and abdomen with a slight yellowish tinge. Wings hyaline, slightly yellowish. Median area of the clypeus not flattened on the anterior half as in the typical form, which it otherwise resembles.

♂. 6–7·5 mm. long. Pubescence as in the ♀. Tibiae, tarsi, the underside of the anterior third of the fore and middle femora and the hind femora excepting the extreme base, flavo-ferruginous. As in the ♀, the median area of the clypeus is convex lengthwise, not flattened in front as in the ♂ of the typical form. The face below the anterior ocellus is less protuberant than in *dimidiatus* ♂, and its median longitudinal groove is shallower. The fore femora are distinctly excised below at the base. The apical portion of the stipites is shorter and broader, and the inner paramera are also slightly shorter than in the type of the species. The fimbriae on the fifth and sixth tergites are flavo-ferruginous. Otherwise like the type of the species.

Bekily and Behara, 17 ♀♀, 12 ♂♂. November–April.

Possibly a distinct species, but apart from the excised anterior femora in the ♂, the differences are rather slight.

Tachysphex insulsus n.sp. (Figs. 75, 75 *a–d*)

♂. 9 mm. long. Head and thorax black, the mandibles ferruginous in the middle, tegulae flavo-ferruginous. Abdomen, tibiae, tarsi, the greater part of the hind femora and the apex of the middle femora, pale ferruginous; the anterior tibiae slightly fuscous below. Calcaria and spines on the legs ferruginous. Wings hyaline, the veins brown. Pubescence on the head and thorax silvery, the abdomen without pubescent fasciae. Anterior half of the clypeus flattened, shining, sparsely and coarsely punctured, the rest of the clypeus, the face, vertex, mesothorax and metanotum dull, very closely and finely punctured, the interspaces about as wide as the punctures. The temples, metapleura and sides of the epinotum moderately shining, superficially and microscopically punctured. Dorsum of the epinotum dull, finely reticulate-punctate, the declivity dull, closely and transversely striate. First five tergites nearly dull, microscopically and closely punctured; the pygidial area about one-fourth longer than wide at the base, shining, sparsely and coarsely punctured. Sternites shining and impunctate.

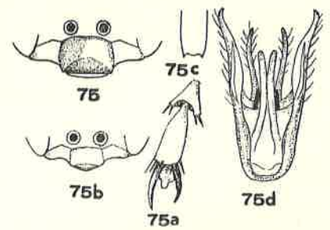


Fig. 75. *Tachysphex insulsus* ♀, clypeus, × 10; *a*, last two joints of right hind tarsus, × 18; *b*, ♂, clypeus, × 10; *c*, eighth sternite, × 18; *d*, genitalia, × 30.

Median area of the clypeus 1½ times wider than long, the anterior margin feebly convex. Interocular distance across the base of the clypeus a little more than three times greater than across the vertex, where it is equal to a little less than the length of the first two joints of the flagellum. The flagellum is fairly slender, the second joint is almost three times longer than wide at the apex and the third joint is about one-fourth longer than the second; the third to ninth joints are four times longer than wide. Dorsum of the epinotum not much narrowed caudad, only one-fourth wider at the base than at the hind margin, and twice as wide at the base as long; the hind margin straight. Fourth joint of the hind tarsi not deeply bifid as in the majority of the species, its spinose hind angles truncated (Fig. 75 *a*). The outer claw of all the tarsi shorter than the inner and bent downwards.

♂. 6·8–8 mm. long. Colour and pubescence as in the ♀. Face a little more finely punctured. The first four tergites almost as finely punctured as in the ♀, but the following tergites are more clearly punctured, especially the apical one. Sternites nearly dull, finely and closely punctured. Interocular distance across the clypeus a little more than three times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum.

Median area of the clypeus twice as wide as long, its apical third depressed, the apical margin obtusely angular in the middle. Second joint of the flagellum twice as long as wide, the third one-fourth longer than the second. Dorsum of the epinotum twice as wide at the base as long, one-third wider there than at the hind margin. Anterior femora excised below. Eighth sternite with the apical angles dentiform, feebly convex between them. Fourth tarsal joint of hind tarsi as in the ♀.

Bekily, 1 ♀; Antanimora, 1 ♀; Bekily, 4 ♂♂. September–February.

Not closely related to any of the African species.

Tachysphex crassicornis n.sp. (Figs. 76, 76 *a*)

♀. 7·5–8 mm. long. Allied to the preceding species, *T. insulsus*, but with shorter antennal joints in both sexes, a wider median area of the clypeus in the ♀ and differently coloured abdomen in the ♂. Head and thorax black. Mandibles ferruginous in the middle. Tegulae ochreous. Tergites brownish red, the sternites brownish black, the apical margins of the first four narrowly yellowish red. Legs black, the spines and calcaria reddish yellow. Wings hyaline, very faintly stained with yellow, the veins brown.

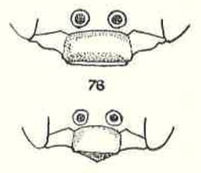


Fig. 76. *Tachysphex crassicornis* ♀, clypeus, × 14; ♂, clypeus, × 14.

Anterior third of the median area of the clypeus shining, sparsely and coarsely punctured, the rest of the clypeus, face and vertex very finely punctured, the face closely so and dull, the vertex less closely and moderately shining. The puncturation of the face is much closer and finer than in *insulsus*. The puncturation of the pro-mesothorax is like that of *insulsus* but finer and a little less close. As in that species the dorsum of the epinotum is reticulate-punctate and the declivity closely transversely striate, but the sides of the segment are shining, microscopically punctured and finely transversely striate at the anterior and posterior margins. First to fifth tergites moderately shining, microscopically punctured, the pygidial area shining and sparsely punctured. Sternites shining, the second closely and very finely punctured in the basal half, the other sternites with a few large punctures at the apical margin. Median area of the clypeus 1⅔ wider than long, the apical margin straight. Interocular distance across the clypeus a little less than three times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum plus a quarter of the third. Flagellum much less slender than in *insulsus*; the second joint is twice as long as wide and a little shorter than the third, the third to ninth joints are about twice as long as wide. Dorsum of the epinotum shorter than in *insulsus*, from 2¼ to 2⅖ wider at the base than long, and two-fifths wider at the base than at the hind margin. Pygidial area nearly twice as long as wide at the base, the apex narrowly truncate. Fourth joint of the hind tarsi like that of *insulsus*.

♂. 6·5 mm. long. First three tergites and the second and third sternites ferruginous, the remaining tergites and sternites varying from brown to black. Hind tibiae and tarsi pale ferruginous, sometimes pale brown and the tibiae ferruginous only on the upper side. Fore and middle tarsi brown. The pubescence on the upper half of the face and on the mesonotum yellowish grey. The first three tergites with inconspicuous pubescent fasciae on the depressed apical margins. Otherwise like the ♀ in colour, sculpture and pubescence. Median area of the clypeus like that of *insulsus* ♂, but not so wide, being only one-third wider than long. Interocular distance across the clypeus 2⅛ times greater than across the vertex, where it is

equal to the length of the first two joints of the flagellum plus two-thirds of the third joint. Flagellum short, as in the ♀; the second joint is two-thirds longer than wide at the apex and the third to eleventh joints a little more than twice as long as wide. Dorsum of the epinotum twice as wide at the base as long, and 1½ times wider there than at the hind margin. Eighth sternite and genitalia like that of *insulsus*.

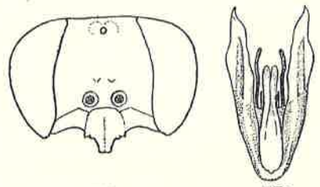
Bekily and Ranomafana, 4 ♀♀, 6 ♂♂. October–February.

Tachysphex Turneri Arn. race **sacalava** n.subsp. (Figs. 77, 77 *a*)

Ann. Transv. Mus. IX, p. 61, ♀, ♂, 1923

var. *transvaalensis* Arn., *Ann. Transv. Mus.* XI, p. 66, ♀, 1924.

♀. 10 mm. long. Larger than the specific form and the var. *transvaalensis*. It differs from both in the colour of the legs. The femora and middle tibiae are black, the anterior and hind tibiae blackish below and more or less reddish brown above, the basal joints of the tarsi reddish brown and the last three joints ferruginous. It is like the var. *transvaalensis* in having the abdomen entirely pale ferruginous. The head, thorax and abdomen strongly punctured as in the type of the species, but relative to the greater size, more strongly punctured on the face and less so on the scutellum and metanotum. On the other hand, the sculpture of the epinotal dorsum is different, consisting of a very regular and raised reticulation, the interspaces smaller than in the type of the species. The median area of the clypeus has a small tooth at the anterior corners and the median tooth is broadly truncate, not sharply triangular as in the type of the species. The eyes are much more divergent below, the interocular distance across the clypeus being nearly twice as great as across the vertex, whereas in the type of the species it is a little less than one-third greater. The interocular distance on the vertex is equal to a little less than the length of the first three joints of the flagellum. The flagellum is more slender, the second joint is 2½ times longer than wide at the apex and the third to ninth joints are at least 2½ times longer than wide, whereas in the type of the species the second joint is only twice as long as wide and the third to ninth joints are barely more than twice as long as wide. The scutellum is wider, 2½ times wider in front than long (twice as wide as long in the typical form). Dorsum of the epinotum not quite so wide at the base, being only 2¼ times wider there than long.



77 77a

Fig. 77. *Tachysphex Turneri* race *sacalava* ♀, head, ×*c.* 10; *a*, ♂, genitalia, ×24.

♂. 7·3–9 mm. long. The extreme base of the first abdominal segment black, the rest of the abdomen ferruginous. Tibiae and tarsi and apices of the femora flavo-ferruginous, the underside of the fore and middle tibiae slightly infuscated. As in the type of the species ♂, the middle of the second sternite and the basal half of the third and fourth sternites are covered with a dense and microscopic pubescence, making those parts opaque. The punctuation of the face, vertex and mesonotum is finer and much closer than in the specific form, in which the interspaces are at least three times wider than the punctures, whereas in this race they are not wider than the punctures. Like the ♀, the reticulate-rugose sculpture of the epinotal dorsum is less coarse than in the type and the tergites are more finely punctured. As in the ♀, the eyes are more divergent below than in the ♂ of the specific form, the interocular distance across the clypeus being nearly twice as great as across the vertex, where it is equal to the length of the first three joints of the flagellum (only one-third greater in the type). Dorsum of the epinotum twice as wide at the base as long, as in the typical form, but a little more narrowed caudad. Anterior femora deeply excised at the base below, the proximal end of the excision acute.

In addition to the strong puncturation and the shape of the clypeus, another important character in this species is the great width of the head in both sexes; in this race the head is even wider, being in the ♀ half as wide again as the mesonotum, measured in front of the tegulae, and nearly as much in the ♂.

Genus **Tachytes** Panz.

Krit. Rev. II, 129, p. 1806; Arnold, *Ann. Transv. Mus.* XIII, p. 387, 1929

In this genus it is by no means easy to distinguish the females of quite a considerable number of species, the differences being rather subtle, and the general habitus very similar to the naked eye. To avoid repetition, the reader should refer to my remarks on the genus in the *Ann. Transv. Mus.* loc. cit. supra, but in order to abbreviate the descriptions of the new species which follow, it should be noted that there are some characters which are not described in detail in those descriptions, being generic and not specific. They are the following: the clypeus, temples and face are covered with a decumbent and dense pubescence, intermixed with a thin and erect pilosity, the pubescence less dense on the temples than elsewhere. On the thorax the decumbent pubescence is dense, and obscures the sculpture below it on the dorsum of the pronotum, mesopleura and mesosternum; on the mesonotum it is less evident except at the margins. The metanotum is usually heavily pubescent. The epinotum has an erect pilosity with a sparse pubescence below it. In the majority of the species the first five tergites in the ♀ and the first six in the ♂ have apical fasciae of pubescence, the hairs on each half directed in opposite directions, and the pygidium is covered with a coarse decumbent pubescence or fine setae. The apical margins of the fifth tergite and the second to fifth sternites have an irregular row of stiff erect hairs. The anterior femora are densely pubescent on the outside, and the middle and hind tibiae have on their upper side, in addition to three rows of spines, a decumbent and coarse pubescence, usually of a silvery or golden colour. The median area of the clypeus has at each corner of its anterior margin two or three small teeth, sometimes very indistinct. The sculpture of the mesothorax consists of a very close and fine puncturation, which is very much the same in many species, and such differences as there may be can rarely be resolved under a magnification of less than 30 diameters. The dorsum of the epinotum has usually a little coarser sculpture than that of the mesothorax, consisting in most species of a close puncturation often intermixed with a reticulate rugulosity. In nearly all species there is a small ovoid pit just in front of the middle of the hind margin. The first five tergites are microscopically punctured. The pygidial area is elongate triangular, and its proportions of length compared with the basal width are very much the same in most of the species. As in the allied genus *Tachysphex* the venation is very constant and affords no reliable characters of specific value. In the females the most reliable specific characters are, the width of the interocular distance on the vertex compared with the basal joints of the flagellum, the length of the galea and the puncturation of the sternites. The males, on the other hand, even when in other respects very similar, can easily be distinguished by the shape of the genitalia, particularly by the shape of the feebly chitinized apical part of the stipites. A point of interest is that in the majority of the Madagascan species the flagellum is parti-coloured.

Key to the species

♀♀

(2) 1. Maxillary palpi five-jointed, labial palpi three-jointed (subgen. *Calotachytes* Turner). Large species 16–21 mm. long. Anterior three-fourths of the clypeus distinctly flattened. **argyropis** Sauss. (p. 108)

(1) 2. Maxillary palpi six-jointed, labial palpi four-jointed (subgen. *Tachytes* Panz. *s. str.*). Smaller species, less than 15 mm. long. Clypeus convex, sometimes slightly inflected or depressed just behind the apical margin.

(4) 3. The greater part of the sternites and the apical margins of the tergites brownish red. **rufomarginata** Arn. (p. 109)

(3) 4. Abdomen black.

(6) 5. Antennae black; tibiae, tarsi and middle and hind femora pale ferruginous. **indifferens** Arn. (p. 110)

(5) 6. At least some of the joints of the flagellum dark ferruginous; middle and hind femora black.

(8) 7. Apical fourth of the third to fifth sternites dull, finely and closely punctured. Pygidial area covered with fulvous setae; pubescent fasciae on the tergites silvery grey. **picticornis** Arn. (p. 111)

(7) 8. Third to fifth sternites shining, sparsely and coarsely punctured. Pubescent fasciae on the tergites yellowish grey.

(10) 9. Tibiae, tarsi and apices of the femora flavo-ferruginous. Pygidium covered with bright golden setae. Wings clear hyaline. Length 10·5–11·5 mm. **copiosa** Arn. (p. 111)

(9) 10. Tarsi fusco-ferruginous, tibiae dark brown. Pygidium covered with pale coppery red setae. Wings hyaline, tinged with yellow. Length 14 mm. **flavocinerea** Arn. (p. 112)

♂♂

(2) 1. Maxillary palpi five-jointed, labial palpi three-jointed. Anterior half of the clypeus flattened. Wings flavo-hyaline, abdomen blackish brown, the pubescence on it pale brownish yellow. Large species, 14–17 mm. long. **argyropis** Sauss. (p. 108)

(1) 2. Maxillary palpi six-jointed, labial palpi four-jointed.

(4) 3. Abdomen dark brown, the apical margins of the segments reddish umber. **rufomarginata** Arn. (p. 109)

(3) 4. Abdomen black, the apical margins of the segments sometimes a little paler or brown.

(8) 5. Antennae black.

(7) 6. Tibiae and tarsi ferruginous. Puncturation of the mesonotum fine, but clearly resolvable with a magnification of 30 diameters. Length 10–12 mm. **indifferens** Arn. (p. 110)

(6) 7. Tibiae, tarsi and apices of the femora flavo-ferruginous. Puncturation of the mesonotum excessively fine, barely resolvable with a magnification of 30 diameters. Length 10 mm. **copiosa** Arn. (p. 111)

(5) 8. Antennae not entirely black.

(10) 9. First three and last three joints of the flagellum black, the rest ferruginous. Inner paramera of the genitalia distinctly shorter than the outer. **picticornis** Arn. (p. 111)

(9) 10. First three joints of the flagellum black, the rest brownish red. Inner paramera of the genitalia as long as the outer. **flavocinerea** Arn. (p. 112)

Tachytes (subgen. **Calotachytes**) **argyropis** Sauss. (Figs. 78, 78 *a*)

Soc. Entom. II, p. 18, ♀, 1887; *Hist. Madag.* XX, p. 476, ♀, ♂, 1892

♀. 16–21 mm. long. Wings pale flavo-hyaline (not ferruginous as stated in Saussure's description). Clypeus and the underside of the antennae, and sometimes also the upper side, very dark reddish brown, like the colour of the pronotum, tibiae and tarsi (C.U.C. brun 701). Galea nearly twice as long as the scapes. First joint of the labial palpi very long and slender, nearly as long as the other two joints united. Interocular distance on the vertex equal to the length of the second joint of the flagellum. The second joint is nearly three times as long as wide and one-fifth longer than the third. Anterior metatarsi with six spines. Pygidial area covered with coppery red pubescence. Sternites shining, sparsely and coarsely punctured near the posterior margin.

♂. 13–17 mm. long. Clypeus, antennae, pronotum, tibiae and tarsi darker than in the ♀, the wings more faintly yellowish than in that sex, the pubescent fasciae on the abdomen browner, the pubescence on the clypeus and face pale golden. Interocular distance on the vertex as in the ♀. Second joint of the flagellum twice as long as wide at the apex, barely longer than the third.

Sternites 1–6 dull, closely and finely punctured all over, the seventh smooth and fairly shining. Anterior metatarsi with five spines. The genitalia (Figs. 78, 78 *a*) are complicated structures, difficult to describe, and differ considerably from those of the subgen. *Tachytes* s.str.

Bekily, Behara and Antanimora, 31 ♀♀, 12 ♂♂. October–February.

Allied to *T. Marshalli* Turn. but the vertex is narrower and the pubescence on the abdomen of a different colour.

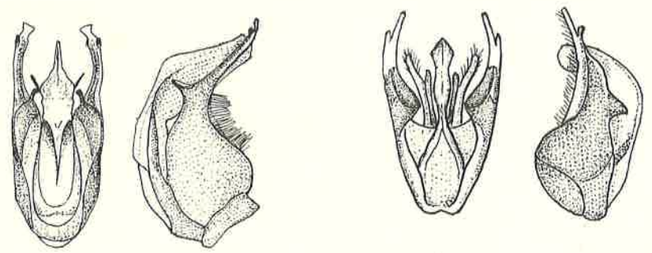


Fig. 78, *a*. *Tachytes argyropis* ♂, genitalia, dorsal and lateral views, × 14.

Fig. 79, *a*. *Tachytes rufomarginata* ♂, genitalia, dorsal and lateral views, × 20.

Tachytes oviventris Sauss.

Mitt. Schweiz. Ent. Ges. VIII, p. 260, ♀, 1891; *Hist. Madag.* XX, p. 478, ♀, 1892

The collection contains no specimens which can be identified with this species. No exact locality is mentioned in Saussure's description, merely Madagascar, coll. Dr Schulthess.' If the description is correct, the colour of the species must be unique in the genus, since the abdomen is said to have 'brilliant bluish and purple reflections'.

Tachytes rufomarginata n.sp. (Figs. 79, 79 *a*)

♂. 12 mm. long. Head and thorax black, the abdomen dark brown (C.U.C. rouge 116), the apical margins of the segments and the legs reddish umber (C.U.C. rouge 112), the femora blackish over the basal two-thirds. Mandibles fusco-ferruginous. First joint, basal half of the second joint and the last three joints of the flagellum black, the other joints and the scape bright ferruginous. Wings hyaline, with a yellowish tinge, the veins ochreous. Clypeus and face with pale golden pubescence. The pubescence and pilosity on the thorax greyish white. Tergites with inconspicuous apical fasciae of white pubescence. Pygidial area with pale golden pubescence. Head and thorax dull, the vertex finely and sparsely punctured. Puncturation of the mesonotum, scutellum and metanotum fairly fine and very close, of the mesopleura very shallow and finer than that of the mesonotum. Dorsum of the epinotum coriaceous and reticulate, the declivity finely coriaceous, the sides closely and minutely punctured.

Second sternite shallowly, finely and closely punctured, the remaining sternites shining, sparsely and a little more coarsely punctured, the tergites dull. Galea shorter than the scapes. Clypeus with a shallow median excision on the anterior margin. Interocular distance on the vertex very little shorter than the length of the first two joints of the flagellum. The second joint of the flagellum is nearly half as long again as the third. Scutellum with a shallow median longitudinal impression. Dorsum of the epinotum very little longer than

the scutellum. The stipites of the genitalia have a large cuneiform protuberance on the inside at about the middle of their length. Anterior metatarsi with four spines on the outer margin.

♀. 12 mm. long. Head and thorax black. Scape pale ferruginous, the first three and the last three joints of the flagellum black, the other joints dark ferruginous. Abdomen dark brownish red, the first sternite and the basal half of the second blackish, the basal halves of the first five tergites brownish black. Tibiae, tarsi and apices of the femora dark ferruginous. Wings clear hyaline, the veins dark ochreous, the tegulae brownish ochreous. Pilosity white. Pubescence of the clypeus and face dull silvery, becoming pale golden above, on the pronotal dorsum silvery, on the rest of the thorax greyish silvery, fairly abundant on the epinotum. First three tergites with quite distinct yellowish silvery pubescent apical fasciae; on the fourth and fifth tergites this pubescence is confined to the sides. Pygidial area covered with bright golden setae. The sculpture is like that of *indifferens* Arn. The median excision on the apical margin of the clypeus is wider than in *indifferens*, the angles of the excision subdentate, and the three lateral teeth more developed than in that species. Flagellum a little more slender than in *indifferens*, the second joint three times longer than wide at the apex. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. Galea shorter than the scape. Calcaria ferruginous, the spines on the legs whitish, the anterior metatarsi with five spines on the outer margin.

Bekily, 3 ♂♂, 2 ♀♀. February.

Tachytes indifferens n.sp. (Fig. 80)

♀. 11–14 mm. long. Black. Legs, including the coxae and trochanters, and basal two-thirds of the anterior femora, ferruginous. Wings clear hyaline, the veins brown. Pubescence and pilosity on the clypeus and face greyish silvery, becoming pale golden on the upper part of the face. Pilosity on the thorax greyish white, except on the meso- and metanotum where it is dull golden. Pubescent apical fasciae on the first four tergites golden, the pygidial area with pale coppery red setae. Anterior third of the clypeus shining, sparsely and coarsely punctured, the apical margin with a shallow median excision. Vertex closely and finely punctured, the mesonotum and scutellum a little more strongly punctured than the vertex, the dorsum of the epinotum closely and transversely rugulose. Second sternite dull, closely and finely punctured excepting a small triangular area on the apical margin which is smooth and shining; third to fifth sternites shining, sparsely and coarsely punctured, their posterior lateral angles closely and finely so. Galea broad, shorter than the scape. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. The second joint of the flagellum is one-fourth longer than the third and $2\frac{1}{3}$ times longer than wide at the apex. Dorsum of the epinotum as long as the scutellum. Anterior metatarsi with five spines on the outer margin, the spines and calcaria of all the legs ferruginous.

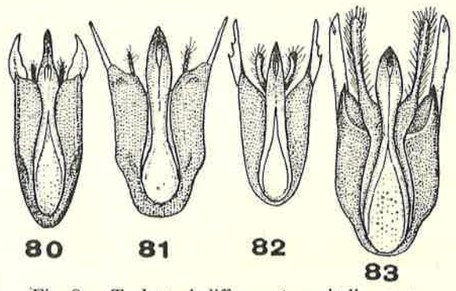


Fig. 80. *Tachytes indifferens* ♂, genitalia, × 24.
Fig. 81. *T. picticornis* ♂, genitalia, × 24.
Fig. 82. *T. copiosa* ♂, genitalia, × 24.
Fig. 83. *T. flavocinerea* ♂, genitalia, × 24.

♂. 10–12 mm. long. Pubescent fasciae of the tergite greyish white, the pygidium with yellowish setae. Otherwise like the ♀ in colour and pubescence. Mesopleura and mesosternum slightly shining, more coarsely but less closely punctured than in the ♀, the interspaces about three times as wide as the punctures. Second sternite nearly dull, closely punctured, the remaining sternites smooth and shining on their basal third, the apical two-thirds closely punctured, the puncturation large basad, becoming gradually smaller caudad. Interocular distance on the vertex and the proportions of the second and third joints of the flagellum as in the ♀.

Bekily and Behara, 14 ♀♀, 10 ♂♂. November–April.

Tachytes picticornis n.sp. (Figs. 81, 84)

♀. 13 mm. long. Fifth to eighth joints of the flagellum dark ferruginous, paler below than above, the remaining joints and the scapes black. Tibiae, tarsi and calcaria ferruginous, the spines on all the legs pale yellowish. Wings hyaline, the veins yellowish red. Pubescence greyish silvery, tinged with yellow on the mesonotum. Pilosity grey. First five tergites with a thin grey pubescence and fasciae of silvery grey pubescence on the apical margins. Pygidial area with fulvous setae, coppery red at certain angles. Clypeus closely punctured, but sparsely and coarsely just behind the anterior margin, a little more than twice as wide as long, the anterior margin strongly convex and excised in the middle. Vertex with a sparse puncturation of large and small punctures intermixed. Mesonotum, scutellum and metanotum very closely punctured, the dorsum and declivity of the epinotum closely and finely reticulate, the reticulations emphasized transversely, the sides of the epinotum punctulate and not quite dull. First and second sternite and the apical margins of the third to fifth sternites dull, closely and finely punctured, the sixth sternite sparsely and coarsely punctured on the apical half, the rest of the sternites shining, with a few large punctures. Galea shorter than the scape. Second joint of the flagellum as long as the third. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. Dorsum of the epinotum as long as the scutellum. Anterior metatarsi with six spines on the outer margin.

Fig. 84. *Tachytes picticornis* ♂, clypeus, × 10.

♂. 9–12 mm. long. Middle and hind femora more or less fusco-ferruginous above. Seventh tergite covered with yellowish silvery pubescence. Otherwise like the ♀ in colour. Sternites with a slight gloss, closely and fairly strongly punctured, the third to fifth a little less closely and distinctly coarsely punctured in the middle at the base. Otherwise like the ♀ in sculpture. Clypeus twice as wide as long, the median area slightly more produced in front than in the ♀, the apical margin convex and entire. Interocular distance on the vertex equal to a little more than the length of the first two joints of the flagellum. The joints of the flagellum are rather short, the second and third only twice as long as wide at the apex. Anterior metatarsi with four spines on the outer margin. Galea as long as the scape. Otherwise like the ♀.

Bekily and Antanimora, 2 ♀♀, 8 ♂♂. January–February.

Allied to *T. indifferens*.

Tachytes copiosa n.sp. (Fig. 82)

♀. 10·5–11·5 mm. long. Black. Scapes black above and fusco-ferruginous below, first and last three joints of the flagellum black, the remaining joints ferruginous. Tibiae, tarsi and apices of the femora flavo-ferruginous. Apical margins of the first five abdominal segments narrowly brownish yellow. Wings hyaline, the veins dark ochreous. Pilosity whitish. Pubescence on the clypeus and face silvery, becoming golden above, on the sides of the thorax and on the femora silvery, on the dorsum of the thorax pale yellowish. On the first four tergites it is yellowish grey and thin, except on the apical margins where it is denser and greyish golden; pygidial area with bright golden pubescence.

Clypeus $2\frac{3}{4}$ times wider than long, slightly inflected, shining and sparsely punctured in front, finely and closely punctured behind. Vertex punctured as in *picticornis*. The punctuation of the mesonotum and scutellum is much finer, closer and shallower than in *picticornis*, the punctures almost contiguous and barely resolvable under a magnification of less than 50 diameters. The dorsum and declivity of the epinotum are microscopically coriaceous and without reticulations. Second sternite dull, finely and closely punctured, the third to fifth very sparsely and coarsely punctured behind the smooth apical margins, closely and finely only in the posterior lateral corners, the fine punctuation not extending in a broad band right across the segment as in *picticornis*. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. The second joint of the flagellum is nearly three times longer than wide at the apex and one-sixth longer than the third. Dorsum of the epinotum as long as the scutellum. Calcaria and spines on the legs yellowish. Anterior metatarsi with five spines on the outer margin.

♂. 10 mm. long. Antennae black. Pubescence of the face, clypeus and seventh tergite pale golden. Punctuation of the mesonotum and scutellum not quite so fine as in the ♀. Second sternite slightly shining, the punctuation as close as in the ♀, but finer and shallower. The coarse punctuation on the succeeding sternites is a little more abundant than in the ♀. Fifth and sixth sternites with a fairly dense, oblique and pale brown pubescence. Otherwise like the ♀ in colour, sculpture and pubescence. Clypeus nearly three times wider than long, the apical margin not excised. Second joint of the flagellum very little more than twice as long as wide. Anterior metatarsi with four spines on the outer margin.

Behara, 5 ♀♀, 3 ♂♂. November.

Tachytes flavocinerea n.sp. (Fig. 83)

♀. 14 mm. long. Black. First three joints of the flagellum black, the remaining joints, the scapes and the tarsi dark brownish red. Tibiae dark brown. Wings hyaline, tinged with yellow, the veins ochreous. Calcaria ferruginous, the spines on the legs yellowish white. Pubescence on the face, clypeus, thorax and tibiae very pale golden, somewhat darker on the mesonotum. Pilosity yellowish grey. First four tergites with apical pubescent fasciae which are yellowish grey when seen from above and yellowish silvery grey when seen obliquely. Pygidial area with pale coppery red setae.

Anterior half of the clypeus shining, fairly strongly but not closely punctured. The rest of the clypeus, the vertex, mesonotum and scutellum finely and very closely punctured, the scutellum more finely than the mesonotum, the interspaces as wide as the punctures. Dorsum of the epinotum closely reticulate-punctate, the declivity transversely rugulose. Second sternite dull, very closely, finely and obliquely punctured, the third to fifth sternites shining and with a few large punctures on the posterior half, the sixth shining, coarsely and closely punctured on the posterior half.

Galea as long as the scape. Clypeus about twice as wide as long, the anterior margin entire and convex. Flagellum fairly slender, the second joint three times longer than wide at the apex and two-sevenths longer than the third. Interocular distance on the vertex barely longer than the second joint of the flagellum. Anterior metatarsi with six spines on the outer margin.

♂. 10–13 mm. long. Pubescence on the face and clypeus golden, on the thorax pale yellowish grey, the setae on the seventh tergite silvery golden. Third to sixth sternites not much more strongly punctured than the second, but less closely and only moderately shining. The punctuation on the head and thorax is slightly stronger than in the ♀. Otherwise like the ♀ in colour, sculpture and pubescence. Clypeus a little less than twice as wide as long. Interocular distance on the vertex as long as the second joint of the flagellum. Anterior metatarsi with five spines on the outer margin. Otherwise like the ♀. Eighth

sternite narrow, its apical margin angularly excised, the apical angles rounded. The genitalia are unlike those of the other Madagascan species. The membranous apical part of the stipites is blade-like and the chitinized portion ends in a short tooth; the inner paramera are as long as the outer and densely fringed with hairs.

Bekily, Ivondro and Antanimora, 3 ♀♀, 3 ♂♂. January.

Genus **Larra** Fab.

Ent. Syst. II, p. 220, 1793

The collection contains examples of the six species described by Saussure, but one of these, *variipes*, sinks in synonymy, being the ♂ of *carbunculus*. Two species, *prismatica* and *betsilea*, were taken with their prey, species of Gryllotalpidae, and it is noticeable that the males are considerably smaller than the females. The males are always more strongly punctured on the abdomen than the other sex and can easily be identified by the structure of the genitalia. The females, on the other hand, are not so easily separated, the specific characters lying chiefly in colour, puncturation of the abdomen, slight differences in the shape of the pronotal collar, the shape of the epinotum and the width of the vertex.

Key to the species

♀♀

(2) 1. Tergites almost impunctate and very shining, the first three in greater part red.
betsilea Sauss. (p. 114)

(1) 2. Tergites entirely black, with at least a fine and sparse puncturation.

(6) 3. Legs, excluding the coxae and trochanters, ferruginous, the wings pale fuscous.

(5) 4. Interocular distance across the clypeus three times greater than across the vertex, where it is equal to the length of the second joint of the flagellum plus a quarter of the first. Suprafrontal area with fairly deep punctures and moderately shining. Pygidial area elongate triangular.
prismatica Sauss. (p. 114) = Saussure K.U.

(4) 5. Interocular distance across the clypeus $2\frac{3}{4}$ times greater than across the vertex, where it is equal to the length of the second joint of the flagellum plus four-fifths of the first. Suprafrontal area with a sparse and very shallow puncturation and very shining. Pygidial area scutate.
Heydenii Sauss. (p. 115)

(3) 6. Anterior legs fusco-ferruginous, the middle and hind pairs very dark reddish brown to blackish.
carbunculus D.T. (p. 116) = variipes de Saussure

♂♂

(2) 1. The base and sides of the first tergite and the base of the second red, or at least the base of the first tergite of that colour.
betsilea Sauss. (p. 114)

(1) 2. Abdomen entirely black.

(6) 3. Legs, excluding the coxae and trochanters, ferruginous. Wings pale fuscous.

(5) 4. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus one-fourth of the third. Genitalia, Fig. 86 *c*; inner paramera very short, only their apices visible from above.
prismatica Sauss. (p. 114) = Saussure K.U.

(4) 5. Interocular distance on the vertex equal to the length of the first joint of the flagellum plus half of the second. Genitalia, Fig. 87 *a*; inner paramera longer, the portion visible from above being fully as long as the dilated apical part of the sagittae.
Heydenii Sauss. (p. 115)

(3) 6. Legs black, or the anterior pair more or less ferruginous and the middle and hind pairs dark reddish brown to black.

(8) 7. Legs entirely black. Interocular distance on the vertex equal to a little more than the length of the first three joints of the flagellum. Punctures on the sides of the epinotum as large as those on the mesopleura.
madecassa Sauss. (p. 116)

(7) 8. Legs not entirely black. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. Punctures on the sides of the epinotum distinctly smaller than those on the mesopleura.
carbunculus D.T. (p. 116) = variipes de Saussure

Larra betsilea Sauss. (Figs. 85, 85 *a*)

Soc. Entom. II, p. 17, ♀, 1887; *Hist. Madag.* XX, p. 488, ♀, ♂, 1892; Schulz, *Zool. Ann.* IV, p. 189, 1911

♀. 15–20 mm. long. Clypeus three times wider than long, the anterior margin feebly convex. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus one-fourth of the third. First joint of the flagellum 2⅓ times, the second nearly three times, longer than wide; the second three-sevenths longer than the first and one-third longer than the third joint. Pronotal collar very short and oblique. Dorsum of the epinotum as wide at the base as at the apex and as long as wide, the lateral margins feebly convex behind the stigmata. Pygidial area 1½ times longer than wide at the base. Anterior tibiae spinose above and on the out side. Tergites impunctate and shining. Sternites microscopically punctured.

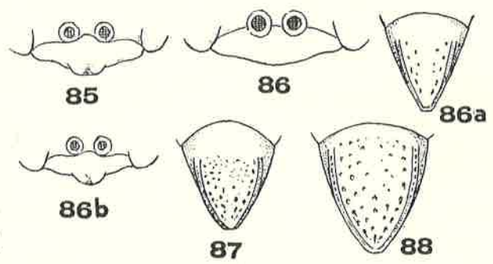


Fig. 85. *Larra betsilea* ♂, clypeus, × 10.
Fig. 86. *L. prismatica* ♀, clypeus, × 10; *a*, pygidium, × 10; *b*, ♂, clypeus, × 10.
Fig. 87. *L. Heydenii* ♀, pygidium, × 14.
Fig. 88. *L. carbunculus* ♀, pygidium, × 10.

♂. 9–16 mm. long. Median area of the clypeus moderately produced, its anterior third smooth and shining and with a barely perceptible median depression behind the anterior margin; this feeble depression, viewed from certain angles, gives a false impression that the anterior margin is subexcised (subéchancré Saussure). Interocular distance on the vertex equal to the length of the first three joints of the flagellum plus half of the fourth. Second joint of the flagellum twice as long as wide at the apex and three-fifths longer than the first. Pronotal collar linear. Dorsum of the epinotum slightly longer than wide. Tergites and sternites with a fine, sparse and oblique puncturation which becomes gradually smaller and closer caudad. Otherwise like the ♀. The red colour of the first two abdominal segments is variable in extent; in one specimen it is confined to the sides and base of the first tergite.

Bekily and Behara, 8 ♀♀, 9 ♂♂.

L. proditor Kohl (1891) should be considered a race of this species; the ♀♀ are indistinguishable in structural characters, but the ♂♂ of *proditor* have paler wings, the first two tergites almost entirely red and the stipites a little broader in the apical part (Fig. 85 *b*). Schulz reduces this species to the rank of a race of *L. pseudonathema* Kohl (1894), which is a synonym of *proditor*, but Saussure's *betsilea* has priority, so that *proditor* should sink to subspecific rank.

Larra prismatica Sauss. (Figs. 86, 86 *a–c*)

Soc. Entom. II, p. 17, ♀, 1887; *Hist. Madag.* XX, p. 492, ♀, 1892

Larra Saussurei Kohl, *Ann. naturh.* (*Mus.*) *Hofmus., Wien*, VII, p. 220, ♀, 1892; Schulz, *Zool. Ann.* IV, p. 190, 1911.

♀. 14–16 mm. long. Clypeus 3¼ times wider than long in the middle, the apical margin feebly convex. Interocular distance across the clypeus fully three times greater than across the vertex, where it is equal to the length of the second joint of the flagellum plus one-fourth of the first. The latter is about twice as long as wide, the second joint is nearly one-third

longer than the first and 2½ times longer than wide at the apex. Pronotal collar linear above. Dorsum of the epinotum parallel-sided, a trifle wider than long.

Pygidial area 1½ times longer than wide at the base. Anterior tibiae spinose at the apex, but not on the outside.

♂. 7·5–12 mm. long. Clypeus three times wider than long in the middle, the median area moderately produced, its anterior margin convex. Interocular distance across the clypeus nearly twice as great as across the vertex, where it is equal to the length of the first two joints of the flagellum plus one-fourth of the third. Second joint of the flagellum twice as long as wide at the apex and 1½ times longer than the first, the latter about twice as long as wide. Pronotal collar linear above. Dorsum of the epinotum a trifle wider at the base than long, parallel-sided. The puncturation of the mesonotum consists of round punctures, of the same depth all over, whereas in the ♀ they are oblique, or deeper in front than behind. Apart from the colour of the legs and some other characters, this serves to distinguish the ♂♂ of this species from those of *carbunculus*, in which the puncturation is distinctly oblique. There is very little difference between the genitalia of the two species, but the hairs on the inner margin of the stipites are longer, thicker and more abundant in *carbunculus*.

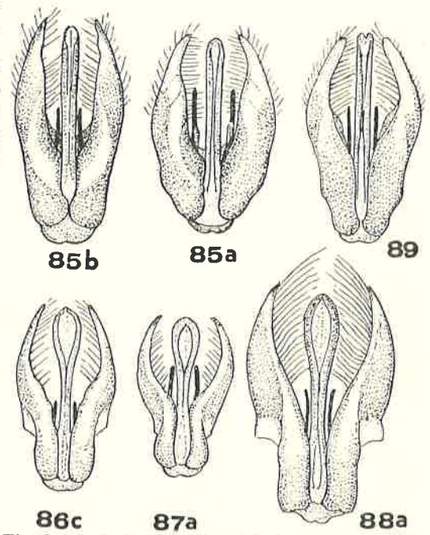


Fig. 85. *a*, *Larra betsilea*, genitalia, × *c.* 24; *b*, *L. proditor*, genitalia, × *c.* 24.
Fig. 86 *c*. *L. prismatica*, genitalia, × *c.* 24.
Fig. 87 *a*. *L. Heydenii*, genitalia, × *c* 24.
Fig. 88 *a*. *L. carbunculus*, genitalia, × *c.* 24.
Fig. 89. *L. madecassa*, genitalia, × *c.* 24.

The very great variation in size in the males of this species is worthy of note, the largest being nearly half as long again as the smallest.

Bekily, Ivondro and Ranomafana, 6 ♀♀, 12 ♂♂. December-April.

Closely allied to *L. outeniqua* Arn., which is perhaps only a race of this species. It differs from *prismatica* in having a shorter second joint of the flagellum, finer puncturation on the sides of the epinotum and less divergent orbits, the interocular distance across the clypeus in the ♀ being distinctly less than three times as great as across the vertex.

Larra Heydenii Sauss. (Figs. 87, 87 *a*)

Mitt. Schweiz. Ent. Ges. VIII, p. 261, ♀, 1891; *Hist. Madag.* XX, p. 494, ♀, ♂, 1892

♀. 12–13 mm. long. Clypeus 4¼ times wider than long, the anterior margin feebly convex. Interocular distance across the clypeus 2¾ times greater than across the vertex, where it is equal to the length of the second joint of the flagellum plus four-fifths of the first. First and second joints of the flagellum slightly more than twice as long as wide, the second about one-fifth longer than the first. Pronotal collar linear above. Dorsum of the epinotum parallel-sided, as long as wide. Pygidial area 1½ times longer than wide at the base, the lateral margins more convex than in *prismatica*. Anterior tibiae without spines on the outside.

♂. 10 mm. long. Clypeus three times wider than long in the middle, the median area produced as in *prismatica* ♂. Interocular distance across the clypeus 2⅓ times greater than

across the vertex, where it is equal to the length of the first joint of the flagellum plus half of the second. The second joint is not quite 1½ times longer than the first. Dorsum of the epinotum as long as wide at the base, slightly (one-eighth) narrower behind than in front.

Imerina-Anosibé: Perinet, 1 ♀; Rogez, 1 ♂.

Closely related to *prismatica* but distinguished from it in the ♀ by the much finer and sparser puncturation of the suprafrontal area and of the tergites, which are more shining than in *prismatica*, and also by the scutate shape of the pygidial area. In the ♂ it differs from *prismatica* by the more divergent inner orbits and by the shape of the genitalia.

Larra carbunculus D.T. (Figs. 88, 88 *a*)

Cat. Hymen. VIII, p. 665, 1897

carbonaria Sauss. (nec Smith, 1857), *Hist. Madag.* XX, p. 491, ♀, 1892.
variipes Sauss., *Hist. Madag.* XX, p. 493, ♂, 1892; Schulz, *Zool. Ann.* IV, p. 190, 1911.

♀. 16·5–21 mm. long. Clypeus four times wider than long in the middle, the anterior half, excepting the sides, with a few large punctures, the rest finely punctured, much more finely than in *betsilea*, the apical margin more convex than in that species. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus one-third of the first joint. The latter twice as long as wide, the second 3¼ times longer than wide and three-fourths longer than the first. Pronotal collar linear. Dorsum of the epinotum a little wider at the base than long, and as wide there as at the hind margin. Pygidial area scutate, more convex-sided than in *betsilea* but like that of *Heydenii*, about one-third longer than wide at the base. Anterior tibiae spinose at the apex but not on the outside.

♂. 12–16 mm. long. Clypeus three times wider than long in the middle, the anterior margin of the median area a little more convex than in *betsilea* ♂. Interocular distance across the clypeus 2½ times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum. Second joint of the flagellum twice as long as wide at the apex.

Rogez, Perinet and Ivondro, 2 ♀♀, 23 ♂♂. November–January.

Allied to *erythropyga* Turn. from which it differs in the ♀ by the entirely black abdomen, shorter clypeus and linear pronotal dorsum. Schulz mistakenly placed *variipes* Sauss. as the ♂ of *prismatica*. The ♂ of the latter is much smaller and has the legs red as in its ♀.

Larra madecassa Sauss. (Fig. 89)

Soc. Ent. II, p. 17, ♂, 1887; *Hist. Madag.* XX, p. 496, ♂, 1892

♂. 12–15 mm. long. Very similar superficially to *carbunculus* D.T. but easily distinguished from it by the entirely black legs and scapes, the stronger puncturation of the thorax and the wider vertex. Interocular distance across the clypeus very little more than twice as great as across the vertex, where it is equal to the length of the first three joints of the flagellum. Clypeus a little more than three times wider than long, the median area moderately produced, the anterior margin convex and with a feeble depression behind it. First joint of the flagellum 1½ times longer than wide, the second twice as long as wide and two-thirds longer than the first, the third as long as the first. Pronotal collar linear. Dorsum of the epinotum a little, but quite distinctly wider caudad than cephalad, and fully one-fourth longer than wide at the base, with a well-defined median carina which almost reaches the hind margin. The punctures on the vertex and mesonotum are nearly twice as large as in *carbunculus*, and whereas in that species the punctures on the sides of the epinotum are clearly smaller than those on the mesopleura, in this species they are as large. First six tergites finely and sparsely punctured, the seventh more strongly and more closely than the others. The sternites are a little more strongly punctured than their tergites.

Bekily and Rogez, 4 ♂♂. January–March.

Genus **Liris** Fab.

Syst. Piez. p. 227, 1804

Liris haemorrhoidalis Fab. race **jocositarsa** Sauss. (Fig. 90)

L. jocositarsa Sauss., *Soc. Ent.* II, p. 18, ♂, 1887.
L. jocositarsa Sauss., *Hist. Madag.* XX, p. 515, ♂, 1892.
L. jocositarsa Sauss., Kohl, *Ann. naturh. (Mus.) Hofmus., Wien*, VII, p. 226, ♀, 1892.
L. pedestris Sauss., *Hist. Madag.* XX, p. 517, ♀, 1892.

This race differs from the typical form only in the colour of the integument and the pubescence on the abdomen, and in some trifling structural characters. It is indeed astonishing that Saussure not only failed to recognize the close relationship with the Fabrician species but also described the two sexes under different names.

♀. 16–21 mm. long. Differs from the typical form as follows:

Anterior half of the mesonotum, base of the first tergite and the whole of the first sternite fusco-ferruginous, the last two abdominal segments dark reddish brown. The legs are also of a darker ferruginous colour than in the typical form. The pubescence on the thorax is darker, dull golden instead of brassy. On the tergites the pubescence is of ashy grey colour, more evident on the apical part of the first four segments, where it forms transverse fasciae. The pubescence on the pygidial area is pale reddish brown. The dorsum of the epinotum is strongly and transversely, but not closely, rugose, the rugae becoming feeble caudad; behind the stigmata the sides converge a little caudad, whereas in the specific form the dorsum is slightly widened caudad.

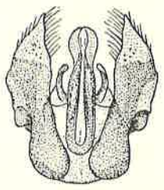


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Fig. 90. *Liris haemorrhoidalis*, race *jocositarsa* ♂, genitalia × 14.

♂. 9–14 mm. long. Pronotal tubercles ferruginous, sides of the epinotum sometimes rufescent, mesonotum often entirely black, first abdominal segment black, middle and hind femora more or less fuscous below. First three joints of the flagellum more or less reddish, but sometimes almost black. Otherwise like the ♀ in colour. The pubescence of the thorax is like that of the ♀, that of the abdomen greyish golden. Sculpture of the epinotum like that of the ♀. Otherwise like the ♀ of the specific form. The genitalia and the shape of the anterior femora do not differ in the least from *haemorrhoidalis* i.sp., but the second joint of the hind tarsi is not quite so dilated, and its inner margin is less convex.

Antananarivo: Bekily and Behara, 9 ♀♀, 7 ♂♂. July–January.

The prey consists of several species of crickets.

Liris Fab. subgen. **Motes** Kohl

Kohl, *Ann. naturh. (Mus.) Hofmus., Wien*, XI, p. 351, 1896

=*Notogonia* A. Costa, *Notogonidea* Rohw. etc.*

In my monograph of the Ethiopian Sphecidae (*Ann. Transv. Mus.* IX, p. 251, 1923) it was stated that *Notogonidea* (=*Motes*) differed from *Liris* only in having the mandibles excised on the outer margin, and that it might very well be regarded as a subgenus of *Liris*. In that work, by a regrettable oversight, I made *Motes* a synonym of *Notogonidea* A. Costa, whereas the position should have been reversed, *Motes* having priority. The only difference between them is that in *Motes* there are no teeth on the inner margin of the mandibles. But the argument applies equally well in respect to the presence or absence of an excision on the outer margin, being a character of equal value, and therefore I feel obliged to reduce *Motes*

* For the synonymy of *Motes* see Pate, 'Generic names of sphecoid wasps', *Mem. Amer. Ent. Soc.* IX, p. 93, 1937.

to the rank of a subgenus of *Liris*. Such a step is further justified by comparison of the genitalia of *L. haemorrhoidalis* with that of *Motes*, particularly such species as *M. felina* Arn., *M. thysanomera* Kohl and others, which shows that the genitalia are built very much on the same pattern.

The subgenus is well represented in Madagascar, and includes several of the medium-sized black species with greyish or silvery pubescent fasciae on the tergites; these may be divided into two groups, one with a naked pygidium and the other with a pubescent pygidium. These species, which are all very similar to the naked eye, can easily be distinguished in the male sex by the genitalia, but the separation of the females is much more difficult. In each species, and in both sexes, the sculpture of the epinotum varies within rather narrow limits, but although for each species it is distinctive, the difference between one species and another is very subtle, difficult to describe and equally difficult to make clear by means of drawings of any kind. In fact, micro-photographs, which I am unable to provide, would probably be the only way in which the differences could be made clearly apparent. The venation, on which I formerly placed some reliance, is of very little use, as such differences as exist are very slight and even within a species are subject to some variation.

In the separation of the females of the two groups mentioned above, the following are the more important characters, in descending order of value: the shape of the clypeus and of the pygidium, the interocular width of the vertex as compared with the width measured across the bottom of the eyes and with the length of the basal joints of the flagellum, the proportions of the epinotal dorsum, the sculpture of the epinotum, the comparative lengths of the joints of the flagellum, the puncturation of the mesothorax, the character of the pubescence on the pygidial area, the length of the pronotal dorsum, the puncturation of the sternites and the colour of the legs, especially the tarsi. Most of these characters are not mentioned in Saussure's descriptions, and it is in dealing with species which are undoubtedly distinct although exceedingly similar superficially that the descriptive methods of the older authors prove so regrettably insufficient. I am therefore unable to identify definitely one of Saussure's species, *Radamae*, although no doubt it is represented in the collection. Furthermore, the varieties listed under that species by Saussure leave no doubt in my mind that it is a mixed species. The difference in the colour of the legs in this group of *Motes* is very slight between certain species, but is nevertheless singularly constant, as can be clearly seen when long series of two such species are separated by reference to the genitalia. Only an examination of the types of *Radamae* and its supposed varieties can settle the question of their identity.

A character which, taken in combination with others, is of real value in the discrimination of the species is the sculpture of the mesonotum. This is of two kinds; one which I describe as *microscopically rugulose-punctate* consists of more or less transverse wavy rows of contiguous and oblique punctures, the rows slightly separated, the individual punctures barely resolvable under a magnification of less than 50 diameters. The other, described as *microscopically and closely punctured*, consists of discrete round punctures, with interspaces which are as wide as the punctures and reticulate, the reticulations just visible with a magnification of 75 diameters. For both kinds of sculpture Saussure used the terms *pointillé* or *coriacé*, which are not sufficiently accurate.

Key to the species

♀♀

(2) 1. Wings flavo-hyaline, the body entirely black. **xanthoptera** Arn. (p. 121)
(1) 2. Wings hyaline, or faintly fusco-hyaline or tinged with yellowish brown.
(4) 3. Hind femora ferruginous, the rest of the legs black; wings tinged with yellowish brown. **solstitialis** Sm. (p. 121)
(3) 4. Legs otherwise coloured.

also: Liris crepitans Leclercq, 1967
Liris keiseri (Leclercq, 1961)
Liris sabinus (Leclercq, 1961) tibiae III ferrugineous
Liris utopicus (Leclercq, 1961)

(26) 5. Pygidial area, except at the base, covered with (*a*) dense silky pubescence or (*b*) decumbent setae.
(7) 6. Pygidial area as in 5 (*a*). **antaca** Sauss. (p. 126)
(6) 7. Pygidial area as in 5 (*b*).
(11) 8. Legs, excluding the coxae and trochanters, in greater part red.
(10) 9. Legs entirely red; third sternite dull, the fourth to sixth shining. **avellanipes** Sauss. (p. 122)
(9) 10. Femora blackish at the base, the rest of the legs red; third to sixth sternites shining. **dyscheira** Sauss. (p. 123)
(8) 11. Legs black, the tarsi sometimes ferruginous or fusco-ferruginous.
(13) 12. Mesonotum strongly and closely punctured, the interspaces shining and for the greater part smaller than the punctures; dorsum of the epinotum coarsely reticulate-rugose. **nigricans** Wlk. race **reticulata** Sauss. (p. 132)
(12) 13. Mesonotum not strongly punctured, epinotal dorsum not coarsely reticulate-rugose.
(17) 14. Sternites 1–3 dull, 4–6 shining.
(16) 15. Mesonotum very closely and finely punctured, the interspaces about twice as wide as the punctures; dorsum of the epinotum $1\frac{1}{2}$ times wider at the base than at the apex. **alaris** Sauss. (p. 125)
(15) 16. Mesonotum microscopically transversely rugulose-punctate. Dorsum of the epinotum one-fourth wider at the base than at the apex. **incerta** Arn. (p. 127)
(14) 17. Sternites 1–4 dull, 5 and 6 shining, or if 2–4 not quite dull then less than 9 mm. long.
(21) 18. Mesonotum closely and microscopically punctured; inferior interocular distance more than three times greater than the superior.
(20) 19. Inferior interocular distance four times greater than the superior, the latter equal to a little less than the length of the second joint of the flagellum. Wings hyaline, faintly smoky. Epinotal dorsum finely and closely, transversely rugose, the interspaces punctulate, the median longitudinal carina very weak. Pygidial area with reddish yellow setae. **dejecta** Arn. (p. 129)
(19) 20. Inferior interocular distance $3\frac{1}{2}$ times greater than the superior, the latter equal to the length of the second joint of the flagellum. Wings strongly tinged with yellowish brown. Epinotal dorsum strongly and distantly transversely rugose, the median longitudinal carina strongly developed. Pygidial area with fulvous setae. **brunnipennis** Arn. (p. 130)
(18) 21. Mesonotum microscopically and transversely rugulose-punctate, or reticulate-punctate; the inferior interocular distance three times greater than the superior.
(25) 22. Mesonotum microscopically and transversely rugulose-punctate.
(24) 23. Dorsum of the epinotum transversely and rather sparsely rugose, the interspaces opaque, the median longitudinal carina well developed; second joint of the flagellum a little more than twice as long as wide at the apex. **radialis** Sauss. (p. 127)
(23) 24. Dorsum of the epinotum closely reticulate, the transverse threads somewhat emphasized, covered (at least) at the sides with a decumbent whitish pubescence; second joint of the flagellum three times longer than wide at the apex. Length less than 9 mm. **gracilicornis** Arn. (p. 132)
(22) 25. Mesonotum very finely and closely reticulate-punctate; scutellum shining. Length less than 9 mm. **minima** Arn. (p. 132)
(5) 26. Pygidial area glabrous, or with a very fine, sparse and decumbent pubescence and a few erect hairs on the apical half.
(28) 27. Pygidial area entirely glabrous; femora and tibiae black. **sepulchralis** Gerst. race **hova** Arn. (p. 132) + miscophoides (Arnold)
(27) 28. Pygidial area with a sparse and very fine pubescence on the apical half-femora and tibiae red. **rufipes** Sauss. (p. 133)

♂♂

(2) 1. Wings flavo-hyaline, the body and legs entirely black. **xanthoptera** Arn. (p. 121)
(1) 2. Wings hyaline, or faintly fusco-hyaline, or tinged with yellowish brown.
(4) 3. Hind femora ferruginous, the rest of the legs black; wings tinged with yellowish brown. **solstitialis** Sm. (p. 121)
(3) 4. Legs otherwise coloured.

(8) 5. Femora and tibiae red; pronotal dorsum not linear.
(7) 6. Mesonotum microscopically transversely rugulose-punctate; dorsum of the epinotum, excepting the outer fourths, finely and transversely rugose. **avellanipes** Sauss. (p. 122)
(6) 7. Mesonotum microscopically and closely punctured; dorsum of the epinotum coarsely and transversely rugose. **dyscheira** Sauss. (p. 123)
(5) 8. Femora and tibiae black, except in *sepulchralis-hova*, in which the tibiae are more or less reddish brown above.
(10) 9. Dorsum of the epinotum coarsely reticulate-rugose; mesonotum shining, strongly and closely punctured. **nigricans** Wlk. race **reticulata** Sauss. (p. 132)
(9) 10. Dorsum of the epinotum not coarsely reticulate-rugose; mesonotum dull, microscopically sculptured.
(14) 11. Stipites of the genitalia gradually attenuated from base to apex, of even texture throughout and more or less cultriform (see Fig. 99 *a*).
(13) 12. Pronotal dorsum linear above; tibiae black; anterior margin of the median area of the clypeus feebly convex. **dejecta** Arn. (p. 129)
(12) 13. Pronotal dorsum about as long in the middle as half the length of the first joint of the flagellum; hind tibiae and tarsi pale brownish ferruginous, the fore and middle tibiae somewhat rufescent; median area of the clypeus produced into a short and convex lobe. **sepulchralis** Gerst. race **hova** Arn. (p. 132)
(11) 14. Stipites of the genitalia not cultriform, either (*a*) heavily chitinized over the basal two-thirds, more or less, of its length and thence abruptly attenuated into a membranous apical portion which is triangular, or spatulate or lamelliform; the inner paramera more or less spatulate, twisted and heavily chitinized or (*b*) gradually attenuated from a little beyond the middle to the apex to form an elongate triangular lamella, the outer margin of which is fringed with very long curved hairs; the inner paramera membranous. (**minima** and **gracilicornis**) (p. 132)
(18) 15. Hind femora flattened on the inside and angulated near the base.
(17) 16. Second to fourth joints of the tarsi pale ferruginous; apical portion of the stipites more or less lamelliform, much longer than wide (Fig. 98). **setigera** Arn. race **coloripes** Arn. (p. 129)
(16) 17. Tarsi blackish above, reddish brown below; apical portion of the stipites very short, triangular, wider than long (Fig. 97 *a*). **radialis** Sauss. (p. 127)
(15) 18. Hind femora not angulated near the base.
(24) 19. Stipites of the genitalia as in 14 (*a*).
(23) 20. Tarsi blackish.
(22) 21. Wings strongly tinged with yellowish brown; genitalia, Fig. 100 *b*. **brunnipennis** Arn. (p. 130)
(21) 22. Wings smoky hyaline, the apical margin darker; genitalia, Fig. 101 *a*. **scabriuscula** Arn. (p. 131)
(20) 23. Tarsi, excepting the apical joint, more or less ferruginous. **alaris** Sauss. (p. 125)
(19) 24. Stipites of the genitalia as in 14 (*b*).
(26) 25. Dorsum of the epinotum finely and closely reticulate-rugose, one-fourth wider at the base than long; flagellum not very slender, the second joint twice as long as wide at the apex. **minima** Arn. (p. 132)
(25) 26. Dorsum of the epinotum regularly and finely reticulate, the transverse threads somewhat emphasized, the outer fourths covered with long, decumbent whitish pubescence. Second joint of the flagellum three times longer than wide at the apex. **gracilicornis** Arn. (p. 132)

Liris (subgen. **Motes**) **solstitialis** Sm. (Fig. 91)

Cat. Hymen. Brit. Mus. IV, p. 283, ♀, 1856;
Arnold, *Ann. Transv. Mus.* IX, p. 238, ♀, ♂, 1923

Notogonia femoralis Sauss., *Soc. Entom.* II, p. 17, ♀, 1887.
N. femoralis Sauss., *Hist. Madag.* XX, p. 502, 1892.

The collection contains 6 ♀♀ and 2 ♂♂. In both sexes the wings are a little darker than in the continental form, tinged with yellowish brown instead of clear yellow, but otherwise there is no difference between the ♂♂. The ♀♀ have the vertex slightly narrower, the interocular distance there being equal to the length of the second joint of the flagellum plus one-third of the first, whereas in the specific form it is equal to the length of the second joint plus one-half of the first. These differences are hardly sufficient to justify subspecific rank for the Madagascan specimens.

Bekily, November–May.

The prey consists of Gryllidae.

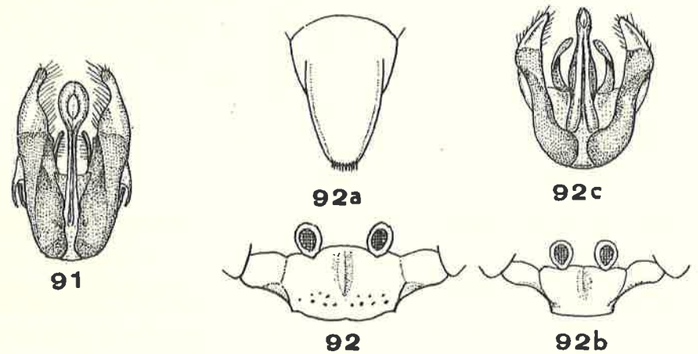


Fig. 91. *Liris* (*Motes*) *solstitialis* ♂, genitalia, ×24.
Fig. 92. *Liris* (*Motes*) *xanthoptera* ♀, clypeus, ×*c.* 14; *a*, pygidium, ×*c.* 14; *b*, ♂, clypeus, ×*c.* 14; *c*, genitalia, ×24.

Liris (subgen. **Motes**) **xanthoptera** n.sp. (Figs. 92, 92 *a–c*)

♀. 12–14 mm. long. Black. Mandibles fusco-ferruginous in the middle. Wings flavo-hyaline, the apical margin faintly and narrowly fuscous. Clypeus and face with a fine, decumbent and brownish grey pubescence. The short exserted pubescence on the mesopleura and epinotum is also of that colour. First three tergites with narrow apical fasciae of cinereous pubescence. Clypeus, face, vertex, mesothorax and metanotum dull, almost reticulate-punctate, the punctures on the mesonotum slightly larger than on the scutellum, the clypeus with a few large punctures behind the anterior third, the epimerum and upper half of the sternum of the mesopleura with a rather coarse reticulate rugosity superimposed. Metapleura dull, strongly and obliquely rugose. Dorsum of the epinotum dull, finely, evenly and closely rugose transversely, the rugae not extending over the outer fourths of the width, being replaced there by about twelve costae; the declivity slightly shining, transversely and not closely costate, the sides dull, exceedingly finely and closely punctured, their anterior third and posterior margins with an oblique rugosity superimposed.

Tergites 1–5 and sternites 1–3 dull, microscopically and closely punctured, the pygidial area coarsely and closely, the fifth and sixth sternites sparsely and coarsely punctured and shining. Clypeus three times wider than long in the middle; the median area distinctly produced, subcarinate medially over the basal two-thirds, the anterior margin feebly convex and subrectangular at the corners. Interocular distance at the bottom of the eyes three times as great as across the vertex, where it is equal to the length of the second joint of the flagellum. Second joint of the flagellum nearly twice as long as the first, as long as the third and nearly three times longer than wide at the apex. Pronotum depressed, its dorsum linear. Dorsum of the epinotum distinctly narrowed caudad, nearly one-fourth wider at the base than at the convex hind margin, as long as wide at the base, with a median longitudinal carina on the basal half and a shallow median depression on the apical half. Pygidial area triangular, nearly 1½ times longer than wide at the base, the apex broad and fringed with ten brown spines. Anterior metatarsi with four spines on the outer margin. The distance between the recurrent veins on the cubitus is variable, being usually less than half the length of the second abscissa of the radius, but in one specimen it is as long and in two others the recurrent veins are almost contiguous.

♂. 12 mm. long. Wings more deeply infuscated than in the ♀, the infuscation extending basad as far as the pterostigma and the first transverse cubital vein. Pubescence on the face grey. Mesonotum with a fundamental and close puncturation, barely visible under a magnification of less than 50 diameters, on which is superimposed a fine reticulation. Dorsum of the epinotum more strongly rugose than in the ♀ and with stronger transverse anastomoses, or almost reticulate; the sides of the epinotum obliquely and fairly strongly rugose over their whole extent. Sternites dull, finely and very closely punctured. Otherwise like the ♀ in colour, sculpture and pubescence.

Clypeus 3⅓ times wider than long in the middle, the median area narrower in front than behind, its apical margin nearly straight. Interocular distance at the bottom of the eyes 2½ times greater than across the vertex, where it is equal to the length of the first two joints of the flagellum. The second joint of the flagellum is five-eighths longer than the first, as long as the third and twice as long as wide. Dorsum of the epinotum a little wider at the base than long in the middle. Otherwise like the ♀.

Bekily and Fort Dauphin, 5 ♀♀, 2 ♂♂. November–May.

The prey taken with two specimens consists of crickets. Allied to *irrorata* Sm. but smaller, with paler wings, wider vertex and much stronger puncturation of the thorax and closer rugosity on the epinotal dorsum.

Liris (subgen. **Motes**) **avellanipes** Sauss. (Figs. 93, 93 *a–c*)

Bull. Soc. Ent. Suisse, VIII, p. 261, ♀, 1891; *Hist. Madag.* XX, p. 508, ♀, ♂, 1892

♀. 12–14 mm. long. Femora and tibiae red, the tarsi reddish brown, the anterior femora sometimes infuscated for a short distance at the base. Anterior third of the clypeus shining, less closely punctured than the rest of the clypeus and the face and vertex, which are closely and very finely so (30 diameters). Scutellum and metanotum punctured like the vertex. Mesonotum microscopically and transversely rugulose-punctate. Dorsum of the epinotum with a fundamental, microscopic and reticulate-punctate sculpture on which is superimposed a transverse rugosity, stronger and less close in front than behind, fading away laterad, the lateral margins behind the stigmata with about nine transverse costae, the sides of the declivity with about twelve costae which become successively shorter ventrad and do not extend over much more than the outer fourths; the median part closely and transversely rugulose. The sides of the epinotum are very closely punctured (50 diameters) and have traces of an oblique striation. Second sternite and apical half of the third dull, microscopically and transversely rugulose-punctate, the basal half of the third smooth and slightly

shining, the fourth to sixth shining, the fourth and fifth sparsely and coarsely punctured in their apical half, the sixth more finely and fairly closely punctured all over.

Clypeus three times wider than long, the median area with a small median excision on its feebly convex apical margin. Inferior interocular distance nearly three times as great as the superior, the latter equal to the length of the second joint of the flagellum. The second joint is a little shorter than the third and 2½ times longer than wide at the apex. Pronotal collar depressed and linear above. Dorsum of the epinotum narrowed caudad, two-fifths wider at the base than at the hind margin, as long as wide behind, the lateral margins of the dorsum and declivity rounded, not marginate. First three tergites with apical fasciae of silvery pubescence which are wider in the middle than at the sides. Pygidial area nearly 1½ times longer than wide at the base, its lateral margins feebly convex, the apical margin wide and armed with four brown spines; the area is closely covered with short, fawn-coloured setae, excepting the base in the middle which like the rest of the pygidium is shining and impunctate. Anterior tibiae without spines on the outside.

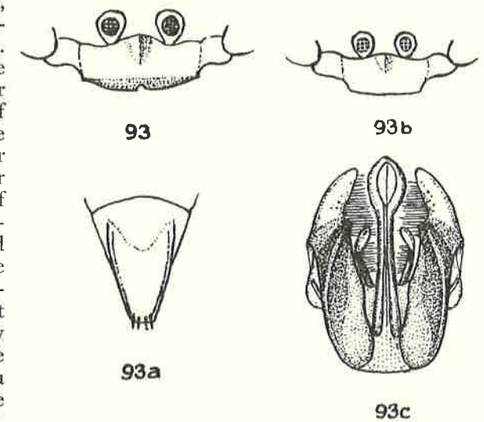


Fig. 93. *Liris* (*Motes*) *avellanipes* ♀, clypeus, × 16; *a*, pygidium, × 16; *b*, ♂, clypeus, × 16; *c*, genitalia, × 35.

♂. 7–10 mm. long. All the sternites dull, closely and microscopically punctured, otherwise like the ♀ in colour, sculpture and pubescence. Clypeus a little more than three times wider than long in the middle. Inferior interocular distance 2½ times greater than the superior, the latter equal to the length of the first two joints of the flagellum. The second joint of the flagellum is nearly one-third longer than the first, nearly twice as long as wide and about as long as the third. Dorsum of the epinotum a trifle longer than wide at the apex and one-fifth wider at the base than at the apex. Otherwise like the ♀.

Behara, 1 ♀, 2 ♂♂; Bekily, 2 ♀♀. January–April.

Saussure records a variety in which the black colour at the base of the legs is more extensive. Taking this into consideration and his statement that the epinotum of *dyscheira* has exactly the same sculpture as *avellanipes*, it becomes evident that the descriptions of the two species are almost interchangeable. However, of *avellanipes* he remarks that the dorsum of the epinotum has a raised median area bounded at the sides by indistinct intrastigmal grooves (U-shaped groove). The ♀♀ described above appear to show this feature, but although the surface laterad is somewhat lower than the middle, the grooves are illusory, their presence being suggested by the abrupt termination mesad of the decumbent greyish pubescence which covers the lateral margins.

Liris (subgen. **Motes**) **dyscheira** Sauss. (Figs. 94, 94 *a–c*)

Hist. Madag. XX, p. 510, ♀, 1892

♀. 12–13 mm. long. Black. Mandibles, femora and tibiae ferruginous, the basal half of the anterior femora and the basal third, more or less, of the middle and hind femora, black. Tarsi dark brown, the basal joint almost black.

Clypeus, face, vertex and mesothorax dull, microscopically and closely punctured, the

interspaces as wide as the punctures, a little wider on the scutellum. Dorsum of the epinotum reticulate-rugose, the transverse rugae emphasized but attenuated laterad and caudad, with a longitudinal median carina which nearly reaches the hind margin. The outer fourths of the dorsum, caudad of the stigmata, are rather coarsely and transversely rugose. The sides of the epinotum finely, closely and obliquely rugose, the rugae strongest in front below, the interspaces microscopically reticulate-punctate, the declivity transversely rugose or almost costate at the sides and bounded at its lateral margins by a carina. Tergites without distinct apical pubescent fasciae, the first five slightly shining, microscopically and closely punctured, the pygidial area closely and fairly coarsely punctured. Second sternite dull at the base, slightly shining in the middle of the apical half and finely punctured. Third to sixth sternites shining, sparsely and coarsely punctured. Inferior interocular distance not quite three times greater than the superior, the latter equal to the length of the second joint of the flagellum plus half of the first. Clypeus 3¼ times wider than long in the middle, the median area distinctly produced, the anterior angles rounded, the apical margin straight. Second joint of the flagellum twice as long as wide at the apex and half as long again as the first.

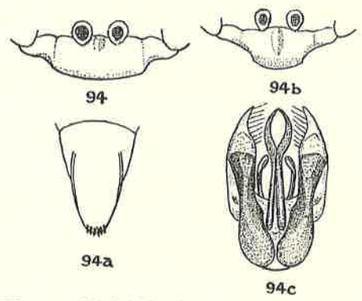


Fig. 94. *Liris* (*Motes*) *dyscheira* ♀, clypeus, ×14; *a*, pygidium, ×14; *b*, ♂, clypeus, ×14; *c*, genitalia, ×24.

Pronotal collar depressed and linear above. Dorsum of the epinotum narrowed caudad, nearly one-third wider at the base than at the hind margin, not quite so long as wide at the base, the hind margin defined by a high carina. Pygidial area narrow, two-thirds longer than wide at the base, covered with coarse, short and yellowish pubescence, the apical margin rounded and fringed with six brown spines. Anterior tibiae not spinose on the outside.

♂. 9–10 mm. long. The silvery grey pubescence on the clypeus and face longer and denser than in the ♀, the mesonotum with a thin grey pubescence at the sides and in the middle. First three tergites with very inconspicuous apical fasciae of grey pubescence. Dorsum of the epinotum more strongly sculptured than in the ♀, the transverse rugae reaching the lateral margins, the sides strongly rugose, the declivity almost as strongly so as the sides. Sternites nitidulous, microscopically and closely punctured, the fifth and sixth a little more strongly punctured laterad and caudad. Otherwise like the ♀ in colour and sculpture.

Inferior interocular distance 2½ times greater than the superior, the latter nearly equal to the length of the first two joints of the flagellum. Clypeus more produced than in the ♀, three times wider than long in the middle, the anterior margin of the median area feebly convex. Dorsum of the epinotum as long as wide at the hind margin, one-seventh wider at the base than at the hind margin. Otherwise like the ♀.

Bekily, 1 ♀, 4 ♂♂, April–May; Ivondro, 1 ♂, January.

Allied to *avellanipes* from which it differs by the sculpture of the thorax and the more produced median area of the clypeus, and very distinctly by the shape of the genitalia. More closely allied to *erythropyga* Arn. from which it differs by the closer puncturation of the mesonotum, the closer rugosity of the epinotum and by the colour of the legs and apex of the abdomen. In *erythropyga* ♂ the vertex is wider, the inferior interocular distance being only twice as great as the superior.

Alaris group, femora and tibiae black

Section A. *Pygidial area setose or pubescent*

Liris (subgen. **Motes**) **alaris** Sauss. (Figs. 95, 95 *a*)

Hist. Madag. xx, p. 503, ♀, ♂, 1892

♀. 12–13 mm. long. Black. Tarsi red or brownish red, the apical half of the fifth joint dark brown. Apical third of the clypeus shining, finely and sparsely punctured; the rest of the clypeus, face, vertex, mesonotum, scutellum and metanotum closely and very finely punctured, the mesopleura microscopically rugulose and with a fine and sparse puncturation superimposed. Dorsum of the epinotum with a median longitudinal carina on the basal third, beyond which it is shallowly impressed to the apical margin, fairly closely and transversely rugulose, the rugae connected by numerous anastomoses, so that viewed in the transverse direction the surface appears to be finely reticulate-punctate. The sides of the epinotum are obliquely and more closely rugulose than the dorsum; the declivity is transversely rugose, its upper corners and the posterior corners of the dorsum costate. The puncturation of the sternites is like that of *antaca*.

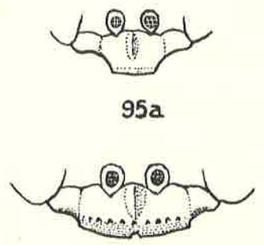


Fig. 95, *a*. *Liris* (*Motes*) *alaris*, ♀, ♂, clypeus, ×16.

Inferior interocular distance 3¼ times greater than the superior, the latter equal to a little more than the length of the second joint of the flagellum. Clypeus 2⅔ times wider than long, the median area distinctly produced and subcarinate medially over the basal two-thirds and with a row of large punctures behind the anterior third, its anterior margin feebly convex and shallowly excised in the middle. Second joint of the flagellum twice as long as the first, as long as the third, 2⅔ longer than wide at the apex.

Pronotal collar depressed and linear above. Dorsum of the epinotum narrowed caudad, half as wide again at the base as at the apex and as long as wide at the apex. Pygidial area V-shaped, the apex widely rounded, covered with dark brown setae, one-fifth longer than wide at the base, the apical margin fringed with ten brown spines.

♂. 9–10·5 mm. long. Sternites dull, very finely and closely punctured, the puncturation on the following sternites becoming progressively larger on each segment. Inferior interocular distance a little less than three times greater than the superior, the latter equal to the length of the first two joints of the flagellum.

Clypeus three times wider than long, the median area more strongly produced than in the ♀. Second joint of the flagellum twice as long as wide at the apex, about as long as the third. Dorsum of the epinotum as long as wide at the apex, more narrowed caudad than in the ♀, the width at the base being fully 1½ times the width at the hind margin. Otherwise like the ♀. In the ♀ the recurrent veins are contiguous on the cubitus, without forming a distinct petiole, and in the ♂ they are not quite contiguous. In both sexes the external face of the hind femora is more sharply punctured than in the other species of this group.

Antananarivo and Anosibé: Rogez, 2 ♂, 1 ♂. January and April.

L. (*Motes*) *felina* Arn.* should be considered a race of this species, the genitalia being identical. It differs from the specific form as follows. ♀. Pygidial area covered with greyish fawn coloured setae, intermixed with long, exserted blackish hairs. Tarsi of a paler red.

* *Ann. Transv. Mus.* ix, p. 247, 1923 and xiii, Fig. 18, p. 396, 1929. The figure of the genitalia is not quite accurate, as the fringe of hairs on the inner margin of the stipites ends some distance before the apex.

Dorsum of the epinotum less closely and more sharply rugulose, the rugae not connected by anastomoses. Inner orbits more divergent below, the inferior interocular distance being $3\frac{1}{2}$ times greater than the superior. The latter is equal to the length of the second joint of the flagellum. The recurrent veins meet before joining the cubitus, forming a short petiole to the discoidal cell.

♂. Colour of the tarsi and sculpture of the epinotum as in the other sex.

It is unfortunate that to conform to the law of priority *felina* must be reduced to subspecific rank, instead of *alaris*, since it is very evident that the island form is younger and a derivative of the continental one.

Liris (subgen. **Motes**) **antaca** Sauss.

'*ancara*', *Mitt. Schweiz. Ent. Ges.* VIII, p. 260, 1890; *Hist. Madag.* XX, p. 505, ♀, 1892.

♀. 14–15 mm. long. Face, vertex, scutellum and metanotum microscopically and closely punctured, the mesonotum and mesopleura microscopically and transversely rugulose-punctate. Anterior third of the clypeus shining, more strongly and less closely punctured than the basal part, which is punctured like the face. Dorsum of the epinotum transversely and not closely rugose, the rugae thin, and in the posterior half arcuate cephalad, the interspaces shallowly and closely punctured, the posterior corners with about five costae which do not extend mesad beyond the outer fourths. The sides of the epinotum dull, closely and very finely rugulose, the declivity dull, closely and transversely striato-rugose. First three sternites dull, microscopically rugulose-punctate, the fourth to sixth shining, the fourth finely and fairly closely punctured and with a few larger punctures behind the apical margin, the fifth sparsely and coarsely except over the posterior angles where it is finely punctured. The sixth is closely punctured, the punctures about half as large as those of the fifth.

Inferior interocular distance $2\frac{2}{3}$ greater than the superior, the latter equal to the length of the second joint of the flagellum plus two-thirds of the first. Clypeus three times wider than long, the anterior margin feebly convex. Second joint of the flagellum a little shorter than the third, nearly two-thirds longer than the first and $2\frac{1}{4}$ times longer than wider at the apex. Pronotal collar depressed, linear above. Dorsum of the epinotum one-fifth wider at the base than at the hind margin, as long as wide at the hind margin. First three tergites with silvery pubescent fasciae; pygidial area U-shaped, about two-thirds longer than wide at the base, covered with long, brownish fawn coloured pubescence, the apical margin fringed with eight or nine brown spines.

Behara, 2 ♀♀. November.

The shape of the pygidial area and the dense silky pubescence on it are very distinctive of this species. *Motes transvaalensis* Cam. (=*griseola* Arn.) should be considered a race of this species, having the pygidium exactly the same. It differs from the specific form as follows:

Tarsi and spines of the legs black. Fourth tergite, as well as the first three tergites, with silvery apical fascia. Inner orbits more divergent below, the inferior interocular distance being a little more than three times greater than the superior, and the latter equal to the length of the second joint of the flagellum. Dorsum of the epinotum less closely and more finely rugose, the rugae straight and fading away laterad; shorter than in the specific form, the length being only five-sixths of the width at the hind margin.

Liris (subgen. **Motes**) **Radamae** Sauss.

Mitt. Schweiz. Ent. Ges. VIII, p. 260, ♂, 1891; *Hist. Madag.* XX, p. 507, ♀, ♂, 1892

This is undoubtedly a mixed species, for not only does Saussure say that the pygidium is covered with black *or* red pubescence, but also that the epinotum may be striate or

coriaceous, a degree of variation which is most improbable in the species of this genus. In addition, he lists four varieties, based on the colour of various parts. Without an examination of the actual specimens on which Saussure's description was based, it would be unwise to designate a lectotype, and therefore I propose to ignore this species. It is highly probable that Saussure's material includes, inter alia, the smaller examples of the species described below as *incerta* and also ♀♀ of *radialis*.

Liris (subgen. **Motes**) **incerta** n.sp. (Figs. 96, 96 *a*)

♀. 10·5–12·5 mm. long. Black. Mandibles fusco-ferruginous. The anterior tarsi and the basal joint of the middle and hind tarsi blackish brown, the remaining joints reddish brown above, paler or reddish below. Wings hyaline, tinged with brownish yellow, the apical margin narrowly darker, the veins blackish. Clypeus and face with silvery pubescence; thorax, first five tergites and the legs with a cinereous pubescence, the first three tergites with very distinct apical fasciae of silvery pubescence. Pygidium densely covered with fawn-coloured setae. Face, clypeus, vertex, scutellum and metanotum microscopically and closely punctured, the mesonotum, mesopleura and metapleura microscopically transversely rugulose-punctate. Dorsum of the epinotum with a very shallow, close and fine puncturation, on which is superimposed a transverse, fairly sparse and thin rugosity, which fades away laterad and caudad, the posterior half of the lateral margins transversely costate, the costae not extending inwards beyond the outer fourths, carinate lengthwise in the middle, the carina not reaching the hind margin. Sides of the epinotum opaque, obliquely rugulose on the anterior half, the declivity transversely and closely rugose, its upper corners costate. Tergites 1–5 and sternites 2 and 3 microscopically and transversely rugulose, the remaining sternites shining, sparsely and coarsely punctured.

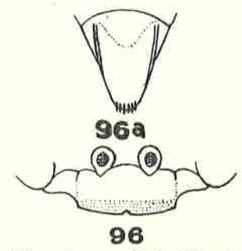


Fig. 96, *a*. *Liris* (*Motes*) *incerta* ♀, clypeus and pygidium, × 14.

Clypeus $3\frac{1}{3}$ times wider than long, the apical margin of the median area feebly convex and with a small median excision. Inferior interocular distance three times greater than the superior, the latter nearly equal to the length of the second joint of the flagellum plus half of the first. The second joint is as long as the third, two-thirds longer than the first and a little more than twice as long as wide. Pronotal collar depressed and linear above. Dorsum of the epinotum moderately narrowed caudad, about one-fourth wider at the base than at the apex, as long as wide at the apex. Pygidial area broadly V-shaped, rounded at the apex, half as long again as wide at the base, the apex fringed with six brown spines; the base of the pygidium smooth and shining.

Bekily, Rogez, Ranomafana and Behara, 14 ♀♀. November–June.

Allied to *radialis*, but on the average a larger insect. It can be distinguished at a glance from *radialis* in having the fourth sternite shining and sparsely punctured and in the sculpture of the epinotal dorsum, in which anastomoses between the transverse rugae are lacking. The prey taken with most of the specimens consists of median-sized Gryllidae, but the prey of one of them is a *Gryllotalpa* many times bulkier than its captor.

Liris (subgen. **Motes**) **radialis** Sauss. (Figs. 97, 97 *a*)

Soc. Entom. II, p. 17, ♂, 1887; *Hist. Madag.* XX, p. 506, ♂, 1892; Arnold, *Ann. Transv. Mus.* XX, p. 123, 1940

♀. 8·5–11 mm. long. Black. The second to fifth joints of the tarsi dark brown above, more or less reddish below. Mandibles fusco-ferruginous in the middle. Wings hyaline,

tinged with fuscous, the apical margin slightly darker. Pubescence on the clypeus, face and of the apical fasciae of the first three tergites, greyish silvery. Pygidial area covered with fawn-coloured setae and a few exserted brownish bristles, the apical margin fringed with six to eight brown spines.

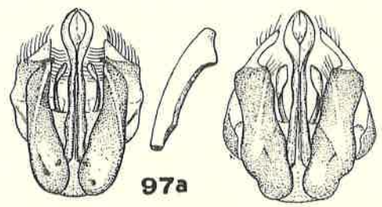


Fig. 97. *Liris* (*Motes*) *radialis* ♂, genitalia, ×30; *a*, left hind femur, ×14.
Fig. 98. *Liris* (*Motes*) *setigera* race *coloripes* ♂, genitalia, ×24.

Anterior fourth of the clypeus shining, finely and sparsely punctured, the rest of the clypeus, face, vertex, scutellum and metanotum closely and microscopically punctured, the mesonotum and mesopleura microscopically and transversely rugulose-punctate. Dorsum of the epinotum with fairly widely separated thin and transverse rugae and also with somewhat stronger longitudinal ones which are more distinct when the segment is viewed lengthwise than transversely, the interspaces opaque, carinate in the middle; the lateral margins behind the stigmata are not rounded but defined by an irregular carina and the posterior corners are transversely costate. The declivity of the epinotum is microscopically reticulate-punctate, transversely costate in the upper corners and also with several short rugae extending fan-wise upwards from the bottom. Second to fourth sternites dull, microscopically and transversely rugulose, the fifth sternite shining, coarsely and sparsely punctured in the apical half, the sixth shining, coarsely and closely punctured. The pygidium smooth and shining at the base, densely punctured in the setigerous area. Inferior interocular distance three times greater than the superior, the latter equal to slightly more than the length of the second joint of the flagellum.

Clypeus $3\frac{1}{3}$ times wider than long, the anterior margin nearly straight, feebly excised in the middle. Second joint of the flagellum a little more than twice as long as wide at the apex, the third joint one-third longer than the second. Pronotal collar depressed, linear above. Dorsum of the epinotum about one-third wider at the base than at the hind margin, as long as wide at the hind margin. Pygidial area widely V-shaped, one-fourth longer than wide at the base, the apex narrowly rounded.

♂. 6·5–8·5 mm. long. Tarsi darker on the underside than in the ♀, reddish brown. First three tergites (not the first four as stated in Saussure's description) with apical fasciae of silvery pubescence. All the sternites dull, microscopically rugulose. The longitudinal rugae on the epinotal dorsum feebly developed, almost obsolete. Otherwise like the ♀ in colour and sculpture.

Inferior interocular distance nearly $2\frac{1}{2}$ times greater than the superior, the latter equal to a trifle more than the length of the first two joints of the flagellum. Clypeus $3\frac{1}{3}$ times wider than long, not excised in the middle. Second joint of the flagellum not quite twice as long as wide at the apex. Dorsum of the epinotum two-sevenths wider at the base than at the apex. Posterior femora flattened on the inside and angulated near the base.

Bekily, Rogez, Ivondro and Perinet, 19 ♀♀, 23 ♂♂. October–February.

The form with red tarsi, which Saussure referred to as a variety, is a different species, *setigera* Arn. race *coloripes* Arn. q.v. infra.

The synonymy which I proposed in regard to this species and *antaca* (*Ann. Transv. Mus.* XIII, p. 394, 1929) is proved wrong. The species which I originally described as *sepulchralis* Gerst. is *setigera*, and neither that species nor *antaca* can be synonymized with *radialis*.

Liris (subgen. **Motes**) **setigera** Arn. race **coloripes** Arn. (Fig. 98)
Ann. Transv. Mus. XX, p. 123, ♂, 1940

♂. 7–9 mm. long. Black. Mandibles fusco-ferruginous in the middle. Tarsi pale ferruginous, the apical joints brown, the basal joint of the anterior pair more or less blackish at the base. Pubescence of the clypeus and face yellowish silvery; first three tergites with apical fasciae of yellowish grey pubescence, the seventh with similar pubescence all over. The transverse rugae on the epinotal dorsum are thinner, closer together and less wavy than in *radialis*, the lateral margins of the dorsum and of the upper part of the declivity are less strongly costate, and their junction with the sides of the epinotum is rounded. Otherwise the sculpture is like that of *radialis*. The proportions of the clypeus and the interocular distances are nearly the same as in *radialis*, the clypeus being $3\frac{3}{4}$ times wider than long, and the divergence of the inner orbits only a little less, the inferior interocular distance being a little more than $2\frac{1}{3}$ times greater than the superior; the latter is equal to a little more than the length of the first two joints of the flagellum. The median area of the clypeus is, however, different, its anterior margin being straight, and subrectangular at the anterior corners, whereas in *radialis* the anterior margin is feebly convex and rounded at the corners. The dorsum of the epinotum is slightly less narrowed caudad than in *radialis*. Hind femora as in *radialis*. The genitalia differ considerably, the membranous apical part of the stipes being long and narrow, whereas in *radialis* it is short and triangular; the stiff hairs on the stipes are also different.

Behara, 2 ♂♂. November.

The ♀ is unknown, but it is hardly likely to differ from the specific form except in the colour of the tarsi.

Liris (subgen. **Motes**) **dejecta** n.sp. (Figs. 99, 99 *a*)

♀. 12 mm. long. Black. Mandibles, extreme apex on the inside of the anterior tibiae and all the tarsi dark ferruginous. Wings hyaline, the veins dark brown. Pubescence on the face and thorax greyish white. First three tergites with inconspicuous apical fasciae of dull silvery pubescence. Pygidial area with short reddish yellow setae, the apex with a row of six or seven short spines. Clypeus, face, vertex, mesothorax and metanotum microscopically and closely punctured, the punctures on the mesopleura very shallow. Dorsum of the epinotum with a shallow reticulate-punctate sculpture, on which is superimposed a fine, sparse and transverse rugosity, strongest mesad, fading out laterad, also costate behind the stigmata, the costae not extending inwards beyond the outer fourths, the declivity transversely costate, strongest laterad, the sides of the epinotum finely, closely and obliquely rugose, the rugae becoming almost obliterated in the posterior half. Fifth tergite finely and closely punctured, the pygidial area strongly punctured, first three sternites dull and transversely rugulose, the fourth microscopically and closely punctured and dull, the fifth and sixth shining, coarsely and sparsely punctured.

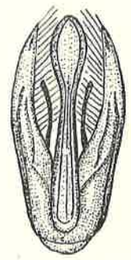


Fig. 99. *Liris* (*Motes*) *dejecta* ♀, clypeus, ×16; *a*, ♂, genitalia, ×36.

Clypeus four times wider than long, the median area moderately produced, its anterior margin almost straight, feebly excised in the middle, the lateral angles subrectangular. Inferior interocular distance four times greater than the superior, the latter equal to a little less than the length of the second joint of the flagellum. The second joint of the flagellum is as long as the third, three-fifths

longer than the first and two-thirds longer than wide at the apex. Pronotum depressed, linear above. Dorsum of the epinotum two-fifths wider at the base than at the apex and as long as wide at the apex. Pygidial area triangular, the apex rounded. Second abscissa of the radius nearly as long as the third, the space between the recurrent veins on the cubitus narrow, or about half as long as the second abscissa of the radius.

♂. 10 mm. long. Extreme apex of the tibiae ferruginous, as in the ♀. Tarsi blackish brown, the apices of the first three joints ferruginous. Wings hyaline, the apical margin beyond the cells faintly smoky. Pubescence as in the ♀. Sixth sternite slightly shining, the rest of the abdomen dull. Otherwise the sculpture is like that of the ♀ but very much finer. The punctures on the head and mesothorax are barely resolvable with a magnification of less than 35 diameters, and the transverse rugosity on the epinotal dorsum is almost obsolete, except at the base. Clypeus three times wider than long, the median area like that of the ♀ but the anterior margin is slightly convex and not excised in the middle. Inferior interocular distance $3\frac{2}{3}$ times greater than the superior, the latter equal to a little less than the length of the second joint of the flagellum. The latter is as long as the third, twice as long as the first and a little more than twice as long as wide at the apex. Dorsum of the epinotum about $1\frac{1}{2}$ times wider at the base than at the apex, and as long as wide at the apex. Second abscissa of the radius shorter than in the ♀, about one-third as long as the third abscissa and equal to the space between the recurrent veins on the cubitus.

Bekily, 1 ♀, 2 ♂♂. December–January.

Allied to *alaris*. The genitalia resemble those of *M. flavitincta* Arn. but that species has the pygidial area glabrous, and is larger.

Liris (subgen. **Motes**) **brunnipennis** n.sp. (Figs. 100, 100 *a*, *b*)

♂. 11–14 mm. long. Black. Mandibles, apical third of the basal joint and the whole of the remaining joints of the tarsi, ferruginous. Wings hyaline, strongly tinged with yellowish brown, slightly paler at the base, the apical margin very little darker than the rest of the wing. Pubescence of the clypeus and face silvery, of the thorax yellowish grey and short and scanty; the first three tergites with narrow apical fasciae of greyish silvery pubescence. Pygidial area with fulvous setae, the apical margin with eight long blackish spines.

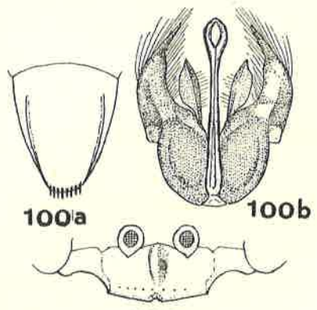


Fig. 100. *Liris* (*Motes*) *brunnipennis* ♀, clypeus, × 14; *a*, pygidium, × 14; *b*, ♂, genitalia, × 24.

Clypeus, face, vertex, mesonotum, scutellum and metanotum microscopically and closely punctured, almost reticulate-punctate, the mesopleura very finely rugulose. Dorsum of the epinotum with widely separated transverse rugae, connected here and there by anastomoses, the interspaces dull, longitudinally carinate in the middle, the outer fourths, behind the stigmata, with about seven or eight transverse costae, the lateral margins of both dorsum and declivity carinate. The sides of the epinotum are dull, their posterior half obliquely and sparsely rugose, the declivity feebly and transversely rugose and with a few rugae at the bottom diverging fan-wise. Sternites 1–4 dull, microscopically rugulose, the first strongly rugose lengthwise over a median triangular area, the fifth sternite shining and rugulose on the basal half and closely, finely punctured over the apical half, the sixth sternite shining, closely and coarsely punctured.

Clypeus nearly $3\frac{1}{2}$ times wider than long, the median area moderately produced, about one-third wider in front than long, its anterior margin almost straight, distinctly excised

in the middle, the anterior corners rectangular. Inferior interocular distance $3\frac{1}{3}$ times greater than the superior, the latter equal to the length of the second joint of the flagellum. The flagellum is more slender than in any of the preceding species, all the joints excepting the first two being fully four times longer than wide; the second joint is twice as long as the first and nearly three times longer than wide at the apex and the third is one-fourth longer than the second. Pronotum depressed, linear above. Dorsum of the epinotum about one-fourth wider at the base than at the hind margin and nearly as long as at the hind margin. Pygidial are broadly triangular, half as long again as wide at the base, rounded at the apex.

♂. 8·3–12 mm. long. Tarsi black, the apices of the joints slightly rufescent. All the sternites dull; the median longitudinal carina on the epinotum much stronger than in the ♀, otherwise like the ♀ in colour, sculpture and pubescence, but with the puncturation of the head and mesothorax somewhat finer, that of the mesonotum approaching the transversely rugulose-punctate condition.

Clypeus $3\frac{3}{4}$ times wider than long, the median are nearly $1\frac{1}{2}$ times wider in front than long. Inner orbits less divergent below than in the ♀, the inferior interocular distance being only $2\frac{2}{3}$ greater than the superior, the latter equal to a little less than the length of the second joint of the flagellum. The second joint is as long as the third, nearly twice as long as the first and fully twice as long as wide at the apex; the third and following joints are about three times longer than wide. Dorsum of the epinotum about one-fourth wider at the base than long.

In both sexes the epinotal dorsum is margined caudad by a high and trenchant carina.

Bekily, 9 ♀♀, 14 ♂♂. November–May.

The prey consists of immature Gryllacridae. The genitalia are not unlike those of *alaris*, but in that species the outer paramera are not fringed with long hairs.

Liris (subgen. **Motes**) **scabriuscula** n.sp. (Figs. 101, 101 *a*)

♂. 7 mm. long. Closely allied to the preceding species, *brunnipennis*, but smaller and with shorter antennal joints and different genitalia. Black, the tarsi and apices of the tibiae also entirely black. Wings not quite so strongly tinged with brown as in *brunnipennis*. Mandibles ferruginous. Apical third of the median area of the clypeus shining, finely and sparsely punctured, otherwise the puncturation of the head and mesothorax is like that of *brunnipennis*, but finer relative to the smaller size. The dorsum of the epinotum has a transverse rugosity more widely spaced than in *brunnipennis* but stronger, and over the median third of the width of the segment the anastomoses are thicker and more continuous, forming broken longitudinal rugae; the lateral margins of the dorsum are bounded by a carina, but not so distinct as in *brunnipennis*, and the lateral costae and the median longitudinal carina are weaker. The sculpture of the rest of the epinotum and of the abdomen is like that of *brunnipennis*.


101

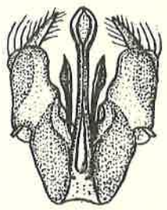

101a

Fig. 101. *Liris* (*Motes*) *scabriuscula* ♂, clypeus, × 20; *a*, genitalia, × 35.

Clypeus about $3\frac{1}{2}$ times wider than long, the median area $1\frac{1}{2}$ times wider in front than long, the anterior margin feebly convex and rectangular at the anterior corners. Inferior interocular distance $2\frac{1}{4}$ times greater than the superior, the latter equal to a little more than the length of the first two joints of the flagellum. The flagellum is less slender than in *brunnipennis*; the second joint is as long as the third, twice as long as wide at the apex and the third and following joints are only slightly more than twice as long as wide. Pronotum depressed, linear above. Dorsum of the epinotum

one-third wider at the base than at the apex and as long as wide at the apex. The membranous apical part of the stipites is much less pilose than in *brunnipennis*, and the lateral bursa a little below the middle of the stipites has a tongue-like process which is absent in the other species.

Bekily, 4 ♂♂. January and April.

Liris (subgen. **Motes**) **minima** Arn.

Ann. Transv. Mus. IX, p. 249, ♀, 1923; XIII, p. 397, ♂, 1929

Behara, 1 ♂, November; Bekily, 1 ♂, March.

Liris (subgen. **Motes**) **gracilicornis** Arn.

Ann. Transv. Mus. IX, p. 250, ♀, 1923; XIII, p. 397, ♂, 1929

Antananarivo, 2 ♂♂; Behara, 1 ♀.

The apical lamelliform part of the stipites is a little more attenuated, otherwise the Madagascan specimens do not differ from the specific form.

Liris (subgen. **Motes**) **nigricans** Wlk. race **reticulata** Sauss.

List. Hymen. in Egypt, p. 21, ♀, 1871

Notogonia reticulata Sauss., *Hist. Madag.* XX, p. 512, ♀, ♂, 1892.
N. palumbula Kohl, *Ann. naturh. (Mus.) Hofmus., Wien*, IX, p. 304, ♂, 1894; Turner, *Ann. Mag. Nat. Hist.* (8), no. 112, p. 319, 1917.

Bekily, 12 ♀♀, 17 ♂♂. November–June.

These differ in no way from the continental *palumbula* Kohl. The latter, and the Indian *Leptolarra reticulata* Cm. (1900), have been reduced by Turner to the rank of subspecies of *nigricans* Wlk. of which there is a co-type in the British Museum. As Saussure's name for the subspecies has priority, a new name is required for the Indian form, for which *indica* is hereby proposed.

SECTION B. *Pygidial area glabrous or very feebly pubescent*

Liris (subgen. **Motes**) **sepulchralis** Gerst.

Mber. Akad. Wiss. Berl. p. 510, ♀, 1857; Peters, *Reise Mossam. Zool.* V, p. 479, ♀, 1862

Notogonia pompiliformis Panz. r. *intermedia* Arnold, *Ann. Transv. Mus.* IX, p. 245, ♀, ♂, 1923.
N. pompiliformis Panz. r. *intermedia* Arnold, *Ann. Transv. Mus.* XIV, p. 396, 1929.
N. pompiliformis Panz. r. *intermedia* Arnold, *Ann. Transv. Mus.* XX, p. 142, 1940.

race **hova** n.subsp.

♀. 7·4–11·5 mm. long. This race differs from the specific form chiefly by the more slender antennae, the more widely divergent inner orbits, the longer epinotal dorsum and the sparsely punctured pygidial area.

Inferior interocular distance $2\frac{5}{8}$ greater than the superior, the latter equal to a trifle more than the length of the second joint of the flagellum. The second joint of the flagellum is a little more than three times longer than wide at the apex. The dorsum of the epinotum is one-sixth wider at the base than long, sometimes slightly less. The pygidial area is more finely and more sparsely punctured than in the continental form.

♂. 6·3–7·7 mm. long. Middle and hind tibiae and all the tarsi reddish brown, the basal joint of the hind pair sometimes darker at the base. In the typical form the basal joint is black, the remaining joints dark brown and all the tibiae entirely black. The inner orbits are more divergent below, the inferior interocular distance being $2\frac{1}{8}$ times greater than the superior, while the latter is equal to slightly more than the length of the first two joints of the flagellum. The second joint is four-fifths longer than the first. The epinotal dorsum, as in the ♀, is longer than in the typical form, being barely one-seventh wider at the base than long. The genitalia do not differ in the two forms.

Bekily and Behara, 11 ♀♀, 24 ♂♂. December–January.

It is to be observed that the variation in size, especially of the ♀♀, is as great as in the continental form.

Liris (subgen. **Motes**) **rufipes** Sauss. (Figs. 102, 102 *a*)

Hist. Madag. XX, p. 511, ♀, 1892

Notogonia Ganahlii Dalle Torre, *Cat. Hymen.* VIII, p. 668, 1897.

♀. 11–13 mm. long. Anterior third of the clypeus shining. Face between the longitudinal tori, and the vertex, nitidulous. Head, pro-mesonotum, scutellum and metanotum microscopically punctured, the interspaces on the mesonotum about twice as wide as the punctures. Meso- and metapleura, sides and declivity of the epinotum opaque. Dorsum of the epinotum closely, transversely and finely rugose, the interspaces feebly reticulate, the posterior corners with about three or four short transverse costae; the declivity is carinate at the lateral margins and is transversely costate, the costae becoming progressively shorter ventrad. Sternites moderately shining, with a very fine and fairly close fundamental puncturation on which is superimposed a larger one, sparse on the third and fourth, largest and fairly sparse on the fifth and closer on the sixth. Pygidial area shining, convex transversely, shallowly and fairly closely punctured at the sides, the punctures largest at the base.

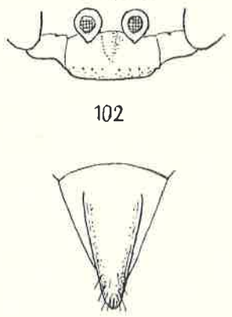


Fig. 102. *Liris* (*Motes*) *rufipes* ♀, clypeus, ×16; *a*, pygidium, ×16.

Clypeus $3\frac{1}{8}$ times wider than long, the median area twice as wide as long, its apical margin almost straight and rounded at the anterior corners. Inferior interocular distance fully four times greater than the superior, the latter four-fifths the length of the second joint of the flagellum. The second joint of the flagellum is one-third longer than the first, a little shorter than the third and twice as long as wide at the apex. Pronotal collar depressed, linear above. Epinotal dorsum rather short, nearly one-third wider at the base than at the apex, as long as wide at the apex. Pygidial area narrow, elongate triangular, twice as long as wide at the base, the apical margin rounded and with three very short spines; on the apical half there are a few exserted hairs and a sparse decumbent pubescence.

Rogez, 2 ♀♀. February and May.

This species bears a superficial resemblance to *Motes thysanomera* Kohl and *erythropyga* Arn. but differs from them, inter alia, in having the pygidial area much narrower and almost glabrous, not setose as in those species. As far as one can judge from the insufficient description, *Larra rufipes* Smith (1858) is a true *Larra*, and it was therefore unnecessary for Dalla Torre to make an emendation to Saussure's name for the species. Saussure's observation that in the unique specimen before him the pronotum is separated from the mesonotum by a deep fissure is misleading. The pronotum is capable of some movement

and sometimes as a result of manipulation while a specimen is being pinned, the pronotum and the mesonotum become spread slightly apart.

Tribe *MISCOPHINI*

In Saussure's monograph no species belonging to this tribe was recorded from the island. In the Seyrig collection there are two species of *Solierella* and three of *Miscophus*. It is, however, very probable that with more intensive collecting some of the other African genera will also be found, especially on the western side of the island, and for that reason the following key to the genera includes all those which are found on the continent.

Key to the genera

(4) 1. Venation greatly reduced, the radial and cubital cells of the fore wing obsolete.

(3) 2. Both discoidal cells obsolete. (Mandibles strongly excised on the outer margin, the inner margin edentate. Episternal suture absent. Anterior tarsi without a comb. Pygidial area absent. Only the proximal part of the cubital vein is present.) **Miscophoides** Brauns

(2) 3. Second discoidal cell obsolete. (Mandibles as in *Miscophoides*; episternal suture absent. A distinct pygidial area present. Fore wing: anal, medial and basal veins complete, the subcostal ends at its junction with the submedial, the proximal portion of the cubitus remains and forms the upper margin of the single discoidal cell; stigma, radial vein, second recurrent vein, cubital, radial and second discoidal cells absent. Hind wing: only the extreme base of the radius is present, medial vein considerably abbreviated, the two being joined in a short curve by the proximal part of the cubitus. Basal lobe obsolete.) **Saliostethoides** Arn.

(1) 4. The radial cell and at least one cubital cell present.

(8) 5. Only one discoidal cell present.

(7) 6. Episternal suture absent. Anterior tarsi without a comb. Fore wing: pterostigma very small, radial cell small and angular at the apex, the transverse cubital vein bounding the cubital cell in the process of resorption; the single recurrent vein enters the cubital cell at about its middle. Hind wing: only the extreme proximal portions of the radial and cubital veins are visible, the basal lobe very small. **Saliostethus** Brauns

(6) 7. Episternal suture distinct. Only the first discoidal cell present. Radial cell appendiculate. (Anterior tarsi without a comb. Pronotal tubercles reaching the tegulae. Middle coxae nearly contiguous. Venation of the hind wing nearly obsolete, only the costal and the base of the submedial being distinct.) **Nitela** Latr.

(5) 8. Two discoidal cells present.

(10) 9. Only one cubital cell present. Middle tibiae with one spur. **Miscophus** Jur. group **Handlirschii** Kohl

(9) 10. Two or three cubital cells present.

(12) 11. Two cubital cells present; second discoidal cell stalked; radial cell not appendiculate. Middle tibiae with one spur. **Miscophus** Jur. (p. 134)

(11) 12. Three cubital cells present, the third sometimes incomplete, owing to the extinction of the third transverse cubital vein. Radial cell appendiculate, second discoidal cell stalked. **Solierella** Spin. (p. 138)

Miscophus Jur.

Nouv. méth. class. Hymén. p. 205, 1807

CHARACTERS. The eyes reach the base of the mandibles and are slightly convergent above. Mandibles with an excision on the outer margin, the inner margin edentate, the apex acute. Palpi rather long. Collar of the pronotum well developed, not depressed below the level of the mesonotum or only slightly so. Episternal suture distinct. Eight visible ventral plates on the abdomen in the ♂.

Fore wing: pterostigma small, radial cell not appendiculate; second cubital cell stalked on the radius, but sometimes owing to the fusion of the second and third transverse cubital

veins the second cubital cell is extinguished; the first recurrent vein enters the first cubital cell and the second recurrent enters the second cubital, or where that is absent, is interstitial with the single transverse cubital vein. Two discoidal cells present, the second stalked; the basal vein originates beyond the end of the first submedial cell.

Hind wing: the cubitus originates far beyond the end of the submedial cell, basal lobe fairly small.

The ♀ has a tarsal comb on the front legs; claws unarmed.

The prey consists of small spiders.

Key to the species, ♀♀ and ♂♂

(4) 1. Body black, tibiae and femora without yellowish white spots.

(3) 2. ♀ and ♂. Pronotal collar short, sloping gradually cephalad from the posterior margin. Mesonotum punctured. **Seyrigi** Arn. (p. 135)

(2) 3. ♀ and ♂. Pronotal collar long, the dorsum convex transversely and lengthwise, about two-thirds wider behind than long; mesonotum longitudinally rugulose. **sordidatus** Arn. (p. 137)

(1) 4. ♀. Head and thorax black, sometimes with a slight aeneous lustre; first three abdominal segments ferruginous, the rest black. ♂. Femora and tibiae with yellowish white spots. **maculipes** Arn. (p. 136)

The pubescence in these three species is simple, but in many African species some of it is composed of tufts of curved hairs, or as in *rhodesianus* Turn. it is long and woolly.

Miscophus Seyrigi n.sp. (Figs. 103, 103 *a–d*)

♀. 5·5 mm. long. Black. In some lights the head and mesonotum have a barely perceptible greenish lustre. Mandibles fusco-ferruginous. Pubescence white, very short and scanty, a little longer on the clypeus.

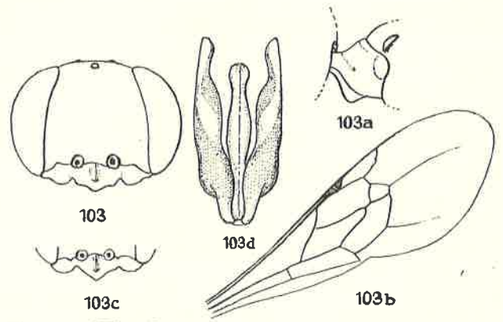


Fig. 103. *Miscophus Seyrigi* ♀, head, × *c.* 14; *a*, pronotum, × *c.* 14; *b*, fore wing, × *c.* 14; *c*, ♂, clypeus, × *c.* 14; *d*, genitalia, × *c.* 75.

The first five tergites have very sparse whitish pubescence on the apical margins, without forming distinct fasciae. Wings hyaline, faintly fuscous beyond the cells in the fore wing, the veins blackish. Epinotum slightly, the temples and abdomen distinctly, shining; the rest of the body not quite dull. Head finely reticulate-punctate, the temples very shallowly so. Pronotum closely, transversely rugulose, the mesonotum, mesopleura and scutellum reticulate-punctate, the mesopleura a little more strongly so than the mesonotum, their posterior third also finely rugose. Metanotum punctulate. Metapleura and sides of the epinotum transversely rugose, the rugae becoming closer and smaller caudad. Dorsum of the epinotum finely, closely and obliquely rugose laterad from the middle, the rugae becoming transverse over about the posterior third, and with a thin median longitudinal carina which does not reach the middle of the segment; the declivity transversely costate, its median impression fairly deep. Abdomen very finely and closely punctured, the sixth tergite a little more strongly than the rest. Anterior margin of the median area of the clypeus obtusely angular in the middle and feebly sinuate on each side, subcarinate lengthwise over the basal two-thirds, the apex of the carina broad; the

whole clypeus about three times wider than long in the middle. Inferior interocular distance 2½ times greater than the superior, the latter equal to a trifle more than the length of the second joint of the flagellum plus half of the first. Posterior ocelli twice as far from each other as from the eyes. Second joint of the flagellum twice as long as the first, four times longer than wide at the apex and as long as the third. Dorsum of the pronotum short, less than half as long as the first joint of the flagellum, the anterior face sloping gradually to the neck. Mesonotum about half as wide again as long. Scutellum trapezoidal, twice as wide in front as long. Dorsum of the epinotum 1½ times wider at the base than at the apex, not quite as long as wide at the apex, very little longer than the declivity, the junction of the two faces angular. Petiole of the second discoidal cell not quite half as long as the first abscissa of the radius. Comb of the anterior tarsi composed of long thin spines, of which there are three on the basal joint.

♂. 5 mm. long. Mesonotum with a faint aeneous lustre. The posterior third of the mesopleura without rugae, otherwise like the ♀ in colour, sculpture and pubescence. Inferior interocular distance five-sevenths greater than the superior, the latter equal to the length of the first two joints of the flagellum plus two-thirds of the third joint. Posterior ocelli as far from the eyes as from each other. Second joint of the flagellum 3½ times longer than wide at the apex. Median area of the clypeus produced into a subacute angle. The median longitudinal carina of the epinotal dorsum nearly reaches the apical margin. Otherwise like the ♀.

Bekily, 2 ♀♀, 3 ♂♂.

Not closely related to any of the African species.

Miscophus maculipes n.sp. (Figs. 104, 104 *a*, *b*)

♀. 3·1–3·6 mm. long. Head and thorax black. First three abdominal segments ferruginous, the fourth to sixth brownish black, the apical margins of the fourth and fifth testaceous. Mandibles, excepting the piceous apex, apical margin of the clypeus and the underside of the scapes pale ochreous. The apical third or less of the anterior and middle femora on the upperside, small spots very near the base and apex on the upperside of the middle and hind tibiae and a spot on the pronotal tubercles, straw yellow. Tarsi dark brown. Wings hyaline, the veins pale brown, the apical part of the fore wing, beyond the cells, faintly fuscous. Pubescence on the head, mesopleura and epinotum simple, short and scanty, the rest of the body almost glabrous. Face and clypeus fairly dull, the rest of the body shining. Face and clypeus very finely punctured, the clypeus slightly less closely than the face, the punctures on the face barely resolvable with a magnification of less than 30 diameters, the interspaces about twice as wide as the punctures. The puncturation of the temples is a little sparser and much shallower than that of the face. Dorsum of the pronotum punctate-rugulose. The punctures on the mesonotum, mesopleura and scutellum shallow, almost twice as large as those of the face, the interspaces three times as large as the punctures. Mesosternum more strongly punctured than the mesopleura; the upper part of the episternum below the tegulae impunctate. Metapleura almost impunctate and very narrow ventrad. Dorsum of the epinotum finely and obliquely rugose, the rugae becoming gradually transverse over the posterior third, the median longitudinal carina distinct but

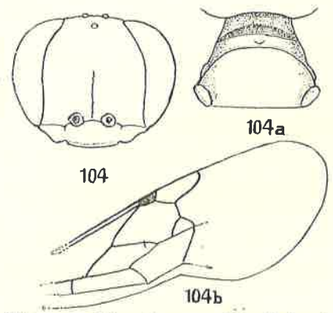


Fig. 104. *Miscophus maculipes* ♀, head, ×24; *a*, pro-mesonotum, ×24; *b*, fore wing, ×24.

not reaching the apical margin; the dorsum and declivity separated by a carina which is produced on each side of the middle into a broad and obtuse tooth. The sides of the epinotum are closely and transversely rugulose. The puncturation of the abdomen is about as fine as on the face but shallower and sparser. Clypeus three times wider than long, the median area feebly convex transversely, its apical margin almost straight. Inferior interocular distance not quite twice as great as the superior, the latter equal to a trifle more than the length of the first two joints of the flagellum. Posterior ocelli twice as far from each other as from the eyes. Second joint of the flagellum twice as long as the first and four times longer than wide. Dorsum of the pronotum six times wider behind than long in the middle and subtuberculate in the middle. Mesonotum and scutellum both twice as wide as long. Dorsum of the epinotum as long as wide at the apex, about twice as wide at the base as at the apex, its posterior angles rounded. Anterior tarsi without a distinct comb, the basal joint with two short spines on the outside. The petiole of the second cubital cell is a little shorter than the first abscissa of the radius and meets the radius at the end of its basal third. The second recurrent vein meets the second cubital cell at its distal lower angle.

♂. 3·2 mm. long. The apical margin of the clypeus, and in one specimen the whole of the lateral sclerites, pale straw yellow. First two tergites and all the sternites fusco-ferruginous, or the tergites brownish black and the sternites fusco-ferruginous. In a third specimen the whole of the abdomen is dark brown, with the apical margins widely testaceous. Femora dark brown, the tibiae pale brown, the spots on the femora and tibiae smaller than in the ♀ and of a smoky yellow colour. The apical part of the wings paler than in the ♀. Otherwise like the ♀ in colour and pubescence. Face and vertex slightly shining, the puncturation as fine as in the ♀ but less dense, the interspaces being about two to three times wider than the punctures. The puncturation of the thorax and tergites is as dense as in the ♀ but larger, especially on the mesopleura. The sculpture of the epinotum is like that of the ♀ but there is also a distinct puncturation between the rugae on the dorsum and the apical margin is without teeth. Sternites with a shallow and larger puncturation than in the ♀.

Median area of the clypeus narrower than in the ♀. Inferior interocular distance not quite half as great again as the superior, the latter much wider than in the ♀ and equal to the length of the first three joints of the flagellum. Posterior ocelli as in the ♀. Second joint of the flagellum 3½ times longer than wide at the apex. Pronotal collar a little longer than in the ♀, as long in the middle as the first joint of the flagellum. Otherwise like the ♀.

Bekily, 15 ♀♀, 3 ♂♂. November–January, April and July.

There are probably two broods a year. Not related to any of the African species with simple pubescence. In some of the ♀♀ and in one of the ♂♂ there is a very faint greenish bronzy lustre on the head and mesonotum.

Miscophus sordidatus n.sp. (Figs. 105, 105 *a*, *b*)

♀. 5 mm. long. Black, without any metallic lustre. Mandibles brownish yellow, piceous at the apex. The apical margin of the median area of the clypeus depressed and fusco-ferruginous. Underside of the scapes brownish yellow. Tarsi, fore and middle tibiae and the underside of the hind tibiae, reddish brown. Wings hyaline, the apical part beyond the cells faintly fuscous.

Pubescence on the head and thorax simple, whitish and very sparse, on the thorax confined chiefly to the mesopleurae and sides of the epinotum. On the abdomen the pubescence is grey, very scanty, microscopic and not forming distinct apical fasciae. Temples, pronotum, mesosternum, declivity of the epinotum and the abdomen feebly shining, the rest of the body dull. Depressed apical margin of the clypeus smooth and shining, the rest of the clypeus, the face and vertex closely and transversely rugulose. Temples finely and shallowly

punctured. Pronotum transversely, mesonotum and scutellum longitudinally rugulose and more strongly so than on the face, metanotum transversely reticulate-rugulose, mesopleura obliquely rugulose and more finely than the mesonotum, mesosternum shallowly and finely punctured. Dorsum of the epinotum finely and closely rugose, over the basal two-fifths the rugae diverge obliquely laterad from the median line and over the apical part they are transverse; the median longitudinal carina is weak and does not quite reach the apical margin. Sides of the epinotum obliquely rugose, the declivity costate, less closely above than below, its median sulcus narrow and shallow. Abdomen microscopically punctured. Median area of the clypeus about twice as wide as long, slightly gibbous in the middle, the apical margin transverse. Inferior interocular distance twice as great as the superior, the latter equal to the length of the first two joints of the flagellum. Posterior ocelli as far from the eyes as from each other. Second joint of the flagellum as long as the third, a little more than twice as long as the first and four times longer than wide. Pronotum long, the depressed neck two-thirds as long as the dorsum, the latter convex transversely and lengthwise, moderately raised in the middle and about two-thirds wider than long. Mesonotum half as wide again as long. Scutellum three-sevenths wider in front than long. Dorsum of the epinotum a little more than twice as wide at the base as at the apex, 1½ times longer than wide at the apex, the posterior and lateral margins rounded. Abdomen ovate. Anterior tarsi without a distinct comb. Petiole of the second cubital cell nearly as long as the cell is high, meeting the radius at its middle.

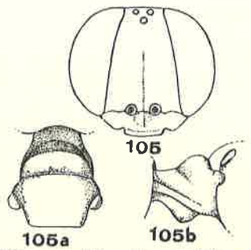


Fig. 105. *Miscophus sordidatus* ♀, head, ×18; *a*, pro-mesonotum, ×18; *b*, pronotum, lateral view, ×18.

♂. 4·7 mm. long. Of the two specimens of this sex, the allotype is like the ♀ in colour, pubescence and sculpture, except that the apical median part of the epinotal dorsum has the rugosity longitudinal and arcuate outwardly, instead of transverse; in the other specimen the first three abdominal segments are reddish brown, but otherwise like the ♀ in colour and sculpture.

Clypeus as in the ♀. Inner orbits less divergent below than in the ♀, the inferior interocular distance two-thirds greater than the superior, the latter equal to the length of the first two joints of the flagellum plus four-fifths of the third. Second joint of the flagellum three times longer than wide at the apex, as long as the third and half as long again as the first. Pronotal dorsum shorter than in the ♀, a little more than twice as wide behind as long.

Dorsum of the epinotum twice as wide at the base as at the apex, and barely longer than wide at the apex.

Bekily, 1 ♀, February; 1 ♂ (allotype), Ihosy, November and 1 ♂, Bekily.

Allied to *cyanescens* Turn. but without any metallic lustre on the abdomen. In both sexes it differs from that species by the narrower face, finer sculpture of the narrower pronotum and by the different sculpture of the mesonotum and epinotum. The ♂ has a much narrower vertex than *cyanescens*.

Genus **Solierella** Spin.

Gay, *Hist. fis. Chile Zool.* VI, p. 349, 1851

Characters. Mandibles not excised on the outer margin, or only feebly so, the apex acute. Clypeus wide and short, the apical margin in the ♂ with one to three teeth. Antennae short, 12-jointed in the ♀, 12- or 13-jointed in the ♂ (12-jointed in both the Madagascan species). Pronotum with a distinct collar; the pronotal tubercles do not extend back as far as the tegulae. Mesonotum with a short carina on each side anteriorly. Episternal suture

distinct, no epicnemium present. Dorsum of the epinotum wider than long, with a distinct marginate median area; the declivity vertical. Apical segment of the abdomen conical in the ♀, bluntly so in the ♂, without a pygidial area. In the ♂ there are seven visible ventral segments. Legs almost spineless, tarsi without a comb. Middle coxae not contiguous; hind coxae with a short spine on the upper side near the base. Fore wing: pterostigma small but distinct; three cubital cells present, the second stalked on the radius; two recurrent veins, the first received by the first cubital cell and the second by the second cubital cell, or both received by the latter; the basal vein is either interstitial with the transverse submedial vein (nervulus) or arises a little beyond it. Hind wing: the cubitus arises well beyond the end of the submedial cell. The basal lobe is elliptical and the basal sinus is deep; the anal lobe is much longer than the submedial cell.

The two Madagascan species belong to the subgenus *Sylaon* Picc. in which the first recurrent vein enters the first cubital cell, and the mandibles are not excised on the outer margin.

In my description of the South African *S. scrobiculata* Arn. (*Ann. Transv. Mus.* XIII, p. 400, 1929), it was erroneously stated that the ♂ had 12-jointed antennae. They are 13-jointed, but the suture between the last two joints is very indistinct. In the two Madagascan species described hereunder they are definitely 12-jointed, the suture between the last two joints being completely obliterated.

The species of this genus prey on larval Hemiptera.

Solierella madagascariensis n.sp. (Figs. 106, 106 *a–c*)

♀. 4·5 mm. long. Closely allied to *S. scrobiculata* Arn. and with very similar sculpture, but easily distinguished from that species by the yellowish white macula at the base of the hind tibiae. Black. Mandibles with a flavo-ferruginous bar just behind the apex. Tibiae with a yellowish white macula at the base above, the maculae on the fore and middle pairs very small. Wings hyaline, the veins dark brown, the extreme apex of the fore wing very faintly smoky. Clypeus, lower half of the face, and the temples with short silvery pubescence, the tergites with microscopic brownish pubescence, elsewhere almost glabrous. The sculpture is very similar to that of *scrobiculata*; as in that species the vertex and the face above the fork of the median carina, and the mesonotum and scutellum have a wide-meshed raised reticulation. On the head the interspaces are shining and finely punctured, but more deeply than in *scrobiculata*. In the latter the interspaces are all very much of the same size and not quite so wide as the anterior ocellus, whereas in this species those which lie a little below the anterior ocellus are wider than long and the others are more or less round and as wide as the anterior ocellus. The rami of the median carina are more divergent and the space below them as far as the hind margin of the clypeus is more or less longitudinally rugulose, and not finely punctured as in *scrobiculata*. In the latter species there are two short longitudinal ridges, separated by a shallow concavity, between the posterior ocelli, whereas in this species there is a single, sharp carina. The anterior margin of the pronotal dorsum is reflected backwards medially, almost meeting the hind margin, whereas in

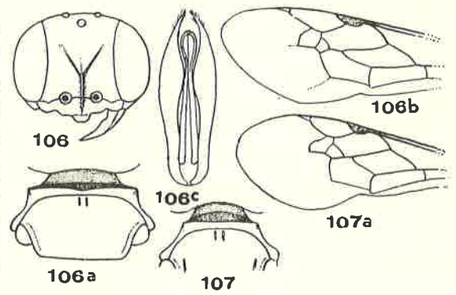


Fig. 106. *Solierella madagascariensis* ♀, head, ×*c.* 18; *a*, pro-mesonotum, ×*c.* 18; *b*, fore wing, ×*c.* 18; *c*, ♂, genitalia, ×60.

Fig. 107. *Solierella pallidipes* ♀, pronotum, ×*c.* 18; *a*, fore wing, ×*c.* 18.

scrobiculata the indentation is very slight, the two margins being almost parallel over their whole length. Tegulae black (ochraceous in *scrobiculata*). The sculpture of the rest of the thorax differs very little from that of *scrobiculata*, but the sides of the epinotum and the declivity are more finely rugose. In both species the whole thorax is fairly dull. Abdomen more shining than in *scrobiculata* and a little more finely and less closely punctured. Mandibles not excised on the outer margin. Median area of the clypeus tectiform, produced into a short quadrate lobe and carinate lengthwise medially, the carina not reaching the apical margin. Inferior interocular distance about half as great again as the superior, the latter equal to the length of the first four joints of the flagellum. Posterior ocelli nearly twice as far from each other as from the eyes. The eyes do not reach the base of the mandibles, the cheeks being two-thirds as long as the first joint of the flagellum. Temples two-thirds as wide as the eyes, with two longitudinal carinae (only one in *scrobiculata*). Second joint of the flagellum as long as the third, very little longer than the first and 1½ times longer than wide at the apex. Anterior margin of the pronotal collar acutely carinate, fully eight times wider than the segment is long at the sides, the anterior face vertical, the anterior corners rectangular. Mesonotum four-fifths wider than long. Dorsum of the epinotum fairly flat, three-sevenths wider at the base than at the apex and about half as long as wide at the apex. Posterior coxae with a short erect spine on the upper side at the base. In the fore wing the nervulus is prefurcal, i.e. the basal vein arises beyond the end of the submedial cell; the stalk of the second cubital cell is a little shorter than the second abscissa of the radius.

♂. 3–4 mm. long. Tarsi brownish ochreous, the hind pair paler than the others and with the basal joint slightly dilated in the middle. The basal maculae on the fore and middle tibiae almost obsolete. Sculpture, on the whole, like that of the ♀ but the rugosity of the epinotum is closer and much finer than in the ♀. Median area of the clypeus produced into a short blunt tooth. Antennae 12-jointed, the second joint of the flagellum nearly twice as long as wide. Inferior interocular distance nearly one-third greater than the superior, the latter equal to the length of the first four joints of the flagellum. Otherwise like the ♀.

Bekily, 6 ♀♀, 10 ♂♂. July–November.

Solierella pallidipes n.sp. (Figs. 107, 107 *a*)

♀. 3·5–4 mm. long. Black. Mandibles fusco-ferruginous. The following parts are very pale or whitish yellow: pronotal tubercles, the upper side of the tibiae, extreme apex of the femora and the calcaria. First two joints of the tarsi pale reddish buff, the remaining joints brown and becoming gradually darker distad. Apical margins of the first five abdominal segments brownish yellow. Wings hyaline, barely tinged with fuscous apically, the veins dark brown. Clypeus, face, temples, pronotal dorsum, mesopleura, lateral areas of the epinotal dorsum and the lateral margins of the declivity with a rather coarse, yellowish silvery pubescence. Tergites 1–5 with a very fine, sparse and greyish pubescence, not forming fasciae on the apical margins. The whole body, excepting the lower half of the sides of the face, moderately shining. Clypeus, face and vertex finely but not very closely punctured, the upper part of the face, from the ends of the rami of the median carina to the anterior ocellus, also with a superficial wide-meshed reticulation, the occiput and temples with punctures a little larger than those of the face, the vertex just behind the ocelli with a feeble transverse rugulosity. Pronotum punctulate, the sides obliquely rugulose. Mesonotum and scutellum finely punctured, more strongly than the face, the interspaces about three times as large as the punctures. Mesopleura vertically rugulose, the interspaces punctured, the mesosternum shallowly and sparsely punctured. Metanotum punctate-rugulose. Dorsum of the epinotum with a trapezoidal, marginate median area, a little wider in front than long, carinate lengthwise in the middle, the carina not reaching the apex, and with three or four weak and oblique rugae on each side; the lateral areas of the dorsum are obliquely, feebly and not closely rugose, here and there also reticulate. Declivity and sides

of the epinotum transversely rugose; on the sides the rugae do not extend far beyond the posterior half. The puncturation of the abdominal segments is very fine but not dense, and becomes gradually finer caudad.

Clypeus like that of *S. madagascariensis*; the cheeks are shorter than in that species, or about half as long as the first joint of the flagellum. The median carina of the face is feebler, and the rami of its fork are shorter, thinner and less divergent. The temples have only one longitudinal carina. There is a short elongate tubercle between the posterior ocelli, which are slightly farther from each other than from the eyes. Inferior interocular distance nearly 1½ times greater than the superior, the latter equal to the length of the first three joints of the flagellum. The second joint of the flagellum is one-third longer than the first, a little shorter than the third and twice as long as wide at the apex. Pronotal collar slightly shorter in the middle than at the sides (which are more oblique than in *madagascariensis*), nine times wider behind than long in the middle. Dorsum of the epinotum nearly one-third wider at the base than at the apex, twice as wide at the apex as long. The petiole of the second cubital cell is about half as long as the second abscissa of the radius, and the third transverse cubital vein is more or less convex outwardly in its lower half, not bluntly angular as in *madagascariensis*.

♂. 3–3·4 mm. long. The pale parts of the legs of a deeper yellow than in the ♀, or pale ochreous. The puncturation of the head and thorax a little stronger, the mesonotum in front of the posterior margin and the middle third of the scutellum with some longitudinal rugulosity. Otherwise like the ♀ in colour, sculpture and pubescence. Median area of the clypeus produced into a short and acute tooth. Eyes almost touching the base of the mandibles. Interocular distance above and below as in the ♀, the superior equal to the length of the first four joints of the flagellum. Antennae 12-jointed.

The second joint of the flagellum is twice as long as wide at the apex and one-third longer than the first, the apical joint twice as long as wide and acute at the apex. Otherwise like the ♀.

Bekily, 25 ♀♀, 5 ♂♂. November–March. The prey is a small and immature Homopteron.

This species can easily be distinguished from *madagascariensis* by the colour of the legs and the different sculpture of the head and mesonotum.

Subfamily PEMPHREDONINAE

Key to the genera and subgenera

(2) 1. Only one cubital cell present. Radial cell not appendiculate. Middle tibiae with only one calcar. Pronotal tubercles extend back as far as the tegulae. A pygidial area present in the ♀. Mandibles not excised on the outer margin. Pterostigma very large; only one discoidal cell present. Very small species, 2–5 mm. long. **Ammoplanus** Gir. (p. 143)

(1) 2. More than one cubital cell present.

(10) 3. Two cubital cells present (middle tibiae with only one calcar).

(7) 4. Two recurrent veins present.

(6) 5. Posterior tibiae without spines on the upper surface. Pygidial area absent. Abdomen subpetiolate. **Passaloecus** Shuck. (p. 151)

(5) 6. Posterior tibiae spinose. A distinct pygidial area present in the ♀. Abdomen not petiolate. **Diodontus** Curtis

(4) 7. Only one recurrent vein present, entering the first cubital cell.

(9) 8. Abdomen petiolate. The cubitus of the hind wing arises before the end of the submedial cell. Pygidial area more or less distinct in the ♀; eighth ventral plate of the ♂ produced into a spine. **Stigmus** Jur. (p. 149)

(8) 9. Abdomen not petiolate. The cubitus of the hind wing arises beyond the end of the submedial cell. Pygidial area absent. Eighth ventral plate of the ♂ simple. **Spilomena** Shuck. (p. 142)

(3) 10. Three cubital cells present. (Abdomen petiolate, the petiole composed of the first sternite only; apical ventral plate of the ♂ produced into an upturned spine. Epicnemium well developed. Pterostigma large. Mandibles not excised on the outer margin.)

(12) 11. Face swollen between the hind margin of the clypeus and the antennal sockets, the swollen area with an anterior transverse carina joined to a median and vertical one (see Fig. 117 *a*). Antennae short and clavate in the ♀, moniliform in the ♂. In the ♀ at the most only the second to the seventh and the apical joints of the flagellum are longer than wide; sixth tergite strongly convex transversely, without a pygidial area or with a feebly defined and short one at the apex. Hind tibiae of the ♀ usually without spines on the upper surface. Labrum excised. Cubitus of the hind wing emitted beyond the end of the submedial cell. **Psenulus** Kohl (p. 153)

(11) 12. Face not swollen between the hind margin of the clypeus and the antennal sockets, but sometimes with a median tooth or tubercle. Antennae filiform or feebly clavate, never moniliform. In the ♀ the second to fifth joints of the flagellum are distinctly longer than wide. Sixth tergite with a well-defined pygidial area. Hind tibiae of the ♀ spinose above. Labrum not excised. Cubitus of the hind wing emitted before the end of the submedial cell. **Psen** Latr. (p. 152)

(A) The first recurrent vein enters the second cubital cell, and the second enters the third, or (rarely) is interstitial. The flagellum of the ♂ is compressed and serrate. Episternal suture well defined. Subgenus **Psen** s.str. (p. 152)

(B) Both recurrent veins enter the second cubital cell. Flagellum of the ♂ simple. Episternal suture not defined. Subgenus **Mimesa** Wesm.

Some of the smallest Sphecids are included in this subfamily, so that for the study of the structural characters relatively high magnifications are essential. In the following descriptions, particularly of *Ammoplanus* and *Spilomena*, I have added in brackets the least magnification (using a Leitz binocular stereoscopic microscope) which is necessary before the sculpture can be clearly seen.

Tribe *PEMPHREDONINI*

Less than three cubital cells present. Antennae inserted close to the hind margin of the clypeus.

Genus **Spilomena** Shuck.

Trans. Amer. Ent. Soc. II, p. 79, 1840

Spilomena Seyrigi n.sp. (Figs. 108, 108 *a*, *b*)

♀. 3–3·4 mm. long. Black. Legs, including the coxae and trochanters, pale ochreous. Mandibles brownish ochreous, the apex brown. Scapes and first four joints of the flagellum ochreous, the remaining joints pale brown. Pronotal tubercles and tegulae pale ochreous. Wings hyaline, the veins brownish ochreous, the pterostigma brown. Third to sixth tergites with a sparse greyish pubescence, otherwise the body is almost glabrous. Head and thorax slightly glossy, the abdomen impunctate and shining. Clypeus impunctate. Lower half of the face acuducted,* the upper half of the face, vertex, mesonotum, mesopleura, scutellum and metanotum with a close puncturation, the interspaces acuducted with lines radiating from the punctures (50 diameters). Dorsum of the pronotum shorter in the middle than at the sides, at the latter point less than half as long as the first joint of the flagellum, sparsely and longitudinally rugose, like the declivous anterior face, the anterior margin raised, the lateral angles acute; the sides of the pronotum obliquely rugose. Dorsum of the epinotum with a somewhat irregular and open rugose sculpture; the rugae are directed obliquely

* This term, which is not to be found in any modern dictionary, may be usefully brought into use again, as it obviates a lengthy description. It is to be found in the chapter on orismology in Kirby's old *Introduction to Entomology*, IV, 1828, and is defined as meaning 'scratched across very finely as if with the point of a needle or pin'.

outwards over the basal half and posterior corners, transversely in the middle of the apical half. The declivity is reticulate-rugose, and its raised lateral margins are produced, a little below the middle, into a short triangular tooth. The junction of the dorsum and declivity is widely rounded. The sides of the epinotum over the posterior half are transversely rugose. Third and following sternites transversely rugulose. Median area of the clypeus strongly convex transversely, a little wider in front than long, the apical margin narrowly depressed and feebly concave; the posterior third subcarinate. The face, from the posterior margin of the clypeus to about the middle, has a median longitudinal carina. The head, including the outer orbits, is fully one-third wider than it is long (measured from the anterior margin of the clypeus to the anterior ocellus). Cheeks obsolete, the eyes reaching the base of the mandibles. Ocelli arranged in an equilateral triangle, the distance of the posterior pair from the eyes nearly three times greater than their distance from each other. First joint of the flagellum twice as long as wide, the second and third a little longer than wide, the apical joint transversely compressed and nearly twice as long as wide, the remaining joints as wide as, or wider than long. Dorsum of the epinotum twice as wide at the base as long, flat in the middle, moderately convex and sloping downwards at the sides, the posterior margin convex. Apical abdominal segment transversely compressed, the tergite with a very narrow lanceolate pygidial area, extending over the apical two-thirds of its length. Second abscissa of the radius nearly twice as long as the first.

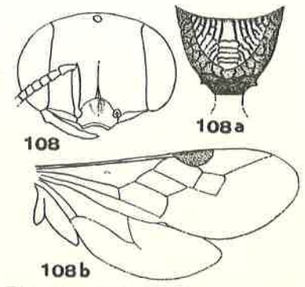


Fig. 108. *Spilomena Seyrigi* ♀, head, ×30; *a*, epinotum, ×30; *b*, wings, ×18.

♂. 2·6 mm. long. Front of the scapes and subtriangular maculae on each side of the bottom of the face, greyish white, the lateral sclerites and the apical margin of the median area of the clypeus brownish ochreous. Otherwise like the ♀ in colour. Posterior third of the mesonotum longitudinally rugulose; the interspaces between the rugae on the epinotal dorsum finely reticulate. Third and following sternites microscopically and transversely rugulose. Otherwise like the ♀ in sculpture. First joint of the flagellum twice as long as wide, the second a little longer than wide, the third and fourth as long as wide, the fifth to ninth submoniliform and wider than long, the tenth and eleventh as long as wide, the apical joint nearly twice as long as wide, compressed in the apical half and acuminate.

Temples as wide as the eyes. Second abscissa of the radius nearly three times longer than the first, the second transverse cubital vein convex outwardly. Otherwise like the ♀.

Bekily, 4 ♀♀, 1 ♂. March–August.

This species differs from *S. Stevensoni* Arn. by the obsolete cheeks, and from that species and *S. Merceti* Arn. by the different sculpture of the epinotal dorsum. From *S. Turneri* Arn. it differs by the much wider head and shorter pronotum and from *S. robusta* Arn. by the shorter pronotum and the sculpture of the epinotal dorsum.

Genus **Ammoplanus** Gir.

Ann. Soc. Ent. France (4), IX, p. 469, 1869

CHARACTERS. Head wider than the thorax and distinctly flattened dorso-ventrally. The eyes touch the base of the mandibles, the latter bidentate at the apex and not excised on the outer margin. Labrum bilobed. Clypeus short, in the ♀♀ of some species almost linear, so that the antennae appear to be inserted almost on the anterior margin of the head. Antennae short, not extending back much beyond the occiput. A shallow impressed line extends from the clypeus to the anterior ocellus. Prothorax narrow, the collar a little

depressed below the level of the mesonotum. Pronotal tubercles reaching the tegulae. Episternal suture distinct, epicnemium absent. Dorsum of the epinotum without a marginate median area, the declivity vertical. Abdomen not petiolate, a pygidial area is present in the ♀; seven ventral segments visible in the ♂, the seventh produced into a spine. Legs, apart from the apical spines of the tibiae, unarmed. Fore wing: pterostigma ovate and very large, usually not chitinized and pigmented except at its margins; radial cell very short and oblique or abruptly truncate, its costal margin much shorter than the truncating vein; only one cubital cell present, and very large, being so formed by the obliteration of the first transverse cubital vein; it receives the single recurrent vein near its middle. The radius in the majority of the species does not reach the costa distad, but ends abruptly some distance before it. The subcosta near its distal end is bent downwards and dilated, leaving a large gap between it and the costa. Hind wing: radial cell very short, joining the costa in a wide angle; the cubital vein originates far beyond the end of the submedial cell; basal lobe narrow, basal sinus deep.

The specific characters lie chiefly in the length of the clypeus, the width between the inner orbits at their junction with the clypeus, the height of the vertex above the eyes, the shape of the pronotum, the sculpture, especially of the epinotum, and the radial cell, whether open or closed.

Key to the species

♀♀

(6) 1. The distal end of the radius does not reach the costa. Mesosterna convex transversely and not covered with long and decumbent pubescence.

(3) 2. First abscissa of the radius one-seventh as long as the second; pterostigma entirely hyaline; clypeus in greater part black. **claripennis** Arn. (p. 147)

(2) 3. First abscissa of the radius at least one-quarter as long as the second; clypeus pale yellow.

(5) 4. First abscissa of the radius half as long as the second; distal fourth of the pterostigma pigmented. **madecassus** Kohl (p. 148)

(4) 5. First abscissa of the radius one-quarter as long as the second; pterostigma hyaline. **madecassus** var. **orientalis** Arn. (p. 148)

(1) 6. Distal end of the radius reaching the costa. Mesosterna flattened on the inner half and depressed, forming a wide V-shaped groove covered with long, decumbent and greyish pubescence.

(8) 7. First joint of the flagellum half as long again as the second, the fifth to tenth joints not wider than long; hind femora fuscous on the apical third; dorsum of the pronotum as long in the middle as the first joint of the flagellum and somewhat gibbous laterad. **jucundus** Arn. (p. 145)

(7) 8. First joint of the flagellum twice as long as the second, the fifth to tenth joints wider than long. Hind femora, excepting the extreme apex, brown; dorsum of the pronotum almost linear in the middle and fairly short at the sides and not noticeably gibbous laterad. **brevicornis** Arn. (p. 146)

♂♂

(2) 1. Tenth and eleventh joints of the flagellum 2½ times, the twelfth three times longer than wide; lower three-fifths of the face yellow all over. **egregius** Arn. (p. 148)

(1) 2. Tenth to twelfth joints of the flagellum short; not more than the lower half of the face yellow.

(4) 3. The width of the face in the middle between the inner orbits is one-seventh greater than the distance between the anterior ocellus and the hind margin of the clypeus. Clypeus and lower half of the face, excepting a narrow median black streak, chrome yellow; hind femora pale brown excepting the extreme apex. **brevicornis** Arn. (p. 146)

(3) 4. The width of the face in the middle between the inner orbits is one-fifth greater than the distance between the anterior ocellus and the hind margin of the clypeus. Clypeus and lower half of the face, excepting a median black streak, pale lemon yellow; hind femora pale yellow on the basal two-thirds and fuscous on the apical third. **jucundus** Arn. (p. 145)

Ammoplanus jucundus n.sp. (Figs. 109, 109 *a–e*)

♀. 2·5 mm. long. Black. Mandibles, labrum, scapes and legs pale ochreous, the extreme apex of the femora and the extreme base of the tibiae pale stramineous, the apical half of the hind femora brown, the upper side of the hind tibiae yellowish brown. Fore and middle coxae pale ochreous, the hind coxae at the apex and the hind trochanters pale stramineous. Tegulae and posterior half of the pronotal tubercles pale stramineous, or almost whitish yellow. The inner third of the mesosternum flattened, sloping mesad and covered with a decumbent greyish pubescence; the apex of the abdomen with a few microscopic hairs, otherwise glabrous. The dorsum of the epinotum slightly dull, the rest of the body very shining.

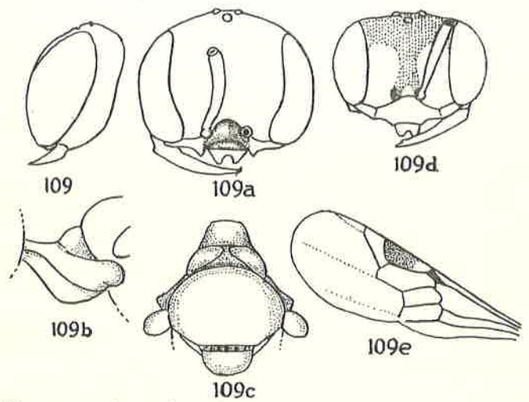


Fig. 109, *a*. *Ammoplanus jucundus* ♀, head, ×40; *b*, pronotum, ×40; *c*, pro-mesonotum, ×40; *d*, ♂, head, ×40 (stippled parts black, clear parts yellow); *e*, ♀, fore wing, ×24.

Clypeus impunctate. The lower half, or less, of the face closely and very shallowly striolate, the striae more or less longitudinal, somewhat convergent mesad. Temples smooth. Neck of the pronotum closely and transversely rugulose, the dorsum and also the mesonotum less closely, the sides of the pronotum with four or five curved rugae, the episternum of the mesopleura with a few strong rugae, the rest of the mesopleura somewhat superficially striate and with a well-defined clathrate groove extending from the anterior margin to the median coxae. Scutellum with three or four large punctures. Metanotum and metapleura smooth. Dorsum, sides and upper third of the declivity of the epinotum with a sharp and wide-meshed reticulation; the declivity with a deep median groove. Fourth to sixth sternites shallowly punctured, the rest of the abdomen impunctate. Clypeus not linear, the lateral sclerites angularly produced at their junction with the median one and a little longer than the width of the scapes; the anterior third of the median area flat and feebly inflected, the upper margin of the inflection straight. The width of the face in the middle is one-fifth greater than the distance between the anterior margin of the clypeus and the anterior ocellus. Posterior ocelli three times as far from the eyes as from each other. First four joints of the flagellum longer than wide, the first 2¼ times longer than wide, half as long again as the second, the latter as long as the third, the fifth to tenth as wide as long, the apical joint 1½ times longer than wide at the base. Interocular distance on the vertex equal to the length of the first seven joints of the flagellum. Cheeks obsolete. Dorsum of the pronotum swollen on each side, shorter in the middle than at the sides and about four times wider behind than long in the middle. Dorsum of the epinotum narrowed caudad, half as wide again at the base as long in the middle and as wide at the apex as long. Wings hyaline, strongly iridescent, and at certain angles with a brilliant blue reflection. Veins pale ochreous, sometimes almost colourless; the proximal third, or less, of the pterostigma is hyaline, the rest chitinized and more or less brown; the radius is angularly bent at its distal end and reaches the costa, and the appendicular cell is faintly outlined. The second abscissa of the radius is twice as long as the costal margin of the radial cell.

♂. 2·3–2·5 mm. long. Labrum, mandibles, clypeus, lower half of the face excepting a median area behind the scapes, and the underside of the scapes, pale lemon yellow; flagellum pale yellow, becoming gradually darker to pale brown at the apex. Otherwise like the ♀ in colour. Mesonotum more strongly rugulose than in the ♀, fourth to seventh sternites fairly strongly and closely punctured, otherwise like the ♀ in sculpture. The mesosternum on each side is convex transversely, its inner third not flat and sloping mesad to form a V-shaped trough as in the ♀, and not densely covered with long decumbent pubescence.

Clypeus four times wider than long in the middle, the median area not inflected anteriorly as in the ♀, its apical margin moderately concave. The width of the face in the middle between the inner orbits is one-fifth greater than the length, measured from the hind margin of the clypeus to the anterior ocellus. Interocular distance on the vertex equal to the length of the first six joints of the flagellum. First joint of the flagellum about four times longer than wide at the apex, the second as long as the first, the third to eleventh a little longer than wide, the twelfth twice as long as wide. Posterior ocelli twice as far from the eyes as from each other. Cheeks short, less than half as long as the first joint of the flagellum. Dorsum of the epinotum more narrowed caudad than in the ♀, twice as wide at the base as at the apex, and slightly longer (one-sixth) than wide at the apex. The apical spine of the eighth sternite is flat, its apex rounded. Otherwise like the ♀.

Bekily, 4 ♂♂, September; 4 ♀♀, October and April.

Apparently closely related to *A. madecassus* Kohl but with a closed radial cell and with the hind femora brown at the apex. The dorsum of the pronotum is longer than in the African *A. consobrinus* Arn. and the head wider than in *A. rhodesianus* Arn. and much wider than in *A. mandibularis* Cam.

Ammoplanus brevicornis n.sp. (Figs. 110, 110 *a*)

♀. 2·5 mm. long. Exceedingly like *A. jucundus* Arn. from which it differs as follows:

Legs a little darker, more ochreous than stramineous, the hind femora excepting the extreme apex brown all over, the hind tibiae excepting the extreme base, pale yellowish brown. Wings hyaline, the veins colourless, excepting the costa, subcosta and radius which are slightly fuscous. Pterostigma hyaline at the base, the distal third pale brown. Sculpture like that of *jucundus*, the pectus also as in that species. Anterior margin of the median area of the clypeus arcuate, slightly depressed but not inflected. First joint of the flagellum 2¼ times longer than wide, fully twice as long as the second joint which like the third is as long as wide, the fourth a trifle longer than wide, the fifth to tenth wider than long, the eleventh half as long again as wide at the base and bluntly pointed at the apex. Posterior ocelli a little more than twice as far from the eyes as from each other. The pronotal collar does not slope gradually to the neck as in *jucundus* but as a short and steep anterior face; the dorsal face is not impressed in the middle and is barely swollen at the sides. The venation differs from that of *jucundus* only in having the apical or truncating portion of the radius curved and not straight, and in having the cubitus strongly curved upwards at its proximal end near its junction with the basal vein.

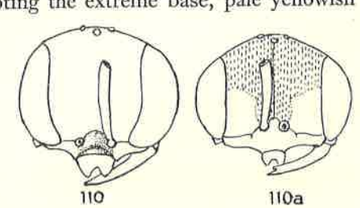


Fig. 110. *Ammoplanus brevicornis* ♀, head, ×40; *a*, ♂, head, ×40 (stippled parts black, clear parts yellow).

♂. 2·3 mm. long. Sculpture stronger than in the ♀, the pectus as in *jucundus* ♂, from which it differs as follows. Mandibles, labrum, clypeus, cheeks, lower half of the face except in the middle and the underside of the scapes, chrome yellow. Legs pale ochreous, the hind femora and tibiae of a paler brown than in the ♀. The head is narrower than in *jucundus* ♂;

the width of the face in the middle between the inner orbits is only one-seventh greater than the length, measured from the hind margin of the clypeus to the anterior ocellus. Flagellum pilose, the apical half submoniliform, the first joint but little longer than the second, all the remaining joints a little longer than wide. The transverse rugulosity of the mesonotum and the reticulations on the epinotal dorsum are sharper than in *jucundus* ♂. Venation as in the ♀.

Bekily, 1 ♀, 5 ♂♂. October–November and July.

The type of the ♀ has an abnormality which the writer has never observed before in many thousands of Hymenoptera examined; the left eye is very distinctly larger than the right, as shown in Fig. 110.

Ammoplanus claripennis n.sp. (Figs. 111, 111 *a*)

♀. 2–2·2 mm. long. Black. Mandibles, labrum, scapes, sometimes the lateral sclerites of the clypeus, tegulae, posterior margin of the pronotal tubercles and the legs, pale straw yellow; the middle third of the hind femora slightly darker or ochreous. Flagellum brownish yellow. Wings hyaline, the costa, subcosta, the margin of the pterostigma and the second abscissa of the radius pale brown, the other veins unpigmented. Epinotum moderately, the rest of the body very shining. Face longitudinally striolate below, becoming reticulate dorsad, the reticulation very faint on the vertex; on the upper half of the face there are some very scattered fine punctures (75 diameters). Pronotum closely, the mesonotum more sparsely, transversely rugulose, the mesonotum and also the scutellum with a few scattered punctures, metanotum and mesopleura smooth, mesosternum transversely rugulose. Dorsum of the epinotum with a wide-meshed and somewhat irregular reticulation, the declivity transversely rugulose, its sides with a few rugae at the bottom. Third to sixth sternites punctulate, the rest of the abdomen impunctate.

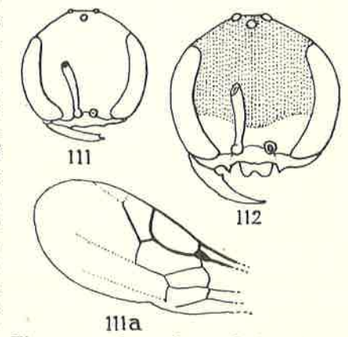


Fig. 111. *Ammoplanus claripennis* ♀, head, ×40; *a*, fore wing, ×40.

Fig. 112. *Ammoplanus madecassus* var. *orientalis* ♀, head, ×40.

Clypeus narrow and very short, the anterior margin of the median area feebly concave and slightly angularly produced at the anterior corners. The eyes are strongly convergent at the base, the distance between the inner orbits in the middle of the face being two-thirds greater than across the clypeus. Interocular distance on the vertex equal to the length of the first nine joints of the flagellum. Scapes half as long as the flagellum, the first joint of the latter a little more than twice as long as wide and 2½ times longer than the second, which is a little wider than long; the third to tenth a little longer than wide, the apical joint twice as long as wide. Posterior ocelli nearly twice as far from the eyes as from each other. The dorsum of the pronotum lies well below the mesonotum and is distinctly shorter than in *jucundus* and *brevicornis*; seen from above the middle part is almost linear, only the shoulders being clearly visible. Dorsum of the epinotum less narrowed caudad than in *jucundus* and *brevicornis*, only one-quarter wider at the base than at the apex and two-thirds as long as wide at the apex. The venation resembles that of *madecassus* and the African *consobrinus* and *rhodesianus* in having the radius ending abruptly some distance from the costa, but the first abscissa of the radius is much shorter than in *madecassus* or only one-seventh as long as the second.

Bekily, 11 ♀♀. September.

Evidently closely allied to *madecassus* but as far as can be ascertained from Kohl's unusually brief description, differing from it by the clypeus not being straw yellow all over, the smaller

size, the short first abscissa of the radius, the longer and less curved transverse cubital vein and the entirely hyaline pterostigma. The last character is, however, of minor importance, since the series of *jucundus* in the collection shows that the degree of pigmentation of the pterostigma varies to a slight extent.

Ammoplanus madecassus Kohl

Voeltzkow, *Reise Ost Afr.* II, p. 374, ♀, 1909

The differences between this species and *claripennis* have been shown in the previous description, which otherwise would also apply to Kohl's species. The collection contains one ♀ specimen which differs sufficiently from the specific form to merit varietal rank.

var. **orientalis** n.var. (Fig. 112)

♀. 2·5 mm. long. In addition to the labrum, clypeus and mandibles, the lower third of the face, the bottom of the temples and the mental portion of the underside of the head are also pale yellowish white. The scapes are also of that colour, but the flagellum is pale brownish ochreous, like the apices of the mandibles and of the scapes. Wings hyaline, only the costa, subcosta, radius and the vein margining the pterostigma pale brown; the rest of the veins and the pterostigma unpigmented. Mesonotum very finely reticulate-striate (75 diameters). Clypeus as in the specific form, with a triangular tooth on each side of the median area. Head narrow, the width in the middle measured from the inner orbits being only a little less than the length from the anterior margin of the clypeus to the anterior ocellus. Scapes as long as the first six joints of the flagellum. The first joint of the latter $1\frac{1}{2}$ times longer than wide, not quite twice as long as the second, the second to sixth as wide as long, the seventh to tenth a little longer than wide, the apical joint twice as long as wide. Mandibles acute at the apex, with a small tooth on the inner margin near the base. Dorsum of the epinotum $1\frac{1}{2}$ times wider at the base than at the apex, and four-fifths as long as wide at the apex. The first abscissa of the radius makes a right angle with the second, the latter four times as long as the first (in *madecassus* according to the text-figure the first is half as long as the second).

Bekily, 1 ♀. September.

In the other Madagascan species and also in the three African ones the ♀♀ have no yellow colour above the clypeus.

Ammoplanus egregius n.sp. (Figs. 113, 113 *a*)

♂. 2·3 mm. long. Black. Labrum, mandibles, clypeus, lower three-fifths of the face, a triangular area at the bottom of the temples, the underside of the head in front, the scapes, the posterior margin of the pronotal tubercles and the legs, pale lemon yellow. Flagellum pale brownish ochreous, the tegulae stramineous.

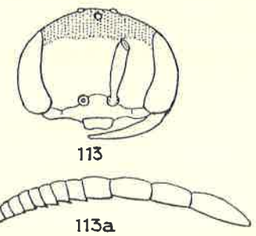


Fig. 113. *Ammoplanus egregius* ♂, head, × 40; *a*, flagellum, × 80.

Head without sculpture except on the upper part of the face which is acuducted (75 diameters). Pronotum and mesonotum transversely striolate, mesopleura, scutellum and metanotum smooth. Epinotal dorsum with a wide-meshed reticulate rugosity, the sides and declivity sparsely rugulose. Abdomen smooth, excepting the last four sternites which are closely and shallowly punctured. Epinotum nitidulous, the rest of the body very shining.

Labrum feebly excised. Clypeus wide, about five times wider than long in the middle, the anterior margin of the median area straight. Eyes much less convergent below than in any of the preceding species, the interocular distance at their base being equal to three-fourths of the distance between the anterior margin of the clypeus and the anterior ocellus. The interocular distance on the vertex is equal to a little more than the length of the first nine joints of the flagellum. Posterior ocelli nearly as far from each other as from the eyes. First joint of the flagellum $1\frac{1}{2}$ times longer than wide, the second to eighth joints wider than long, the ninth $1\frac{1}{2}$ times longer than wide, the tenth and eleventh $2\frac{1}{2}$ times and the twelfth three times longer than wide; the joints are covered with pale ochreous granulations (75 diameters). Dorsum of the epinotum about as long as wide at the apex and half as wide again at the base as at the apex. The radius is curved at its junction with the costa, and its second abscissa is three times longer than the first.

Bekily, 1 ♂. September.

The wide face and the very long apical joints of the flagellum distinguish this species from all the Madagascan and African. The yellow colour is also much more extensive on the face than in the other species.

Genus **Stigmus** Panz.

Faun. Ins. Germ. VII, p. 86, 1805

CHARACTERS. Eyes feebly divergent above, or slightly convergent above and below, and reaching the base of the mandibles. The mandibles with two teeth at the apex and a very small one between them. Posterior part of the head well developed, the vertex long, the temples wider than the eyes. Antennae filiform and slender. Lower half of the face with a carina on each side margining the inner orbits; the temples with a groove margining the outer orbits. Pronotal collar fairly long, sharply marginate in front, the anterior face vertical and depressed a little below the level of the mesonotum; pronotal tubercles prominent, reaching the tegulae.

No epicnemium present; the episternal suture distinct and having a longitudinal groove proceeding from it caudad. Dorsum of the epinotum merging gradually into the declivity, often with a marginate median area. Abdomen petiolate, the petiole curved dorsad and formed by the first sternite. Apical tergite in the ♀ with a very small pygidial area, in the African and Madagascan species hardly more than a lanceolate groove at the apex of the segment. Legs not spinose, tarsal comb absent, the intermediate coxae contiguous. Apical segment in the ♀ somewhat transversely compressed; seven ventral plates visible in the ♂, the eighth produced into a flat spine projecting beyond the seventh.

Fore wing: pterostigma large, its costal margin distinctly convex; radial cell lanceolate; two cubital cells present, the first fully $2\frac{1}{2}$ times larger than the second, the latter subquadrate; the single recurrent vein enters the first cubital cell at about its middle; only one discoidal cell present. Hind wing: the cubital vein arises before or at the end of the submedial cell; basal lobe small.

These insects nest in hollow twigs and straw, and prey on Aphidae.

Key to the species ♀♀ and ♂♂

1. Petiole reddish umber, smooth and oval in cross-section. **nubilipennis** Arn. (p. 149)
2. Petiole black, longitudinally striate and quadrate in cross-section. **tenellus** Arn. (p. 151)

Stigmus nubilipennis n.sp. (Figs. 114, 114 *a–d*)

♀. 5–6 mm. long. Black. Antennae pale brownish ochreous, the last three to five joints darker or almost black. Mandibles dull yellow, piceous at the base and apex. Clypeus dark reddish brown. Tarsi and petiole pale reddish umber, the rest of the legs dark brown, pronotal tubercles white, the apex of the abdomen rufescent. Wings hyaline, with a yellowish

cloud on each side of the basal vein and on the submedial cells, and another cloud as wide as the pterostigma and extending from it to the posterior margin of the fore wing; the extreme apical margin also slightly yellow, the veins and pterostigma dark brown.

Mandibles and apical margin of the clypeus with a few fine hairs, otherwise glabrous and shining. Lower half of the face transversely acuducted (50 diameters), the temples sparsely and longitudinally rugulose at the base, the postocular groove on them clathrate, the sides of the pronotum obliquely rugulose. The sides of the epinotum with a few rugae in front and some irregular oblique striation on the posterior half; the rest of the body smooth and impunctate. Dorsum of the epinotum with a broad Y-shaped median area, the arms of the Y narrowed laterad and with about six costae on each side, the tail of the Y triangular and with one or two transverse costae dorsad, the apex of the triangle joining another and shorter triangle, transversely costate, at the bottom of the declivity. The lateral margins of the dorsum are bounded by a deep and clathrate groove which is continued caudad as far as the middle of the declivity.

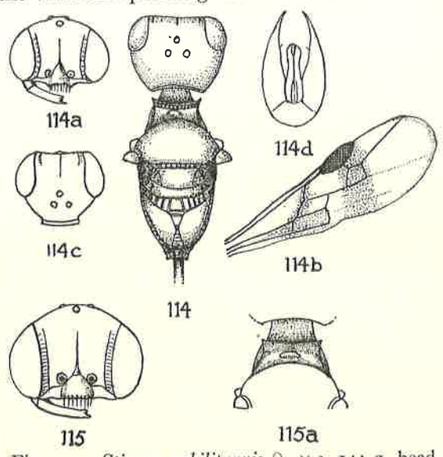


Fig. 114. *Stigmus nubilipennis* ♀, ×*c.* 14; *a*, head, ×*c.* 14; *b*, wing, ×*c.* 10; *c*, ♂, head, dorsal view, ×*c.* 14; *d*, genitalia, ×40.

Fig. 115. *Stigmus tenellus* ♀, head, ×24; *a*, pronotum, ×24.

Clypeus slightly protruding, the anterior margin of the median area strongly concave and as wide as the median area is long. The hind margin of the clypeus is acutely angular in the middle and a carina extends from it to about half-way up the face. Inner orbits feebly convergent below, the space between them and the lateral carinae feebly transversely rugose. Scapes as long as the first two joints of the flagellum plus half of the third; all the joints of the flagellum at least twice as long as wide, the second joint a little longer than the first. Posterior ocelli nearly three times as far from the eyes as from each other. Temples widest above, 1½ times wider there than the eyes. Pronotal collar twice as wide in front as long in the middle, with a clathrate groove behind the high anterior margin, the latter produced into an acute tooth on each side; behind the groove there is a low median tubercle. Mesonotum very convex lengthwise and transversely, the scutellum with a clathrate and transverse groove in front. Petiole as long as the first two tergites plus half of the third, its upper surface smooth and convex transversely. Second abscissa of the radius twice as long as the first, the third 4½ times longer than the second.

♂. 5 mm. long. Fore and middle tarsi pale ochreous, the rest of the legs pale brown, paler than in the ♀. Scapes pale brownish ochreous at the base, becoming gradually darker towards the apex. The clouding on the wings is somewhat stronger than in the ♀. Anterior margin of the median area of the clypeus not strongly concave as in the ♀ but almost straight. Vertex shorter than in the ♀, the back of the head much more narrowed caudad than in that sex. Pronotal collar shorter. Otherwise like the ♀.

Bekily, Ivondro, Ranomafana and Ambositra, 5 ♀♀, 4 ♂♂. September–March.

This species differs from the African *gueinzius* Turn. and *rugosifrons* Arn. by the smooth lateral areas of the epinotal dorsum, the longer petiole and the clouded wings.

Stigmus tenellus n.sp. (Figs. 115, 115 *a*)

♀. 4–4·3 mm. long. Closely allied to *S. nubilipennis* Arn. from which it differs as follows. Mandibles whitish yellow near the base. Clypeus black. Scapes and first four joints of the flagellum brownish ochreous, the remaining joints blackish brown. Anterior tibiae reddish umber above, ochreous below, the anterior tarsi ochreous. Face, as far as the top of the median carina, closely rugulose, transversely and very finely so on each side of the median carina, more strongly and obliquely at the sides. Vertex, behind the posterior ocelli, transversely and microscopically rugulose, the temples longitudinally so and at the base with a few strong rugae. Dorsum of the pronotum without a crenulate groove behind the anterior margin. Mesonotum very sparsely and finely punctured. The anterior corners of the lateral areas of the epinotal dorsum have a few transverse rugae, and the sides of the epinotum are reticulate in the upper half behind and have a few rugae which reach the anterior margin. In some specimens there is a trace of a transverse rugulosity in the lower posterior angle of the mesopleura. Petiole black, quadrangular in cross-section, strongly striate lengthwise. Wings hyaline, the fore wing very faintly stained with yellow beyond the cells and over the radial and second cubital cells, the median cell tinged with brown close to the basal vein, the veins and pterostigma brown. Clypeus not so short at the sides as in *nubilipennis*, the anterior margin of the median area straight. Posterior ocelli twice as far from the eyes as from each other. Petiole very little longer than the first two tergites. Second abscissa of the radius not quite twice as long as the first. Otherwise like *nubilipennis* ♀.

♂. 3·8–4·2 mm. long. Mandibles whitish yellow. Flagellum darker than in the ♀. Median area of the clypeus a little narrower in front than in the ♀. Second joint of the flagellum one-fifth shorter than the first, the latter as long as the third, the second to sixth joints convex lengthwise on the underside. Pronotal collar with a shallow and feebly crenulate groove behind the anterior margin. Otherwise like the ♀. The stipites of the genitalia resemble those of *nubilipennis* but are a little shorter and less acute at the apex.

Bekily, 12 ♀♀, 6 ♂♂. September–October and June–July.

Genus **Passaloecus** Shuck.

Essay indig. Fossorial Hymen. p. 188, 1837

Subgenus **Polemistus** Sauss.

(Genus) *Hist. Madag.* xx, p. 565, 1892; Turner, *Ann. Mag. Nat. Hist.* xvii, p. 128, 1916

Turner's opinion that Saussure's genus can hardly be separated from *Passaloecus* is scarcely tenable. *Polemistus* is at least worthy of subgeneric rank, differing from the genus as follows. Eyes distinctly convergent below, their inner margin strongly concave in the middle. Joints of the flagellum much shorter, the first eight as wide as, or wider than long. Abdomen with a short but distinct petiole, formed by at least the anterior two-fifths of the first sternite (not more than one-quarter in *Passaloecus* s.str.).

P. Braunsi Kohl, which should be placed in this subgenus, has two spines at about the middle of the hind tibiae, but in all the specimens of *macilentus* Sauss. now before me, I am unable to see any spines there, even with the highest magnification. The other differences cited by Saussure appear to be trivial or merely specific ones.

Passaloecus (subgen. **Polemistus**) **macilentus** Sauss.

Hist. Madag. xx, p. 567, ♀, 1892

♀. Saussure gives the length as 3 mm. but the five specimens in the Seyrig collection measure from 4 to 4·5 mm. To Saussure's fairly detailed description the following notes may be added.

Superior interocular distance nearly half as great again as the inferior. First joint of the flagellum slightly longer than wide, as long as the third and a little longer than the second; the latter and the fourth to eighth joints as long as wide, the ninth and tenth a little longer than wide, the apical joint nearly three times as long as wide at the base. Posterior ocelli as far from the occipital margin as from the eyes. Dorsum of the epinotum twice as wide at the base as long. Third sternite with a shallow transverse impression near the middle of its length.

♂ (hitherto undescribed). 3·8–4·1 mm. long. Second to fifth joints of the flagellum dilated on the underside near the apex and bearing a tuft of hairs (75 diameters), the first joint slightly longer than wide, the apical joint nearly three times as long as wide. As in *P. Braunsi* Kohl, the abdomen, especially the first segment, is narrower than in the ♀. Otherwise like the ♀.

Bekily, 5 ♀♀, 10 ♂♂. February–March.

Allied to *P. Braunsi* Kohl from which it can be distinguished in both sexes by the absence of the spine on the lower part of the face.

Tribe *PSENINI*

Three cubital cells present. Antennae inserted at about the middle of the face.

Genus **Psen** Latr.

Préc. car. génér. Insect. p. 122, 1796

Psen madecassus n.sp. (Figs. 116, 116 *a*, *b*)

♀. 10–10·7 mm. long. Head black, thorax fusco-ferruginous, the metanotum, metapleura, sides and declivity of the epinotum and the base of the median dorsal area darker, or almost black. Abdomen dark reddish brown, the apical margins of the second to fifth segments paler, or testaceous red, the sixth segment fusco-ferruginous.

Mandibles reddish brown, antennae ferruginous, the eighth to tenth joints almost black. Femora blackish, tibiae and tarsi ferruginous. Wings hyaline, the radial cell faintly tinged with yellow, the pterostigma and veins yellowish brown. Clypeus and face up to the level of the lower margin of the antennal sockets and at the sides up to the level of the posterior ocelli densely clothed with golden pubescence, the middle of the face from the antennal sockets to the anterior ocellus with a sparser, greyish pubescence. The pubescence on the temples is golden in front, whitish behind. Thorax and first three abdominal segments, excepting the petiole, with a fairly long whitish pubescence, decumbent and dense on the pronotal collar, oblique elsewhere, the dorsum of the epinotum almost bare, dense laterad on the apical margins of the first three tergites. The last three tergites with yellowish pubescence and some longer yellowish hairs.

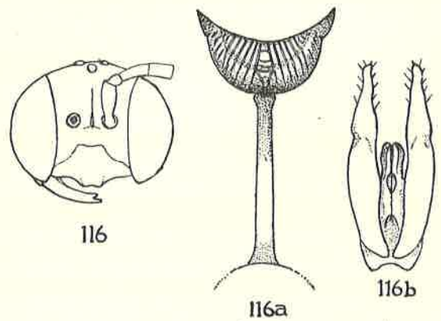


Fig. 116. *Psen madecassus* ♀, head, × 12; *a*, epinotum and petiole, × 12; *b*, ♂, genitalia, × *c.* 27.

Middle of the face between the antennae and the anterior ocellus finely and sparsely punctured, the vertex and occiput more strongly so and moderately shining, the interspaces

on the vertex about three times as wide as the punctures, the temples almost smooth. Pronotum dull, finely and sparsely punctured. Epicnemium shining, and with a close and very fine puncturation. Mesonotum coarsely punctured, more finely and more closely at the sides and in front than elsewhere, the interspaces in the middle shining and about twice as wide as the punctures; the scutellum is as coarsely punctured as the mesonotum and has traces of a longitudinal rugulosity. Mesopleura and metanotum fairly dull, closely and finely punctured, the metapleura smooth and shining. Median triangular area of the epinotum not marginate, merely slightly sunk below the level of the lateral areas, traversed on each side by six oblique costae which extend over on to the lateral areas as far as their posterior margin; in the middle is a triangular space, widest caudad and with four or five transverse costae, which joins a deep median groove on the declivity; the groove widens ventrad. The declivity is coarsely and transversely rugose, and the sides of the epinotum, excepting a small part in front, are reticulate-rugose. Abdomen shining, the petiole with a few punctures at the sides, the fifth tergite and the sides of the sixth sparsely and coarsely punctured, the rest of the abdomen with a fine, shallow and fairly sparse puncturation.

Clypeus feebly convex, twice as wide in front as long in the middle, the anterior margin of the median area feebly sinuate in the middle. Inner orbits equally divergent above and below, the interocular distance on the vertex equal to the length of the first three joints of the flagellum plus two-fifths of the fourth joint. Face with a median longitudinal carina, not reaching the anterior ocellus above, dilated and more prominent below. Flagellum subclavate, the first joint globose, the second joint nearly four times as long as wide at the apex, the third and fourth twice as long as wide, the eighth and ninth as long as wide, the eleventh moderately acuminate, 1½ times longer than wide at the base. Posterior ocelli as far from the eyes as from each other. Temples a little narrower than the eyes. Antennal sockets twice as far from each other as from the eyes. Dorsum of the pronotum very short and concave. The petiole is longitudinally grooved at the sides and is as long as the first two tergites plus half of the third; the rest of the abdomen broadly ovate, twice as long as wide. Pygidial area elongate triangular, sharply marginate at the sides. The proportions of the four abscissae of the radius are 3 : 2 : 5 : 6. Hind tibiae spinose; calcaria of all the legs white.

♂. 8·5–9·5 mm. long. Thorax darker than in the ♀, the pubescence on the abdomen sparser but longer, scutellum more sparsely punctured than in the ♀ and without traces of longitudinal rugae. The inner orbits are more convergent below than in the ♀, the interocular distance on the vertex being one-sixth greater than the inferior, and equal to the length of the first three joints of the flagellum plus three-fourths of the fourth. The flagellum is more slender than in the ♀ but gradually incrassate apically; the second joint is not quite one-third longer than the third and nearly three times longer than wide at the apex, the fourth joint a trifle shorter than the third; the remaining joints are of about equal length but become gradually wider to the penultimate. Petiole as long as the first two tergites. The spine of the seventh sternite is stout and curved upwards; no pygidial area present. The abdominal complex behind the petiole is a little more globose than in the ♀, being only four-fifths longer than wide. Otherwise like the ♀.

Bekily, Ranomafana and Ivondro, 7 ♀♀, 13 ♂♂. October–March.

The prey taken with one specimen is a small, adult Cercopid. Not unlike the Indian *rufiventris* Cam. but with a much shorter petiole, i.e. much less than the length of the head and thorax united, and without a constriction at the base of the fifth abdominal segment.

Genus **Psenulus** Kohl

Ann. naturh. (*Mus.*) *Hofmus., Wien*, XI, pp. 254, 293, 1896

This genus is closely allied to *Psen*, from which it may be distinguished by the following characters

Cubitus of the hind wing originating beyond the end of the submedial cell; face swollen in its lower half, the upper part of the swollen portion having a prominent median vertical carina which meets a transverse carina below it. Sixth tergite convex transversely, without a well-developed pygidial area, or with only a very small and shallow one at the apex of the segment.

The other characters on which Kohl based the definition of the genus are not constant. As I have remarked elsewhere,* species having the three diagnostic characters mentioned above do not always have the hind tibiae without spines in the ♀, nor are only the second and third joints of the flagellum longer than wide in that sex. In some species, as in *dilectus* Sauss., the transverse carina of the face is very feebly developed.

Key to the species, ♀♀ and ♂♂

(2) 1. Black. Mandibles, antennae, pronotal collar, hind margin of the scutellum and sometimes the metanotum, ferruginous; abdominal segments more or less ferruginous. **dilectus** Sauss. (p. 154)

(1) 2. Head and thorax in greater part black, abdomen yellowish red.

(4) 3. Scutellum and metanotum entirely black. Posterior tibiae of the ♀ with two spines on the upper side of the apical half. ♂ 8·7 mm. long, its petiole as long as the first tergite plus half of the second. **reticulosus** Arn. (p. 154)

(3) 4. Scutellum, or at least its hind margin, and the metanotum ivory white.

(6) 5. Scutellum entirely ivory white. **reticulosus** var. **albo-scutellatus** Arn. (p. 156)

(5) 6. Only the hind margin of the scutellum ivory white; ♀ 6·3–8·5 mm., ♂ 6–6·5 mm. long. **fulgidus** Arn. (p. 156)

Psenulus dilectus Sauss.

(*Psen*), *Hist. Madag.* xx, p. 571, ♀, 1892.

♀. 8–8·5 mm. long. Comparing this species with the European *P. ater* Saussure says that the face below the ocellus is 'partagé par un sillon qui entre les antennes, devient une carinule bifurquée en ⅄'. This is not quite correct, but as the whole area is densely pubescent, the true structure is not easily perceived. By carefully scraping away the pubescence it is seen that the rather short longitudinal carina joins a feeble and nearly straight transverse carina below it.

Interocular distance on the vertex equal to the length of the first five joints of the flagellum and 1½ times greater than the inferior interocular distance. Second joint of the flagellum about three times longer than wide at the apex, the third 1½ times longer than wide, the fourth slightly longer, the fifth as long as wide, the sixth to tenth wider than long, the apical joint slightly longer than wide at the base. First abdominal segment strongly clavate, the tergite being very convex, rising abruptly from the sternite or petiole; the latter is as long as the first tergite plus one-quarter of the second, and the first tergite is two-thirds longer than wide. The sixth tergite has a very narrow longitudinal groove extending over its apical third.

Bekily, 7 ♀♀. October and June–July.

This species can easily be distinguished from the other Madagascan ones not only by the colour but by the abruptly clavate first abdominal segment.

Psenulus reticulosus n.sp. (Figs. 117, 117 *a–d*)

♀. 9 mm. long. Head and thorax black, the following parts straw-yellow: mandibles, excepting the piceous apex, palpi, scapes, underside of the first joint of the flagellum, dorsum of the pronotum excepting the outer fourths, the hind margin of the pronotal tubercles and

* *Ann. Transv. Mus.* x, p. 47, 1923–4.

the fore and middle pairs of legs. Hind legs ochreous, their tibiae and tarsi a little darker or reddish ochreous. Tegulae testaceous. Petiole straw yellow, the rest of the abdomen flavo-ferruginous, becoming gradually darker caudad so that in some specimens the last two segments are reddish brown. Wings hyaline, with a faint yellowish tint, the pterostigma ochreous, the veins brown. There is a sparse grey pubescence on the clypeus, on the face below the transverse carina and temples, also on the thorax, excepting the epinotal dorsum; it is short on the upper surface of the thorax but fairly long on the sides and underneath. The abdomen has a short and yellowish grey pubescence on the last three segments.

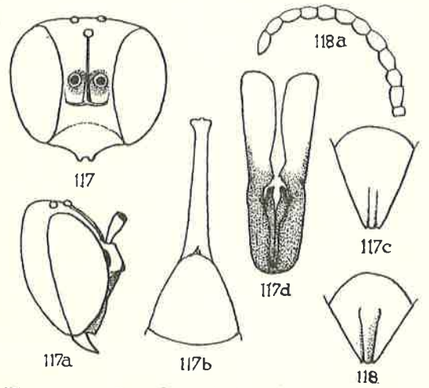


Fig. 117, *a*. *Psenulus reticulosus* ♀, head, × 14; *b*, petiole and first tergite, × 14; *c*, sixth tergite, × 24; *d*, ♂, genitalia, × 24.

Fig. 118. *Psenulus fulgidus* ♀, sixth tergite, × 24; *a*, ♂, flagellum, × 14.

Face above the transverse carina, vertex and temples moderately glossy, the face almost impunctate, the vertex with a few small punctures, the occiput with a larger and fairly close puncturation, the temples very finely and sparsely punctured. Mesothorax and the metanotum nearly dull, with a sparse puncturation of large and small punctures intermixed, the interspaces between the larger ones about three to four times as wide as the punctures. The puncturation on the mesonotum is finer and closer in front and behind than in the middle, and on the mesopleura, scutellum and metanotum sparser than on the mesonotum. Metapleura smooth and shining. Dorsum and anterior half of the sides of the epinotum smooth and shining, the posterior half of the sides and the lower half of the declivity closely reticulate-rugose, the upper half of the declivity with a longitudinal rugosity which merges into the reticulation below. Dorsum of the epinotum short, with a deep but not marginate groove at the base, attenuated laterad and traversed by six costae on each side, continued in the middle into a vertical groove which is dilated ventrad and transversely rugose; the two grooves forming a more or less T-shaped area. Abdomen smooth and shining.

Clypeus twice as wide as long, with two small and obtuse teeth in the middle of the apical margin. The superior interocular distance is about one-fourth greater than the inferior and is equal to the length of the first four joints of the flagellum plus half of the fifth. Posterior ocelli one-third farther from the eyes as from each other. The transverse carina of the face is acute, the vertical one high and triangular in cross-section; above the antennal sockets it joins a raised line which reaches to the anterior ocellus. Flagellum moderately clavate, the first joint globose and a little longer than wide, the second joint twice as long as wide at the apex, the third and fourth nearly so, the fifth and sixth 1½ times longer than wide, the seventh to tenth a little longer than wide. Collar of the pronotum marginate in front, the shoulders subrectangular. Mesonotum with the usual longitudinal impressed line on each side of the middle and extending over the anterior half of the segment. Petiole moderately widened caudad, as long as the first tergite plus two-thirds of the second, the first tergite fairly flat, three times wider at the apex than at the base and nearly as long as wide. Sixth tergite with a very shallow, parallel-sided pygidial area extending over the apical half of the segment. Posterior tibiae with two widely separated spines in the apical half. The first recurrent vein enters the second cubital cell just beyond its proximal basal angle, and the second enters the third cubital cell at its first fifth.

♂. 8·7 mm. long. Flagellum pale brownish red. Abdomen ferruginous. Upperside of the anterior femora stained with brown. Puncturation of the mesonotum larger and deeper than in the ♀ and with traces of a transverse rugosity over the posterior third. The sides of the mesonotum from the tegulae backwards are margined by a sparsely costate groove. The longitudinal rugosity on the upper part of the declivity of the epinotum extends cephalad almost as far as the basal groove on the dorsum. Otherwise like the ♀ in colour, sculpture and pubescence.

The teeth on the anterior margin of the clypeus are less developed than in the ♀. Second joint of the flagellum twice as long as wide, the second to eleventh moniliform, swollen in their apical half, diminishing gradually in length to the eleventh but all longer than wide, the last joint lanceolate and $2\frac{1}{3}$ times longer than wide. Pronotal collar longer than in the ♀.

Scutellum distinctly gibbose. Petiole as long as the first tergite plus half of the second. Posterior tibiae without spines on the upper side. The genitalia are peculiar, differing from those of *Psen* spp. in having the stipites not opposed but lying one over the other. They are very long, flat and membranous in the apical half.

Rogez and Perinet, 11 ♀♀, 1 ♂. October–June.

var. **albo-scutellatus** n.var.

♀. 9–11 mm. long. The scutellum, excepting the lateral margins, and the metanotum, ivory white. The rugosity on the declivity of the epinotum finer and more superficial than in the specific form. Flagellum a little more slender, the second joint three times longer than wide at the apex. Otherwise like the type of the species.

Perinet, Ivondro, Rogez and Ranomafana, 8 ♀♀. September–May.

Psenulus fulgidus n.sp. (Figs. 118, 118 *a*)

♀. 6·3–8·5 mm. long. Closely allied to *reticulosus* Arn. and with almost the same colour, differing therein only as follows. The whole of the pronotal dorsum, the hind margin of the scutellum and the metanotum ivory white. The fore and middle legs paler, only the tarsi somewhat ochreous.

Wings clear hyaline, without any tint of yellow. The whole body, excepting the clypeus and the face below the transverse carina, is shining. The sculpture on the whole similar to that of *reticulosus*. Upper part of the face and the vertex more closely punctured than in *reticulosus*, the secondary or smaller puncturation of the mesonotum more abundant, the mesopleura more strongly and more closely punctured. The posterior half of the sides of the epinotum and the declivity closely and irregularly reticulate-rugose, the reticulations extending upwards to the brow of the declivity, the median groove of that part broadly and triangularly dilated below and only feebly rugose. Pubescence as in *reticulosus* but relatively longer and denser, especially on the clypeus and the lower half of the face. Clypeus like that of *reticulosus*. Superior interocular distance one-fourth greater than the inferior and nearly equal to the length of the first six joints of the flagellum. Posterior ocelli nearly as far from each other as from the eyes. Flagellum shorter and more clavate than in *reticulosus*, the second and third joints two-thirds longer than wide, the fourth and fifth one-third longer than wide, the sixth one-fourth longer, the seventh to tenth as long as wide, the apical joint $1\frac{1}{2}$ times longer than wide at the base. The median longitudinal carina on the face has its upper edge dilated to form a lozenge-shaped concave area (35 diameters). Pronotal collar longer than in *reticulosus*, six times wider in front than long at the sides (seven times in *reticulosus*). Petiole as in that species. First tergite as long as wide at the apex. Sixth tergite with a fairly deeply excavated pygidial area which extends over the apical two-thirds of the segment and is dilated cephalad. Hind tibiae with three or four short spines on the apical half. Venation like that of *reticulosus*, but the distance between the second transverse cubital vein and the second recurrent vein is slightly greater.

♂. 6–6·5 mm. long. Flagellum pale brownish red, fore and middle femora brownish above. Puncturation of the mesothorax denser than in the ♀, the interspaces between the larger punctures about twice as wide as the punctures; in some specimens there is a trace of a transverse rugosity on that part. Otherwise like the ♀ in colour, sculpture and pubescence. Flagellum strongly moniliform, more dilated in the middle than in *reticulosus* ♂, the first joint wider than long, all the other joints longer than wide. Petiole as long as the first tergite plus one-fifth of the second; the first tergite one-third longer than wide at the apex. Hind tibiae without spines on the upper surface. Otherwise like the ♀.

The genitalia differ from those of *reticulosus* in having the flat blade-like apical part of the stipites longer, or one-third longer than the basal, whereas in *reticulosus* the two parts are of equal length.

Bekily, Behara and Ranomafana, 16 ♀♀, 9 ♂♂. September–April.

Subfamily CRABRONINAE

Kohl, 'Die Gattungen der Sphegiden', *Ann. naturh.* (*Mus.*) *Hofmus.*, *Wien*, XI, p. 484, 1896; Dalla Torre, *Cat. Hymen.* VIII, p. 578, 1897; Kohl, 'Die Crabronen Palärk. Reg.', *Ann. naturh.* (*Mus.*) *Hofmus.*, *Wien*, XXIX, pp. 1–17, 1915; Arnold, *Ann. Transv. Mus.* XI, p. 338, 1926; XX, p. 134, 1940

This subfamily is composed of two genera, the Nearctic *Anacrabro* Pack. and the cosmopolitan *Crabro* F. The latter and *Cerceris* are the two largest Sphecid genera. Kohl in 1915 listed 532 species of *Crabro*, and without a doubt the number now exceeds 600. Excepting such genera as may have been erected since that date and which are unknown to me, I follow Kohl in regarding all those species and those which I have described from the Ethiopian Region as belonging to one super-genus. It is unnecessary to repeat the arguments for this view, for which the reader is referred to the papers cited above, but it may be said immediately that the Madagascan fauna, which is singularly rich in Crabronine wasps, provides further support for it, as will be shown later on. As Kohl has remarked, the genus, so rich in species and variety of form, is in the process of dissolving into a large number of closely related genera. However, it cannot be said that this dissolution has proceeded so far at the present time that these genera can be clearly defined, nor that the constituent species belong even to clearly definable subgenera. In my monograph of the Ethiopian species (1926) certain subgenera were recognized, but at this date such a step seems unjustified and I follow Kohl in recognizing only species-groups within the genus. It is true that some of these groups have at least some characters which appear to be so special and restricted as to render them worthy of subgeneric rank, but only if the Holarctic and Oriental species alone are taken into consideration. As an example we may take *Entomognathus*; this is the only species-group which has pubescent eyes, but in some of the Ethiopian species this pubescence is exceedingly scanty, so much so that the discovery of a new species, in which it has entirely disappeared but conforming in all other characters to the group, would not be in any way surprising. Kohl (1915) in his key to the species-groups mentions, inter alia, two other characters as pertaining to the *Entomognathus* group. One is the absence of yellow spots on the abdomen and the other the absence of a mesosternal crest in front of the middle coxae. Now in regard to the first not only is the statement negatived by the Ethiopian *patricius*, in which yellow markings are present on the abdomen, but in two new Madagascan species there are large and brilliant yellow maculae on the thorax as well as on the abdomen, and in fact, in one of them the abdomen is mainly yellow. In so far as the other character is concerned, this same species has a well-defined mesosternal crest.

Another example in support of the statement that subgeneric rank is difficult to define in this genus is afforded by the relationship between *Dasyproctus* Lep. and *Neodasyproctus* Arn. The latter was defined as a species-group chiefly on account of the absence of a posterior epicnemium on the mesopleurae and the shining and strongly punctured integument, so very different from the dull or matt surface of the head and thorax peculiar to *Dasyproctus*. But two new species from Madagascar as well as the South African *N. basutorum* Turn. exhibit a puncturation finer and much closer than in the type of the species-group, *N. Kohli* Arn., not truly intermediate between the two, but clearly tending in that direction. Such a situation would no doubt present no difficulties to those authors who would calmly erect another new genus for the reception of these species, thereby bringing the day nearer when there will be as many, or nearly as many, Crabronine genera as there are species. On the other hand, we can enlarge the definition of the species-groups until at last the boundaries of some of them overlap and thereby furnish still another proof that a subgeneric division of *Crabro* is as yet hardly practicable.

Genus **Crabro** F.

Syst. Ent. p. 373, no. 117, 1775

Key to the species

♀♀

(12) 1. Eyes pubescent. Mandibles acute at the apex, excised on the outer lower margin. Ocelli arranged in a low isosceles triangle. The suture between the mesonotum and scutellum dilated laterad. First tergite much wider than long (forming a segment of a circle), or at least broadly campanulate, not petiolate nor as long as, or longer than wide at the apex. The transverse cubital vein of the fore wing meets the radius at about its middle and the recurrent vein meets the cubital cell beyond its middle. Pygidial area in the ♀ flat and triangular. Species-group **Entomognathus** Dhlb. (p. 161)

(5) 2. Abdomen with yellow markings.

(4) 3. Abdomen mainly yellow. Basal part of the median area of the clypeus produced into a porrect platform, thicker at the base than at the apex, its apical margin entire, or arcuately incised medially, or feebly tridentate (Figs. 119, 119 *a*). 8·5–9 mm. long. **midas** Arn. (p. 161)

(3) 4. Abdomen black, the whole of the fourth, fifth and sixth tergites and lateral maculae on the second and third tergites, yellow. Median area of the clypeus produced at the base into a thick porrect protuberance, which is arcuately excised in the middle of the apical margin and is three times wider at the base than long (Fig. 120). 6·5–7 mm. long. **mimicus** Arn. (p. 163)

(2) 5. Abdomen without yellow markings.

(7) 6. Anterior margin of the clypeus with three teeth, the outer ones broad and triangular, the middle one small, λ-shaped or subcuneiform (Fig. 122). **tridens** Arn. (p. 165)

(6) 7. Anterior margin of the clypeus with a feeble tooth or angle on each side of the median area.

(11) 8. Tergites shining, sparsely and finely punctured.

(10) 9. Sixth abdominal segment and the apical half of the fifth ferruginous. The carina margining the temples ends below in a rectangular tooth. Wings tinged with fuscous. 6–6·5 mm. long. **ruficaudatus** Arn. (p. 164)

(9) 10. Only the sixth abdominal segment ferruginous, or reddish brown. The carina margining the temples ends below in an acute, curved tooth. Wings clear hyaline. 4·6 mm. long. **faunus** Arn. (p. 166)

(8) 11. Tergites dull, closely and fairly strongly punctured; dorsum of the epinotum divided by high carinae into nine polygonal areas. **diversicornis** Arn. (p. 168)

(1) 12. Eyes glabrous.

(14) 13. Maxillary palpi five-, labial palpi three-jointed. Abdomen much longer than the thorax, the first segment forming a long and strongly clavate petiole. Posterior tibiae thickened apically. Dorsum of the epinotum usually without a distinctly defined median area. Mesothorax without an epicnemium. Species-group **Rhopalum** Kirby, **ichneumoniformis** Arn. (p. 169)

(13) 14. Maxillary palpi six-, labial palpi four-jointed.

(34) 15. Antennae twelve-jointed in the ♀, thirteen-jointed in the ♂.

(23) 16. Head, mesothorax and tergites dull, owing to a fundamental reticulate sculpture which is not resolvable under a magnification of even 100 diameters; the superimposed puncturation, if present, sparse, fine and shallow. Mesopleura with a distinct epicnemium in front, and a slightly less distinct one behind. First abdominal segment petioliform, usually clavate and in the majority of the species much longer than wide. Pygidial area present in the ♀, small, Y-shaped and deeply excavated. The recurrent vein meets the cubital cell distinctly beyond its middle. Species-group **Dasyproctus** Lep. (p. 169)

(22) 17. The brow of the facial concavity margined by a carina.

(19) 18. Tibiae more or less yellow above. Petiole 4½ times longer than wide across the node. **saevus** Sauss. (p. 172)

(18) 19. Tibiae ferruginous.

(21) 20. The underside of the temples in front, near the base of the mandibles, nitidulous, longitudinally rugulose and punctured between the rugae. Petiole three times longer than wide across the node. **crudelis** Sauss. (p. 170)

(20) 21. The underside of the temples in front shining, coarsely longitudinally rugose and punctured. Petiole 3½ times longer than wide across the node. **infrarugosus** Arn. (p. 173)

(17) 22. The brow of the facial concavity not margined by a carina. Petiole short, barely twice as long as wide behind. Tibiae more or less yellow above. **ferox** Sauss. (p. 171)

(16) 23. Vertex and thorax without a matt surface; mesopleura without a posterior epicnemium.

(29) 24. Vertex and thorax closely and deeply punctured, sometimes very coarsely, the interspaces shining. Petiole as in *Dasyproctus* group. The recurrent vein meets the cubital cell well beyond its middle. Ocelli arranged in a low isosceles triangle. Dorsum of the epinotum without a clearly defined median area. Species-group **Neodasyproctus** Arn. (p. 174)

(26) 25. Pronotal collar and the base of the fourth tergite with ivory white bands. **eburneopictus** Arn. (p. 175)

(25) 26. Markings on the pronotum and abdomen yellow.

(28) 27. Vertex strongly reticulate-punctate, the mesonotum closely and coarsely punctured, the interspaces shining. Petiole three times longer than wide across the node. Abdomen shining, the second to fifth tergites very finely and shallowly punctured, the interspaces fully three times wider than the punctures. 9·5–10 mm. long. **densepunctatus** Arn. (p. 174)

(27) 28. Vertex finely and closely punctured, not reticulate-punctate, the interspaces being about as wide as the punctures. Mesonotum with a slight greasy lustre due to a microscopic (50 diameters) close and longitudinal striation, with a fine puncturation superimposed. 5·7–6 mm. long. **striolatus** Arn. (p. 176)

(24) 29. The recurrent vein meets the cubital cell at, or only a little beyond its middle. Epinotum usually with a well-defined median area. Ocelli arranged in an equilateral triangle. A mesosternal crest or tooth, in front of the middle coxae, often present. Species-group **Crossocerus** Kohl **sens.lat.** (p. 179)

(31) 30. Dorsum of the pronotum long, fully half as long as the scutellum, with a wide and deep transverse groove extending from the anterior corners and curving caudad nearly to the depressed hind margin. (Subgroup **Coelocrabro**) **sociabilis** Arn. (p. 180)

(30) 31. Dorsum of the pronotum short, without a transverse groove.

(33) 32. Clypeus yellowish white, the anterior margin with five teeth. First tergite 2⅓ times longer than wide at the apex. 5·6–7 mm. long. **brunniventris** Arn. race **bekiliensis** Arn. (p. 180)

(32) 33. Clypeus black, its median area produced into a rectangular lobe, and with a short tooth on each side of the same. First tergite one-fifth longer than wide at the apex. 4·4–5·6 mm. long. (Subgroup **Coelocrabro**) **hirtitibia** Arn. (p. 179)

(15) 34. Antennae twelve-jointed in both sexes. The recurrent vein meets the cubital cell beyond the second third of its length, i.e. not far from the distal angle. Mesosternum with a distinct crest or tooth in front of the middle coxae. First tergite never petioliform. Mesothorax usually very strongly sculptured. Dorsum of the epinotum never shining, without a distinct median area, usually coarsely sculptured. Ocelli arranged in a low isosceles triangle. Species-group **Crabro** Kohl (p. 181)

(38) 35. Mandibles with a sharp and long tooth on the upper inner margin.

(37) 36. Clypeus yellow, pronotal dorsum without yellow markings. Mesonotum reticulate-punctate and dull. Epinotal declivity with yellow maculae on each side. Fifth tergite without a yellow band. Legs with yellow markings. Wings pale flavo-hyaline. 14 mm. long. (Subgroup **Solenius**) **praeclarus** Arn. (p. 181)

(36) 37. Clypeus black. Pronotal dorsum yellow. Mesonotum longitudinally rugose, strongly punctured between the rugae and shining. Epinotum entirely black. Fifth tergite with a transverse yellow band, interrupted in the middle. Legs with some yellow markings. Wings hyaline. 11 mm. long. (Subgroup **Solenius**) **Seyrigi** Arn. (p. 183)

(35) 38. Mandibles edentate on the inner margin. Black, with a reddish tinge, the anterior corners of the mesonotum, the mesopleurae partially and the lateral areas of the epinotal dorsum dark wine-red. 11·5–13·5 mm. long. **Slateri** Arn. race **nigrescens** Arn. (p. 183)

♂♂

(6) 1. Eyes pubescent. Mandibles excised on the lower outer margin, acute at the apex. Ocelli arranged in a low isosceles triangle. The suture between the mesonotum and the scutellum dilated laterad. First tergite much wider than long (forming a segment of a circle), or at least broadly campanulate, not petiolate. The transverse cubital vein meets the radius at about its middle, the recurrent vein meets the cubitus beyond the middle. Species-group **Entomognathus** Dhlb. (p. 161)

(5) 2. Abdomen with yellow markings. A mesosternal crest present in front of the middle coxae.

(4) 3. Legs entirely yellow. Apical joint of the flagellum curved, excavated below, truncate at the apex and narrower there than at the base. **midas** Arn. (p. 161)

(3) 4. Femora more or less black at the base. Apical joint of the flagellum curved, excavated below, broadly truncate at the apex and as wide there as at the base. **mimicus** Arn. (p. 163)

(2) 5. Abdomen without yellow markings. No mesosternal crest present. The eighth to tenth joints of the flagellum are angularly dilated posteriorly, the apical joint is very large, slightly curved, flattened dorso-ventrally at the apex, which is broadly truncate (Fig. 124 *b*). **diversicornis** Arn. (p. 168)

(1) 6. Eyes glabrous.

(8) 7. Maxillary palpi five-, labial palpi three-jointed. Abdomen much longer than the thorax, the first segment forming a long and strongly clavate petiole. Mesothorax without an epicnemium. Species-group **Rhopalum** Kirby, **ichneumoniformis** Arn. (p. 169)

(7) 8. Maxillary palpi six-, labial palpi four-jointed.

(22) 9. Antennae thirteen-jointed.

(17) 10. Head, mesothorax and tergites dull, owing to a reticulate sculpture which is not resolvable with a magnification of even 100 diameters; superimposed puncturation, if present, sparse, fine and shallow. Mesopleura with epicnemia in front and behind. First abdominal segment petioliform. The recurrent vein meets the cubital cell distinctly beyond its middle. Species-group **Dasyproctus** Lep. (p. 169)

(16) 11. The brow of the facial concavity margined by a carina.

(13) 12. Tibiae more or less yellow above. **saevus** Sauss. (p. 172)

(12) 13. Tibiae ferruginous. Fifth joint of the flagellum dilated at the apex below. Anterior and middle femora and the middle tibiae fringed below with long white hairs.

(15) 14. Petiole nearly $3\frac{1}{2}$ times longer than wide across the node. **crudelis** Sauss. (p. 170)

(14) 15. Petiole four times longer than wide across the node. **infrarugosus** Arn. (p. 173)

(11) 16. The brow of the facial concavity not margined by a carina. Tibiae marked with yellow above. **ferox** Sauss. (p. 171)

(10) 17. Vertex and thorax without a matt surface. Mesopleura without a posterior epicnemium.

(19) 18. Vertex and thorax closely punctured, the interspaces shining. The recurrent vein meets the cubital cell well beyond its middle. Ocelli arranged in a low isosceles triangle. Dorsum of the epinotum without a distinctly defined median triangular area (species-group *Neodasyproctus* Arn.). Petiole five times longer than wide across the node. The flagellum stout. **protensus** Arn. (p. 178)

(18) 19. The recurrent vein meets the cubital cell at, or only a little beyond its middle. Epinotum usually with a well-defined median area. Ocelli disposed in an equilateral triangle. A mesosternal crest or tooth, in front of the middle coxae, is usually present. Species-group **Crossocerus** Kohl (p. 179)

(21) 20. Anterior tibiae densely fringed below with long white hairs. Clypeus black, the apical margin without distinct teeth. **hirtitibia** Arn. (p. 179)

(20) 21. Anterior tibiae not fringed with long hairs below. Clypeus yellowish white, with five sinuations. **brunniventris** Arn. race **bekiliensis** Arn. (p. 180)

(9) 22. Antennae twelve-jointed.

(24) 23. Mandibles with a large and acute tooth on the inner upper margin, near the middle. Black, with yellow markings on the thorax and abdomen. **Seyrigi** Arn. (p. 183)

(23) 24. Mandibles edentate on the inner upper margin. Dark vinaceous red, without any yellow markings. **Slateri** Arn. race **nigrescens** Arn. (p. 183)

Species-group *Entomognathus*

Crabro midas n.sp. (Figs. 119, 119 *a–g*)

♀. 8·5–9 mm. long. Black. The following parts chrome yellow: basal half of the mandibles (the apical half dark red), clypeus, scapes, dorsal face and the upper half of the anterior face

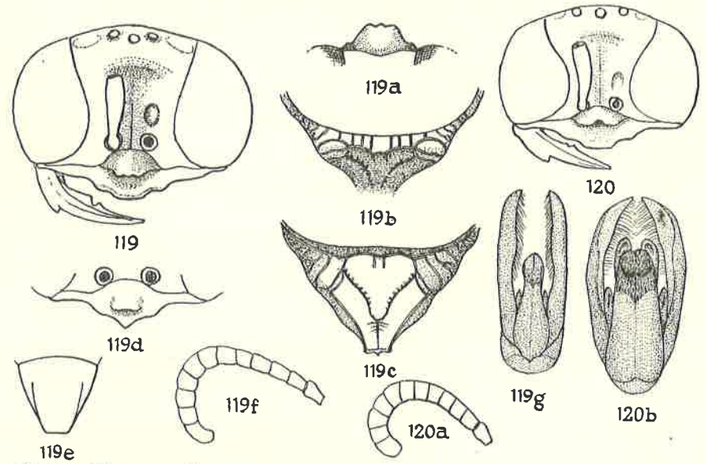


Fig. 119. *Crabro* (*Entomognathus*) *midas* ♀, head, × 14; *a*, clypeal platform from above, × 14; *b*, epinotum, dorsal view, × 14; *c*, posterior view, × 14; *d*, ♂, clypeus, × 14; *e*, pygidium, × 14; *f*, flagellum, × 24; *g*, genitalia, × 24.

Fig. 120. *Crabro* (*Entomognathus*) *mimicus* ♀, head, × 14; *a*, ♂, flagellum, × 24; *b*, genitalia, × 40.

of the pronotal collar, pronotal tubercles, epicnemium and episternum, scutellum including the cuneoli and the lateral posterior trabeculae, the metanotum more or less, and its trabe-

culae, a transverse macula on the mesosternum in front of the middle coxae, and the greater part of the abdomen. The base of the first tergite is more or less brownish black, the first four tergites have narrow reddish brown apical bands and the fifth a very narrow reddish yellow band. Flagellum black, the first and the last four joints somewhat rufescent below. Tegulae testaceous, with a yellow spot in front. Wings pale fuscous, paler at the base, the pterostigma dull red, the veins dark brown. Clypeus, sides of the face and the temples with silvery pubescence, vertex with a sparse, erect and yellowish pubescence. Eyes pubescent. Thorax and abdomen with yellowish pubescence, short and inconspicuous on the dorsum and sides of the thorax, denser and longer on the mesosternum, sternites and pygidium. The whole body shining. Mandibles acute at the apex, the lower outer margin excised, the inner upper margin with two broad teeth at about the middle. Median area of the clypeus with the anterior margin convex in the middle and slightly sinuate on each side, the basal part of the area produced into a porrect, and seen from above, more or less trapezoidal lamella, $1\frac{1}{2}$ times wider at the base than long and thicker at the base than at the apical margin, which is either entire or more or less arcuately excised, or as in the type, feebly tridentate. Facial concavity impunctate, the vertex with a few large punctures. Dorsum of the pronotum nearly impunctate, the anterior face and the sides strongly and obliquely rugose. Posterior corners of the prosternum thickened and produced, forming a more or less truncated tooth, plainly visible from above. Mesonotum, mesopleura, scutellum and metanotum with a few small setigerous punctures. The sutures between the mesonotum, scutellum and metanotum deep but not clathrate. Dorsum of the epinotum shorter in the middle than at the sides, margined caudad by a high ridge, the narrow middle part with four costae on each side, the lateral areas broken up by transverse ridges into four unequal areas, of which the posterior one is the largest; the declivity is flat and not grooved medially but with a median and reversed pyriform field which is margined above by carinae and at the sides by a foveolate groove. The lateral margins of the declivity are separated from the sides of the epinotum by a high carina. Epicnemium of the mesopleura sharply marginate posteriorly, the mesosterna with a strong and oblique crest in front of the middle coxae, the episternal and epi-metasternal sutures deep and clathrate, the hind margin of the mesopleura also clathrate. Second sternite with a shallow and fine puncturation, the interspaces about twice as wide as the punctures, the third to fifth sternites finely and sparsely punctured, the sixth more closely and more strongly punctured, the pygidial area wide, triangular, coarsely and closely punctured. Median area of the clypeus half as wide again as long. Facial concavity with a median longitudinal impressed line, and an oval pit on each side just above the antennal sockets.

Junction of the face and vertex rounded; hind margin of the occiput and temples bounded by a trenchant carina which is dilated at the point where the temples are widest, the groove between the carina and the margins clathrate; temples at their widest four-fifths as wide as the eyes. The lateral foveae on the vertex are very shallow and indistinct. The interocular distance on the vertex is equal to the length of the first eight joints of the flagellum and is nearly twice as great as the least distance between the eyes, which is at a point slightly above the level of the antennal sockets. First five joints of the flagellum longer than wide, the sixth and seventh as long as wide, the eighth to tenth a little wider than long, the apical joint $1\frac{1}{2}$ times longer than wide at the base. Pronotal dorsum convex transversely and lengthwise, slightly depressed in the middle. Mesonotum $1\frac{1}{2}$ times wider than long, with two small shallow pits in front behind the middle of the anterior margin and a short impressed line on each side opposite the tegulae. Anterior femora subtriquetrous; hind tibiae densely spinose on the upper surface, middle tibiae with a row of about nine spines on the upper inner margin.

The truncating vein of the radial cell is perpendicular to the radius, the transverse cubital vein meets the radius a little beyond its middle and the recurrent vein meets the cubital cell

a long way beyond the middle or at about one-fourth of its length from the distal end of the cell.

♂. 6·5 mm. long. Basal third and apical margin of the first tergite black, the median part chrome yellow. Second and third tergites black, with a chrome yellow macula, narrowed mesad, on each side of the basal half, the fourth tergite black at the base and apex and yellow in the middle, the remaining tergites yellow, the apical one slightly brown at the sides. Otherwise like the ♀ in colour, sculpture and pubescence.

Median area of the clypeus not produced into a lamella as in the ♀, the basal half merely somewhat protuberant and the anterior concave, the anterior margin acutely angular. First four joints of the flagellum about $1\frac{1}{2}$ times longer than wide, the fifth to seventh as long as wide, the eighth to eleventh wider than long, the twelfth curved, truncate and transversely compressed at the apex and longer than wide. Metapleura with a small yellow spot near the lower angle. Pygidial area trapezoidal, with large and elongate punctures. Otherwise like the ♀. The stipites of the genitalia are lamelliform and densely pilose on the underside and about twice as long as the cardo; the latter, as in most of the Crabroninae, is not in the same plane as the paramera, but subvertical.

Behara, 3 ♀♀, 1 ♂. October.

Not related to any of the Ethiopian species. In the perpendicular truncating vein of the radial cell and the presence of a mesosternal crest, this species differs from the European members of the species group except *C. Schmiedeknechti*, in which the truncating vein is also perpendicular.

Crabro mimicus n.sp. (Figs. 120, 120 *a*, *b*)

♀. 6·5–7 mm. long. Closely allied to *C. midas*, and with the clypeus somewhat similar, but with the abdomen mainly black.

Black. The following parts lemon yellow: clypeus, scapes, dorsum and upper third of the anterior face of the pronotum, pronotal tubercles, scutellum and its lateral trabeculae, the trabeculae of the metanotum, lateral maculae on the second and third tergites and the whole of the fourth, fifth and sixth tergites. Mandibles pale yellow on the basal half, ferruginous on the apical. Flagellum blackish above, brownish ochreous below. Sternites 1–5 black, the second with a somewhat V-shaped apical yellow macula dilated laterad, the third and sometimes also the fourth with a narrow pre-apical yellow band, the sixth sternite black at the base, flavo-ferruginous at the apex. Legs yellow, with the following parts blackish: the basal half on the underside and the basal third on the upperside of the anterior femora, the basal half of the middle femora and the basal four-fifths of the hind femora. Last four tarsal joints of all the legs reddish ochreous. Coxae more or less spotted with dull yellow on the underside.

Wings pale fusco-hyaline, the basal fourth clear hyaline, the pterostigma and veins blackish. Sides of the clypeus and the lower half of the face with a dense silvery pubescence, the temples with a sparser one. Eyes very slightly pubescent. The rest of the body with a greyish yellow pubescence, shorter and much scantier than in *midas*. Sculpture as in *midas* but the dorsum of the epinotum is even shorter, and the median area has only four costae (or six including the lateral margins). Anterior margin of the median area of the clypeus straight, or sometimes feebly concave in the middle and sinuate on each side, the basal part produced into a porrect platform, thicker than in *midas*, or almost triangular in cross-section, arcuately excised in the middle or seen from above bilobed, and nearly three times wider at the base than long. First five joints of the flagellum longer than wide, the sixth, ninth and tenth as long as wide, the seventh and eighth wider than long, the eleventh $1\frac{1}{2}$ times longer than wide. Interocular distance on the vertex equal to the length of the first eight joints of the flagellum and four-fifths greater than the least interocular distance

on the face. The latter has an oval fovea above both antennal sockets, as in *midas*. On each side of the vertex there is a shallow elliptical fovea extending from the posterior ocelli almost to the margin of the eyes. Posterior corners of the prosternum produced, but not quite so much as in *midas*. Mesosternum with a crest in front of the middle coxae. First tergite with a short and deep longitudinal groove at the base. Middle and hind tibiae sparsely spinose on the upper surface. The truncating vein of the radial cell meets the radius obliquely, the transverse cubital vein meets the radius a little before its middle and the recurrent vein meets the cubitus at about one-third of its length from the transverse cubital vein.

♂. 6 mm. long. Fourth to seventh tergites lemon yellow, the apical margin of the fourth black and of the fifth and sixth reddish yellow. Otherwise like the ♀ in colour, sculpture and pubescence. The posterior corners of the prosternum acute, but not produced as in the ♀. Clypeus like that of *midas* ♂ but the apical margin is only feebly convex in the middle, not produced into a triangular tooth.

The flagellum is thicker than in *midas*, the fourth to eleventh joints wider than long, the apical joint very little longer than wide at the base. The genitalia differ considerably from those of *midas*; the stipites are falcate and membranous on the inside over the apical two-thirds, and the inner paramera, which in *midas* are not visible from above, project well beyond the apex of the sagittae. The latter are stouter at the base and longer than in *midas*, and their apical part is densely setose.

Bekily, 13 ♀♀, 2 ♂♂. November–January.

The prey taken with one specimen is a small Chrysomelid beetle.

Crabro ruficaudatus n.sp. (Figs. 121, 121 *a*, *b*)

♀. 6–6·5 mm. long. Black, the sixth abdominal segment and the apical margin of the fifth ferruginous or sometimes dark reddish brown. Clypeus, scapes, pronotal tubercles, apex of the anterior femora, fore and middle tibiae, the hind tibiae excepting the extreme base and the apical fourth, and the first four joints of the tarsi, yellowish white. Tegulae testaceous, with a white spot in front. Mandibles fusco-ferruginous. Wings hyaline, the apical half faintly fuscous, the pterostigma and veins black.

On the whole body, which is fairly shining, there is a scanty whitish pubescence, more dense on the clypeus and mesopleura than elsewhere, the face is nearly glabrous. Median area of the clypeus with a few large punctures, the face impunctate, the vertex fairly strongly punctured in front of the anterior ocellus, the interspaces from three to four times as wide as the punctures, behind the anterior ocellus much more sparsely and more finely punctured. Temples finely and closely punctured. Pronotum and epicnemium very finely punctured. The puncturation of the mesothorax is a little finer and less close than that of the posterior part of the vertex. The mesonotum has two large pits on each side of the middle a short distance behind the anterior margin and a short impressed line at the sides opposite the tegulae. The suture between the mesonotum and scutellum is deep, clathrate and widened laterad. Metanotum and metapleura with a few small punctures. Dorsum of the epinotum longer than in the two preceding species, merging into the vertical declivity in a wide curve, without a marginate area but with a basal transverse groove which is divided by eight costae. The posterior corners of the dorsum and the upper part of the sides below them are feebly rugose. Declivity with a pyriform and transversely rugose median groove, the lateral margins of the declivity defined by sharp carinae which are angularly bent inwards dorsad and extend over the posterior part of the dorsum. First five tergites very finely but not closely punctured, the punctures decreasing in size progressively caudad. Pygidial area elongate triangular, nearly twice as long as wide at the base, marginate at the sides, strongly and closely punctured. Sternites 2–5 with a few large and widely separated punctures, the sixth finely and sparsely punctured.

Median area of the clypeus subquadrate, gibbous at the base, as long as wide, the anterior margin straight in the middle, arcuately excised laterad and with a blunt tooth beyond the excision. Face with an elongate groove on each side adjacent to the inner orbits, much narrowed below, the interocular distance on the vertex being nearly four times greater than the least distance between the eyes, which is at the level of the antennal sockets. There is a median longitudinal impressed line on the face which does not reach the anterior ocellus; the brow of the face is not marginate but nevertheless joins the vertex rectangularly. Posterior ocelli three-fifths farther from the eyes than from each other; the lateral foveae on the vertex deep and elliptical. Interocular distance on the vertex equal to the length of the flagellum less the apical joint. First joint of the flagellum half as long again as wide and by the same amount longer than the second, the third joint one-fourth longer than the second, the second to tenth joints all a little longer than wide and increasing slightly in size successively, the apical joint twice as long as wide. Temples and occiput sharply marginate behind. Pronotal dorsum shorter at the sides than in the middle, where it is as long as one of the ocelli and slightly depressed caudad. Scutellum and metanotum strongly convex lengthwise. Dorsum of the epinotum $1\frac{1}{2}$ times wider at the base than at the hind margin. Middle and hind tibiae feebly spinose, the former with three brown spines in a row near the apex. Posterior metatarsi not transversely compressed. Truncating vein of the radial cell oblique; the transverse cubital vein meets the radius slightly before its middle and the recurrent vein meets the cubital cell a little beyond the middle.

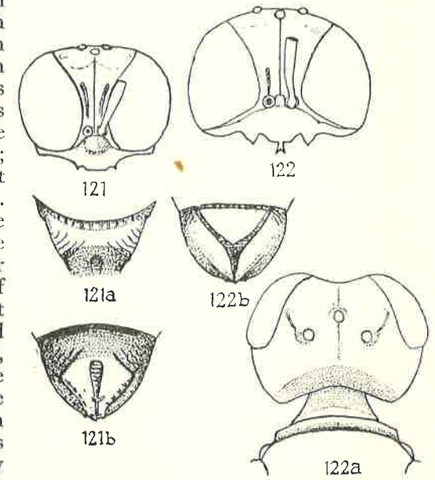


Fig. 121. *Crabro* (*Entomognathus*) *ruficaudatus* ♀, head, × *c.* 14; *a*, *b*, epinotum, from above and from behind, × *c.* 14.

Fig. 122. *Crabro* (*Entomognathus*) *tridens* ♀, head, ×24; *a*, head and pronotum, ×24; *b*, epinotum seen from behind, ×24.

Rogez and Ivondro, 5 ♀♀.

The two specimens from Ivondro have the apical segment of the abdomen dark reddish brown.

Crabro tridens n.sp. (Figs. 122, 122 *a*, *b*)

♀. 3·8–4 mm. long. Black. Median area of the clypeus sometimes pale straw yellow. Mandibles excepting the piceous apex, scapes, upper half of the pronotal tubercles, tibiae and tarsi pale ochreous; the underside of all the tibiae with a fuscous streak not reaching the base and apex. The last two joints of the middle and hind tarsi fuscous. Tegulae whitish in front, apex of abdomen slightly rufescent. Wings hyaline, the pterostigma and veins dark brown. Clypeus and sides of the face with a dense silvery pubescence, the temples with a sparse one, the rest of the body with a very short, fairly sparse and whitish pubescence. Eyes moderately pubescent. Clypeus densely and fairly strongly punctured, the rest of the head closely and finely, the interspaces on the face about as wide as the punctures, on the vertex and temples from two to three times as wide; face nearly dull, vertex and temples nitidulous. Pronotum dull, microscopically and closely punctured (45 diameters), the

junction of the neck and collar with a few longitudinal rugae. Prosternum, anterior coxae and the epicnemium shining, finely but not closely punctured. Mesonotum nitidulous, with a puncturation slightly larger than that of the vertex, except near the anterior margin where it is a little smaller and closer. The puncturation of the shining scutellum and mesopleura a little larger and sparser than that of the mesonotum. Metanotum dull and punctulate, metapleura shining and as strongly punctured as the mesonotum. Epinotum with a well-defined median triangular area which is shining and microscopically reticulate and bounded by grooves; the basal groove with about ten short costae, the lateral grooves irregularly costate and meeting at about the middle of the declivity and thence continued to the bottom as a triangular depression. The lateral areas of the dorsum have a few rugae, the sides and declivity are moderately shining and finely punctured; the interspaces are about three times as wide as the punctures. Abdomen, excepting the apical segment, shining, the first five tergites microscopically punctured, the second sternite with a few large and scattered punctures, the third to fifth sternites impunctate and microscopically reticulate (50 diameters), the pygidial area triangular, a little longer than wide at the base, sharply marginate at the sides, sparsely and coarsely punctured, the sixth sternite closely and finely so.

Clypeus flat, the anterior margin of the median area with a large triangular tooth on each side, the margin between them convex and produced in the middle into a short and more or less cuneiform tooth. Interocular distance on the vertex equal to the length of the flagellum less the apical joint and three times greater than the least distance between the eyes, which is at the level of the antennal sockets. Facial concavity shallow, not marginate above, with a median longitudinal impressed line reaching the anterior ocellus and a narrow groove on each side. The ocelli are set in a shallow depression and form a wide, low triangle, the posterior pair twice as far from each other as from the eyes. The lateral foveae of the vertex are replaced by deep curved grooves extending forwards from the depressed ocellar area. First joint of the flagellum twice as long as wide, the second to fifth about as long as wide at the apex, the sixth to tenth wider than long, the apical twice as long as wide. A shallow impressed line extends from the anterior ocellus almost to the brow of the occiput. Temples very wide, nearly as wide as the eyes. Dorsum of the pronotum short, feebly convex transversely, not much longer in the middle than at the sides and about as long in the middle as the first joint of the flagellum. Mesonotum at its widest two-thirds wider than long; scutellum nearly semi-circular, half as wide again in front as long.

Dorsum of the epinotum very short, not longer than the metanotum. Anterior face of the first tergite oblique and twice as long as the dorsal face and with a median longitudinal groove. Middle and hind tibiae almost spineless on the upper surface. Hind metatarsi short, as long as the second and third tarsal joints united. Venation as in *C. ruficaudatus* Arn.

Bekily, 12 ♀♀. November, March–April.

Not related to any of the Ethiopian species; the peculiar median tooth of the clypeus distinguishes this species from all the others of the species-group.

Crabro faunus n.sp. (Figs. 123, 123 *a*, *b*)

♀. 4·6 mm. long. Black. Mandibles ochreous, piceous at the apex. Scapes, pronotal tubercles, the anterior half of the tegulae, tibiae, tarsi and apices of the femora, whitish yellow, the underside of the middle and hind tibiae with a blackish streak not reaching the base of apex. Apex of the sixth abdominal segment reddish brown. Flagellum brown, brownish yellow below. Wings hyaline, the pterostigma and veins dark brown. Whole body shining, excepting the pygidial area. Clypeus and sides of the face with silvery pubescence, the rest of the body with a short, sparse and greyish pubescence.

Clypeus closely and finely punctured, face impunctate, vertex with a fairly fine puncturation, the interspaces about twice as wide as the punctures; occiput and temples more finely

punctured, the interspaces as wide as the punctures. Dorsum of the pronotum a little more deeply punctured than the temples, and as closely. The puncturation of the mesonotum and scutellum is slightly larger than that of the vertex. Epicnemium, mesosternum and mesopleura more finely and more closely punctured than the mesonotum, the mesopleura less closely than the other parts. Metanotum and metapleura microscopically punctured. Epinotum, excepting the median area which is impunctate, very finely punctured (40 diameters), the punctures about as large as those on the temples, the interspaces two to three times wider than the punctures. First five tergites shallowly, finely and sparsely punctured, the punctures slightly increasing in size caudad, the pygidial area coarsely and closely punctured, covered with silvery setae. Second sternite with a puncturation as large and as close as that of the mesopleura, the other sternites impunctate.

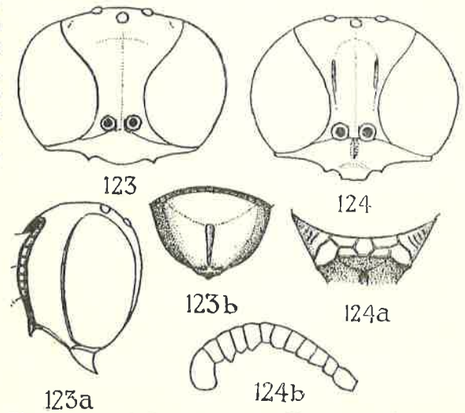


Fig. 123, *a*. *Crabro* (*Entomognathus*) *faunus* ♀, head, × 24; *b*, epinotum seen from behind, × 24.

Fig. 124. *Crabro* (*Entomognathus*) *diversicornis* ♀, head, × 24; *a*, dorsum of epinotum, × 24; *b*, ♂, flagellum, × 40.

Anterior margin of the median area of the clypeus strongly convex and with a broad short tooth on each side. Facial concavity shallow, with a short impressed longitudinal line on each side, the brow not marginate but merging gradually into the vertex. A median longitudinal impressed line extends over the upper half of the face as far as the anterior ocellus. Interocular distance on the vertex (at the level of the posterior corners of the eyes) $3\frac{1}{2}$ times greater than the least distance between the eyes on the face. Posterior ocelli very slightly farther from each other than from the eyes. As in *C. tridens* Arn. a curved impression extends on each side from the depressions in which lie the posterior ocelli. The interocular distance on the vertex is about equal to the length of the flagellum. A shallow impressed line extends from the anterior ocellus caudad. The occiput and temples are margined behind by a wide clathrate groove, the outer margin of which is sharp and high and is produced into an acute tooth at the junction of the posterior and inferior margins of the temples. The latter are as wide as the eyes. Eyes fairly densely pubescent. First joint of the flagellum $1\frac{1}{2}$ times longer than wide, the second as long as wide, the third half as long again as wide, the fourth and fifth as long as wide, the sixth to tenth wider than long, the apical half as long again as wide. Pronotal dorsum a little longer than the first joint of the flagellum, its shoulders oblique. Mesonotum $1\frac{1}{2}$ times wider than long, the scutellum twice as wide in front as long, the suture between it and the mesonotum deep, but not clathrate nor dilated laterad. Triangular area of the epinotum twice as wide at the base as long, with a transverse groove at the base which has about twelve costae, its lateral margins indicated by a shallow line, its apex continued into a median, triangular impression on the declivity; the sides of the latter not marginate. First tergite with a median longitudinal impressed line extending over its basal third. Hind tibiae broad, only three times longer than wide at the apex, hind metatarsi nearly as long as the second and third tarsal joints united. Truncating vein of the radial cell moderately oblique; the transverse cubital vein meets the radius in the middle and the recurrent vein meets the cubital cell a little beyond the middle.

Bekily, 2 ♀♀. December–January.

Allied to *tridens*, from which it is clearly distinguished by the shape of the clypeus and the tooth on the temples.

Crabro diversicornis n.sp. (Figs. 124, 124 *a*, *b*)

♂. 3·8 mm. long. Black. Mandibles reddish brown, paler near the base. Scapes, pronotal tubercles, tibiae, tarsi, underside of the anterior femora and the apices of the middle and hind femora, pale yellow, the rest of the femora pale brownish red. Apical joints of the middle and hind tarsi fuscous. Flagellum black above, dirty yellow below. Seventh abdominal segment flavo-ferruginous. Wings hyaline, slightly smoky at the apical margin, the pterostigma and veins dark brown. Clypeus, sides of the face and the temples with silvery pubescence, fairly sparse on the temples. The epicnemium, anterior fourth of the mesopleura and the mesosternum with longer, dense silvery pubescence, the rest of the thorax with a short, grey and sparse pubescence. Eyes sparsely pubescent. The whole body, excepting the clypeus, pronotum, epicnemium and last two abdominal segments, moderately shining.

Clypeus closely and finely punctured. The puncturation of the face above the concavity is fairly strong, on the occiput and temples fine and shallow, the interspaces about twice as wide as the punctures. Facial concavity shallow, with a deep median longitudinal line reaching to the anterior ocellus. Foveae of the vertex small, very shallow and separated from the ocellar depression. Pronotum and epicnemium very finely, closely punctured. Mesonotum, scutellum and metanotum with a puncturation as large as that of the vertex but sparser, the interspaces being about three to four times as wide as the punctures.

Mesopleura very finely and sparsely punctured; metapleura coriaceous. Dorsum of the epinotum divided by high carinae into nine polygonal areas, of which the basal-lateral ones are obliquely rugose, and the others feebly punctured. Sides of the epinotum coriaceous and obliquely rugose caudad, more strongly above than below, the declivity coriaceous, with a shallow median longitudinal groove, widest above. First six tergites strongly and closely punctured, strongest on the first and second, the punctures becoming progressively smaller and less close on each succeeding segment; the punctures on the first two are nearly twice as large as those on the mesonotum, with interspaces as wide as the punctures on the first tergite and twice as wide on the second. Second sternite coarsely and closely punctured, the punctures fully twice as large as those of the corresponding tergite, the interspaces as wide as the punctures, the third to seventh sternites very finely and closely punctured. Seventh tergite a little more coarsely punctured than the second, trapezoidal, the apical margin convex.

Median area of the clypeus tumid at the base, produced in front into a short, transverse and rectangular lobe, obtusely angular or subdentate at the corners. Interocular distance on the vertex $2\frac{1}{3}$ times greater than the least distance between the eyes on the face and longer than the whole flagellum. Posterior ocelli nearly twice as far from each other as from the eyes. First joint of the flagellum $1\frac{1}{2}$ times longer than wide, the second to eleventh joints wider than long, the sixth swollen posteriorly, the eighth to tenth angularly dilated posteriorly, the twelfth large, $1\frac{1}{2}$ times longer than wide at the base, slightly curved, flattened dorso-ventrally at the apex, which is broad and transverse. Temples as wide as the eyes, the hind margin with a wide clathrate groove as in *faunus*, but not produced into a curved tooth below. The posterior orbits are margined by a shallow crenulate groove. A shallow median line extends from the anterior ocellus to the occiput. Dorsum of the pronotum convex transversely, longer at the sides than in the middle, where it is feebly impressed lengthwise; the shoulders rounded.

Mesonotum with two deep pits a little behind the anterior margin, and with an elongate but shallower pit on each side opposite the tegulae. Suture between the mesonotum and the scutellum deep, dilated laterad and clathrate. Dorsum of the epinotum longer than in

faunus, nearly half as long as the scutellum, the declivity vertical, its junction with the dorsum rectangular, marginate at the sides. First tergite one-third wider behind than long, the anterior face subvertical, much shorter than the dorsal and longitudinally grooved medially. Truncating vein of the radial cell oblique, the second abscissa of the radius half as long again as the first, the first abscissa of the cubital vein nearly half as long again as the second. Middle and hind tibiae moderately spinose. Hind metatarsi longer than the two following joints united. Mesosterna with a crest in front of the middle coxae.

♀. 4·5 mm. long. Femora, excepting the yellow apex, black, apical half of the pygidium flavo-ferruginous, otherwise like the ♂ in colour. Pygidial area covered with yellowish silvery setae, coarsely and closely punctured, elongate triangular, about $1\frac{1}{2}$ times longer than wide at the base, the lateral margins distinctly convex. Pubescence as in the ♂, but less dense on the mesopleura and mesosternum. Declivity of the epinotum closely and transversely rugulose; otherwise the sculpture is like that of the ♂ but relatively coarser, especially on the mesopleura and abdomen.

Median area of the clypeus subcarinate lengthwise at the base, the transverse lobe on the apical margin wider than in the ♂, the anterior corners rectangular. Flagellum simple, the second to fifth joints about as long as wide, the sixth to tenth wider than long, the apical joint nearly twice as long as wide. Interocular distance on the vertex three times greater than the least distance between the eyes, which is at the bottom of the face. Middle and hind tibiae strongly spinose. Otherwise like the ♂.

Bekily, 1 ♀, 1 ♂. February.

The peculiar structure of the flagellum in the ♂ is unique in the species-group, and affords another proof, if such were necessary, that even the species-groups cannot be sharply defined.

That the species belongs to the *Entomognathus* group is proved by the pubescent eyes and the flat triangular pygidial area, but it shares an anomalous character, the mesosternal crest, with *midas* and *mimicus*, in which, however, the ♂♂ have simple flagella.

Species-group *Rhopalum* Kirby

Crabro ichneumoniformis Arnold

Ann. Transv. Mus. XII, p. 130, ♀, ♂, 1927

The Madagascan specimens are barely distinguishable from the specific form, differing only in minor details of colour. The scapes are whitish yellow, and the hind femora, excepting the base and apex, and the tergites are more reddish than black, like the sternites.

Bekily, Ankaratra and Ambohimanga, 3 ♀♀, 20 ♂♂. November–March.

I take this opportunity to correct a regrettable error. *C. riparium* Arn. (*Ann. Transv. Mus.* XI, p. 352, 1926) was placed in the species-group *Rhopalum*. A re-examination of the specimens in the National Museum, Southern Rhodesia, shows that the maxillary and labial palpi are six- and four-jointed respectively, and the basal joints being exceedingly small were overlooked. Moreover, the petiole is not nodose as in *Rhopalum*, nor are the hind tibiae abruptly swollen apically as in that species-group. Finally, the presence of a distinct epicnemium should have made it clear that the species cannot be a member of that group. It should be placed in the species-group *Crossocerus*, subgroup *Cuphopterus*. It is also probable that *C. Turneri* Arn. which was placed in *Rhopalum* should also be transferred to *Crossocerus*, but a re-examination of the type, in the British Museum, is at the present time impossible.

Species-group *Dasyproctus* Lep.

This species-group is the most clearly defined one of the genus, on account of the peculiar fundamental sculpture of the vertex, temples, the greater part of the pro-mesothorax and

the tergites, which is so fine that it is not resolvable with a magnification of even 100 diameters. For a detailed description of the species-group the reader may refer to my monograph of the Ethiopian Sphecidae (*Ann. Transv. Mus.* XI, p. 357, 1926) and to Kohl (*Ann. naturh. (Mus.) Hofmus., Wien*, XI, p. 438, 1896). The most important specific characters have been for the greater part omitted by Saussure in his descriptions; these are, the shape of the clypeus, the structure of the flagellum and particularly the length of the first three joints, the shape of the petiole and the sculpture of the underside of the temples. These particulars are therefore provided in the following descriptions to supplement those of Saussure, which are sufficiently detailed in regard to the colour and other superficial characters.

The species of this group differ from the majority of the Crabroninae in their nesting habits. They do not nest in dry hollow twigs and decayed wood nor dig tunnels in the ground, but nest in galleries excavated in the stems of living plants growing in sunny situations, such as aloes, gladioli, etc. The object of this is undoubtedly to prevent the rapid desiccation of the prey provided for the larvae, which consists of Diptera.

Crabro crudelis Sauss. (Figs. 125, 125 *a*, *b*)

Hist. Madag. XX, p. 579, ♀, ♂, 1892

♀. 8·2–9·5 mm. long. Clypeus like that of *C. bipunctatus* Lep., the median area produced into a shining triangular lobe; a median carina extends from the lobe to the antennal sockets and on each side of the lobe there is a blunt tooth. Facial concavity deep, the upper margin sharply carinate, the carina forming an angle of about 135°. The vertex has a shallow and

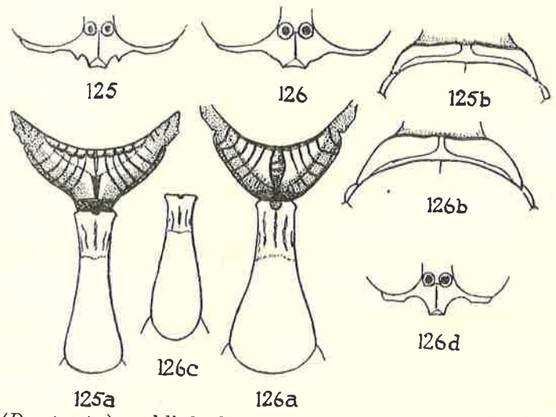


Fig. 125. *Crabro* (*Dasyproctus*) *crudelis* ♀, clypeus, × *c.* 14; *a*, epinotum and petiole, × *c.* 14; *b*, pronotum, × *c.* 14.

Fig. 126. *Crabro* (*Dasyproctus*) *ferox* ♀, clypeus, × *c.* 14; *a*, epinotum and petiole, × *c.* 14; *b*, pronotum, × *c.* 14; *c*, ♂, petiole, × *c.* 14; *d*, clypeus, × *c.* 14.

In Figs. 125 *a* and 126 *a* the finer sculpture of the epinotum is not shown.

fine piligerous puncturation. The underside of the temples in front, i.e. the anterior portion of the ventral surface of the epicranium, is nitidulous, closely and longitudinally rugulose and punctured between the rugae. First three joints of the flagellum of equal length, the second twice as long as wide at the apex. Sides of the pronotum obliquely rugose; anterior epicnemium shining, closely punctulate, the posterior epicnemium also punctulate but with

a few larger punctures in front and rugulose ventrad. Metapleura nitidulous, transversely rugose and finely punctured. Mesonotum and scutellum punctured like the vertex, the puncturation on the mesopleura nearly obsolete. Metanotum closely and longitudinally rugose. Dorsum and declivity of the epinotum obliquely rugose and striolate between the rugae, the median triangular area of the dorsum with a deep, clathrate and transverse groove at the base. Declivity sharply marginate at the sides below, the sides of the epinotum closely and transversely striolate. Petiole three times longer than wide across the node, the latter not abrupt, forming the posterior two-fifths of the length; the basal two-fifths of the petiole is nitidulous and punctate-rugulose.

♂. 6–8 mm. long. Sixth tergite with a transverse and narrow yellow macula; vertex in front of the anterior ocellus with a fairly coarse and close puncturation, the interspaces for the greater part as wide as the punctures, but near the eyes twice as wide; dorsum and declivity of the epinotum coarsely and rather irregularly reticulate-rugose, the basal groove of the dorsum wider than in the ♀. Otherwise like the ♀ in colour, sculpture and pubescence.

Clypeus like that of the ♀ but the triangular median lobe is narrower and the teeth on each side less prominent. Second to fifth joints of the flagellum flattened on the underside, the second joint twice as long as wide at the apex, about two-thirds longer than the first and a trifle longer than the third; the fifth joint dilated below near the apex, as in *bipunctatus* Lep. Petiole longer and less strongly nodose than in the ♀, nearly $3\frac{1}{2}$ times longer than wide across the node. Anterior and middle femora and the middle tibiae fringed on the underside with a long, grey and exserted pubescence.

Bekily and Fianarantsoa, 4 ♀♀, 5 ♂♂. September, March–May.

Allied to *bipunctatus* Lep. from which it differs by the shorter petiole and differences in colour, the legs being darker and the scutellum maculated with yellow.

Crabro ferox Sauss. (Figs. 126, 126 *a–d*)

Hist. Madag. XX, p. 580, ♀, 1892

Dasyproctus immanis Sauss., *Hist. Madag.* XX, p. 581, ♂, 1892.

♀. 7·5–9 mm. long. Mandibles varying from pale yellow to brownish yellow, with the apical third piceous. First joint of the flagellum brown. The yellow markings on the thorax, abdomen and legs of a more vivid yellow than in *crudelis* and the majority of the species (C.U.C. jaune, no. 258). The anterior and middle femora are more or less yellow at the apex (not the middle and hind femora as stated by Saussure). The erect pubescence on the metanotum is sparse and greyish, not black as stated in the original description. Underside of the temples shining, sparsely and finely punctured except in the anterior corner, where the puncturation is a little stronger and closer. The puncturation of the mesonotum is denser but not stronger than in *crudelis*. The dorsum of the epinotum is obliquely, or fan-wise rugose, the rugae much stronger than in *crudelis*, the interspaces rugulose; the dorsum is longer and more horizontal than in that species and the triangular median area less clearly defined laterad and without a distinct basal transverse groove. The median longitudinal groove of the declivity is terminated ventrad by a transverse carina, which does not extend right across the face of the declivity as it does in *crudelis*. A little less than the basal third of the petiole is nitidulous, punctate-rugulose and traversed by three longitudinal rugae.

Clypeus similar to that of *crudelis* but without a distinct tooth on each side of the median lobe. The facial concavity is shallow, not margined above by a carina but merging gradually into the vertex. First joint of the flagellum nearly $1\frac{1}{2}$ times longer than wide, the second joint two-fifths longer than the first and $2\frac{1}{3}$ times longer than wide at the apex, the third joint as long as the first. The anterior margin of the pronotal dorsum is convex (straight and feebly sinuate in *crudelis*), and its median impression is narrower and deeper than in that

species and the shoulders more rounded. Petiole shorter than in *crudelis*, barely twice as long as wide behind, the node more infundibuliform.

♂. 7–8 mm. long. Hind femora with a yellow spot of variable size on the upper side near the apex. The black mark on the upperside of the scapes is also variable and the yellow maculae on the femora are more extensive than in the ♀. Puncturation of the vertex in front of the anterior ocellus much stronger than in the ♀ and comparatively coarse; the puncturation of the mesonotum also stronger than in the ♀. Posterior epicnemium coarsely punctured, the metapleura and sides of the epinotum transversely rugose. The dorsum and declivity of the epinotum with a wide-meshed and very coarse reticulation. The basal third of the petiole is more or less reticulate-punctate and the longitudinal rugae less distinct than in the ♀. Median area of the clypeus more produced in front and narrower than in the ♀. Second joint of the flagellum 2½ times longer than wide, not flattened below, one-quarter longer than the first. Fifth joint simple, not dilated below. Petiole longer and less wide behind, three times longer than wide across the node. Otherwise like the ♀.

Bekily, Behara, Antanimora, Rogez, Ivondro, Fort Dauphin, Anosibe and Antananarivo, 20 ♀♀, 15 ♂♂. October–February.

It is remarkable that Saussure failed to recognize the relationship and described the ♂ as a different species under the name of *immanis*; the livery of the two sexes is the same, and the differences in sculpture and length of the petiole are only the usual sexual differences which pertain to the species-group.

Allied to *C. dubiosus* Arn. from which it differs by the yellow markings on the scutellum and in the ♂ by the second joint of the flagellum being convex below.

Crabro saevus Sauss. (Fig. 127)

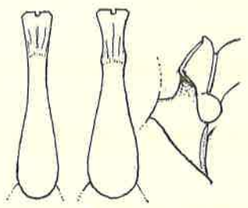
Hist. Madag. xx, p. 579, ♂, 1892

The collection contains two specimens which can be identified without doubt as being this species.

♀. 7 mm. long (hitherto undescribed). Scutellum with a transverse yellow macula constricted in the middle. Fifth tergite yellow, only the apical margin and a central basal streak black. In one of the two specimens the third tergite has small lateral yellow spots. Otherwise like the ♂ in colour.

Clypeus like that of *ferox*, closely and finely punctured; facial concavity closely, finely and shallowly punctured, slightly shining, margined above by a fine carina, which, seen from above, is widely arcuate, not angular. The puncturation of the underside of the temples in front is like that of *ferox* and of the pro-mesonotum like that of *crudelis*.

Metanotum dull, closely and longitudinally rugose and with some transverse rugae, the metapleura dull, coarsely and transversely rugose and punctulate. Dorsum and declivity of the epinotum closely reticulate-rugose, the meshes small, the rugae thin and low. The triangular area of the dorsum is indistinctly delimited at the sides, but at the base has a deep and clathrate groove. The sides of the epinotum are dull, very closely and obliquely striate, and feebly reticulate in the posterior upper third. The median longitudinal groove of the declivity is terminated below by a transverse carina which extends to the lateral margins; the latter are bounded by a carina and a clathrate groove on the inside. Basal fourth of the petiole not quite dull, closely punctured and with three longitudinal rugae; the petiole is long and only feebly nodose, fully 4½ times longer than wide across the middle of the node. First joint of the flagellum nearly twice as long as



127 128 128a

Fig. 127. *Crabro* (*Dasyproctus*) *saevus* ♀, petiole, × 14.

Fig. 128. *Crabro* (*Dasyproctus*) *infrarugosus* ♀, petiole, × 14; *a*, pronotum, lateral view, × 14.

wide, the second joint 2⅝ longer than wide and very little longer than the first. Pronotum like that of *crudelis*, but with the shoulders narrowly rounded.

Bekily, 2 ♀♀. November and April.

Crabro infrarugosus n.sp. (Figs. 128, 128 *a*)

♀. 9 mm. long. Black. Mandibles ferruginous. Front of the scapes, pronotal tubercles, a transverse band on each side of the pronotal collar and extending over the upper part of the anterior face, and an ovate macula on each side of the second tergite, lemon yellow. Fore and middle tibiae and tarsi fusco-ferruginous. Tegulae dark brown. Wings pale fuscous. Pubescence silvery on the clypeus and lower half of the temples, black, erect and very short on the vertex and mesonotum, greyish and very sparse on the mesopleura and pale brownish yellow on the tergites.

Clypeus closely and finely punctured; facial concavity margined above by a carina, the vertex immediately behind the carina finely reticulate-punctate, the rest of the vertex and the upper part of the temples and the mesopleurae almost impunctate. The underside of the temples, from the anterior margin behind the mandibles to the occipital margin, closely, strongly and longitudinally rugose and punctured between the rugae, strongly so on the lower half. Anterior and posterior epicnemia moderately shining and punctured. Metanotum longitudinally, metapleura transversely rugose, punctulate between the rugae. Dorsum of the epinotum closely, finely and obliquely rugose, the declivity and sides of the epinotum dull, closely and transversely striolate. The base of the triangular area of the dorsum with a transverse and clathrate groove, the sides of the triangle feebly defined, the lateral margins of the epinotum sharply carinate, the median longitudinal groove of the declivity terminated below by a transverse carina which extends to the lateral margins. Basal third of the petiole rugulose and with the usual three short rugae.

Clypeus like that of *crudelis* ♀, but the median lobe a little wider in front. First three joints of the flagellum of equal length, the second joint two-thirds longer than wide at the apex. Dorsum of the pronotum like that of *crudelis*, but much more raised in front, and more widely impressed lengthwise in the middle. Petiole moderately nodose, 3½ times longer than wide across the node.

♂. 7 mm. long. Scutellum with a yellow transverse macula, constricted in the middle. Fifth tergite with a transverse yellow band, narrowed and interrupted mesad. Vertex in front of the anterior ocellus very distinctly punctured. Temples with the same sculpture as in the ♀. Metanotum reticulate-rugose; dorsum of the epinotum coarsely reticulate-rugose, the declivity transversely rugose and coriaceous between the rugae, the sides of the epinotum transversely rugulose.

Median area of the clypeus like that of the ♀ but longer, narrower at the anterior margin, and without the blunt tooth on each side. The carina at the upper margin of the facial concavity is arcuate, not forming almost a rectangle as in *Saussurei* Kohl. Second to fifth joints of the flagellum slightly flattened on the underside, the fifth joint dilated at the apex below, the second joint as long as the third, a trifle longer than the first and two-thirds longer than wide at the apex. Pronotal collar as in the ♀. Petiole four times longer than wide across the node. Anterior and middle femora and middle tibiae fringed with long whitish hairs on the underside. Otherwise like the ♀.

Rogez, 1 ♀, 2 ♂♂. June.

Apart from the distinct puncturation of the vertex and the arcuate carina on the brow of the facial concavity, the description of the ♂ of this species could apply to *C. Saussurei* Kohl, but these differences suffice to show that it is distinct. Furthermore, Kohl makes no mention of the strong sculpture on the underside of the head, a character which would not have escaped the keen observation of that author.

The species is allied to *bipunctatus* Lep. from which it differs by the colour of the legs, the shape of the pronotal dorsum and the sculpture of the epinotum. In *bipunctatus* the underside of the temples in front is only punctured, not rugose.

Crabro Saussurei Kohl

Ann. naturh. (*Mus.*) *Hofmus., Wien*, IX, p. 282, ♂, 1894; Schulz, *Zool. Ann.* IV, p. 185, 1911

The collection contains no specimens which can be identified with this species, based on a specimen from Madagascar, leg. Sikora. It cannot be synonymized with *crudelis* ♂, since it is stated to have hardly any trace of puncturation on the vertex, temples and mesopleurae. Schulz, who does not appear to have seen the type, synonymizes it with *crudelis* on account of the emargination of the fifth joint of the flagellum and the pilosity of the fore and middle femora. But these characters are present in other valid species, and for that reason I am unable to accept Schulz's view.

Species-group *Neodasyproctus* Arn.

This group was based on *C. Kohli* Arn. and in 1929 another species, also from Africa, *C. basutorum* was described by Turner. In the latter the puncturation is much less coarse than in *Kohli*, and in the Madagascan species described hereunder the puncturation on the whole is very close and much finer, showing an approach to that of *Dasyproctus* s.str., so that the definition of the group requires emendation. Nevertheless, the species of the group are clearly distinct from *Dasyproctus* by the absence of the matt surface on the integument and by the absence of the posterior epicnemium.

Characters. Vertex and thorax closely punctured, sometimes very coarsely so, the surface between the punctures never matt or dull as in *Dasyproctus* s.str. Mandibles tridentate in the ♀, bidentate in the ♂. Scapes convex on the underside, or in some species flat and carinate on each side (as in *Dasyproctus*). Mesopleura without a posterior epicnemium. Pygidial area V-shaped and shallowly excavated (*Kohli*) or Y-shaped and deeply excavated as in *Dasyproctus*. Brow of the facial concavity neither carinate nor sharply delimited from the vertex, the concavity shallow. Petiole as in *Dasyproctus*, or stout and feebly clavate (*Kohli*?). Metatarsi of the middle and hind legs long, as long as the following joints united.

Crabro densepunctatus n.sp. (Figs. 129, 129 *a–d*)

♀. 9·5–10 mm. long. Black. Mandibles fusco-ferruginous. Scapes, pronotal collar, pronotal tubercles, metanotal disk and a triangular macula with the apex mesad, on each side of the base of the fourth tergite, lemon yellow. Anterior tibiae and tarsi ferruginous, middle tibiae and tarsi, base and apex of the hind tibiae and the apical abdominal segment, fusco-ferruginous. Middle femora yellowish white on the outside. Extreme base of the second abdominal segment ferruginous. Flagellum black, the first three joints fusco-ferruginous. Wings faintly fuscous, the veins black.

Vertex moderately shining, in front of the anterior ocellus finely reticulate-punctate, behind it more sparsely and shallowly punctured, the interspaces there as wide as the punctures. The temples have a puncturation half as large as that of the posterior part of the vertex and are moderately shining; on the underside they are sparsely punctured, the interspaces between three and four times as wide as the punctures. Thorax nitidulous. Sides of the pronotum punctulate and sparsely and obliquely rugose, the dorsum smooth. Mesonotum reticulate-punctate, the punctures increasing gradually in size caudad, the largest punctures about twice as large as those on the posterior part of the vertex, but much deeper; on the posterior third of the segment, excepting the sides, there is a trace of a longitudinal rugosity between the punctures. Scutellum finely and longitudinally rugose, with large elongate

punctures in between. Epicnemium very finely and closely punctured. Metanotum sparsely, and mesopleura and mesosternum closely punctured, the punctures on the mesopleura increasing in size caudad. Metapleura transversely rugose. Dorsum of the epinotum finely and obliquely rugose, shallowly punctured between the rugae, the triangular area indistinct, indicated only by a slightly depressed line; the lateral areas of the dorsum and the declivity transversely rugoso-punctate, the lateral margins of the declivity carinate, the sides of the epinotum closely, finely and transversely striate. Abdomen shining. Petiole with a strong puncturation at the base and a weaker one on the node; tergites 2–5 microscopically punctured, the sixth with a few large punctures outside the pygidial area. Sternites 2–5 impunctate excepting a few setigerous punctures near the apical margin, the second with a very fine and sparse puncturation at the base, the sixth closely punctured in its apical half.

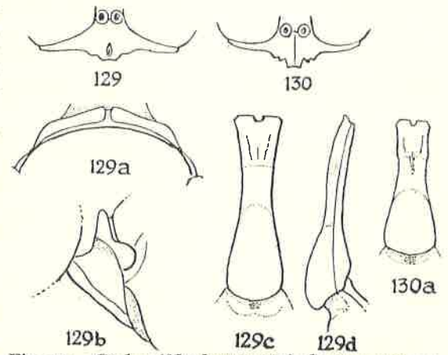


Fig. 129. *Crabro* (*Neodasyproctus*) *densepunctatus* ♀, clypeus, × 14; *a*, *b*, pronotum, dorsal and lateral views, × 14; *c*, *d*, petiole, dorsal and lateral views, × 14.
Fig. 130. *Crabro* (*Neodasyproctus*) *eburneopictus* ♀, clypeus, × 14; *a*, petiole, × 14.

Clypeus with a dense silvery pubescence and unlike that of *Kohli*, the type of the species-group, but like that of (*Dasyproctus*) *ferox* Sauss. and differing only in having an elongate tubercle in front instead of a carina extending over the whole length. Facial concavity shallow, covered with silvery pubescence, much narrower than in *Kohli*, being hardly more than twice as wide above as below. First three joints of the flagellum of equal length, the second two-thirds longer than wide, the third and fourth as long as wide, the fifth to tenth wider than long. Vertex with a trace of a lanceolate fovea on each side, contiguous with the eyes. Posterior ocelli a little farther from the eyes than from each other. Pronotal collar longer in the middle than at the sides, the dorsum more elevated than in *Dasyproctus* spp. and without the transverse lamelliform carina which is present in *Kohli*. Mesonotum about one-third wider than long. Scutellum strongly convex lengthwise.

Triangular area of the epinotum twice as wide at the base as long. Petiole not stout and feebly clavate as in *Kohli* but like that of the majority of the *Dasyproctus* group, fully three times longer than wide across the node, the latter nearly twice as long as wide. The base of the second tergite is more depressed than in *Dasyproctus* s.str. and has a wide and rugulose pit in the middle. Pygidial area Y-shaped, deeply excavated, the sides of the tergite with long stiff yellow hairs. Hind tibiae with a row of three short spines on the upper surface. The truncating vein of the radial cell meets the radius in a right angle; second abscissa of the radius nearly one-third longer than the first, the first abscissa of the cubitus fully twice as long as the second.

Ivondro, Perinet and Rogez, 6 ♀♀. January–May.

The transverse yellow band on the fourth tergite is entire in some specimens and reduced to two lateral spots in others. In two of the specimens, from Rogez and Perinet, the abdomen has a reddish tinge.

Crabro eburneopictus n.sp. (Figs. 130, 130 *a*)

♀. 8·5 mm. long. Not unlike *densepunctatus* Arn. but more finely punctured on the head and thorax and with a stouter petiole. Black. Mandibles fusco-ferruginous, black at the

base. Tegulae, tibiae and tarsi, excepting the apical joint, fusco-ferruginous. Scapes ivory white, their inner face ferruginous. A narrow line on the anterior half of the pronotal collar, a small spot on each side of the base of the third tergite and a basal band, interrupted mesad and dilated laterad, on the fourth tergite, ivory white. Apical margin of the fifth tergite testaceous, the sixth tergite and sternite pale brown. Wings hyaline, faintly smoky, the pterostigma pale yellow, the veins black.

Clypeus, facial concavity and the temples with silvery pubescence, the sides of the sixth tergite with stiff, long and yellowish hairs. Clypeus, face, vertex, mesonotum, scutellum and metanotum dull, the rest of the thorax with a slight gloss, the abdomen moderately shining. Clypeus and facial concavity finely and closely punctured. Vertex, mesonotum and scutellum finely reticulate-punctate, the puncturation on the posterior third of the mesonotum and on the scutellum slightly larger and with the interspaces raised, forming a feeble longitudinal rugosity. The puncturation of the occiput and anterior half of the temples is as close, but only half as large as that of the vertex; the posterior half of and the underside of the temples are shining, sparsely and more strongly punctured. Dorsum of the pronotum smooth and shining, the declivous face very finely and shallowly punctured, the neck and sides obliquely rugulose. Epicnemium finely, closely and shallowly punctured and shining. Mesopleura transversely rugulose, punctured between the rugae, the punctures twice as large as those of the scutellum, the mesosternum finely and closely punctured. Hind margin of the scutellum with a narrow clathrate groove. Metapleura transversely rugose. Sides of the epinotum closely and transversely striate and with a greasy lustre; dorsum of the epinotum closely and finely rugose fan-wise, the rugae attenuated caudad, the interspaces rugulose, punctured and slightly shining, the upper half of the declivity coriaceous and sparsely punctured, the lower half closely and transversely rugose, the lateral margins feebly carinate. Basal third of the petiole with an irregular and elongate puncturation; on the rest of the petiole the puncturation is more regular and decreases in size caudad, the interspaces on the node about twice as large as the punctures. Second to fifth tergite very finely punctured, the fifth a little more strongly than the others. Sternites smooth and shining.

Median area of the clypeus carinate lengthwise in the middle, produced in front into a rectangular lobe, on each side of which are two blunt teeth. First joint of the flagellum as long as the third and a little longer than the second, the latter one-third longer than wide, the fourth joint a little longer than wide, the fifth to tenth wider than long, the apical joint twice as long as wide. Posterior ocelli a little farther from the eyes than from each other. Dorsum of the pronotum like that of *densepunctatus*. Petiole short, $2\frac{1}{3}$ times longer than wide across the node, the latter strongly convex. Pygidial area Y-shaped, deeply excavated. Second abscissa of the radius one-fifth longer than the first, the first abscissa of the cubitus a little more than twice as long as the second.

Ambositra, 1 ♀. March.

Easily distinguished from all the other species of the group by the ivory white markings.

Crabro striolatus n.sp. (Figs. 131, 131 *a*, *b*)

♀. 5·7–6 mm. long. Black. Scapes, anterior half of the pronotal dorsum and the disk of the metanotum pale yellow. Mandibles ferruginous, blackish at the base and apex. Flagellum ferruginous, paler above than below, becoming gradually darker towards the apex, which is brown. Posterior half of the pronotal collar, pronotal tubercles, tegulae, extreme base of the second abdominal segment, the apical margin of the fifth, the whole of the sixth and the tibiae and tarsi, more or less ferruginous. The middle and hind metatarsi yellowish white at the base, the femora brown. Wings hyaline, the pterostigma and veins pale brown.

Clypeus, temples, mesopleura and epinotal declivity with silvery pubescence, fairly dense on the clypeus, sparse on the other parts; the rest of the thorax almost glabrous. Pubescence on the abdomen greyish and microscopic.

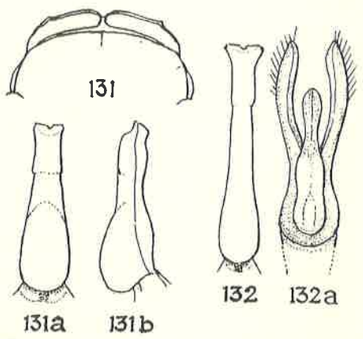


Fig. 131. *Crabro* (*Neodasyproctus*) *striolatus* ♀, pronotum, ×24; *a*, *b*, petiole, dorsal and lateral views, ×24.

Fig. 132. *Crabro* (*Neodasyproctus*) *protensus* ♂, petiole, ×24; *a*, genitalia, ×80.

Clypeus and facial concavity finely and closely punctured and dull. Vertex, occiput and upper part of the temples dull, with a close and very fine puncturation (25 diameters), the interspaces nearly as large as the punctures; the lateral foveae of the vertex lanceolate and distinct. A short median impressed line on the vertex extends from the level of the posterior ocelli to the brow of the occiput. Lower part and the underside of the temples more strongly and less closely punctured than the upper, with a trace of a longitudinal striation in addition, and moderately shining. Dorsum of the pronotum dull, the anterior face and sides dull and rugulose. Mesonotum and scutellum dull, with a microscopic and close longitudinal striation (50 diameters), on which is superimposed a very fine puncturation with interspaces about three times as wide as the punctures. Metanotum finely and closely punctured, the metapleura transversely rugose.

Dorsum and declivity of the epinotum dull, punctured and with traces of an oblique and fine rugosity on the dorsum. The latter has a transverse and clathrate groove at the base but no distinct median triangular area; there is a median longitudinal groove from the base of the dorsum to the bottom of the declivity. The lateral margins of the declivity are feebly carinate. The sides of the epinotum are transversely rugulose and sparsely punctulate. Abdomen, excepting the basal third of the petiole, nearly dull, finely and closely punctured on tergites and sternites, the punctures on the petiole a little larger than on the other segments, the interspaces as wide as the punctures on the second to fifth segments. Pygidial area V-shaped, wider than in the two preceding species, tumid at the base, sparsely punctured and shallowly excavated.

Clypeus like that of *eburneopictus*, but the apical margin of the lobe is wider and the lateral teeth less distinct. The head behind the eyes is not flat as in *eburneopictus* but distinctly convex transversely. Flagellum short, when extended backwards not passing the posterior margin of the eyes, the first four joints of about equal length, each a little longer than wide, the fifth to tenth wider than long. The anterior portion of the pronotal collar is higher behind than in front, its anterior margin bounded by a lamelliform carina which is slightly sinuate. Petiole feebly clavate, about three times as long as wide across the node, the latter pyriform, strongly convex transversely. The abdominal complex behind the petiole is broadly ovate, the suture between the second and third tergites deep. Second abscissa of the radius nearly half as long again as the first, the first abscissa of the cubitus three times as long as the second; the truncating vein of the radial cell nearly perpendicular to the radius.

Bekily, 2 ♀♀. February and April.

The fine sculpture of the mesonotum shows a distinct approach to that of *Dasyproctus* s.str., for a progressive increase in the density and fineness of the striae and punctures would lead to a condition in which the whole surface would be matt.

A specimen from Behara represents a colour variety in which the basal joint of the tarsi, the fore and middle tibiae and the apical third of the femora are lemon yellow, and the petiole fusco-ferruginous. It is somewhat larger than the type of the species, being 7·2 mm. long.

Crabro protensus n.sp. (Figs. 132, 132 *a*)

♂. 6 mm. long. Black. Scapes, pronotal dorsum and tubercles, a round spot on the anterior angles of the scutellum, the cuneoli, disk of the metanotum, the fore and middle legs, excepting the black base of the femora and the ochreous third to fifth joints of the tarsi, a streak on the basal two-thirds of the hind femora on the upper side, and the hind metatarsi, lemon yellow. The last four joints of the hind tarsi are fuscous. Mandibles pale ferruginous, the base on the upper side yellow. Flagellum dark brown above, ferruginous below. Wings clear hyaline, the pterostigma and veins brown.

Clypeus, temples, facial concavity and the mesopleura with silvery pubescence, very scanty on the face. Epinotum with a sparse and erect whitish pubescence, the abdomen with greyish pubescence.

Clypeus coriaceous and dull, the rest of the head and the thorax, excepting the epinotum, shining, the abdomen moderately shining. Facial concavity short and shallow, not extending above the middle of the eyes, impunctate. The rest of the head finely and closely punctured, almost reticulate-punctate on the anterior part of the vertex and becoming gradually smaller, shallower and farther apart on the occiput and temples, the lower half of the temples with traces of a longitudinal rugulosity (50 diameters). The clathrate groove margining the occiput is wider and deeper than in the preceding species of the group. Dorsum and anterior face of the pronotum smooth, the sides reticulate-rugulose. Mesonotum and scutellum with a puncturation slightly larger than that of the vertex, but less close, except on the anterior fourth of the mesonotum, the interspaces two to three times wider than the punctures. The puncturation of the mesopleura is like that of the mesonotum but a little less close. Metapleura and sides of the epinotum closely and finely rugoso-striate; dorsum and declivity of the epinotum reticulate-punctate.

The dorsum has six or seven longitudinal costae at the base but no distinct basal groove, and the triangular area is not defined. Petiole sparsely punctured, less finely at the base than on the apical half, the rest of the abdomen finely and closely punctured; the punctures on the tergites are about half as large as those on the vertex and the interspaces are as wide as the punctures on the tergites and twice as wide on the sternites.

Median area of the clypeus longitudinally carinate in the middle, its anterior margin straight and with a blunt tooth on each side. First joint of the flagellum as long as wide and as long as the second, the latter a trifle wider than long, the third one-third longer than the second, the fourth and fifth as long as wide, the sixth to eleventh a little wider than long, the apical joint two-thirds longer than wide. Lateral foveae of the vertex ovate, small but distinct. Posterior ocelli two-thirds farther from each other than from the eyes. Dorsum of the pronotal collar highest in the middle of its length and with a lamelliform carina across the anterior margin. Mesonotum nearly as long as wide across the level of the tegulae and very convex. Petiole feebly clavate, five times longer than wide across the node, the abdominal complex behind the petiole narrowly ovate. Second abscissa of the radius two-fifths longer than the first, the truncating vein of the radial cell oblique, first abscissa of the cubitus 3½ times longer than the second.

Behara, 3 ♂♂. November.

Quite distinct from the other members of the group on account of the very long petiole.

Species-group *Crossocerus* s.lat. Kohl

Subgroup *Coelocrabro* Thoms.

Crabro hirtitibia n.sp. (Figs. 133, 133 *a*, *b*)

♂. 4·5–5 mm. long. Black. Mandibles fuscous, yellow at the base. Scapes and anterior femora pale ochreous. Pronotal tubercles pale yellow, tegulae pale brownish. Anterior and middle tibiae and tarsi, basal half of the hind tibiae and the two basal joints of the hind tarsi, yellowish white. The last three joints of the hind tarsi and the apical joints of the fore and middle tarsi, and the underside of the middle tibiae, pale fuscous. Trochanters dirty yellow. Wings hyaline, the pterostigma and veins brown.

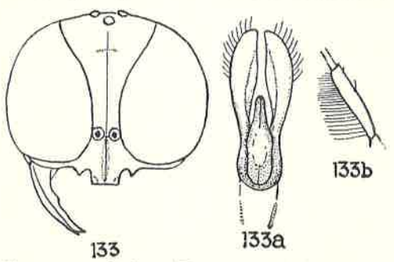


Fig. 133. *Crabro* (*Crossocerus*) *hirtitibia* ♀, head, ×24; *a*, ♂, genitalia, ×40; *b*, left anterior tibia, ×24.

Clypeus, face, temples and pleurae with silvery pubescence, the vertex, pro-mesonotum and abdomen with a sparse, microscopic and white pubescence. Anterior tibiae densely fringed on the underside with long white hairs. The whole body fairly shining.

Clypeus closely and finely punctured. Vertex, occiput, temples and dorsum of the pronotum very finely punctured, the interspaces about four times as wide as the punctures. Mesonotum and scutellum with a close puncturation, the punctures about twice as large as those on the vertex, the interspaces twice as wide as the punctures. Metanotum with a puncturation like that of the pronotum. Mesopleura a little more closely punctured than the mesonotum, but an area around the epimeral pit is impunctate. Metapleura finely and transversely rugose. Median triangular area of the epinotum about three times wider at the base than long, with a deep groove at the base traversed by eight costae and also a median longitudinal groove; outside the latter the dorsum is obliquely and finely rugose. Declivity of the epinotum impunctate, deeply grooved lengthwise in the middle, the sides of the epinotum transversely striolate. First tergite with a fine and sparse puncturation; on the rest of the abdomen the puncturation is microscopic, slightly larger on the seventh.

Median area of the clypeus carinate lengthwise in the middle, a little longer than wide in front, the apical margin straight. Facial concavity very shallow, with a median impressed line which extends to the anterior ocellus. Ocelli disposed in an equilateral triangle, the posterior pair nearly twice as far from the eyes as from each other. Flagellum fringed below with microscopic and erect hairs; the first joint as long as the second, the second to fifth a little longer than wide, the sixth to eleventh as long as wide, the twelfth twice as long as wide. Temples half as wide as the eyes. Mandibles bidentate at the apex. Pronotal collar as long in the middle as the first joint of the flagellum, longer at the sides, the middle third of its width depressed behind, convex lengthwise and transversely, the shoulders rounded. The cuneoli and trabeculae of the scutellum are pale yellow, the former not flat but forming a vertical lamella at each end of the clathrate groove separating the scutellum from the mesonotum. First tergite a little less than twice as long as wide at the hind margin, and nearly twice as wide there as at the base and one-third longer than the second tergite. Seventh tergite widely rounded at the apex. Truncating vein of the radial cell slightly convex distad, the second abscissa of the radius twice as long as the first, the second abscissa of the cubitus about one-fourth longer than the first.

♀. 4·4–5·6 mm. long. Mandibles ferruginous. First joint of the flagellum pale ochreous, the remaining joints dark brown. The pale parts of the legs of a darker tint than in the ♂.

Sixth abdominal segment dark ferruginous. Declivity of the epinotum dull, closely and transversely striate. Sides of the sixth tergite sparsely and finely punctured, the pygidial area V-shaped, coarsely punctured and tumid at the base, shallowly excavated and impunctate at the apex. Otherwise like the ♂ in colour, sculpture and pubescence. Mandibles bidentate at the apex and with an indistinct tooth on the inner margin a little beyond the middle. Median area of the clypeus with a strong median carina, somewhat produced in front, the anterior margin straight and with a stout tooth on each side, the anterior corners somewhat tumid. First and second joints of the flagellum of equal length and both twice as long as wide, the third to fifth a little longer than wide, the sixth to tenth as long as wide. First tergite shorter than in the ♂, one-fifth longer than wide at the apex, 2½ times wider at the apex than at the base. In front of the middle coxae there is a distinct mesosternal tooth. Otherwise like the ♂.

Bekily, 10 ♀♀, 9 ♂♂. October–April.

Allied to *C. burungaensis* Arn. but with a different clypeus and shorter first tergite and much stronger puncturation on the head and mesonotum.

Crabro sociabilis Arnold

Occ. Pap. Rhod. Mus. 1, p. 27, ♀, 1932

One ♀ from Bekily, a little smaller than the type of the species, 5 mm. long. The transverse rugulosity on the first tergite is somewhat stronger and the apical margin of the median area of the clypeus narrower.

Crabro brunniventris Arnold

Occ. Pap. Rhod. Mus. 1, p. 22, ♀, 1932

race **bekiliensis** n.subsp. (Fig. 134)

♀. 5·7–6 mm. long. In this sex this race differs from the type of the species as follows.

Abdomen black. A spot on the middle of the pronotal collar, one on the middle of the scutellum and one on the metanotum, pale yellow, all of variable size and sometimes absent.

The vertex has a fine and very sparse puncturation in front of the ocelli and a slightly denser one behind them, where the interspaces are about six times as wide as the punctures. The mesonotum and scutellum shining, with a fundamental reticulate sculpture (60 diameters), on which is superimposed a puncturation a little larger than that of the vertex and less sparse. Epimerum somewhat dull, very finely and closely punctured. Mesopleura and mesosternum sparsely and finely punctured. The median area of the epinotal dorsum, which is very superficially and obliquely rugulose, has a median longitudinal groove which does not reach the hind margin. The declivity of the epinotum is dull, transversely rugulose. First tergite 2⅓ times longer than wide at the apex, one-sixth longer than the second tergite. Pygidial area flat, triangular, slightly longer than wide at the base, sparsely and coarsely punctured, the apex narrowly truncate.

Clypeus as in the type of the species, but the teeth on the apical margin are a little longer. The underside of the head, behind the mandibles and near the anterior part of the cardo, is produced into a flat, triangular tooth.

♂. 4·3–5·5 mm. long. Black. The following parts are pale lemon yellow: mandibles, excepting the ferruginous apex, base and underside of the temples next to the mandibles, clypeus, scapes, pronotal dorsum excepting the shoulders, pronotal tubercles, epimerum and epicnemium, posterior margin of the prosternum, anterior margin of the mesosternum, the scutellum excepting the base and sides, the disk of the metanotum and the coxae and trochanters. The hind coxae are more or less fuscous on the outside at the base. Anterior and middle femora lemon yellow above, flavo-ferruginous below, the anterior tibiae lemon yellow excepting the apical third below, which is reddish; middle tibiae and the basal third of the hind pair lemon yellow. Hind femora and the apical two-thirds of the hind tibiae dark amber yellow. The fore and middle tarsi whitish, with the last two joints slightly fuscous; hind tarsi brownish, the basal half of the metatarsus white. Wings hyaline, the pterostigma and veins brown. Declivity of the epinotum shining, the transverse rugulosity almost obsolete. Otherwise like the ♀ in sculpture and pubescence.

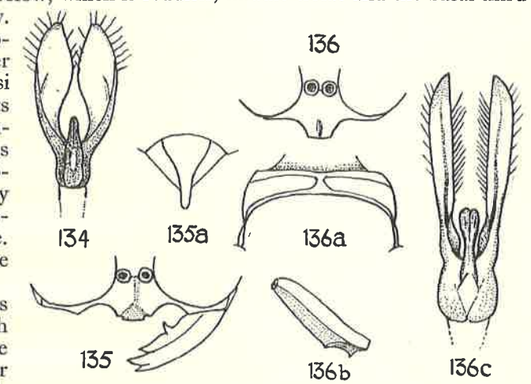


Fig. 134. *Crabro brunniventris bekiliensis* ♂, genitalia, × 40.
Fig. 135. *Crabro praeclarus* ♀, clypeus, × *c.* 10; *a*, pygidium, × *c.* 10.
Fig. 136. *Crabro Slateri nigrescens* ♂, clypeus, × *c.* 14; *a*, pronotum, × *c.* 14; *b*, left anterior femur, × *c.* 14; *c*, genitalia, × 24.

Anterior margin of the clypeus without distinct teeth, merely with five sinuations. Mandibles bidentate at the apex, edentate on the inner margin. All the joints of the flagellum at least twice as long as wide, the second joint one-quarter longer than the first and 2½ times longer than wide. Underside of the head without a tooth near the base of the mandibles. Anterior tibiae clavate, the apical third on the underside flattened. Pronotal dorsum longer and not so wide as in the ♀, about four times wider behind than long in the middle. First tergite three times longer than wide at the apex and one-fifth longer than the second, the latter one-third longer than wide at the apex. Seventh tergite not more strongly punctured than the sixth. Hind metatarsus at the apex and the two following joints slightly swollen. Otherwise like the ♀.

Bekily, 8 ♀♀, 8 ♂♂. October–May.

This species does not conform entirely with the subgroup *Cuphopterus* Mor. as defined by Kohl, as, although the abdomen is without yellow markings, in neither sex are the shoulders of the pronotum angular. On the other hand, it cannot be placed with subgroup *Crossocerus* s.str. as the apical tergite is not more strongly punctured than the preceding one. The prey consists of Homoptera.

Species-group *Crabro* s.str.

Subgroup *Solenius* Lep.

Crabro praeclarus n.sp. (Figs. 135, 135 *a*)

♀. 14 mm. long. Black, merging gradually into a dark chestnut red at the sides of the eyes on the vertex, on the temples, anterior corners of the mesonotum and the upper part of the epimerum. Mandibles ochreous, piceous at the apex. Scapes lemon yellow, except the upper side at the apex. The following parts are also lemon yellow: a transverse band on the metanotal disc, vertical stripes, widest in the middle, on each side of the epinotal declivity, a streak attenuated caudad on the lateral margins of the first tergite and not reaching its apical margin, the base of the first sternite and a transverse macula at its apex, the basal fourth of the second sternite, a transverse band attenuated mesad at the extreme

base of the second tergite, a streak on the underside of the middle femora and spots on the upper and underside of the hind coxae. Anterior tibiae rufescent on the inside above. Tarsi dark brown. Wings flavo-hyaline, the pterostigma and veins reddish brown.

Clypeus with a dense silvery pubescence, the temples with a much finer one, the rest of the body, excepting the sternites, with a microscopic greyish pubescence. Sides of the sixth tergite with long yellow setae, the sternites with a few long yellowish hairs at the apical margins. The posterior tibiae are covered on the inner side with a very dense, adpressed and white pubescence which viewed at certain angles gives a false impression that the colour of the integument there is white.

Anterior third of the median area of the clypeus and the pygidial area shining, the mesopleura and sternites with a slight gloss, the rest of the body dull.

Mandibles tridentate at the apex, the inner margin with a large and acute tooth near the base. Median area of the clypeus protruding, the apex truncate and with a small tooth on each side, the basal part subcarinate lengthwise in the middle and finely punctured. Vertex and occiput finely reticulate-punctate, the temples more shallowly and less closely except on the underside near the base of the mandibles where they are shining, sparsely and coarsely punctured. Dorsum of the pronotum finely punctured, less closely than the temples, the sides of the pronotum coriaceous and with a few rugae. Mesonotum reticulate-punctate, the punctures about three times as large as those on the vertex; scutellum finely, closely and longitudinally rugose and punctured between the rugae, the punctures larger than those of the mesonotum, except at the front and hind margins where they are of the same size. Mesopleura closely and finely punctured on the upper third, the middle third with strong transverse rugae curved downwards ventrad and sparsely punctured between the rugae, the rest of the mesopleura and the mesosternum with a puncturation three times as large as that of the mesonotum, the interspaces two to three times as large as the punctures. In front of the middle coxae there is a short mesosternal crest. Metapleura very regularly and transversely rugose. Median triangular area of the epinotum fairly distinct, nearly twice as wide at the base as long, strongly and evenly rugose fan-wise, the rugae attenuated caudad, the interspaces fairly strongly punctured; the declivity is coarsely and sparsely punctured in the upper third, strongly rugose or almost transversely costate in the lower two-thirds, the sides of the epinotum finely and transversely striato-rugose. Basal two-thirds of the first tergite sparsely punctured on each side, the apical third and the second to fifth tergites very finely and very closely punctured. Pygidial area Y-shaped, sparsely and coarsely punctured, the sides of the pygidium and the sixth sternite with a few large punctures. Sternites 2–5 nearly impunctate, the opaque pubescent patches on the second sternite distinct.

Second joint of the flagellum twice as long as wide at the apex, as long as the third and three-sevenths longer than the first. Temples a little wider than the eyes. A carina extends from the brow of the facial concavity to the anterior ocellus. The ocelli are arranged in a low isosceles triangle, the posterior pair twice as far from each other as from the anterior ocellus and one-sixth farther from the eyes than from each other.

Vertex without lateral foveae; an impressed line extends from the anterior ocellus to the brow of the occiput. Pronotal collar margined in front with a lamelliform carina, the shoulders widely rounded. First tergite $2\frac{1}{4}$ times wider at the apex than at the base, about one-third longer than wide at the apex. Anterior femora triquetrous; middle and hind tibiae strongly spinose above. First abscissa of the radius a little more than one-fifth longer than the second, the first abscissa of the cubitus five times longer than the second.

Ivondro, 3 ♀♀. January.

Crabro Slateri Arnold

Ann. Transv. Mus. XI, p. 374, ♀, 1926

This species is very rare on the continent, being known only from the type. The Madagascan form differs only in minor details but should be considered an island race.

race **nigrescens** n.subsp. (Figs. 136, 136 *a–c*)

♀. 11·5–13·5 mm. long. Mandibles fusco-ferruginous. Thorax much darker than in the type of the species, black with a reddish tinge, only the upper part of the mesopleurae, metapleurae and the lateral areas of the epinotal dorsum dark red. Legs black, the last four joints of the tarsi dark brown. Puncturation of the mesonotum not quite so coarse as in the type of the species. Sides of the epinotum strongly and transversely rugose.

♂. 8·3–9 mm. long. Head and thorax fusco-ferruginous (C.U.C. rouge 111), the mesonotum darker (C.U.C. rouge 116), the sides of the pronotum and the anterior half of the sides of the epinotum black. Tergites nearly black, the apical margins widely yellowish brown (C.U.C. rouge 131). Anterior femora and tibiae and the middle femora ferruginous, the other femora and tibiae black, the tarsi yellowish white. Pubescence of the face pale golden. Tergites, relatively to the difference in size, more strongly punctured than in the ♀, otherwise like that sex in sculpture.

Median area of the clypeus as long as wide across the middle, the anterior margin straight, the apical half subcarinate in the middle.

Antennae 12-jointed, the joints of the flagellum simple, the first joint one-third longer than wide, the second a quarter longer than the first, two-thirds longer than wide and as long as the third, the fourth a little longer than wide, the fifth as long as wide, the sixth to tenth a little wider than long, the apical joint twice as long as wide. Interocular distance on the vertex equal to the length of the first eight joints of the flagellum plus half of the ninth. Pronotal collar longer than in the ♀ and longer at the sides than in the middle. Seventh tergite trapezoidal, without a median longitudinal impression. Anterior femora triquetrous, with a wide and shallow excision at the base. Anterior metatarsi not dilated at the apex. Middle tibiae with a well-developed spur. Otherwise like the ♀.

Bekily, 8 ♀♀, 2 ♂♂. November–March.

In the absence of the ♂, I placed the type of the species tentatively in the subgroup *Clytochrysus* Mor. However, the characters of the ♂ in the subspecies do not agree with that subgroup, as defined by Kohl, since the second joint of the flagellum is not nearly twice as long as the third, nor do they agree with the subgroup of *C. nigritarsus*, as the mesopleura are not smooth and shining. However, apart from the joints of the flagellum being simple, the characters of the species conform more closely to the subgroup *Solenius* Lep. than to any of the other groups.

Crabro Seyrigi n.sp. (Figs. 137, 137 *a*, *b*)

♀. 11 mm. long. Black. The following parts pale yellow: scapes, pronotal collar and tubercles, episternum of the mesothorax, a large oval macula on the scutellum, the metanotal disk, a semi-elliptical macula on each side of the posterior half of the first tergite, a transverse, oval and larger macula on each side of the second tergite, a transverse band narrowly interrupted in the middle on the fifth tergite, the upper side, excepting the apex, of the anterior and middle tibiae, the underside of the middle and hind coxae and trochanters, the middle femora and a bifurcated streak on the underside of the hind femora. The underside of the fore and middle tibiae ferruginous, the tarsi pale ferruginous. Mandibles pale yellow on the outside, ferruginous on the inside, the apical teeth piceous. First five joints of the flagellum

brownish red, the remaining joints black. Wings hyaline, faintly tinged with yellow, the veins blackish; tegulae ferruginous.

Clypeus and anterior third of the temples with silvery pubescence, the face with a pale brassy pubescence. The rest of the body, including the femora and tibiae but excluding the sternites, with a long outstanding and white pilosity; on the last two tergites this pilosity is denser, stiff and a little yellowish. Sternites with a short decumbent yellowish pubescence at the sides and a pre-apical row of yellow setae.

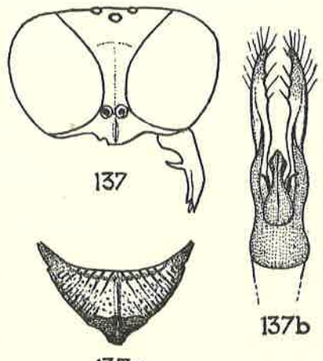


Fig. 137. *Crabro Seyrigi* ♀, head, ×*c.* 10; *a*, epinotum, ×*c.* 10; *b*, ♂, genitalia, ×30.

Clypeus dull, finely reticulate-punctate. Facial concavity shallow, dull and rugulose-punctate. Vertex moderately shining, closely punctured, the punctures larger at the sides than in the middle, the interspaces about as wide as the punctures, the lateral foveae very shallow, not marginate, sparsely and finely punctured, lanceolate and about as long as the first two joints of the flagellum. The puncturation behind the ocelli is twice as large as in front of them, and the interspaces from two to three times as wide as the punctures. Temples, shining, sparsely and fairly finely punctured. Dorsum of the pronotum shining, finely and sparsely punctured, the anterior face and the sides obliquely and strongly rugose and not quite dull. Mesonotum slightly shining, closely and longitudinally rugose and strongly punctured between the rugae. Scutellum shining, strongly and closely punctured at the sides, more sparsely in the middle. Mesopleura shining, coarsely punctured, the punctures as large as those on the mesonotum, the interspaces for the greater part three to four times as wide as the punctures, the mesosternum with a similar but sparser puncturation. Metanotum shining, sparsely and finely punctured, metapleura dull, closely and transversely costate. Dorsum of the epinotum shining, fan-wise rugose, the rugae strong at the base and behind, feeble in the middle, the triangular area not defined, grooved down the middle. The hind margin of the dorsum is bounded by a strong carina.

The sides and the declivity of the epinotum dull, closely and transversely rugulose. Abdomen shining, the first five tergites and the sides of the sternites very shallowly, finely and sparsely punctured. Pygidial area Y-shaped, narrow and deep.

Mandibles tridentate at the apex, the inner upper margin with an acute and large tooth at about the middle. Median area of the clypeus twice as wide as long, produced in front into a short rectangular lobe, wider than long, and with a blunt tooth on each side of the lobe. Second joint of the flagellum one-third longer than the first, a little longer than the third and nearly three times longer than wide at the apex; the third to fifth joints a little longer than wide, the sixth to ninth a little wider than long, the tenth a little longer than wide, the apical joint twice as long as wide. Posterior ocelli arranged in a low isosceles triangle, the posterior pair twice as far from the eyes as from each other. Interocular distance on the vertex nearly equal to the length of the flagellum. Temples as wide as the eyes. Posterior angles of the prosternum produced into a sharp tooth. Pronotal collar convex transversely and lengthwise, hardly longer at the sides than in the middle, the shoulders rounded. A mesosternal crest is present in front of the middle coxae. Dorsum of the epinotum three times wider at the base than long. First tergite slightly longer than wide at the apex, 2½ times wider there than at the base. Second abscissa of the radius one-fifth longer than the first, the second abscissa of the cubitus one-fourth longer than the first.

♂. 8 mm. long. Mandibles black, fusco-ferruginous just behind the apex, the basal half

on the upper side with a narrow yellow line. On the scutellum the yellow markings are reduced to a rhomboid spot on each side and on the cuneoli. Anterior femora yellow on the apical two-thirds of the underside, the middle femora black and with a small yellow spot at the apex on the upperside, the middle tibiae black below and yellow above. Hind femora yellow above, except at the extreme apex. Middle and hind metatarsi whitish. Otherwise like the ♀ in colour.

The puncturation of the vertex behind the ocelli is sparser than in the ♀, the interspaces being from four to five times wider than the punctures. Dorsum of the epinotum with the rugae distinct over the base, somewhat obliterated in the middle, transverse and stronger than in the ♀ on the apical third. The triangular area is defined for a short distance at the base by a curved carina on each side. Puncturation of the tergites a little stronger than in the ♀, the seventh closely and finely punctured, semicircular and without a median longitudinal impression.

Mandibles and median area of the clypeus like those of the ♀, but the clypeus is narrower and the teeth on each side of the lobe are less developed. Antennae 12-jointed, the fifth joint arcuately excised at the base below, the second joint half as long again as the first and about 2½ times longer than wide at the apex, the third and fourth joints 1½ times longer than wide, the fifth slightly longer than wide, the sixth to tenth wider than long, the apical twice as long as wide. Shoulders of the pronotum sharply angular but not dentate. Mesosternal crest clearly defined. Otherwise like the ♀.

Ivondro, 1 ♀, 1 ♂. January.

Genus **Microcrabro** Sauss.

Hist. Madag. xx, p. 575, 1892; Schulz, *Zool. Ann.* iv, p. 184, 1911

Microcrabro micromegas Sauss.

Hist. Madag. xx, p. 575, ♀, 1892

The collection contains no specimens which can be identified with this species. Schulz gives the following additional characters based on an examination of the type and unique specimen, which however is defective, the legs having been lost. '...Temples in front behind the cheeks, produced into a small spine...anterior margin of the clypeus with three large and acute teeth....Mandibles on the underside a little before the apex emarginate, so that they might be termed bidentate at the apex. Labial palpi 4-, maxillary palpi 6-jointed. Second joint of the flagellum longer than the first. Ocelli arranged in an equilateral triangle. Shoulders of the pronotal collar rounded. Radius beyond the truncating vein curved.... Only the anterior epicnemium present. Mesosternum without a crest. The recurrent vein of the fore wing meets the cubital cell a little behind the middle....Middle tibiae with one calcar. Head, thorax and abdomen shining, feebly sculptured, the epinotum with a sharply defined median area. Abdomen without yellow markings, entirely black. Pygidial area flat and triangular.'

To judge by the absence of the posterior epicnemium and the tridentate clypeus, it is possible that this species belongs to the species-group *Neodasyproctus*. Saussure omits mention of the length of the insect, but according to the scale of the figure given in Plate 26 it is about 6·5 mm. long.

Subfamily OXYBELINAE

Genus **Oxybelus** Latr.

Key to the species, ♀♀ and ♂♂

(2) 1. Epinotal process spiniform; abdomen in greater part red. **cristatus** Sauss. (p. 187)

(1) 2. Epinotal process gutter-shaped; abdomen black, with yellow markings.

(4) 3. Pygidial area of the ♀ black; sixth and seventh abdominal segments of the ♂ black, the seventh tergite parallel-sided. ♀ 8·5 mm., ♂ 5·5–6 mm. long. **perornatus** Arn. (p. 186)

(3) 4. Pygidial area of the ♀ ferruginous; apical half of the sixth and the whole of the seventh abdominal segments of the ♂ ferruginous, the seventh tergite wider at the base than at the apex. ♀ 5·5–6·5 mm., ♂ 4·5–6·2 mm. long. **subcristatus** Sauss. (p. 188)

Oxybelus perornatus n.sp. (Fig. 138, 138 *a*, *b*)

♀. 8·5 mm. long. Black. The following parts pale chrome yellow: scapes, first two joints of the flagellum and the underside of the third joint, pronotal dorsum, pronotal tubercles, the axillary sclerites and a spot on the front of the tegulae, round maculae on each side of the scutellum, the metanotum, the apical half above and the whole of the outer side of the anterior and middle femora, the anterior and middle tibiae, excepting a reddish streak on the underside, spots on the posterior femora on the outer side and at the apex below, the base of the hind tibiae and a streak at their apex in front. Metatarsi whitish yellow, the apex of the posterior pair fuscous, the second and third joints of the tarsi pale ferruginous but whitish at the base, sometimes entirely pale fuscous, the apical joint ochreous, its extreme base reddish. The first four tergites with transverse and entire lemon yellow pre-apical bands, that of the first widely dilated laterad, the apical margins translucent and whitish; the fifth tergite with a transverse median yellow macula. Second sternite pale lemon yellow, except at the extreme base and at the sides, the third sternite with a very narrow pre-apical band of the same colour, sometimes broken up into spots. The lamella margining the sides of the scutellum, the metanotal squamae and the apical third of the epinotal process are colourless and hyaline. Tarsal comb of the fore legs pale ferruginous, the spines on the middle and hind legs, and the calcaria, reddish yellow. Mandibles dull white in the basal half, reddish brown in the apical. Anterior half of the median area of the clypeus pale yellow. Third joint of the flagellum with a black spot above, the fourth and fifth pale fuscous, the sixth to eleventh joints reddish ochreous. Wings hyaline, the veins dark brown.

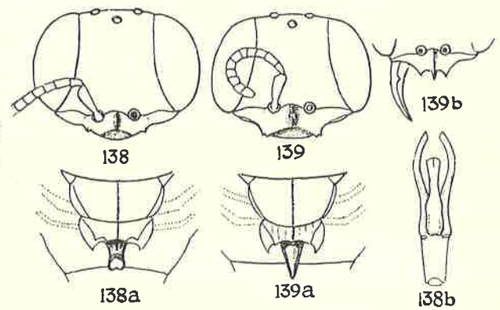


Fig. 138. *Oxybelus perornatus* ♀, head, × 10; *a*, posterior half of thorax, × 10; *b*, ♂, genitalia, × 30.

Fig. 139. *Oxybelus cristatus* ♀, head, × 10; *a*, posterior half of thorax, × 10; *b*, ♂, clypeus, × 10.

Head with a long, sparse and pale yellowish pubescence. Median area of the clypeus dull, finely and closely punctured in the basal half, the apical half shining and with a high cariniform tubercle (distinctly angular when seen from the side) and with a strong triangular tooth on each side. Face and vertex strongly and fairly closely punctured, the punctures gradually increasing in size dorsad, decreasing behind the ocelli, the interspaces about as

wide as the punctures; temples dull, striato-punctate. Mesonotum and mesopleura closely and deeply punctured, the punctures on the mesonotum a little larger than the largest on the vertex, the interspaces as wide as the punctures on the mesonotum, a little wider on the mesopleura, and moderately shining. The scutellum is strongly carinate lengthwise in the middle, shining, the puncturation as large as that of the mesonotum but less close. Metanotal disk carinate lengthwise in the middle, with large and shallow punctures, the squamae transversely rugulose, elongate triangular and acute at the apex. Epinotal process gutter-shaped, curved upwards caudad, slightly dilated apically and concave there, the apical margin feebly sinuate; the median area of the epinotal dorsum shining, with three or four oblique costae on each side, the lateral areas of the dorsum fairly dull, obliquely rugose and punctured between the rugae; the declivity, excepting the median triangle, strongly and transversely rugose, punctured between the rugae. Metapleura and sides of the epinotum, excepting the lower middle portion, shining, transversely costate and coriaceous. First five tergites fairly dull and coarsely punctured, the punctures decreasing in size progressively on each tergite, the punctures larger and more widely spaced on the yellow areas than on the black; the largest punctures, on the first tergite, and as large as those of the mesonotum, the interspaces as wide as the punctures. Pygidial area triangular, one-quarter longer than wide at the base, closely punctured and covered with reddish yellow setae. Second sternite and sides of the other sternites fairly strongly and closely punctured and shining. Thorax and tergites with a grey decumbent pubescence, the scutellum with erect and yellowish hairs. Inferior interocular distance one-third greater than the superior. The posterior ocelli separated from the eyes by a distance equal to their own diameter. Second joint of the flagellum two-fifths longer than the first and twice as long as wide at the apex, the third to fifth joints one-fourth longer than wide, the sixth to tenth as wide as long, the apical joint half as long again as wide. Pronotal collar very short, linear in the middle, the membranous lamella on its anterior margin vertical and much higher than in the majority of the species of the genus. Anterior metatarsi with six spines on the outer margin.

♂. 5·5–6 mm. long. Flagellum ferruginous below, blackish above at the base, becoming gradually paler and reddish apically. Metanotum black. First tergite with a subtriangular lemon yellow macula on each side, the transverse yellow bands on the second and third tergites widely interrupted in the middle, on the fourth and fifth entire or slightly broken. Sternites entirely black. Tarsi entirely reddish ochreous, the hind tibiae yellow on the outside and above. Meso- and metasternum with coarse, decumbent and silvery pubescence. Relatively to the size, the puncturation on the abdomen is coarser than in the ♀, especially on the second sternite.

Clypeus tridentate, the median tooth formed by the projecting end of the longitudinal carina, the apical margin between the outer teeth and the middle one strongly concave. Second joint of the flagellum 2½ times longer than wide at the apex, the third a little longer than wide, the fourth and fifth as long as wide, the sixth to eleventh wider than long. Epinotal process a little more dilated apically than in the ♀. Third to sixth sternites with distinct lateral teeth.

Bekily, 3 ♀♀, 2 ♂♂. October and December.

Not related to any of the African species with gutter-shaped epinotal mucro.

Oxybelus cristatus Sauss. (Fig. 139, 139 *a*, *b*)

Hist. Madag. xx, p. 559, ♀, ♂, 1892

♀. 5·8–8 mm. long. This species cannot be mistaken for any of the Madagascan and African ones, on account of the unusual colour of the third to sixth tergites, which is a pale burnt sienna red; the two basal tergites vary from blackish brown to red brown and have transverse bands of whitish yellow which are narrow in the middle and wide at the sides.

♂. 6–7·5 mm. long. Fore and middle femora pale whitish yellow on the apical two-thirds of the outer side. Otherwise like the ♀ in colour. Clypeus like that of *perornatus* Arn. strongly tridentate on the apical margin. Saussure describes the pronotum as black, but in all the specimens before me the dorsum of that segment is of the same colour as in the ♀, a pale muddy yellow. The genitalia are very much like those of *perornatus* but the stipites are less arcuate in the apical half and are rounded at the apex. This species has the vertical lamella margining the front of the pronotal dorsum much higher than in the African species.

Bekily, 8 ♀♀, 15 ♂♂. October–February.

Oxybelus subcristatus Sauss. (Fig. 140, 140 *a*, *b*)

Hist. Madag. xx, p. 561, ♀, 1892

♀. 5·5–6·5 mm. long. Saussure's statement that the puncturation in this species is like that of *cristatus* is not quite accurate. In the latter, the puncturation on the head and mesonotum is very close or reticulate-punctate, and nearly so on the scutellum, and the puncturation on the mesopleura is larger than on the mesonotum. In this species the interspaces are as wide as the punctures on the head and mesonotum and fully twice as wide on the scutellum. The mesopleura are much more finely punctured, at least in the upper half, than the mesonotum and the interspaces are two to three times larger than the punctures. The second sternite is more shallowly punctured than in *cristatus*.

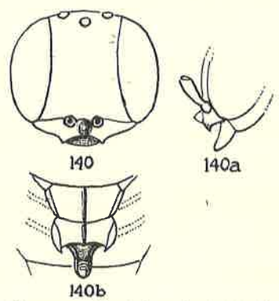


Fig. 140. *Oxybelus subcristatus* ♀, head, × *c.* 14; *a*, clypeus, lateral view, × *c.* 14; *b*, posterior half of thorax, × *c.* 14.

♂. 4·5–6·2 mm. long (hitherto undescribed). Middle and hind tibiae yellow, black underneath and sometimes with a fuscous spot on the outside. Seventh abdominal segment and the apical half of the sixth ferruginous. Otherwise like the ♀ in colour, but all the yellow markings are darker, chrome yellow instead of lemon yellow. The puncturation of the mesonotum and scutellum is coarser than in the ♀, and closer, or reticulate-punctate. The mesopleura are fairly strongly and irregularly rugose, finely punctured between the rugae. Clypeus tridentate as in the preceding species, the teeth somewhat shorter. Second joint of the flagellum 1½ times longer than wide at the apex, the third to eleventh joints wider than long. Otherwise like the ♀.

The interrupted yellow bands on the third to sixth tergites are sometimes obsolete. The genitalia are barely distinguishable from those of *cristatus*.

Bekily and Behara, 10 ♀♀, 26 ♂♂. October–April.

Related to *O. harraricus* Arn. from which it differs by the curved, shorter and wider epinotal process, the colour of the legs and the pygidial area of the ♀, which is rounded at the apex and not broadly truncate as in *harraricus*.

EPILOGUE

A review of the more interesting features of the Madagascan Sphecid fauna can now be undertaken.

In his work in Grandidier's *Histoire de Madagascar*, Saussure described seventy-four species as Madagascan, excluding four from the Mascarene Islands. Of these eight have almost certainly been wrongly credited to the island, probably on account of the faulty labelling in the Romand collection. These are: *Ammophila erythrocephala* F., *A. laevigata* Sm., *Bembix olivacea* F., *Chlorion aurulentus* F., *C. splendidus* F. (=*forficula* Sauss.), *C.*

lobatum F., *Stizus ruficornis* F. and *S. tridentatus* F. Another eight of his species are synonyms, seven being the opposite sex of species described by him under other names, and one, *Notogonia femoralis*, a synonym of *solstitialis* Sm. This leaves fifty-eight species, to which must be added eight others subsequently described by Kohl, Schulthess and Gribodo, or a total of sixty-six. In the preceding pages there have been described eighty-eight new species and four varieties peculiar to the island and seven new races of African species. In addition there are seven African species, not hitherto recorded from Madagascar, which have to be added. Including the latter, the total number of Madagascan Sphecids has been raised to one hundred and seventy-two.

The number of African species which occur on the island, either in the specific form or as races, amounts to twenty-five, as shown in the following table:

Genus	Madagascan	African
Trypoxylon	r. *madecassum* Arn.	*cataractae* Arn.
	punctatissimum Arn.	*punctatissimum* Arn.
Philanthus	*triangulum* F.	*triangulum* F.
Astata	r. *hova*	*ruficaudata* Turn.
Sphex	r. *madecassa* Kohl	*tydei* Guill.
	beniniensis P.B.	*beniniensis* P.B.
Chlorion	*aegyptium* Lep.?	*aegyptium* Lep.
	r. *Voeltzkowi* Kohl	*umbrosum* Christ.
Liris	r. *jocositarsa* Sauss.	*haemorrhoidalis* F.
Subgen. *Motes*	*solstitialis* Sm.	*solstitialis* Sm.
	antaca Sauss.	r. *transvaalensis* Cam.
	alaris Sauss.	r. *felina* Arn.
	r. *coloripes* Arn.	*setigera* Arn.
	minima Arn.	*minima* Arn.
	gracilicornis Arn.	*gracilicornis* Arn.
	nigricans Wlk. r. *reticulata* Sauss.	*nigricans* Wlk. r. *reticulata* Sauss.
	r. *hova* Arn.	*sepulchralis* Gerst.
Tachysphex	*suavis* Arn.	*suavis* Arn.
	r. *sacalava* Arn.	*Turneri* Arn.
	r. *flavo-fimbriatus* Arn.	*fluctuatus* Gerst.
	bruneiceps Arn.	*bruneiceps* Arn.
Crabro	*ichneumoniformis* Arn.	*ichneumoniformis* Arn.
	sociabilis Arn.	*sociabilis* Arn.
	r. *nigrescens* Arn.	*Slateri* Arn.
	r. *bekiliensis* Arn.	*brunniventris* Arn.

This number amounts to a little more than 14½% of the total, so that it is evident that the great majority of the species are peculiar to the island. On the other hand, there are no Sphecid species common to the island and the Indian subregion, a fact which lends little support to the view held by some naturalists that there is an appreciable Indian element in the island fauna. If, however, the Hymenoptera as a whole are taken into consideration, there are a few species which are identical in the two regions, but these, according to Saussure, 'rentrent pour la plupart dans la catégorie de celles qui sont pour ainsi dire cosmopolites entre les limites des régions chaudes de l'ancien continent'.

It is significant that with the exception of a single new subgenus, *Hovanysson*, there are no genera or subgenera of Sphecidae peculiar to the island or which occur there and not on the African continent. The genus *Alysson* does not contradict this statement since an undescribed species of that genus, from Basutoland, has recently been discovered.

African genera which were hitherto not recorded from the island but are now represented by species in the Seyrig collection are but few, being the following: *Alysson*, *Nysson*, *Ammatomus*, *Lyroda*, *Parapiagetia*, *Miscophus*, *Solierella*, *Spilomena*, *Stigmus* and *Psen*. Of

the fifty-five genera found in the Ethiopian Region, thirty-four are represented in Madagascar, but with the exception of the eight species recorded by Kohl from Tulear, there are no records of species from the south-western side of the island, and there can be little doubt that when that region has been thoroughly collected over, many of the missing African genera will be found there, particularly those genera which favour a savannah type of country, such as *Prosopigastra*, *Kohliella*, *Palarus*, *Paranysson* and *Belomicrus*.

It is noteworthy that although 85% of the species are endemic there are no endemic genera or subgenera, excepting the subgenus *Hovanysson*, a condition paralleled by the Rhopalocerous Lepidoptera of the island, which have only four, and in contrast to the Coleoptera, in which a very large number are endemic. The explanation advanced by Holdhaus (Schröder's *Handbuch der Entomologie*, II, p. 779) for the Rhopalocera, namely that the powers of flight of those insects are sufficient to overcome the distance between the mainland and the island, can hardly hold good for the majority of the Sphecidae. Nor can that overworked *deus ex machina*, drifting wood and vegetation from floods, be invoked for the xerothermal genera such as *Tachytes*, *Tachysphex*, *Liris*, etc., which nest in dry and sandy soil and are only accidentally and rarely attached to fallen trees and other vegetation. It has been well established since the advent of the aeroplane, that insects caught up in tornados and dust-devils may be carried to great heights, and reaching the upper air currents, become dispersed over considerable distances. This method of dispersion may possibly account for some of the genera but fails to explain the absence of others having very much the same habitats and mode of life. The writer is therefore driven to the conclusion that the Sphecid fauna of the island is derived from the original continental stock when Madagascar was still joined to the mainland. Geological evidence seems to show that the latest land connection between the two areas was in the later Miocene or early Pliocene periods, between 20 and 13 million years ago. Even if we accept the lower limit, it is remarkable that during that long period of time no new genera have been evolved in the island. As for species, it is not possible to recognize what Saussure terms 'une empreinte locale' amongst the Madagascan Sphecids, with the exception of the island race, *jocositarsa*, of *Liris haemorrhoidalis*, in which melanism is evident.

The Crabroninae are chiefly rubicolous and sylvicolous insects, preferring shady situations for nesting sites, and even the terricolous species of the *Entomognathus* species-group are usually found, at least in Southern Rhodesia, making their nests in ground which is not exposed to the rays of the sun for more than a few hours of the day. The comparatively large number of species of Crabroninae from Eastern Madagascar, 21 as against 48 for the whole Ethiopian Region, is at first sight rather surprising. This is probably accounted for by favourable environment which resulted from the elevation of the north–south mountain chain, which took place soon after the separation of the island from the continental mass, leading to the extension of the forests.* If the habits of the Madagascan *Neodasyproctus* group are the same as the African one, *Kohli* Arn. which nests in hollow stems, their number is also explained by the favourable forest environment.

Compared with the Ethiopian fauna, the number of species belonging to the xerothermal genera, *Tachysphex* and *Tachytes*, is decidedly small, the former being represented by thirteen species and *Tachytes* by seven, whereas there are fifty-five *Tachysphex* species and sixty-six *Tachytes* in the Ethiopian Region. But this apparent paucity of species in those two genera is no doubt due to the fact that the drier south-western side of the island has not been investigated by any experienced hymenopterologist.

* I wish to express my thanks to Mr H. B. Maufe, formerly Director of the Geological Survey, Southern Rhodesia, and to Dr A. L. du Toit, formerly of the Union of South Africa Geological Survey, for helpful information on the geological history of the island.

INDEX

Genera are printed in large capitals; subgenera in small capitals; synonyms in italics

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