

THE SPHEGIDAE OF SOUTH AFRICA

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PART XI

With 20 Text-figures

Genus CHLORION Fab.

Syst. Piez. p. 217, 1804.

Sphex Linn. *Syst. Nat.* Ed. 12, p. 941, 1770.

CHARACTERS. Inner margins of the eyes parallel, or slightly divergent above, more rarely convergent above. Mandibles with one to three teeth on the inner margin. Labrum well-developed. Tongue distinctly long. In the ♂ the joints of the flagellum have one or more longitudinal carinae below; the apical joint in both sexes is truncate at the apex. Pronotal collar discoid or fairly short, always considerably wider than long. Metapleurae produced far backwards as in the other genera of the Chlorion group. Episternal suture clearly defined. Epinotal dorsum without a distinctly defined median area, or with one which extends over practically the whole of it (subgenus *Chlorion* s.str.). The metapleural-epinotal suture is almost entirely obliterated, being defined only slightly above the hind coxae; in the subgenera *Chlorion* and *Proterosphex* there is a groove (stigma-groove), which extends from the end of the metapleural-epinotal suture to the epinotal stigma. Petiole one-jointed, formed by the sternite of the first abdominal segment; the first tergite is conical or campaniform. Pygidial area absent; in some species the apical tergite is compressed transversely. In the ♂ eight ventral plates are visible.

Middle coxae not inserted closely together. Tibiae and tarsi strongly spinose, the anterior tarsi in the ♀, except in the subgenus *Isodontia*, with a well-developed comb. Claws stout, armed with from one to five teeth at the base. Pulvillus present. The inner calcar of the hind tibia has either a close comb of fine hairs along the greater part of its length, or a close comb at the base and a row of separate spines on the apical half.

Fore wing: radial cell rounded at the apex. Three cubital cells present, only in a few American species with only two. The second cubital cell is either higher than wide on the cubitus, or rhomboidal, as wide as, or wider than high. The second and third cubital cells each receive one of the recurrent veins. The basal vein arises at the end of the first submedial cell, or a little beyond it, and meets the subcosta at a considerable distance from the pterostigma.

Hind wing: retinaculum unbroken, beginning at the base of the radial vein. The cubital vein arises at the apex of the submedial cell or a little beyond it. The submedial vein ends in the anal sinus.

Distribution: Both hemispheres.

These insects nest in the ground and provision their young with Orthoptera, chiefly grasshoppers and crickets. The species of the subgenus *Isodontia* are an exception to the rule and make their nests in hollow stems and reeds.

The genus was monographed by Kohl in the *Ann. K.K.N.H. Mus. Wien*, v, Heft 2 and 3, 1890, and therein the habits of several European and North American species are described very fully. In the work cited, and also in his later *Die Gattungen der Sphegiden*, Kohl with considerable justification treated the numerous genera of other authors as species-groups of the single genus *Chlorion* (*Sphex*), but at the same time conceded that in a future subdivision of the genus some of these groups might be entitled to subgeneric rank. For convenience this step has been taken in this work, although it must be admitted that the differences between some of the subgenera are rather slight. The subgenera may be distinguished as follows:

KEY TO THE SUBGENERA OF *CHLORION*

- (8) 1. Second cubital cell narrow, higher than wide on the cubitus, sometimes (American species) fused with the first, owing to the obliteration of the first transverse cubital vein. (Nests made in the ground.)
- (3) 2. Claws with a single tooth at the base. Clypeus much wider than long. Epinotum with a stigma-groove. Stigmata of the first tergite (with only one exception) placed before the middle of the segment. Tarsal comb always well developed in the ♀. The body, especially the abdomen, often with a metallic lustre.
subgenus *Chlorion* Fab. (*Syst. Piez.* p. 217, 1804)
- (2) 3. Claws with more than one tooth at the base; clypeus not very short, not more than twice as wide again as long in the middle, usually a good deal less.
- (7) 4. Claws with two teeth at the base; epinotum without a stigma-groove.
- (6) 5. Apical ventral valve in the ♀ transversely compressed. Fifth and sixth sternites in the ♂ covered with a fine, adpressed silky pubescence. Stigmata of the first tergite placed at, or behind, the middle of the segment. The apical half of the comb on the inner calcar of the hind tibia is composed of well-separated spines.
subgenus *Calosphex* Kohl. (*Ann. K.K.N.H. Mus. Wien*, v, pp. 78 and 112, 1890)
" *Palmodes* Kohl. (*Loc. cit.*)
" *Pseudosphex* Tasch. (*Zeitschr. f. d. ges. Naturw.* xxxv, p. 420, 1869)
(Of these three subgenera only the first is represented in Africa.)
- (5) 6. Apical ventral valve in the ♀ not transversely compressed. (Pronotal collar well developed, never linear above. In our African species the claws have only two teeth at the base, but in some American species as many as five may be present.)
subgenus *Harpactopus* Smith. (*Cat. Hymen. B.M.* iv, p. 264, 1856)
- (4) 7. Claws with three or four teeth at the base.
subgenus *Parasphex* Smith. (*Cat. Hymen. B.M.* iv, p. 267, 1856)
- (1) 8. Second cubital cell wider on the cubitus than high, rhomboidal or more or less rectangular. Claws with two teeth at the base. Comb of the inner calcar of the hind tibiae composed of closely set hairs.
- (10) 9. Petiole very long, at least two-thirds as long as the rest of the abdomen. Epinotum without a stigma-groove. Anterior tarsi without a distinct comb. (The abdomen in the ♂ usually has fimbriae of long hairs on some of the sternites. The nests are made in hollow stems or reeds, not in the ground.)
subgenus *Isodontia* Patton. (*Boston Soc. N.H.* xx, p. 380, 1881)
- (9) 10. 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. (The nests are made in the ground.)
subgenus *Proterosphex* Fernald. (*Proc. U.S. Nat. Mus.* xxxi, p. 294, 1907)

In the following pages the descriptions of those species which are not known to me in nature have been copied from Kohl's works. Some species, which seem to belong to the African portion of the Mediterranean subregion and its extension down the Nile valley, have been included in the key to the species, but have not otherwise been considered.

For determination of the species the measurement of the petiole is to be taken from the extreme base to the point where the first tergite joins it. Measurements of the length of the clypeus should include the ill-defined triangle in front of the antennal sockets, and the length should be measured from the anterior margin to the apex of that triangle. The latter is not a part of the clypeus, but throughout this work it has been treated as such and included in the measurements. In this genus the suture between it and the clypeus is usually very well defined, and for that reason the student is warned not to exclude it in measuring the clypeus. The width means the greatest width, which is always some distance behind the anterior margin, that is, just below the eyes.

The structure of the genitalia in the ♂ is of some importance, especially in the *haemorrhoidalis* Fab. group, in which, together with the shape of the apical tergite and sternite, it is indeed almost the only reliable distinctive character. It is, however, necessary to use this character with discretion, since not only are the genitalia very complicated in shape, but also because a great deal depends on their proper preparation for the microscope and on the angle from which they are viewed. Moreover, it must be borne in mind that a certain, although moderate, amount of variation is bound to occur in their structure, even within the species¹.

In the natural position, the stipites or outer paramera enclose the greater part of the sagittae or inner paramera. The latter are placed above the laciniae or inner lobes of the outer paramera, so that when viewed from above the latter are not, or only partially visible. In preparing the genitalia for examination it is necessary to separate the outer paramera fairly far apart, and to raise the inner ones to a fairly high angle from the base whereby they may be viewed from the side. Since the structure of these organs is so complicated, it is exceedingly difficult to give a concise verbal description of them, and illustrations are therefore essential.

¹ Pérez (*Ann. Soc. Ent. France*, LXIII, pp. 64-81, 1894) has rightly emphasised this point in his paper on the male genitalia of the Hymenoptera and their taxonomic value, in which he says:

"Il n'est pas de caractère invariable, et l'organ copulateur n'est pas soustrait à la loi commune, par cela seul qu'il remplit un rôle dans une importante fonction. On peut même affirmer qu'il est plus sujet à variation que la plupart des autres organes. Cela ne peut surprendre, si l'on considère que c'est une machine fort compliquée, surchargée de saillies, de prolongements, d'appendices, de dents, de soies, de poils, etc. La complexité est toujours une condition éminemment favorable à la variation... Que l'organ copulateur soit sujet à beaucoup varier dans une même espèce, c'est loin d'être un avantage, au point de vue de la zoologie pratique. C'en est un grand, au contraire, et une compensation très heureuse, qu'il diffère beaucoup d'une espèce à l'autre."

That a good deal also depends on the orientation of the different parts of the genitalia is also made apparent by Pérez, who reproduces the drawings made by four different authors of the genitalia of one and the same species. Two of these differ so much from the others that at first glance one would suppose they figured the genitalia of three distinct species.

KEY TO THE SPECIES OF *CHLORION* ♀♀.

- (6) 1. Pronotal collar deeply impressed above, and therefore bituberculate. Claws with only one tooth at the base. Clypeus much wider than long. Second cubital cell higher than wide on the cubitus.
(subgenus *Chlorion* Fab., s.str.)
- (3) 2. Pronotal collar distinctly transversely striated in front. Mesopleurae slightly shining, moderately closely punctured. (Clypeus as long as the third joint of the flagellum, much shorter than the second, with five teeth on the anterior margin. Legs slender. Fore wing yellow, with a brown apical margin. Hind wing feebly infuscated on the apical and hind margins. Thorax black. Head, antennae and legs partially reddish. Abdomen black, with a violaceous metallic lustre. Dongola, Nubia.) *hirtum* Kohl
- (2) 3. Pronotal collar not distinctly transversely striated.
- (5) 4. Wings yellow, with brownish apical margin and without any metallic lustre. (Antennae, tibiae, tarsi, apical half or more of the femora, head, excepting the middle above, yellowish red; apex of abdomen fusco-ferruginous. Abdomen with a very distinct metallic blue lustre.) *xanthocerum* Ill., var. *apicalis* Guérin
- (4) 5. Wings blackish brown, with a metallic blue, violaceous or greenish lustre. *xanthocerum* Ill.
There are also the following varieties:
a. The whole body black, without any metallic lustre. var. *unicolor* Sauss.
Abdomen, and the thorax more or less, with a dark blue or purple metallic lustre.
b. Antennae and pilosity black. var. *kigonserana* Strand.
c. Antennae yellow. var. *subcyaneum* Gerst.
d. Antennae, clypeus, legs and apical abdominal segment more or less ferruginous. var. *maxillaris* Pal.
e. Mandibles, antennae, head more or less, pronotum, tegulae, mesonotum in the middle, and the legs, ferruginous; apical segment of the abdomen ferruginous or reddish brown; wings brown, with a violaceous lustre; very large, 40 mm. long. var. *instabilis* Smith
- (1) 6. Claws with two to four teeth at the base. Pronotal collar with at the most only a shallow median impression above, not bituberculate.
- (24) 7. Second cubital cell higher than wide on the cubitus. (Epinotum without a stigma-groove. On the inner calcar of the hind tibiae the teeth of the comb are coarse and widely separated on the apical half. Stigma of the first tergite placed at or behind the middle of the segment.)
- (13) 8. Apical sternite not transversely compressed. Tergites black, without transverse yellow or white bands. (Claws with two teeth at the base. First tergite attached to the petiole at a steep angle, subvertical. Large species with long and powerful legs.) (subgenus *Harpactopus* Smith)
- (10) 9. Petiole longer than the second joint of the hind tarsus and about two-thirds as long as the first joint. Mesonotum and a transverse bar across the vertex covered with a dense silvery pubescence. Wings blackish brown, with greenish blue reflections. Femora of the hind legs longer than the tibiae by as much as one-fourth of the length of the basal joint of the hind tarsus. *funnebris* Berland
- (9) 10. Petiole not longer than the second joint of the hind tarsus.
- (12) 11. Wings yellow, the apical margin brown. Clypeus with a small excision in the middle of the anterior margin. (Black; pilosity black, the face and sometimes also the collar with white pubescence. Labrum semi-circularly emarginate, with three small teeth at the apex of the arc. Petiole a little shorter than the second joint of the hind tarsus. Femora of the hind legs as long as the tibiae. 26-34 mm. long. Egypt, Nubia and Abyssinia.) *aegyptium* Lep.

- (11) 12. Wings brown, the apical margin beyond the cells fusco-hyaline on the front wing, and hyaline on the hind wing. Clypeus not excised in the middle. (Petiole about as long as the second joint of the hind tarsus. Femora of the hind legs as long as the tibiae. 25-32 mm. long.) *tyrannum* Smith.
- (8) 13. Apical sternite transversely compressed. Abdomen red or yellowish red, the tergites usually with transverse apical bands of yellow or white. Species not very large.
- (17) 14. Claws with two teeth at the base. Head and thorax covered with a dense, decumbent, snow-white or yellowish pubescence and a white pilosity, obscuring the sculpture. (subgenus *Calosphex* Kohl)
- (16) 15. Petiole as long as the basal joint of the hind tarsus. First and second transverse cubital veins clearly convergent towards the radius. 14-16 mm. long. (Khartoum.) *niveatum* Dufour.
- (15) 16. Petiole shorter than the basal joint of the hind tarsus. First and second transverse cubital veins barely convergent towards the radius. 20-27 mm. long. (Khartoum and Nubia.) *nigropectinatum* Tasch.
- (14) 17. Claws with three or four teeth at the base. Head and thorax with a long whitish pilosity and white pubescence, the latter not so dense as to obscure the sculpture. (subgenus *Paraspheg* Smith)
- (19) 18. Medium sized species, 18-24 mm. Thorax and epinotum with white pubescence and pilosity, very dense on the sides and declivity of the epinotum. Tergites without white bands, the apical margins only testaceous. *viduatum* Christ.
- (18) 19. Small species, 13-17 mm. long.
- (23) 20. Tergites with narrow apical ivory-white bands; claws with three teeth at the base; pubescence of the thorax not very dense.
- (22) 21. Dorsum of epinotum dull, transversely rugulose or striate, with numerous fine punctures between the striae. *albiseptum* Lep.
- (21) 22. Dorsum of epinotum shining, very sparsely and very finely punctured, with a narrow median longitudinal area which is transversely striate and duller than the rest of the dorsum. *albiseptum*, race *marginatum* Smith
- (20) 23. Tergites without apical bands of ivory-white; claws with four teeth at the base; head and thorax covered with snow-white pubescence which entirely obscures the sculpture. (Cairo and Senegal.) *leucosoma* Kohl
- (7) 24. Second cubital cell at least as wide as high, more or less rhomboidal. Epinotum with or without a stigma-groove. The comb on the inner calcar of the hind tibia is composed of fine hairs set close together.
- (32) 25. Anterior tarsi spinose but without a true tarsal comb. Second cubital cell more or less rectangular, usually wider than high. (Claws with two teeth at the base. Dorsum of epinotum without a stigma-groove, usually densely punctured. Petiole distinctly long, at least two-thirds as long as the rest of the abdomen. Nests made in reeds and hollow stems, not in the ground.) (subgenus *Isodontia*)
- (29) 26. Pronotal collar linear above; dorsum of epinotum closely punctured, without indications of transverse striation.
- (28) 27. Wings brown, with a violaceous lustre. *pelopoeiformis* Dhlb.
- (27) 28. Wings hyaline, yellowish at the base and along the costa, the apical margin, radial cell and greater part of the 2nd and 3rd cubital cell pale fuscous. *pelopoeiformis* var. *longiventris* Sauss.
- (26) 29. Pronotal collar not linear above, about one-fifth as long as wide. Dorsum of the epinotum more or less transversely striated as well as punctured.
- (31) 30. First seven joints of the antennae, the legs excepting the posterior femora above, bright ferruginous; mesonotum dull, closely and strongly punctured; epinotum closely punctured and with a fine transverse striation superimposed. Wings flavo-hyaline, the apical margin narrowly pale fuscous. 21-25 mm. long. *Simoni* Du Buysson

- (30) 31. Antennae and greater part of the legs black; mesonotum shining, finely and sparsely punctured; epinotum finely, transversely striatopunctate and punctured between the striae. Wings pale fusco-hyaline, the apical margin fuscous. 18-22 mm. long. *Stanleyi* Kohl
- (25) 32. Anterior tarsi with a well-developed comb. Second cubital cell rhomboidal. Stigma-groove on the epinotum nearly always present. Claws with two teeth at the base. Petiole short, less than a quarter of the length of the rest of the abdomen, and rarely longer than the second joint of the hind tarsus. (subgenus *Proterosphex* Fernald)
- (34) 33. Dorsum of epinotum with five or six very prominent transverse rugae. *gorgon* Kohl
- (33) 34. Dorsum of epinotum finely sculptured, without very prominent rugae, or if a few rugae are moderately distinct then the scutellum is ferruginous.
- (36) 35. Scutellum, postscutellum, clypeus, pronotal collar and greater part of the legs ferruginous; dorsum of epinotum finely and closely transversely striate, with in addition seven or eight transverse rugae which are not very apparent unless the segment is viewed obliquely from in front. *rufiscutis* Turner
- (35) 36. Scutellum not ferruginous.
- (42) 37. Metanotum bituberculate in the middle.
- (39) 38. Epinotum with a dense and shaggy pale ochreous yellow pilosity, obscuring the sculpture. Clypeus with a dense, pale golden pubescence and a long pale yellow pilosity; posterior femora and tibiae red. *tuberculatum* Smith
- (38) 39. Pilosity on the epinotum not yellow. Posterior femora and tibiae black.
- (41) 40. Pilosity on the epinotum black, short and scanty, not obscuring the sculpture. *umbrosum* Christ. var. *metallicum* Tasch.
- (40) 41. Pilosity on the epinotum white, dense and long, obscuring the sculpture. *umbrosum* var. *lanatum* Mocs.
- (37) 42. Metanotum not bituberculate in the middle, at the most with only a feeble median longitudinal impression.
- (46) 43. Wings yellow.
- (45) 44. Wings flavo-hyaline, the apical margin beyond the cells pale fuscous. Apical segment of the abdomen fusco-ferruginous, the rest of the body, including the legs, entirely black. *luteipennis* Mocs.
- (44) 45. Wings dark yellow, the apical margin dark brown. Clypeus, first eight joints of the antennae, legs, thorax, first segment of the abdomen and basal two-thirds of the second segment, flavo-ferruginous (pale burnt sienna). *Paulinieri* Guérin
- (43) 46. Wings brown or blackish brown, with metallic reflections.
- (48) 47. Epinotum and sides of the thorax with a dense, pale golden pubescence and a long, pale yellow pilosity, obscuring the sculpture. *observabilis* Turner
- (47) 48. Pubescence on the epinotum not golden, usually black, or more rarely yellowish grey.
- (52) 49. Tergites shining and jet black, owing to the absence of any fine pubescence.
- (51) 50. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. Epinotum with a greyish pubescence, obscuring the sculpture, and yellowish grey pilosity; sometimes both are entirely black. 24 mm. long. *incomptum* Gerst.
- (50) 51. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus one-third of the third joint. Epinotum with a fairly sparse, blackish pilosity, not entirely obscuring the sculpture. 26-30 mm. long. *nigrohirtum* Kohl
- (49) 52. Tergites covered with a microscopic, decumbent and black pubescence and therefore only moderately shining, if at all.

- (60) 53. Legs more or less ferruginous. At least the tibiae and apices of the femora, anterior margin of clypeus and apical segment of the abdomen are ferruginous or fusco-ferruginous.
- (55) 54. Wings with a distinctly greenish metallic lustre. Clypeus convex. Legs pale ferruginous, only the coxae, anterior femora in front and base of the middle and hind femora blackish. 27 mm. long.
haemorrhoidalis Fab. var. *pulchripennis* Mocs.
- (54) 55. Wings with bluish or violaceous lustre, if slightly greenish then the clypeus is flattened in the middle just behind the anterior margin.
- (57) 56. The dorsum of the epinotum is separated from the declivity by an obtusely angular and deep groove which extends almost over the whole width of the apical margin. (Clypeus, scapes, apical third or more of the femora, tibiae and basal joint of the hind tarsi, ferruginous; interocular distance on the vertex equal to the length of the second joint of the flagellum plus two-fifths of the third joint. Dorsum of the epinotum as long as the first two joints of the flagellum plus half of the third joint. 23-27 mm. long.)
haemorrhoidalis var. *volubilis* Kohl
- (56) 57. Dorsum of epinotum without a deep groove between it and the declivity; a small median transverse pit is present which does not extend over more than a fourth part of the apical margin.
- (59) 58. 21-24 mm. long. Dorsum of epinotum without a trace of a median longitudinal impression, but there is a shallow and round impression just in front of the apical margin; distinctly transversely striate and sparsely pilose. Posterior femora black, the extreme apex ferruginous.
decipiens Kohl
- (58) 59. 25-27 mm. long. A shallow median longitudinal impression on the epinotal dorsum is clearly visible; the sculpture of the dorsum is very finely transversely rugulose and indistinct. Posterior femora ferruginous, blackish only at the base.
haemorrhoidalis var. *Kobrowi* Arnold
- (53) 60. Legs black.
- (64) 61. Clypeus two-fifths wider than long. Large species, 26-30 mm. long.
- (63) 62. Basal joint of fore tarsi with nine spines on the outer margin.
Bohemanni Dhlb.
- (62) 63. Basal joint of fore tarsi with ten spines on the outer margin.
Stadelmanni Kohl var. *integrum* Arnold
- (61) 64. Clypeus one-fifth wider than long. Medium-sized species, 22-25 mm. long.
haemorrhoidalis Fab.

KEY TO THE SPECIES OF *CHLORION* ♂♂

- (20) 1. Second cubital cell higher than wide on the cubitus.
- (5) 2. Claws with a single tooth at the base. Clypeus much wider than long. Stigma of the first tergite placed more or less in front of the middle of the segment. Species with metallic lustre, especially on the abdomen.
(subgenus *Chlorion* Fab.)
- (4) 3. Mesopleurae punctured, never rugoso-punctate. (Petiole about as long as the third joint of the flagellum. The second joint of the flagellum shorter than the third. Median area of the clypeus convex, not flattened in front, the anterior margin with three teeth, the whole of it covered with coarse, outstanding, black hairs. 24-28 mm. long. Egypt.)
hirtum Kohl
- (3) 4. Mesopleurae rugoso-punctate or reticulate-punctate.
xanthocerum Ill.

There are the following varieties:

- a. Wings yellow, the apical margin of the fore wing brown. Clypeus, antennae and legs more or less yellowish red. Thorax black. Epinotum dark metallic purple. Abdomen metallic blue, the apical segment and apical margins of the other segments more or less fulvous.
var. *apicalis* Guérin

- b. Wings brown, with a violaceous metallic lustre. Legs, antennae, head, pro- and mesonotum, last two abdominal segments and apical margins of the other segments, bright ferruginous. Thorax dark metallic blue, abdomen metallic green. var. *zonatum* Sauss.
- c. Wings blackish brown, with metallic blue reflections. Antennae black. Thorax black, the epinotum with a purplish metallic lustre. Abdomen dark metallic blue. var. *kigonserana* Strand.
- d. Like c, but with the antennae and face more or less yellowish red. var. *subcyaneum* Gerst.
- e. Like d, but the face, antennae, tibiae, tarsi, apical third of the femora and apical abdominal segment ferruginous. var. *maxillaris* Pal.
- (2) 5. Claws with two to four teeth at the base. The apical half of the comb on the inner calcar of the hind tibia is composed of coarse spines not set closely together. Stigma of the first tergite placed at, or behind, the middle of the segment.
- (15) 6. Claws with two teeth at the base.
- (12) 7. Abdomen black, without transverse yellow or white bands. Wings not hyaline. Large species, with long legs. (subgenus *Harpactopus* Smith)
- (9) 8. Wings yellow, the apical margin brown. (Femora of the hind legs as long as the tibiae. Third joint of the flagellum shorter than the second by half the length of the first. 22-28 mm. long. Egypt, Nubia and Abyssinia.) *aegyptium* Lep.
- (8) 9. Wings not yellow.
- (11) 10. Wings brown, the apical margin beyond the cells hyaline or nearly so; mesonotum covered with black pubescence; petiole about as long as the second joint of the hind tarsus. *tyrannum* Smith
- (10) 11. Wings blackish brown all over, with metallic blue lustre; mesonotum covered with a dense, dull silvery pubescence, which entirely obscures the underlying sculpture; petiole as long as the second joint of the hind tarsus plus one-half of the third joint. *funnebris* Berland
- (7) 12. Abdomen red or yellowish red, with apical bands of yellow or white. Wings hyaline. Head, thorax and epinotum covered with a dense and snow-white pubescence. Small species. (subgenus *Calosphex* Kohl)
- (14) 13. 14-16 mm. long. Petiole long, fully as long as the basal joint of the hind tarsus. *niveatum* Dufour
- (13) 14. 19-22 mm. long. Petiole much shorter than the basal joint of the hind tarsus, only as long as the second joint plus half of the third. *nigropectinatum* Tasch.
- (6) 15. Claws with three or four teeth at the base. Head and thorax with long white pilosity which is not so dense as to obscure the sculpture. (subgenus *Parasphex* Smith)
- (17) 16. 14-20 mm. long. Tergites only testaceous on the apical margins, without ivory-white bands. *viduatum* Christ.
- (16) 17. 12-16 mm. long. Tergites with ivory-white bands on the apical margins.
- (19) 18. Dorsum of epinotum dull, closely and transversely striate. *albisectum* Lep.
- (18) 19. Dorsum of epinotum fairly shining, finely and sparsely punctured. *albisectum*, race *marginatum* Smith
- (1) 20. Second cubital cell at least as wide as high, or wider. (Claws with two teeth at the base.)
- (28) 21. Second cubital cell more or less rhomboidal, wider than high. Epinotum without a stigma-groove. Petiole long, fully two-thirds as long as the rest of the abdomen. (subgenus *Isodontia* Patton)
- (25) 22. Pronotal collar linear above; dorsum of epinotum dull, closely punctured, without indications of transverse striation.
- (24) 23. Wings brown, with a violaceous lustre. *pelopoeiformis* Dhlb.

- (23) 24. Wings hyaline, yellowish at the base and along the costa, the apical margin, radial cell and greater part of the second and third cubital cells pale fuscous. *pelopoeiformis* var. *longiventris* Sauss.
- (22) 25. Pronotal collar not linear above. Dorsum of the epinotum with at least traces of a transverse striation or rugosity.
- (27) 26. First eight joints of the antennae and the legs, bright ferruginous; mesonotum dull, closely and strongly punctured; dorsum of epinotum dull, closely punctured and transversely rugulose. Clypeus with golden pubescence. *Simoni* Du Buysson
- (26) 27. Antennae and greater part of the legs black; mesonotum shining, finely and sparsely punctured; epinotum shining, finely, transversely striate, punctured between the striae. Clypeus with dull silvery pubescence. *Stanleyi* Kohl
- (21) 28. Second cubital cell rhomboidal, as wide as high. Epinotum with a stigma-groove. Petiole short, less than one-fourth the length of the rest of the abdomen, rarely longer than the second joint of the hind tarsus. (subgenus *Proterosphex* Fernald)
- (30) 29. Dorsum of the epinotum with three or four prominent transverse rugae. *gorgon* Kohl
- (29) 30. Dorsum of the epinotum finely sculptured, without prominent rugae.
- (36) 31. Metanotum bituberculate in the middle.
- (33) 32. Posterior femora, and the tibiae more or less, red; epinotum with a dense, shaggy, pale yellow pilosity and pubescence, obscuring the sculpture. *tuberculatum* Smith
- (32) 33. Pilosity of the epinotum not yellow. Posterior femora and tibiae black.
- (35) 34. Pilosity of the epinotum black, short and scanty, not obscuring the sculpture. *umbrosum* Christ. var. *metallicum* Tasch.
- (34) 35. Pilosity of the epinotum white, dense, long and obscuring the sculpture. *umbrosum* var. *lanatum* Mocs.
- (31) 36. Metanotum not bituberculate in the middle, at the most with only a feeble median longitudinal impression.
- (40) 37. Wings yellow.
- (39) 38. Wings pale yellow, the apical margin pale fuscous. Body and legs black. *luteipennis* Mocs.
- (38) 39. Wings dark yellow, the apical margin dark brown. Clypeus, first seven or eight joints of the antennae, pronotal collar, scutellum, metanotum and epinotum, greater part of the abdomen, and the legs flavo-ferruginous. *Paulinieri* Guérin
- (37) 40. Wings brown or blackish brown with metallic reflections, or pale fusco-hyaline.
- (42) 41. Tegulae ferruginous; wings pale fusco-hyaline, the apical margin fuscous. (Scapes, clypeus, mandibles excepting the apex, anterior tibiae and femora and the middle and hind femora and tibiae underneath, ferruginous. Clypeus and lower half of the face with silvery pubescence and pale yellow pilosity. Epinotum with a long, whitish pilosity and dull silvery pubescence.) *rufiscutis* Turner
- (41) 42. Tegulae black; wings brown or blackish brown.
- (44) 43. Tibiae and apices of the femora of the middle and hind legs yellowish red. Wings with a pronounced greenish metallic lustre. (Sternites without dense fringes of black hairs.) *haemorrhoidalis* Fab. var. *pulchripennis* Mocs.
- (43) 44. Legs black; wings without a distinctly green lustre.
- (56) 45. Sternites with apical fringes of long, curved, black hairs, which on at least the 5th and 6th sternites form dense tufts on each side.
- (47) 46. Smaller species, 18-25 mm. long. Second joint of the flagellum not quite one-third longer than the third joint. *incomptum* Gerst. (see figs. 13, 13 a and b)
nigrohirtum Kohl (see figs. 14, 14 a and b)

- (46) 47. Larger species, 25-31 mm. long. Second joint of the flagellum two-thirds longer than the third joint.
- (51) 48. Face wide, the interocular distance on the vertex being equal to the length of the second and third joints of the flagellum, or even more.
- (50) 49. Interocular distance on the vertex equal to the length of the second, third and one-half of the fourth joint of the flagellum.
- (49) 50. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum.
- (48) 51. Face narrower, the interocular distance on the vertex being less than the length of the second and third joints of the flagellum.
- (55) 52. Seventh sternite deeply, angularly emarginate.
- (54) 53. Eighth sternite bluntly triangular.
- (53) 54. Eighth sternite broadly rounded.
- (52) 55. Seventh sternite only shallowly emarginate, if at all.
- (45) 56. Sternites without fringes of long hairs.
- (58) 57. Petiole as long as the second joint of the hind tarsus plus one-third of the third joint.
- (57) 58. Petiole as long as the second joint of the hind tarsus.

abyssinicum Arnold

Schoutedeni Kohl

Bohemanni Dhlb.

Neavei Arnold

Stadelmanni Kohl var. integrum Arnold

haemorrhoidalis Fab.

decipiens Kohl

C. (Chlorion) xanthocercum Ill. (figs. 1, 1a and b). *Mag. Insektenkunde*, 1, p. 193. 1801.

C. massaicus Cameron. Sjöstedt, *Kilimandjaro-Meru Exped.* VIII, p. 262. 1910. Kohl, *Ann. K.K.N.H. Mus. Wien*, v, pp. 183-5. 1890.

♀. 26-37 mm. long. Colour very variable (see list of varieties hereunder).

Black, the epinotum and abdomen with a more or less steely-blue lustre; the apex of the abdomen more or less fusco-ferruginous. Mandibles ferruginous. Legs black, the tarsi reddish black. Wings brown, with a dull metallic blue lustre. Inner and outer margins of the mandibles, anterior margin of the clypeus and the temples with a row of long, coarse hairs, reddish on the mandibles, black on the other parts. Pro-mesonotum and tergites with a microscopic, decumbent, black pubescence. Mesopleurae with a sparse and shallow puncturation and some feeble rugae. Mesosternum sparsely and fairly finely punctured. Dorsum of epinotum closely and transversely striate, with a few transverse rugae in the middle which do not extend as far as the lateral margins. The dorsum is margined at the sides and apex by a depressed line, beyond which the sculpture becomes coarser, obliquely rugose, and extends over the sides. The stigma-groove is deep, and at the junction of the dorsum and declivity there is a raised line. There are a few shallow punctures on the face just behind the antennal sockets, otherwise the head is impunctate. Abdomen impunctate, except the apical segment which has a large and shallow puncturation.

Head wider across the anterior margin than behind, almost semicircular from the frontal aspect, with the vertex somewhat flattened. Mandibles falciform and very long, with a blunt tooth on the inner margin near to the apex. Clypeus with five small teeth on the anterior margin of the median area; in the middle as long as the third joint of the flagellum; the lateral sclerites shorter than the median. The labrum is transversely oblong, the apical angles

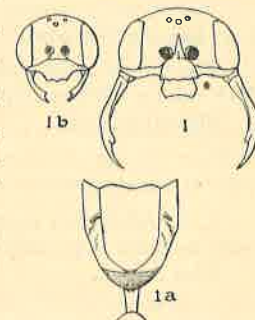


Fig. 1. *Chlorion xanthocercum*, ♀, head; a, ♀, epinotum; b, ♂, head.

rounded, the anterior margin concave. Lower part of the face deeply excavated at the sides; the prominent median portion between the antennal sockets is traversed by a longitudinal sulcus which, narrowed above, reaches the anterior ocellus. Third and fourth joints of the flagellum subequal, the second nearly twice as long as the third. Posterior ocelli twice as far from the eyes as from each other. Eyes convergent above, the interocular distance on the vertex equal to a trifle more than the length of the first three joints of the flagellum. Pronotal collar not short or discoid; the dorsal face is deeply impressed lengthwise in the middle and bituberculate, merging into the vertical anterior face by a fairly abrupt curve; seen from the side, it is about as long as the scutellum. Petiole about as long as the third joint of the flagellum. Anterior tarsi with 7 or 8 long spines on the outer margin of the basal joint.

♂. 23-33 mm. long. Face sparsely and very shallowly punctured. Mesopleurae coarsely punctate and rugose. Dorsum of epinotum less closely and more strongly striate than in the ♀. Sternites sparsely and finely punctured near the apical margins. Median area of the clypeus convex, the anterior half flattened, the anterior margin with a tooth on each side and sometimes with a tooth in the middle. Posterior ocelli half as far again from the eyes as from each other. Inner margins of the eyes nearly parallel; the interocular distance on the vertex equal to the length of the first three joints of the flagellum. Second joint of the flagellum a little shorter than the third. The raised line separating the dorsum of the epinotum from the declivity is much stronger and higher than in the ♀. Otherwise like that sex.

This species occurs throughout the Ethiopian Region, and owing to the wide range of variation in colour, several varieties have been described as distinct species. These varieties are the following:

Var. *unicolor* Saussure. *Reise der Novara*, Zool. II, p. 37. 1867.

The whole body black, without metallic blue lustre. Pilosity black. Wings dark brown with metallic blue lustre.
Mossambique.

Var. *kigonserana* Strand. *Archiv f. Naturges.* LXXXI, heft 2, p. 102. 1915.

♀, ♂. Abdomen excepting the petiole, and the thorax, more or less black, with metallic blue lustre. Pilosity black. Wings as in *unicolor*.
East Africa.

Var. *subcyaneum* Gerst. *Monatsb. Akad. Wiss. Berlin*, p. 510, ♀. 1857.

Antennae, and in the ♂ also the face, more or less yellow. Otherwise like *kigonserana*.
East Africa.

Var. *maxillaris* Pal. Beauv. *Ins. reçu en Afr. et Amér.* p. 38. 1811.

affinis Smith. *Cat. Hymen. B.M.* IV, p. 240, ♂, ♀. 1856.

fulvipes Gerst. *Monatsb. Akad. Wiss. Berlin*, p. 510, ♂. 1857.

levilabris Cam. *Ann. Trans. Mus.* II, p. 137, ♀. 1910.

Abdomen and thorax entirely or in greater part dark metallic blue. Pilosity black. Wings dark brown, with metallic reflections. Legs, clypeus and antennae in greater part ferruginous, the apical abdominal segment also more or less reddish.

East Africa, Congo and Natal.

Var. *instabilis* Smith. (Plate IX, fig. 5.) *Cat. Hymen. B.M.* iv, p. 240, ♂, ♀. 1856.

"♀. 30-40 mm. long. Head black; the inner orbit narrowly and the outer orbit of the eyes broadly rufo-testaceous; the antennae and the face anteriorly rufo-testaceous, the mandibles ferruginous; the head is sometimes rufo-testaceous, with merely a black stain enclosing the ocelli; the mandibles fringed beneath with long hairs. Thorax of an obscure blue-black; sometimes the epinotum is tinged with green; the pro- and mesothorax more or less rufo-testaceous, rarely quite black; the wings nigro-caeruleous; the legs pale ferruginous, the coxae and trochanters black or fuscous; the abdomen blue with purple iridescence, the apical segment pale ferruginous; in some examples the apical margins of the second and following segments are more or less rufo-piceous.

"♂. 23 mm. long. Antennae pale fulvous; the head, pro- and mesothorax above, the tegulae and legs pale ferruginous; the three apical segments of the abdomen are also pale."

Guinea, Congo and Nigeria.

Var. *apicalis* Guérin. Lefebv. *Voy. Abyss.* vi, p. 357. 1850.

Wings yellow, with brown apical margin. Antennae, legs, head and apical abdominal segment more or less ferruginous. The middle and hind femora black except at the apex. Thorax black, with a purplish lustre, very inconspicuous in the ♀, but fairly apparent in the ♂, especially on the epinotum. In the ♂ the apical margins of the second to sixth abdominal segments are narrowly fulvous. Pubescence of the clypeus and face yellowish silvery, more abundant than in the type of the species. Abdomen steel-blue. Pubescence on the pronotal collar and mesonotum yellowish brown or dark brown.

Abyssinia and Uganda.

Var. *zonatum* Sauss. *Reise der Novara, Zool.* ii, p. 36, ♂. 1867.

Legs, antennae, head, pro- and mesonotum, last two abdominal segments and apical margins of the second to sixth segments, bright ferruginous. Thorax dark metallic blue. Abdomen metallic green. Wings brown, with a violaceous lustre.

Guinea. This is probably the ♂ of *instabilis* Smith.

C. (Parasphe) viduatum Christ. (figs. 2 and 2 a). *Naturg. Ins.* p. 305. 1791.

♀. 18-24 mm. long. Abdomen, excluding the petiole, ferruginous, the fourth and fifth tergites usually more or less black at the base, the apical margins of all the segments testaceous; the rest of the body black, except the last joints of the tarsi which are fusco-ferruginous. Wings hyaline, the veins reddish brown. The short spines on the legs are white, the longer ones, including the rather thin cilia of the tarsal comb, blackish.

Face, clypeus, temples, pronotal collar, sides of the thorax and lateral margins of the mesonotum covered with a dense, decumbent, silvery pubescence which in fresh examples completely hides the underlying sculpture. The pubescence also covers the upper side of the coxae, trochanters, femora and tibiae. The pubescent areas also have a long, outstanding, white pilosity. The dorsum of the epinotum has a short, greyish and erect pubescence, not conspicuous when viewed from above. Vertex and occiput moderately shining, sparsely, finely and very shallowly punctured. Mesonotum shining, sparsely punctured, the punctures larger and deeper than those on the vertex. Scutellum

and postscutellum shining, the former with a few punctures. Mesosternum shining, rather coarsely but not closely punctured. Dorsum of epinotum dull, closely and finely transversely striate, not quite so long as wide across the middle, but a little longer than the mesonotum. Inner margins of the eyes almost parallel. Clypeus not quite twice as wide as long, the anterior margin moderately convex. Interocular distance on the vertex equal to the length of the first three joints of the flagellum. The second joint of the flagellum is two-thirds longer than the third joint. Posterior ocelli as far from the eyes as from each other. Petiole shorter than the first tergite, and a little shorter than the basal joint of the hind tarsus. Claws with three teeth at the base, and sometimes with a rudimentary fourth tooth.

♂. 14-20 mm. long. The silvery pubescence is not so dense as in the ♀. Vertex distinctly punctured. Punctuation of the mesothorax stronger than in the ♀. Clypeus produced farther forwards than in the ♀, the anterior margin with a slight excision in the middle. Interocular distance on the vertex equal to the length of the second, third and fourth joints of the flagellum. The second joint of the latter is not quite half as long again as the third. Petiole as long as the first tergite and as long as the basal joint of the hind tarsus. Otherwise like the ♀.

A widely distributed species, found throughout Africa, and also in Asia Minor, India and China. (R.M. and T.M. colls.)

C. (Parasphex) albisectum Lep. *Encycl. méth.* x, p. 462, ♂, ♀. 1825.

This species differs from *marginatum* Smith in only a few points, and since there is no appreciable difference in the genitalia of the ♂♂, it is necessary to sink *marginatum* to the rank of a subspecies. All the examples from the Ethiopian Region which I have seen, including some in the Brauns' collection determined by Kohl as *albisectum*, belong to the race *marginatum*. The type of the latter, in the British Museum, has been examined for me by Dr Waterston, and there is not the slightest doubt that in all characters our African examples conform to the type of *marginatum*. The varieties described by Berland, and quoted below, should be attached as varieties to *marginatum* rather than to the type of the species.

Albisectum differs from its race *marginatum* as follows:

Mesonotum more strongly punctured, the punctures fairly deep. Dorsum of epinotum dull, transversely striolate or rugulose, with numerous shallow punctures between the fine rugae. Pilosity on the head and vertex less abundant, especially on the pro-mesonotum. In the ♀ the petiole is slightly shorter, being as long as the first joint of the hind tarsus plus half of the second joint. In the ♂ it is as long as the first and second joints.

Distributed throughout the Mediterranean region, as far north as Switzerland and south as far as Algeria and Egypt.

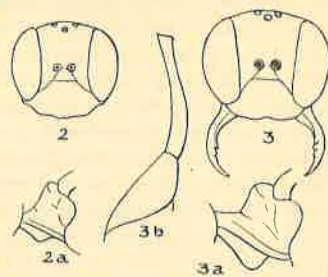


Fig. 2. *Chlorion viduatum*, ♀, head; a, ♀, pronotum, lateral view.

Fig. 3. *Chlorion albisectum*, race *marginatum*, ♀, head; a, ♀, pronotum; b, ♀, petiole and 1st tergite.

albisectum, race *marginatum* Smith (figs. 3, 3 a and b). *Cat. Hymen. B.M.* IV, p. 267, ♂, ♀. 1856.

curvilineatus Cam. *Ann. Soc. Ent. Belg.* LVI, p. 398. 1912.

Sjöstedti Cam. Sjöstedt, *Kilimandjaro-Meru Exped.* VIII, p. 263. 1910.

♀. 13-18 mm. long. Head and thorax black. Legs black, the tarsi dark brown. Petiole varying from ferruginous to black. First tergite, the whole of the second and the base of the third abdominal segment ferruginous, the sixth sternite fusco-ferruginous; the rest of the abdomen black, with ivory-white apical margins on the first five tergites. Wings hyaline, with a very pale fuscous apical margin, the veins brown, but near the base more or less ferruginous like the tegulae. Clypeus, face, temples and sides of the thorax with decumbent whitish pubescence, barely obscuring the sculpture of the thorax. The upper surface of the legs has a similar pubescence. Pilosity white and rather scanty. The shorter spines on the legs are whitish, the tarsal comb and longer spines at the apices of the joints are fusco-ferruginous. Vertex, occiput and pronotum shining and almost impunctate. Mesonotum shining, shallowly, finely and sparsely punctured. Scutellum and postscutellum shining, the former with a few small punctures. Mesopleurae and mesosternum rugose and punctate, the metapleurae smooth in front and rugose behind. Dorsum of the epinotum shining, very sparsely and finely punctured, with a narrow longitudinal area down the middle which is closely, finely striate and somewhat duller than the punctured parts; at the sides just above the metapleurae it is coarsely, obliquely rugose. Declivity dull and transversely striate. Abdomen smooth and shining. Clypeus two-thirds wider than long, the anterior margin depressed, convex, and shallowly excised in the middle. Mandibles with two teeth on the inner margin a little beyond the middle. Interocular distance on the vertex equal to the length of the first four joints of the flagellum. The second joint is a little more than half as long again as the third joint. Posterior ocelli as far from the eyes as they are from each other. Pronotal collar convex transversely and from front to back, about two and a half times wider than long in the middle. Dorsum of epinotum nearly as long as the mesonotum and scutellum united, a little wider than long in the middle. Petiole long, slightly curved upwards, as long as the first two joints of the hind tarsus. Apical sternite compressed transversely, projecting beyond the apical tergite. Tarsal comb composed of long, flattened cilia. Claws with three teeth at the base. Second cubital cell barely higher than wide on the cubitus.

♂. 12-16 mm. long. Black. Mandibles piceous, tegulae fusco-ferruginous. Petiole black, first tergite and base of the second usually ferruginous, the apical margins of the second to fifth tergites with transverse ivory-white bands, the first often with the same colour at the sides of the apical margin. The white pilosity on the thorax longer than in the ♀, the pubescence on the other hand much scantier. Vertex sparsely and finely punctured. Dorsum of epinotum a little more strongly punctured than in the ♀, but the closely striated median strip is usually absent. Clypeus more produced in front than in the ♀, the anterior margin not distinctly excised in the middle. Interocular distance on the vertex equal to the length of the second to fifth joints of the flagellum. Petiole longer than the first tergite and a trifle longer than the first two joints of the hind tarsus. Sternites flattened, the fourth, fifth and sixth covered with a microscopic, adpressed, greyish pubescence. Otherwise like the ♀.

West Africa; South Africa from Rhodesia to the Cape. (R.M. and T.M. colls.)

Occasionally the ♀ has the legs more or less red, and the anterior margin of the clypeus dark reddish brown. It is doubtful whether such slight variations are worth naming since intermediate forms are almost certain to occur, but in the *Bull. Mus. Nat. d'Hist. Nat. Paris*, No. 3, 1926, Berland has described the following varieties:

Var. *Chudeauxi* Berland. *Loc. cit.* p. 168.

"Anterior margin of the clypeus, the mandibles excepting the apex, the scapes and the first joints of the flagellum, red; legs red, excepting the coxae which are in greater part black; petiole red, abdomen red, the 4th-6th tergites and the apical part of the third, black; cilia of the tarsal comb yellowish white. Upper Senegal-Niger; Nara district, Balé. ♀."

A specimen from the Lydenburg district in the Transvaal Museum agrees in all points with the above description; it has, however, distinctly yellowish fuscous wings.

Var. *Alluaudi* Berland. *Loc. cit.* p. 168, ♂, ♀.

"Tegulae reddish, as also the anterior margin of the clypeus, underside of the femora, and the knees more or less; petiole reddish, brown at the base, abdomen black, the first tergite and the second sternite red, teeth of the tarsal comb reddish. Ivory Coast."

Var. *congoensis* Berland. *Loc. cit.* p. 169, ♀.

"Antennae dark red, tegulae and tarsi brown; petiole brown, becoming paler towards the apex. French Congo, Libreville."

C. (Parasphex) Perezi Berland. *Loc. cit.* p. 170, ♀, ♂.

"♀. 17 mm. long. Head, antennae, thorax and legs entirely black, the claws and the hind margin of the tegulae brownish red; petiole more or less dark reddish brown, sometimes black, the rest of the abdomen entirely bright red, the tergites with not very distinct pale yellow apical margins, the last tergites sometimes with a brownish patch in the middle; wings hyaline, the veins brownish red. On the face, temples, clypeus and front of the thorax there is an erect, whitish pilosity, and in addition there is a very dense, decumbent pubescence, snow-white or slightly golden, on the face, clypeus, temples, pronotum, lateral and posterior margins of the mesonotum, mesopleurae, the whole of the epinotum, the coxae, trochanters, anterior face of the hind femora and the back of the anterior femora; on the first tergite there is a very fine, decumbent, yellowish pubescence. Spines on the legs white, excepting the tarsal comb and the calcaria which are brown. Eyes slightly convergent below, the posterior ocelli farther from each other than from the eyes; clypeus convex, its anterior margin rounded, slightly excised in the middle; first and second joints of the flagellum equal in length to the third and fourth. Mesonotum smooth, shining, with some sparse puncturation; scutellum strongly gibbous, smooth, with a few punctures and a median impression, which is sometimes not clearly visible except in its posterior half; epinotum finely striated transversely, the striation hidden by the pilosity, the sides strongly striated; mesopleurae punctate. Second cubital cell fairly large. Petiole curved, as long as the hind coxa and trochanter, or nearly as long as the first joint of the hind tarsus, or as long as the first three joints of the flagellum.

"♂. 14-16 mm. long. Like the ♀, sometimes with the petiole quite black and the brown patches on the tergites more developed.

"Senegal, 3 ♂♂ and 4 ♀♀. (Coll. J. Pérez.) This species, allied to *albisectum*, is distinguished from other African species chiefly by the entirely red abdomen, the silvery pubescence and the venation of the wings."

Apart from the presence of pubescence on the epinotum so dense as to hide the striation, I can see no difference between this insect and *viduatum* and strongly suspect that it is no more than a slight variety of the latter. The figure of the venation given by Berland also agrees with that of *viduatum*.

C. (Parasphe) leucosoma Kohl. *Ann. K.K.N.H. Mus. Wien*, v, p. 338, ♀, 1890.

This species, originally recorded from Cairo, has also been taken at Dakar, Senegal (teste Berland), and therefore comes within the scope of this monograph.

According to Kohl this insect (♀, 17 mm. long) resembles *marginatum* Smith completely in the shape of the collar and scutellum, the length of the petiole, number of teeth on the claws and convergence of the eyes, and but for a slightly longer clypeus would have been considered by that author as a variation of *marginatum*. In other characters it differs from that race of *albisectum* as follows: "In general appearance strongly resembling *C. niveatum*. As in that species, the head, thorax and greater part of the legs are covered with a dense, decumbent, snow-white pubescence, so that the sculpture below is invisible; the abdomen has a pale yellowish red colour and bright yellow apical margins. Wings quite pale with an almost milky-white reflection. In the unique example, the first recurrent vein enters the first cubital cell and the second enters the third cubital cell."

Berland also draws attention to the shortness of the palpi in this species.

C. (Isodontia) pelopoeiformis Dhlb. (figs. 4 and 4a). *Hym. Eur.* 1, p. 437. 1845.

♀. 22-29 mm. long. Black; mandibles, scapes, first five joints of the flagellum and the legs usually fusco-ferruginous, the middle and hind femora black in front. The reddish coloration is variable in degree and sometimes extends over the pronotum and the anterior part of the mesothorax, but the thorax is rarely entirely fusco-ferruginous. Wings dark brown, with a violaceous lustre, the basal lobe of the hind wing almost hyaline. Clypeus, face, temples and posterior half of the petiole with a very sparse, greyish yellow pubescence.

Clypeus with a reddish brown pilosity, long but not very dense. The rest of the head, epinotum and petiole with a long greyish pilosity, the rest of the thorax with a sparse, blackish pilosity. On the temples there are some black hairs intermixed with the grey ones. Head and thorax dull, excepting the scutellum. Clypeus and face closely, finely and shallowly punctured. The vertex on each side of the ocellar area is microscopically punctured, but behind it the puncturation is stronger than on the face. Thorax not coarsely punctured; the puncturation fairly sparse on the pronotum, scutellum and metapleurae, close elsewhere. On the dorsum of the epinotum it is so close and regular that the sculpture is almost reticulate-punctate. Basal half of the petiole shining. Abdomen moderately shining, but in fresh specimens this feature is masked by a sparse, blackish pubescence. Mandibles with a sharp tooth on the inner margin. Clypeus convex, the anterior margin

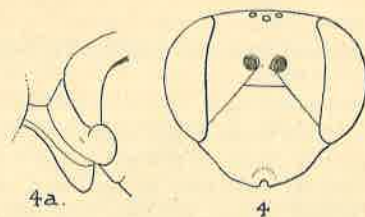


Fig. 4. *Chlorion pelopoeiformis*, ♀
head; a, ♀, pronotum.

moderately convex, with a small, round excision in the middle, behind which there is a small depressed area which is sometimes indistinct. The clypeus is very little wider than long in the middle. Inner margins of the eyes feebly convergent below, almost parallel. Posterior ocelli half as far again from the eyes as from each other. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. The second joint is a little more than half as long again as the third. Pronotal collar very short, depressed below the level of the mesonotum, the dorsal face almost linear. Scutellum fairly convex, with a very shallow median longitudinal impression. Dorsum of epinotum convex transversely, sloping towards the declivity, shorter than the mesonotum and about twice as long as the scutellum. Petiole slightly curved upwards, as long as the hind femur, and a little longer than the basal joint of the hind tarsus. First tergite a little more than one-quarter longer than wide at the apex. The rest of the abdominal complex ovate, twice as long as wide in the middle. Claws with two acute teeth at the base. Second cubital cell about one and a half times longer on the cubitus than high; the second abscissa of the radius half as long again as the third. First recurrent vein interstitial with the second transverse cubital vein, or nearly so.

♂. 18-26 mm. long. Pilosity of the head and thorax grey or greyish yellow all over, not intermixed with blackish hairs as in the ♀. Third to sixth sternites with a long, black pubescence. Second joint of the flagellum one-third longer than the third joint. Posterior ocelli a little nearer to the eyes than in the ♀. Interocular distance on the vertex equal to the length of the first three joints of the flagellum. First tergite narrower than in the ♀. Otherwise like the ♀.

East Africa, from Khartoum to Zululand. (R.M. and T.M. colls.)

A ♀ specimen from Bulawayo in the Rhodesia Museum shows a peculiar aberration in the structure of the clypeus. On each side of the middle it is fairly deeply hollowed out, almost to the anterior margin, thereby leaving a broad longitudinal torus in the middle.

pelopoeiformis var. *longiventris* Sauss. *Reise der Novara*, II, Hymen. p. 37, ♂. 1867.

meruensis Cam. Sjöstedt, *Kilimandjaro-Meru Exped.* VIII, p. 264, ♀. 1910.

This form differs from the type chiefly by the colour of the wings and the greater extent of the red coloration. Both the fore and hind wings are smoky hyaline, yellowish at the base and along the costa, the veins and stigma reddish yellow; the fore wing has the radial cell, the second and third cubital cells in their upper part, and the apex beyond the radial cell, deeply clouded with fuscous. The legs, clypeus anteriorly, scapes and first six joints of the flagellum and greater part of the sides of the thorax are ferruginous. The underside of the petiole and sides of the first tergite, the apical tergite and apical margins of the fifth tergite are also ferruginous.

♂. Colour as in the ♀, but the scutellum is also more or less fusco-ferruginous at the sides. Pubescence on the third to sixth sternites reddish brown.

Guinea and East Africa; Lonely Mine, Gwaii and Victoria Falls, S.R. (R.M. and T.M. colls.)

C. (Isodontia) Simoni Du Buysson (figs. 5 and 5a).

Eremochares Simoni. *Ann. Soc. Ent. France*, pp. 356-7, ♂, ♀. 1897.

♀. 21-25 mm. long. Head and thorax black. Mandibles except at the apex, scapes and first six joints of the flagellum, clypeus, pronotal tubercles and tegulae, ferruginous. The extent of the red colour on the clypeus is vari-

able, but at least the anterior third is red. Legs, including the coxae and trochanters, ferruginous, but the hind coxae, trochanters and femora are black above. Petiole black above, ferruginous below. Abdomen ferruginous; the third and fourth tergites entirely, the apical half of the second tergite and two small oblique spots near the apical margin of the first tergite, black. The third and fourth sternites sometimes slightly blackish, but usually fusco-ferruginous. The second to fifth tergites have the apical margins narrowly stramineous. Wings hyaline, the costal margin suffused with yellow, the apical margin with a pale fuscous cloud, the veins yellowish in the basal half of the fore wing, brownish beyond. Face, clypeus, temples, sides of the thorax, coxae, trochanters and the posterior femora above with a yellowish grey pubescence and a sparse whitish pilosity. Tergites 2-6 with a greyish, decumbent and inconspicuous pubescence. Clypeus dull, microscopically punctured, with a few larger punctures here and there, the sculpture obscured by the pubescence as on the face. The latter is also dull, and rugulose. The vertex behind the ocelli is moderately shining, sparsely and fairly strongly punctured. Temples smooth and shining. Pronotal collar moderately shining, finely and not closely punctured. Mesonotum, scutellum and metanotum not quite dull, closely and distinctly punctured, much more strongly so than in *pelopoeiformis*, and entirely without the short pilosity which is present on those parts in that species. Scutellum fairly flat. Mesopleurae dull, rugulose-punctate. Metapleurae dull, closely and strongly punctured in front, moderately shining and sparsely punctured behind. Dorsum of epinotum dull, transversely and closely rugulose and punctate, the sides and declivity dull, finely and closely punctured and somewhat coriaceous. Mandibles with one large tooth on the inner margin close to the apex. Clypeus slightly longer than wide, moderately convex transversely, the anterior margin with a small excision in the middle; in the middle of the basal half there is a feeble longitudinal carina. The clypeus is less produced in front than in *pelopoeiformis*, and the anterior margin, except at the sides, is almost transverse. Interocular distance on the vertex equal to a little less than the length of the second and third joints of the flagellum; the inner margins of the eyes are feebly convergent above and below. Second joint of the flagellum not quite one-fourth longer than the third; the third and fourth joints subequal. Posterior ocelli as far from the eyes as they are from each other. Pronotal collar short, but not linear above as in *pelopoeiformis*, and not depressed so far below the level of the mesonotum; it is about five times wider than long in the middle. Dorsum of epinotum distinctly less convex transversely than in *pelopoeiformis*, and as in that species twice as long as the scutellum. Petiole longer than the hind femur, as long as the hind tibia or the first two joints of the hind tarsus. First tergite nearly twice as long as its greatest width. Second cubital cell half as long again on the cubitus as high; the second abscissa of the radius two and a third times longer than the third. First recurrent vein entering the second cubital cell at about its apical fourth. Claws with two teeth at the base.

♂. 20 mm. long. First seven joints of the flagellum and last three abdominal segments ferruginous, otherwise coloured like the ♀. Pilosity more abundant than in the ♀ and present on the pronotal collar and mesonotum. The former has a fairly dense, decumbent, yellowish pubescence on the dorsal face somewhat obscuring the sculpture, and there is a little of the same

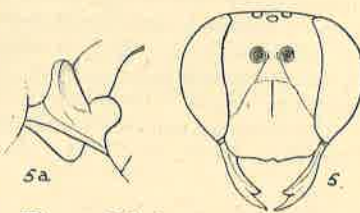


Fig. 5. *Chlorion Simoni*, ♀, head; a, ♀, pronotum.

pubescence on the scutellum, metanotum and sides of the mesonotum. Punctuation of the mesonotum a little stronger than in the ♀, and on the epinotum deeper. Second joint of the flagellum a little more than one-third longer than the following joint, which is shorter than the fourth. Interocular distance on the vertex nearly equal to the length of the second and third joints of the flagellum. Petiole a little shorter than the hind tibia. Otherwise like the ♀.

Hamman's Kraal, Bechuanaland; Dondo, P.E.A.; Southern Rhodesia and Transvaal. (R.M. and T.M. colls.)

C. (Isodontia) Stanleyi Kohl (figs. 6 and 6a). *Ann. K.K.N.H. Mus. Wien*, v, p. 376, ♀, ♂. 1890.

♀. 18–22 mm. long. Black; the first tergite and the hind tibiae more or less fusco-ferruginous. Sometimes the antennae and the greater part of the abdomen are dark reddish brown. Mandibles piceous. Wings pale fuscohyaline, with a distinct violaceous lustre, the costal and apical margins fuscous. Clypeus, face, temples and dorsal face of the pronotal collar with white pubescence; the head, thorax and femora with a long, and not dense, white pilosity. Face and clypeus dull, with a few small punctures.

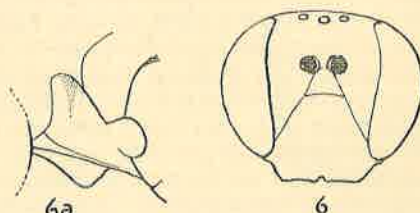


Fig. 6. *Chlorion Stanleyi*, ♀, head; a, ♀, pronotum.

Vertex and temples shining, the former sparsely punctured behind the ocelli. Anterior face of the pronotal collar, mesonotum, scutellum and metanotum shining, finely and sparsely punctured. Meso- and metapleurae shining, with shallow punctures which are larger than those on the mesonotum. Dorsum of epinotum with a slight gloss, transversely rugulose, shallowly punctate between the rugae, which are fairly close together and discontinuous. Abdomen smooth and shining. Mandibles tridentate. Clypeus like that of *Simoni*. Labrum longitudinally carinate in the middle. Inner margins of the eyes slightly convergent above and below. Second joint of the flagellum half as long again as the third, the latter as long as the fourth. Interocular distance on the vertex a little shorter than the length of the second and third joints of the flagellum. Posterior ocelli as far from the eyes as they are from each other. Pronotal collar with a distinct dorsal face like that of *Simoni*, about five times wider than long in the middle. Dorsum of epinotum twice as long as the scutellum, not very convex. Petiole as long as the hind tibia, or the first two joints of the hind tarsus. First tergite two-thirds longer than wide at its widest, distinctly shorter than the petiole. Second cubital cell wider on the cubitus than high. Second abscissa of the radius about twice as long as the first, and two-thirds longer than the third.

♂. 15–19 mm. long. Labrum not carinate. Clypeus with a very shallow median triangular depression which does not reach the middle, the anterior margin feebly concave. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum. The second joint is only a little more than one-third longer than the following joint. Second to fifth sternites with a sparse, decumbent, grey pubescence and a long whitish pilosity. Otherwise like the ♀.

Cape van Gele, Belgian Congo; Bulawayo, Sanyati Valley, Gwaai and Sawmills, S.R. (October to March); Lichtenburg and Mooidrift, Transvaal. (R.M. and T.M. colls.)

C. (Harpactopus) tyrannum Smith (figs. 7 and 7a). *Cat. Hymen. B.M.* iv, p. 264, ♀. 1856.

vagus Radoszk. *Jorn. Acad. Sc. Math. Lisbon*, VIII, p. 209, ♂. 1881.

Engelbegi Brauns. *Ann. K.K.N.H. Mus. Wien*, XIII, p. 392, ♀, ♂. 1899.

♀. 25-32 mm. long. Black. Mandibles in the middle and the claws blackish red. Wings brown, the apical margins of both wings broadly fuscohyaline; the veins dark brown. Clypeus and face, as far as the anterior ocellus, with a coarse whitish pubescence, intermixed with a long, exserted, black pilosity. On the pronotal collar above and on the anterior angles of the mesonotum there is also a little whitish pubescence, inconspicuous and masked by the pilosity.

Pilosity on the thorax black, short and fairly dense except on the epinotum where it is long, very dense and shaggy and hides the underlying sculpture. Tibiae and tarsi strongly spinose, the comb of the anterior tarsi composed of long, black spines, the femora with a fairly sparse, blackish pilosity. Vertex and temples slightly shining, the former sparsely, the latter fairly closely, finely punctured. Anterior face of pronotal collar finely and transversely striate, the sides coarsely and obliquely striato-rugose, the dorsal face shallowly punctured. Mesonotum dull, fairly closely punctured, the punctures arranged in irregular transverse rows and becoming larger towards the posterior margin. Scutellum dull, punctured in front, longitudinally striate behind and punctured between the striae; distinctly impressed lengthwise in the middle so that it is bluntly bituberculate. Metanotum closely, transversely striate and punctate, raised in the middle into a subconical tubercle. Mesopleurae dull, coarsely and obliquely rugose; the metapleurae with similar sculpture but with the rugae larger and farther apart. Dorsum of epinotum closely reticulate-rugose, the rugae emphasized transversely. Abdomen shining, the apical segment and apical half of the preceding segment with a sparse puncturation. Mandibles tridentate. Clypeus nearly twice as wide as long, the median area distinctly convex lengthwise, less so transversely, the anterior margin moderately convex and with a small excision in the middle. Sometimes there is a short median groove behind the anterior margin, not reaching back as far as the middle of the clypeus. Inner margins of the eyes slightly divergent below. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum. Posterior ocelli as far from the eyes as they are from each other. Second joint of the flagellum a little more than one-fourth longer than the third. Pronotal collar very convex transversely, about one-fifth as long as wide. Petiole short, about as long as the second joint of the hind tarsus, less than half as long as the hind tibia. Abdomen distinctly globose, the first tergite subvertical. Posterior femora and tibiae of equal length; the femur is as long as the first and second joints of the hind tarsus. Second cubital cell about as high as wide on the cubitus, the width on the cubitus twice as great as on the radius; third abscissa of the radius a little longer than the second, but shorter than the first.

♂. 16-21 mm. long. Mandibles bidentate. Anterior margin of the clypeus feebly concave. Fourth and fifth sternites clothed with a fine, pale brownish pubescence, their apical margins with a row of thick, black hairs. Interocular

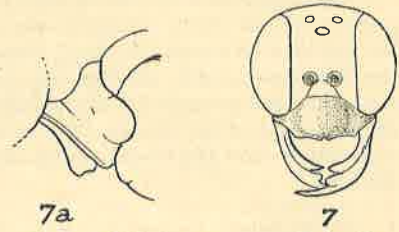


Fig. 7. *Chlorion tyrannum*, ♀, head;
a, ♀, pronotum.

distance on the vertex equal to the length of the first three joints of the flagellum; the second joint of the flagellum not quite half as long again as the third. Posterior ocelli a little nearer to the eyes than they are to each other. Otherwise like the ♀.

Algoa Bay; Bothaville and Bloemfontein, O.F.S.; Sawmills, S.R. October to March.

The appearance of this species coincides with the swarming of the migratory locusts which constitute their prey. Following a heavy infestation of locusts in S. Rhodesia in 1924, this species appeared here, at Sawmills, for the first time within the last 16 years. The species described by Kohl as *tyrannum* is obviously not the species described by Smith, since it differs in the structure of the clypeus, the colour of the wings, the pubescence on the mesonotum and the length of the femora; it is probably a variety of *funnebris* Berland.

C. (Harpactopus) funnebris Berland. *Bull. Mus. Nat. d'Hist. Nat. Paris*, p. 202, ♀. 1926.

♀. 31–33 mm. long. Black. Clypeus, face and mesonotum, excepting the extreme anterior margin, covered with a dense, decumbent, silvery pubescence which hides the underlying sculpture. On the face the pubescence extends as far as the anterior ocellus, but sometimes it is limited to a narrow transverse band just below the ocellus, leaving the lower two-thirds of the face bare. Clypeus, temples and thorax with a sparse, coarse and long, black pilosity; on the epinotum it is brownish black, shorter and less dense than in *tyrannum* and not obscuring the sculpture. Wings dark blackish brown all over, with a metallic bluish green lustre. Clypeus, under the pubescence, fairly shining, smooth in the middle, sparsely and coarsely punctured at the sides. Vertex and temples not quite dull, sparsely and finely punctured. Pronotum dull, transversely striolate, convex transversely, as long as in *tyrannum*, the shoulders subangular when viewed from above. The sculpture of the mesonotum is hidden by the pubescence, but in front where that is absent the sculpture is seen to be transversely rugose; tegulae punctured at the base. Scutellum fairly strongly punctured, dull, with a median longitudinal and shallow impression; metanotum rugose, feebly bituberculate. Mesopleurae strongly and closely reticulate-rugose. Epinotum also reticulate-rugose, but not so closely as the mesopleurae. Coxae strongly punctate-rugose. Femora coarsely punctured, closely so below. Abdomen globose, smooth and nitidulous, the segments with a few fine punctures near the apical margins. Mandibles tridentate. Median area of the clypeus gibbous, very slightly excised in the middle of the anterior margin, which is convex. Inner margins of the eyes parallel. Interocular distance on the vertex equal to a little more than the length of the first two joints of the flagellum. The second joint of the flagellum is long, six and a half times longer than wide at the apex, and nearly twice as long as the third joint. Posterior ocelli as far from the eyes as they are from each other. Dorsum of epinotum as long as the metanotum, scutellum and mesonotum united. Petiole punctured at the base, longer than the posterior coxae, as long as two-thirds of the basal joint of the hind tarsus and a little longer than the second joint of the same. Femora and tibiae more slender than in *tyrannum*, the posterior femora are longer than the tibiae by one-fourth of the length of the basal joint of the tarsus. Second cubital cell nearly twice as wide on the cubitus as on the radius; the second abscissa of the radius a little longer than the third; both recurrent veins are received by the second cubital cell, or sometimes the second recurrent vein is interstitial with the second transverse cubital vein. Tarsal comb long; the basal joint

with eight or nine long spines and a thinner and shorter one between each of the longer. Claws with two teeth at the base. Tibiae and tarsi densely spinose as in *tyrannum*.

♂. 21–25 mm. long. Clypeus produced farther forwards than in the ♀, the apical margin narrowly depressed and shining; the median area less gibbous than in the ♀. The clypeus and face have only a faint trace of the silvery pubescence which is present in the ♀, and the black pilosity of the head and thorax is longer and more abundant. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum plus three-quarters of the fourth. The second joint is barely longer than the third, the two united as long as the fourth. Fourth to sixth sternites dull, without pubescence, the sixth with the posterior margin arcuate, so that the lateral angles stand out prominently, as in *Harpactopus macula* F. Seventh sternite with a blackish, erect pubescence. Petiole a little longer than in the ♀, as long as the second joint of the hind tarsus plus half of the third. Posterior femora not longer than the tibiae. Otherwise like the ♀.

Bura, East Africa; Abyssinia; Steynsburg, Klipplaat, Rondebosch and Willowmore, Cape Province; Vryburg, Bechuanaland; near Wangi, Brit. E. Africa (B.M. coll. 1 ♀). One ♀ in coll. Brauns has the pubescence on the mesonotum slightly golden.

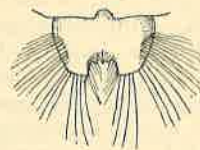
This species, together with *Stschurowskii* Rad., *Radoszkowskii* Kohl and *lugens* Kohl (Palaeartic Region), *Eatoni* Saunders (Algeria) and *tyrannum* Smith are all closely allied and are probably only races of one species, i.e. "*Pepsis*" *macula* F. The type of the latter from Arabia is in the Nat. Hist. Museum, Paris, and from a recent examination by Berland has been shown to be a true *Harpactopus*. That *lugens* Kohl is synonymous with *macula* F., as suggested by Berland, is almost certainly the case, to judge by the shape of the sixth sternite.

C. (Harpactopus) aegyptium Lep. (fig. 8). *Hist. Nat. Ins. Hymén.* III, p. 356. 1845.

H. crudelis Smith. *Cat. Hymen. B.M.* IV, p. 264, ♀. 1856. Kohl, *Ann. K.K.N.H. Mus. Wien*, V, p. 351, ♀, ♂. 1890.

♂ 22–28 mm., ♀ 26–34 mm. long.

"Shape compact. Wings yellow, the apical margin clouded with brown. Pilosity in both sexes black, that of the epinotum, temples and some parts of the thorax shaggy. Pubescence on the face, and sometimes on the collar white.... Second cubital cell clearly contracted on the radius. Clypeus arched, the curvature barrel-shaped. The clypeus in the ♀ has an excision in the middle of the anterior margin, in the ♂ it is truncate with a shallow emargination. Labrum in the ♀ of a very peculiar shape; in the ♂ like that of *viduatum* Christ. Second joint of the flagellum in the ♀ as long as the third and fourth united, in the ♂ slightly longer than the fourth which is longer than the third. The distance between the eyes on the vertex in the ♀ is distinctly less than double the length of the first two joints of the flagellum, and not one and a half times the length of the second joint. Petiole in the ♀ a little shorter than the second joint of the hind tarsus, in the ♂ equal to the length of the second plus half of the third, or fully as long as the second and third joints of the flagellum united. Posterior femora in both sexes as long as the posterior tibiae, as long as the first two joints of the hind tarsus plus half of the third joint. Tibiae



8

Fig. 8. *Chlorion aegyptium*, ♀, labrum (after Kohl).

of the fore legs in the ♀ nearly twice as long as the basal joint of the tarsus; the latter equal in length to the two following joints united, and bearing eight spines on the outer margin. Between these large spines there are finer but equally long ones. In the ♂ the anterior tibiae are one and a half times as long as the basal joint of the tarsus, the latter nearly as long as the three following joints united. The legs are as strongly spinose as in *tyrannum*. Claws with two teeth."

Abyssinia and Nubia; also found in Cyprus, Syria, Egypt, Mauritius and Northern India.

C. (Proterosphe) Paulinieri Guerin (Pl. IX, fig. 3). *Mag. de Zool. Ins.* XIII, p. 8, ♀. 1843.

eximius Lep. *Hist. Nat. Ins. Hymén.* III, p. 360, ♂. 1845.

♀. 33-43 mm. long. Yellowish ferruginous, or pale burnt sienna; the face sometimes, the apical fourth of the second abdominal segment and the third to fifth segments black. The apical abdominal segment ferruginous or fusco-ferruginous. The underside of the thorax and the middle and hind coxae black. Mandibles ferruginous, black at the apex. Mesonotum blackish in front, the black colour extending in a narrow line down the middle. Last four or five joints of the flagellum black. Last joint of all the tarsi blackish over the apical half. Wings ochreous, with a broad brownish apical margin, and a faint violaceous lustre. Face, clypeus and mesonotum with golden pubescence; the sides of the thorax with a yellowish and not dense pilosity; the dorsum of the epinotum with a short, yellowish and erect pubescence, fairly dense but not clearly apparent unless seen from the side. Spines on the legs ferruginous, the claws fuscous. Clypeus with a few large shallow punctures. Vertex smooth and shining; pronotal collar moderately shining, smooth above, the anterior face finely and sparsely punctured. Mesonotum with a fine and very sparse puncturation, obscured by the pubescence. Scutellum and metanotum smooth and shining. Mesopleurae and mesosternum slightly shining, finely and sparsely punctured. Dorsum of the epinotum dull, very sharply and transversely rugose; the rugae, of which there are about 14, are not close together. The declivity is dull, transversely and sparsely rugose. The upper part of the metapleurae is depressed and vertically clathrate. Abdomen smooth and shining, with a few small and shallow punctures on the first two tergites and on the sides of the sternites. Mandibles with a blunt tooth on the inner margin near the apex. Clypeus convex, about one-third wider than long in the middle, with a narrow sulcus behind the arcuate anterior margin. Antennae long and slender; the second joint of the flagellum one-fourth longer than the third and six times longer than wide at the apex; third joint a little longer than the fourth. Inner margins of the eyes almost parallel. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus twice the length of the first joint. Pronotal collar discoid, not linear above, the dorsal face, which is feebly impressed in the middle, being about one-fifth as long as wide. Scutellum and metanotum longitudinally impressed in the middle. Dorsum of epinotum very convex transversely, a little longer than the mesonotum, with a wide and shallow pit at the apex. Petiole as long as the third joint of the flagellum. Claws with two teeth at the base. First joint of the anterior tarsi with nine or ten spines on the outer margin.

♂. 25 mm. long. Last abdominal segment and apical margin of the sixth, ferruginous. Mesonotum black, the anterior margin ferruginous at the lateral angles. The yellowish pilosity on the thorax longer and denser than in the ♀. Last three abdominal segments with a fairly abundant yellowish pilosity.

Clypeus a little longer in the middle than wide, the anterior margin of its median area shallowly concave, with a small blunt tooth in the middle. Interocular distance on the vertex equal to the length of the first two joints of the flagellum. Inner margins of the eyes feebly convergent below. Otherwise like the ♀.

Senegal; Yapi, Gold Coast (Dr J. J. Simpson), in B.M. coll.

Allied to *C. gorgon* Kohl.

C. (Proterosphex) umbrosum Christ. (figs. 9 and 9a). *Naturges. Ins.* p. 293, ♀. 1791.

S. fumicata Christ. *Loc. cit.* p. 295, ♂. 1791.

♀. 26–34 mm. long. Black. Face, clypeus and temples with a dense silvery pubescence intermixed with a long white pilosity. Dorsal face of the pronotal collar, pronotal tubercles and the lateral margins of the mesonotum also with silvery or whitish pubescence. The rest of the thorax has a fairly sparse whitish pilosity, not obscuring the sculpture. Posterior tibiae covered on the inner side with a greyish pubescence which becomes brown towards the apex. Vertex and occiput smooth, almost impunctate. Pronotum

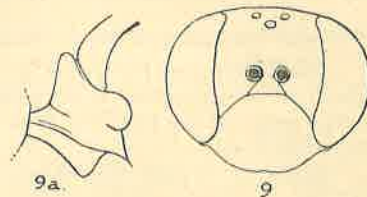


Fig. 9. *Chlorion umbrosum*, ♀, head; a, ♀, pronotum.

dull, microscopically rugulose. Mesonotum, scutellum and metanotum dull, very finely and fairly closely punctured; the sides of the thorax nitidulous, the mesopleurae more sparsely punctured than the mesonotum; metapleurae almost impunctate. Dorsum of epinotum dull, finely and transversely rugose, the rugae thin and straight; the sides of the epinotum nearly dull, with faint traces of rugae. Abdomen shining, the last two segments sparingly punctured. Mandibles tridentate, the apical tooth long, the basal one small. Clypeus convex, the anterior margin convex and entire, about one-third wider than long. Inner margins of the eyes feebly convergent above and below. Posterior ocelli about as far from the eyes as from each other. Interocular distance on the vertex slightly greater than the length of the first two joints of the flagellum. The second joint is two-fifths longer than the third. Pronotal collar thin, the anterior face almost vertical, the dorsal face short but not linear, strongly convex transversely. Scutellum moderately convex, with a feeble median longitudinal impression. Metanotum raised in the middle, where it is impressed lengthwise and therefore bituberculate. Dorsum of epinotum not quite as long as the mesonotum. Petiole hardly shorter than the second joint of the hind tarsus. The posterior tibia as long as the posterior femur and trochanter united. Basal joint of the anterior tarsi with 9 to 11 spines on the outer margin. Third cubital cell considerably narrowed on the radius so that the third abscissa of the radius is even shorter than the first, the second and third transverse cubital veins being almost contiguous. Wings hyaline, the apical margin faintly fuscous, darker at the base near the veins, which are dark brown.

♂. 23–28 mm. long. Mandibles bidentate; clypeus very strongly convex, the anterior margin broadly truncate. Second joint of the flagellum two-thirds longer than the third. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. Inner margins of the eyes slightly convergent below. Petiole shorter than the second joint of the hind tarsus, slightly longer than the third joint. Seventh sternite with a tuft of brownish pubescence on each side. Otherwise like the ♀.

This is the typical form of the species which is found from India and China to the Celebes. Kohl records it also from Africa, but I have seen none from that region. There are several varieties of which the following are found in Africa:

umbrosum var. *metallicum* Tasch. *Zeitschr. f. d. ges. Naturw.* xxxiv, p. 414, ♂, ♀. 1869.

Pubescence of the clypeus and lower face silvery, intermixed with a whitish pilosity. On the rest of the head and on the thorax the pilosity varies from dark brown to black. Tergites with a pruinose pubescence, particularly in the ♂. Posterior femora and tibiae often reddish brown.

Rhodesia, Transvaal and Orange Free State. The commonest variety in the South African subregion. (R.M. and T.M. colls.)

umbrosum var. *lanatum* Mocs. *Magy. Akad. Term. Értek.* xiii, p. 34, ♂. 1883.

This differs from the type of the species by the much longer whitish pilosity, which on the epinotum is so dense as to hide the sculpture on the posterior half or more of the segment. The infuscation at the base of the wings is also less extensive.

Salisbury, Gwaii and Rusapi, S.R.; Scottsburg, C.P.; Bloemfontein, O.F.S.

C. (Proterosphex) tuberculatum Smith (vol. xi, pt I, Pl. II, fig. 5 and figs. 10, 10a, 10b). *Ann. Mag. N.H.* xii, p. 291, ♀. 1873.

S. luteifrons Radoszk. *Jorn. Acad. Sc. Math. Lisbon*, viii, p. 208, ♀. 1881.

♀. 29 mm. long. Black. Middle femora and trochanters fusco-ferruginous; the hind legs, excepting the tarsi, pale red. Apical sternite reddish brown or black. Face and clypeus with a dense, pale golden pubescence and long, yellow pilosity. Thorax, excepting the pronotal collar, mesonotum and scutellum with a long, yellow pilosity, fairly sparse except on the apical two-thirds of the epinotum where it is dense and shaggy and overlies a fine silvery pubescence. The petiole on the upper surface is covered with pale golden pubescence. Vertex and apical segment of abdomen with a few long brown hairs. Mesonotum, vertex and epinotum dull, the rest of the body nitidulous. Mesonotum and mesopleurae with a very sparse and very fine puncturation, the mesosternum a little more strongly punctured. Dorsum of epinotum closely transversely striate. The rest of the thorax and the head impunctate. Sternites shining, the apical one with a shallow and sparse puncturation. Mandibles and clypeus as in *umbrosum*, but the clypeus is produced farther forwards and is a little longer, being only one-third wider than long. Interocular distance on the vertex slightly greater than the length of the first two joints of the flagellum. The second joint is two-thirds longer than the third joint. Pronotum as in *umbrosum*. Metanotum raised a great deal more in the middle than in *umbrosum* and very distinctly bituberculate. Petiole as long as the second joint of the hind tarsus, plus two-thirds of the third joint, and therefore distinctly longer than in *umbrosum*. Basal joint of anterior tarsi with 10 or 11 spines on the outer margin. Third cubital cell not so much narrowed on the radius as in *umbrosum*, the second and third transverse

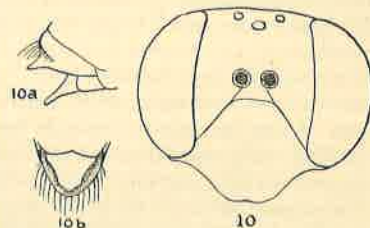


Fig. 10. *Chlorion tuberculatum*, ♀, head; a, ♂, apex of abdomen, lateral view; b, ♂, eighth sternite.

cubital veins being not nearly contiguous, the third abscissa of the radius being slightly longer than the first.

♂. 21-25 mm. long. Mesonotum more abundantly and a little more strongly punctured than in the ♀. Petiole as long as the second joint of the hind tarsus plus two-fifths to one-half of the third joint. Apical half of the seventh tergite depressed and shining, concave lengthwise, the margin between it and the basal half with a row of long, curved hairs. Otherwise like the ♀.

Sierra Leone and Nigeria; S. Rhodesia, Zululand and Natal; Sunday River, Cape Prov.

Not a common species. (R.M. and T.M. colls.)

C. (Proterosphex) luteipennis Mocs. (fig. 11). *Magy. Akad. Term. Értek.* XIII, p. 33, ♀. 1883.

♀. 25-30 mm. long. Black, apical abdominal segment fusco-ferruginous. Pubescence and pilosity black, the former very scanty on the face and clypeus, the pilosity on the epinotum with a slightly brownish tint; abdomen with a microscopic, adpressed pubescence, the apical tergite and the sternites on their apical margins with a few long black hairs. Inner side of the posterior tibiae with a dense, brownish yellow pubescence. Wings pale ochreous, the apical margin beyond the cells, fuscous. Dull, the microscopic puncturation hidden by the pubescence, except on the mesopleurae which have a slight gloss and are very shallowly punctuate. Dorsum of epinotum very feebly and transversely rugulose, the rugae barely apparent except in the middle; there is a longitudinal median impressed line which is very shallow at the base and merges into a slight fovea at the apex. Apical segment of the abdomen distinctly and fairly closely punctured, the last four sternites with a few large punctures behind the apical margin. Labrum carinate lengthwise in the middle. Clypeus not very convex, the middle of the anterior half flattened or very shallowly concave, the anterior margin moderately convex and produced into two small lobes in the middle. Inner margins of the eyes subparallel for the greater part of their length, convergent behind the level of the anterior ocellus. Second joint of the flagellum about two-thirds longer than the third. Interocular distance on the vertex equal to the length of the first two joints of the flagellum plus one-third of the following joint. Pronotal collar short, but not linear above, fairly convex transversely. Scutellum moderately gibbose, impressed lengthwise in the middle. Metanotum not raised into a tubercle in the middle. Dorsum of the epinotum convex transversely and longitudinally, shorter than the mesonotum. Petiole as long as the second joint of the hind tarsus. Basal joint of anterior tarsi with nine or ten spines on the outer margin. Third cubital cell considerably narrowed on the radius, the third abscissa of the radius being shorter than the first.

♂. 22-28 mm. long. Face and clypeus with a dull golden pubescence. Sternites 2-7, with the apical half of the sides punctured and bearing a long, black pilosity which becomes denser on each succeeding segment. The eighth sternite has a dense, short and brownish pubescence. Mandibles bidentate. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum. The second joint of the flagellum is nearly half as long again as the third. Petiole slightly longer than the second joint of the hind tarsus. Otherwise like the ♀.

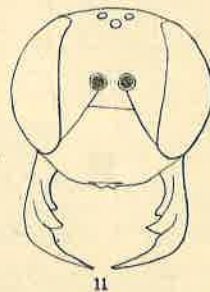


Fig. 11. *Chlorion luteipennis*, ♀.

Egypt, Zanzibar; Salisbury and Hope Fountain, S.R.; Johannesburg, Natal and Algoa Bay. Kohl records this species also from Ceylon and Amboina. (R.M. and T.M. colls.)

C. (Proterosphe) castaneipes Dhlb. *Hym. Eur.* 1, pp. 27 and 438, ♀. 1845. Kohl, *Ann. K.K.N.H. Mus. Wien*, v, p. 432. 1890.

"♀. 24-28 mm. long. Abdomen, excepting the petiole, and the legs, excepting the coxae, bright ferruginous. . . Wings slightly brown, with a feeble violaceous lustre. Pilosity whitish. The collar above and the lateral margins of the mesonotum with whitish pubescence. Sculpture exactly like that of *maxillosus* F. Epinotum very finely and transversely aciculate, barely noticeable. Petiole as long as the third joint of the hind tarsus, and shorter than the second joint of the flagellum by as much as the length of the pedicellus. The shape of the third cubital cell is like that of *nigripes* Smith. If the length of the petiole were not relatively different, and if the mesonotum and scutellum were covered with pilosity as in that species, I would be inclined to regard *castaneipes* as a variation of *nigripes* since it has also the same form of clypeus. In *castaneipes*, moreover, the second joint of the flagellum is relatively longer, since it is shorter than the third and fourth joints by only the length of the pedicellus; in *nigripes* it is at the most only as long as the third joint plus half of the fourth. Cape of Good Hope."

This species is apparently very scarce since it is not represented in the large collection of Dr Brauns, now the property of the Transvaal Museum, nor in the collections of any of the museums in South Africa.

C. (Proterosphe) haemorrhoidalis Fab. (figs. 12 and 12a-c). *Spec. Insect.* 1, p. 443. 1781.

nigripes Smith. *Cat. Hymen. B.M.* iv, p. 254, ♀. 1856. Turner, *Ann. Mag. N.H.* (8), x, No. 58, p. 369. 1912.

umtalicus, Strand. *Archiv f. Naturges.* LXXXI, p. 105, ♂. 1915.

nigripes var. *pachyderma* Strand. *Loc. cit.* p. 106, ♀. 1915.

♀. 22-25 mm. long. Black, apical segment of the abdomen ferruginous.

Mandibles, excepting the apex, and sometimes the extreme anterior margin of the clypeus, fusco-ferruginous. Wings brown, the apical portion beyond the cells darker, with a bluish metallic lustre, here and there also violaceous. Pilosity black, fairly coarse and long on the face and clypeus, finer and shorter on the temples and sides of the thorax; rather dense on the epinotum where it is short on the dorsum and long on the sides and declivity, but not obscuring the sculpture. Mesonotum with a dense, black and decumbent pubescence, which hides the sculpture. In fresh specimens the sides of the face as far up as the antennal sockets have a thin greyish pubescence. Inner side of the posterior tibiae with a dense, brownish fulvous pubescence. Abdomen feebly nitidulous, the rest of the body fairly dull. Clypeus with a few large punctures from whence arise the coarse, black hairs. Epinotum closely and transversely rugulose, the sculpture very shallow and inconspicuous. Apical segment of

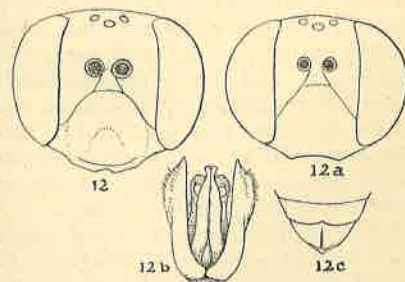


Fig. 12. *Chlorion haemorrhoidalis*, ♀, head; a, ♂, head; b, ♂, genitalia, dorsal view; c, ♂, seventh and eighth sternites.

the sculpture. In fresh specimens the sides of the face as far up as the antennal sockets have a thin greyish pubescence. Inner side of the posterior tibiae with a dense, brownish fulvous pubescence. Abdomen feebly nitidulous, the rest of the body fairly dull. Clypeus with a few large punctures from whence arise the coarse, black hairs. Epinotum closely and transversely rugulose, the sculpture very shallow and inconspicuous. Apical segment of

the abdomen with a distinct puncturation, not coarse and not very dense, the apex of the tergite bluntly angular and shining. Labrum with a median longitudinal carina. Clypeus transversely impressed just behind the anterior margin, the impression fading out at the sides; the anterior margin is feebly convex and has a very small excision in the middle. The clypeus is fairly convex, but in the middle anteriorly it is slightly flattened. Inner margins of the eyes for the greater part parallel, convergent above only beyond the level of the anterior ocellus. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus two-thirds of the third joint. Posterior ocelli as far from the eyes as they are from each other. Second joint of the flagellum half as long again as the third, the latter as long as the fourth. Dorsal face of the pronotal collar not linear, but nevertheless very short, fully six times wider than long, feebly depressed in the middle; the anterior face is almost vertical. Scutellum distinctly gibbous, with a very shallow median longitudinal impression. Postscutellum not impressed in the middle. Dorsum of the epinotum convex transversely, as long as the mesonotum. Petiole as long as the second joint of the hind tarsus. First tergite as long as wide across the apical margin. Basal joint of anterior tarsi with nine spines on the outer margin. Second and fourth abscissae of the radius subequal, the first barely longer than the third.

♂. 18–22 mm. long. Apical segment of the abdomen black, the sternite sometimes fusco-ferruginous. Face and clypeus with a greyish silvery pubescence. Labrum not carinate. Clypeus much more convex transversely than in the ♀, not impressed behind the anterior margin, which is transverse or feebly concave; the middle third in front is not flattened as in the ♀, or only very slightly so. Second joint of the flagellum not quite half as long again as the third joint. Petiole as long as the second joint of the hind tarsus plus one-third of the third joint. Sternites without lateral fimbriae of long, curved hairs. Eighth sternite broadly triangular, bluntly carinate lengthwise in the middle. Sixth and seventh tergites finely and shallowly punctured, with a sparse black pubescence. Otherwise like the ♀. Nyasaland, Portuguese East Africa, Rhodesia, Transvaal and Natal.

The type of this species, which was unknown to Kohl, is in the Banksian collection in the British Museum. It has been examined by Turner, who has elucidated some of the synonymy. The description given above is based on specimens from the British Museum which have been compared with the type by Turner. That author, however, has wrongly synonymised the var. *volubilis* Kohl with the type, *volubilis* being a distinct colour variety. Specimens of *haemorrhoidalis* in some collections have been erroneously determined as *Bohemanni* Dhlb., which is a very similar but larger insect, with a different form of genital armature in the ♂, and with a wider clypeus and longer second joint of the flagellum in the ♀.

I have not seen the type of *umtalicus* Strand, but the description of that species seems to agree very closely with the ♂ of *haemorrhoidalis*, and I have therefore little hesitation in sinking it in synonymy. *S. nigripes* Smith var. *pachyderma* Strand is probably also synonymous with this species. From the description the only point of difference appears to be the length of the petiole which is said to be as long as the second joint of the hind tarsus plus half of the third joint.

haemorrhoidalis var. *volubilis* Kohl. *Ann. K.K.N.H. Mus. Wien*, x, p. 64, ♀, ♂. 1895.

This differs from the type of the species as follows:

♀. 23–27 mm. long. Clypeus, scapes, underside of the basal joints of the flagellum, apical third or more of the femora, the tibiae entirely and the basal joint of the tarsi on the upper side, ferruginous. Tarsi dark brown, more rarely fusco-ferruginous. Apical segment of the abdomen fusco-ferruginous, as in the type of the species. Interocular distance on the vertex equal to the length of the first two joints of the flagellum or a little more, less than the length of the second plus half of the third. The dorsum of the epinotum is a little more strongly rugulose, and the metanotum is more gibbous in the middle and has a shallow, but quite distinct, median longitudinal impression.

Two specimens, the only ones which I have seen, are in the Braunsian collection, both determined as *volubilis* by Kohl himself. They do not attain to the dimensions given by Kohl, measuring only 21 mm. long. The thorax is more slender than in *haemorrhoidalis* type.

♂. 22–25 mm. long. The apical tergite, antennae, legs and clypeus black; only the pubescence on the inner side of the hind tibiae is fusco-ferruginous. Mandibles bidentate. Labrum with a feeble median longitudinal carina. Inner margins of the eyes slightly convergent below; their least distance apart across the clypeus is equal to the length of the third and fourth joints of the flagellum, or fully equal to the second plus half of the third, and almost the same as the interocular distance on the vertex."

Grand Bassa; Cameroons and Togoland.

haemorrhoidalis var. *pulchripennis* Mocs. *Magy. Akad. Term. Értek.* XIII, p. 35, ♀. 1883.

♀. 27 mm. long. Coxae, trochanters, extreme base of the middle and hind femora above and the base and outer side of the anterior femora, black; all the rest of the legs bright ferruginous. Basal half of the mandibles, anterior margin of the clypeus and the scapes, fusco-ferruginous. Wings brown, the apical margin darker and with bluish-violaceous sheen, the rest of the wings with a pronounced greenish lustre. Apical margins of the abdominal segments brownish. Apical tergite black, the apical sternite black basally, piceous apically. Clypeus much more convex than in the type of the species, without a flattened median area in front. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus one-third of the third joint. Dorsum of epinotum more strongly sculptured than in the type of the species, the rugae coarser, especially at the sides.

♂. 25 mm. long. Anterior femora, middle femora except at the apex, and basal half of the hind femora, black; the last three or four joints of the tarsi fuscous. Otherwise the legs are bright ferruginous as in the ♀. Scapes black. Anterior margin of the clypeus black, feebly concave, with a very small transverse lobe in the middle. Wings, pilosity and sculpture as in the ♀. Otherwise like *haemorrhoidalis* type ♂.

This variety is larger than the type of the species, and apart from the colour of the wings and the shape of the clypeus hardly distinguishable from the var. *Kobrowi* described below. The description given above is based on a pair from Sierra Leone (J. J. Simpson) in the British Museum collection.

haemorrhoidalis var. *Kobrowi* v. nov.

♀. 24-27 mm. long. Wings as in the type of the species, without any distinct metallic green lustre. Apical segment of the abdomen and apical margin of the fifth tergite of a bright ferruginous colour, like the legs. Clypeus not strongly convex as in *pulchripennis* but like that of the type of the species. Fifth tergite, excepting a narrow median area, distinctly but shallowly punctured. Apical tergite more strongly and more closely punctured than in the type of the species, also shallowly impressed lengthwise in the middle. Dorsum of the epinotum finely and transversely rugulose as in the type of the species. Otherwise like the var. *pulchripennis*.

Johannesburg (G. Kobrow). Type in coll. Brauns.

C. (Proterosphex) decipiens Kohl. *Ann. K.K.N.H. Mus. Wien*, x, p. 65, ♀, ♂. 1895.

It is only with considerable hesitation that one can concede specific rank to this insect. It would perhaps be more correct to regard it as a race of *haemorrhoidalis*, notwithstanding a noticeable difference in the shape of the epinotum. Examination of examples in the Braunsian collection, determined by Kohl, shows that there is no appreciable difference in the genitalia of the respective ♂♂, and also that some of the differences between *decipiens* and *haemorrhoidalis* (*nigripes*) var. *volubilis*, indicated by Kohl, are based on erroneous measurements.

♀. 21-24 mm. long. In colour and pilosity this sex is exactly similar to *volubilis* ♀, but the clypeus of the latter lacks the yellowish pubescence which is present in *decipiens*, and it is also less wide. The dorsum of the epinotum is much more convex transversely and is also longer, being as long as the first three joints of the flagellum (in *volubilis* as long as the first two plus half of the third). It is finely transversely rugoso-striate and slightly glossy (quite dull in *volubilis*) and lacks the deep groove, obtusely angular in the middle, which separates the dorsum from the declivity. Contrary to Kohl's statement, the petiole in both forms is just as long as the second joint of the hind tarsus. The interocular distance on the vertex is fully equal to the length of the first two joints of the flagellum, or to the length of the second plus two-fifths of the third, which is the same as in *volubilis*, and not less as stated by Kohl. The antennae are more slender than in *volubilis*, and the second joint is relatively longer, being nearly two-thirds longer than the third joint. The tarsal comb is composed of longer and finer spines (nine or ten), the longer ones being fully three-quarters the length of the first tarsal joint (not more than half in *volubilis*).

♂. 20-22 mm. long. I am unable to compare this sex with that of *volubilis*, since I have seen no examples of the latter. The comparison is therefore made with the type of *haemorrhoidalis*. The wings are slightly paler. The tergites are pruinose pubescent. The pilosity and pubescence of the thorax are paler and less abundant than in *haemorrhoidalis*, the pilosity being brownish black and the pubescence grey, so that the insect looks less black. As in the ♀, the dorsum of the epinotum is longer than in *haemorrhoidalis*, and the apical groove between the dorsum and declivity is absent, although a small apical pit is present. The abdomen is distinctly narrower, more elliptical than broadly ovate, the abdominal complex beyond the first tergite being two-thirds longer than wide (only one-half longer in the type of the species). The apical sternite is abruptly acuminate at the apex, as in *incomptum* Gerst., but the apical tergite and the genitalia are the same as in *haemorrhoidalis*.

The sternites are almost glabrous, without even the few long hairs which are present in *haemorrhoidalis*. Second joint of the flagellum half as long again as the third. The interocular distance on the vertex is fully as long as the second joint of the flagellum plus two-thirds of the third joint. The petiole is as long as the second joint of the hind tarsus.

Willowmore, Sunday River and Algoa Bay, C.P. (Dr H. Brauns). Types in the Vienna Museum.

C. (Proterosphex) incomptum Gerst. (figs. 13, 13a and b). *Archiv f. Naturges.* xxxvii, p. 352, ♂. 1871. Kohl, *Ann. K.K.N.H. Mus. Wien*, x, p. 67. 1895. *C. nyanzae* Turner. *Ann. Mag. N.H.* (9), 1, no. 5, p. 358, ♂, ♀. 1918.

♂. 18–23 mm. long. Very closely allied to *haemorrhoidalis*, from which it differs as follows:

Second joint of the flagellum not quite one-third longer than the third joint. Sternites at the sides fringed with long black hairs. Apical tergite with a shallow longitudinal impression in the middle, the apical margin slightly sinuate in the middle. Apical sternite not roundly triangular as in *haemorrhoidalis* but somewhat abruptly acuminate apically, the apex pubescent. The outer paramera of the genitalia are wider than in *haemorrhoidalis*, but on the whole the genitalia have very much the same shape as in that species. Wings much paler, merely pale brown, the bluish lustre much less apparent than in *haemorrhoidalis*. Gerstaecker describes the type as having greyish yellow hairs intermixed with black ones on the clypeus, and a dense, woolly, greyish yellow pilosity on the sides and posterior part of the thorax. The type has been re-described, and the genitalia figured by Kohl. A specimen from Nyasaland in the Brit. Museum, another from the Matopos, S.R. in the Rhodesia Museum, and several others from Portuguese East Africa, Natal and Zululand in the collections of the Transvaal and South African Museums agree in every way with Kohl's description except that the pilosity is entirely black as in *haemorrhoidalis*.

The identification of *nyanzae* Turner is based on an examination of a ♂ and a ♀ from Uganda in the British Museum collection, and determined as such by Turner himself. The genitalia of the ♂ agree exactly with the figure given by Kohl of *incomptum* Gerst.

♀. 24 mm. long. Dorsal surface of the abdomen shining, as in *nigrohirtum* Kohl, with which this species is also closely allied. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. The carina on the base of the clypeus is much shorter than in the ♂. Second joint of the flagellum a little more than half as long again as the third joint.

C. (Proterosphex) nigrohirtum Kohl (figs. 14, 14a and b). *Ann. K.K.N.H. Mus. Wien*, x, p. 66, ♂. 1895.

S. Bohemanni var. *camerunicus* Strand. *Archiv f. Naturges.* lxxxix, p. 105, ♀. 1915.

♂. 20–25 mm. long. Black. Clypeus, temples and pronotal collar above, pronotal tubercles, mesosternum, coxae and outer face of the anterior femora with a greyish silvery pubescence, scanty and inconspicuous except on the clypeus. Temples and anterior coxae with a long whitish pilosity intermixed

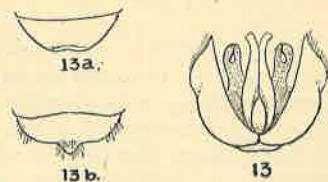


Fig. 13. *Chlorion incomptum*, ♂, genitalia, dorsal view; a, ♂, apical tergite; b, ♂, apical sternite.

with black hairs. Pilosity on the rest of the body black. Abdomen above smooth and shining, without pubescence, the last three tergites with a sparse pilosity. Sternites shining, the third to sixth with fimbriae of long, curved, black hairs at the sides, those on the sixth dense, the seventh with a few short hairs at the sides, the eighth with a short pilosity at the apex. Wings dark brown, with a violaceous lustre. Labrum not carinate. Clypeus distinctly flattened over a triangular area whose base extends over three-fifths of the anterior margin; a low longitudinal carina extends over the basal half of the clypeus. The clypeus is rather narrow, being fully as long as wide. Second joint of the flagellum a little less than one-third longer than the

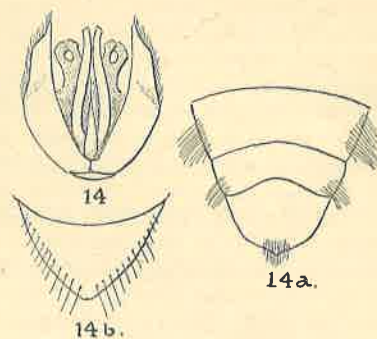


Fig. 14. *Chlorion nigrohirtum*, ♂, genitalia, dorsal view; a, ♂, sixth to eighth sternites; b, ♂, apical tergite.

third joint. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus two-thirds of the third joint. Dorsum and declivity of the epinotum slightly coriaceous and also very indistinctly transversely rugulose. Petiole as long as the second joint of the hind tarsus. Apical margin of the seventh tergite arcuate, feebly sinuate in the middle; on the apical half of the segment there is a shallow median longitudinal impression. Eighth sternite like that of *incomptum*, but less abruptly acuminate at the apex. The genitalia are very much like those of *incomptum*, but the outer paramera are more gradually narrowed towards the apex and their apical third is fringed with longer hairs.

♀. (Hitherto undescribed.) 26–30 mm. long. Labrum carinate longitudinally in the middle. Scutellum shining, deeply impressed lengthwise in the middle, very finely and sparsely punctured. Dorsum of epinotum more distinctly rugulose than in the ♂; the median longitudinal impression is much more distinct than in the ♂, and ends in a large shallow pit at the apex. The declivity of the epinotum is clearly transversely rugulose. Abdomen shining, without pubescence, the fifth and sixth tergites with a sparse exserted pilosity, and also sparsely punctured like the fourth to sixth sternites. Clypeus about one-fifth wider than long, the anterior margin convex, with a pair of very small blunt teeth in the middle. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus one-third of the third joint. Second joint nearly half as long again as the third. Inner face of the posterior tibiae clothed with a dense, fulvous brown pubescence. Petiole not quite as long as the second joint of the hind tarsus. Otherwise like the ♂.

The description given above is based on two specimens from Uganda in the British Museum collection, determined by Kohl himself. The shining abdomen in the ♀ distinguishes this species easily from the rest of the *haemorrhoidalis-Bohemanni* group except *incomptum* which is, however, a smaller insect.

Zanzibar and Usambara; Bugoma Forest, Uganda (S. A. Neave); Abak, Nigeria (M. Jeffreys). (R.M. coll.)

C. (Proterosphe) Bohemanni Dhlb. (figs. 15 and 15 a-c). *Hymen. Eur.* 1, p. 436, ♂. 1845.

kilimandjaroensis Cameron. Sjöstedt, *Kilimandjaro-Meru Exped.* II, p. 262, ♀, ♂. 1910.

transvaalensis Cameron. *Ann. Trans. Mus.* II, p. 140, ♂. 1910.

Abbotii Fox. *Ent. News*, II, p. 42, ♀. 1891.

♀. 26-30 mm. long. Clypeus without greyish yellow pubescence; otherwise this species resembles *haemorrhoidalis* in colour, sculpture and pilosity. It is larger and stouter than that species, and may be distinguished from it by the following characters: clypeus wider, nearly two-fifths wider than long (only one-fifth in *haemorrhoidalis*). Pronotal collar shorter, discoid, almost linear above. Second joint of the flagellum two-thirds longer than the third joint. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus five-sixths of the third joint. Apical tergite more coarsely and more densely punctured. Basal joint of the anterior tarsi with nine spines on the outer margin.

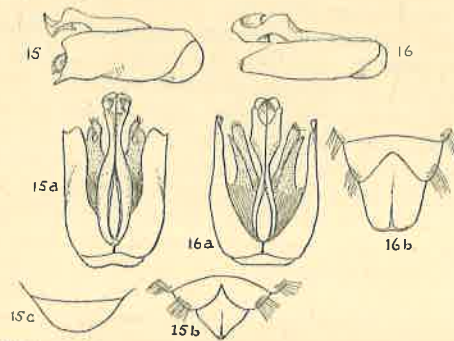


Fig. 15. *Chlorion Bohemanni*, ♂, genitalia, lateral view; a, ♂, genitalia, dorsal view; b, ♂, seventh and eighth sternites; c, ♂, apical tergite.

Fig. 16. *Chlorion Neavei*, ♂, genitalia, lateral view; a, ♂, genitalia, dorsal view; b, ♂, seventh and eighth sternites.

♂. 27-30 mm. long. Second joint of the flagellum two-thirds longer than the third. Clypeus distinctly less convex than in *haemorrhoidalis*. Seventh sternite deeply and angularly emarginate, the apical margin of the eighth sternite convex, and feebly sinuate in the middle; it has also a median longitudinal impressed line at the base. The genitalia are quite different from those of *haemorrhoidalis*; the outer paramera are concavely truncate at the apex, the lower angle produced into a tooth; the inner paramera (penis, or sagittae) are much widened apically, excavated above and bluntly hamate below. They are not unlike those of *Stadelmanni* Kohl from the lateral aspect, but very different from the dorsal. The sternites are fringed with long black hairs on their apical halves, more especially towards the sides, but not so densely as in *incomptum*.

Natal; Kilimandjaro; Matopos, S.R.; Johannesburg.

C. (Proterosphe) Neavei n.sp. (figs. 16, 16 a and b).

♂. 33 mm. long. A specimen from Nyasaland in the British Museum collection, determined by Turner as *Bohemanni*, agrees in every way with Kohl's description of Dahlbom's type except in the structure of the apical sternite and the genitalia. The seventh sternite is deeply emarginate as in

Bohemanni, but the eighth sternite is broadly rounded at the apex, not bluntly angular as in *Bohemanni*. The genitalia are altogether different (see figs. 15 and 16).

♀. A specimen of this sex, 29 mm. long, taken in the same locality as the ♂ described above, should probably be assigned to this species. The clypeus is even wider than in *Bohemanni*, fully two-fifths wider than long. Otherwise no appreciable differences between the two species appear to exist.

Mlanje, Nyasaland; March (S. A. Neave). Type in the British Museum.

C. (Proterosphex) Schoutedeni Kohl (figs. 17 and 17a). *Rev. Zool. Afric.* III, p. 205, ♂. 1913.

♂. 27 mm. long. Clypeus covered with a dense silky pubescence, entirely obscuring the sculpture, and varying from whitish to brownish golden in colour. Mesonotum with dark chestnut-brown pilosity, the epinotum with greyish pilosity. Sometimes the pilosity of the thorax is black, and on the declivity of the epinotum brown. Apical third of the seventh tergite fusco-ferruginous. Otherwise this species resembles *haemorrhoidalis*, but the wings are much paler, being pale fuscous, the apical margin darker. Labrum not carinate. Second joint of the flagellum two-thirds longer than the third joint. Inner margins of the eyes parallel. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum. Petiole nearly as long as the second joint of the hind tarsus, or to the second joint of the flagellum. Apical margin of the last tergite semicircular; eighth sternite carinate longitudinally in the middle, its apical half fairly densely pilose. Inner paramera of the genitalia dilated at the apex, with a small tooth on each side some distance from the end. Otherwise like *haemorrhoidalis* ♂.

Mpika, Belgian Congo; Mlanje, Nyasaland; Durban.

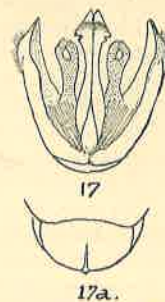


Fig. 17. *Chlorion Schoutedeni*, ♂, genitalia, dorsal view; a, ♂, eighth sternite.

C. (Proterosphex) Stadelmanni Kohl. *Ann. K.K.N.H. Mus. Wien*, x, p. 67, ♂. 1895.

“♂. Black; pilosity black. Wings fuscous, with blue and violet metallic lustre. Mandibles bidentate. Labrum without a distinct median longitudinal carina. Clypeus subtruncate, slightly arcuately emarginate, with a dull silvery pubescence underlying black hairs. Inner margins of the eyes slightly convergent below; the distance between them across the clypeus equal to the length of the second and third joints of the flagellum, across the vertex equal to the length of the second joint plus two-thirds of the third joint. Dorsum of epinotum coriaceous, transversely rugoso-striate. Petiole about as long as the second joint of the hind tarsus. Apical tergite deeply emarginate in the middle of the posterior margin. 28 mm. long.

“This species bears a great resemblance to *nigrohirtum* Kohl, but differs from it by the deep median excision of the apical margin of the last tergite, the shape of the eighth sternite, and most distinctly by the shape of the genitalia. Only the sixth to eighth sternites have lateral black fimbriae. The eighth sternite is slightly excised in the middle of the posterior margin.”

Delagoa Bay.

This species is very distinctly characterised by the shape of the genitalia and the shape of the apical segment of the abdomen, which are clearly illustrated in the plate accompanying Kohl's paper. The inner paramera are

peculiarly shaped and unmistakable. On this account some specimens from Scottsburg, Natal, should be attached to this species, as the genitalia are identical with those figured by Kohl, but since the apical tergite is not excised at the apex, they may be separated as a variety as follows:

Stadelmanni var. *integrum*, n.v. (figs. 18, 18 a and b).

♂. 25-27 mm. long. Seventh tergite with the apical margin ferruginous and entire, almost semicircular, the middle produced into a blunt and very inconspicuous angle. Otherwise like the type of the species. The sculpture of the epinotal dorsum is distinctly coarser than in *haemorrhoidalis*, transversely rugose rather than rugulose, and the short blackish pilosity on the mesonotum is more abundant than in that species. Labrum not carinate, but with a small median tubercle behind the anterior margin. Second joint of the flagellum two-thirds longer than the third joint. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third.

♀. 27 mm. long. Two examples, taken at the same time and place as the ♂♂ described above, are probably the ♀♀ of this form. Apart from the stronger sculpture of the epinotum, slightly finer puncturation of the apical tergite, and the presence of ten spines on the outer margin of the basal joint of the anterior tarsi, they do not differ from *Bohemanni* ♀.

Scottsburg, Natal, March, 4 ♂♂, 2 ♀♀ (R. H. R. Stevenson); Chirinda Forest, S.R. 1 ♀; Rikatla, Portuguese East Africa, 3 ♂♂ (A. Junod).

Types in coll. Stevenson. (R.M. and T.M. colls.)

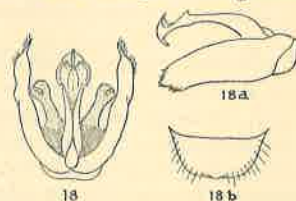


Fig. 18. *Chlorion Stadelmanni* var. *integrum*, ♂, genitalia, dorsal view; a, lateral view; b, apical tergite.

C. (Proterosphex) abyssinicum n.sp. (figs. 19, 19 a and b).

♂. 25-31 mm. long. Black. Mandibles bidentate, ferruginous except at the apex. Wings pale brown, with a faint violaceous lustre. Clypeus covered with a dense, decumbent and brownish golden pubescence. Eighth sternite fusco-ferruginous apically. Pilosity black. Sculpture of head and thorax like that of *Bohemanni*. Sternites with a long black pilosity, forming fairly dense lateral fimbriae on the fourth to seventh sternites. These, and also the third sternite, are distinctly punctured, the punctures shallow but large. Labrum carinate longitudinally in the middle. Clypeus arcuately truncate, with a low carina on the basal half and a short and wide triangular protuberance in the middle underneath the anterior margin. Inner margins of the eyes parallel over the greater part of their length, slightly convergent above at about the level of the anterior ocellus. Interocular distance on the vertex equal to the length of the second and third joints of the flagellum plus half of the fourth. Second joint of the flagellum two-thirds longer than the third. Pronotum, scutellum and epinotum as in *Bohemanni*. Petiole as long as the second joint of the hind tarsus. Apical margin of the seventh tergite convex and entire. Eighth sternite produced into a very short rectangular lobe which is bluntly carinate lengthwise in the middle. Inner paramera of the genitalia much longer

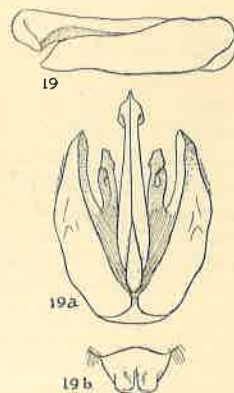


Fig. 19. *Chlorion abyssinicum*, ♂, genitalia, lateral view; a, dorsal view; b, eighth sternite.

than the outer, seen from above abruptly amplified before the fairly acute apex.

Abyssinia. 2 ♂♂ (R. E. Turner). The type measures 31 mm. long, the other specimen, although so much smaller, differs from it in nothing but size. Type in the British Museum.

C. (Proterosphex) observabilis Turner. *Ann. Mag. N.H.* (9), vol. 1, No. 5, p. 360, ♀. 1918.

♀. 26–30 mm. long. Black. Wings pale yellowish brown, with a very faint violaceous lustre; the veins dark brown. Clypeus covered with a dense pale golden pubescence and a few long black hairs. Vertex with a sparse black pilosity, the temples with long, pale golden and brown hairs intermixed. Pronotum with a brownish golden and fairly sparse pubescence, intermixed with a short blackish pilosity. Mesonotum and metanotum with short black hairs. Mesopleurae, mesosternum and epinotum covered with a dense, pale golden pubescence intermixed with a long pilosity of the same colour. The pubescence entirely obscures the underlying sculpture. Scutellum shining and glabrous, impressed longitudinally in the middle; the metanotum not impressed. Tergites with a microscopic blackish pubescence and fairly dull; the last two tergites sparsely punctured and with a few long black hairs. Sternites shining. Clypeus like that of *Bohemanni*. Inner margins of the eyes parallel. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus two-thirds of the third joint, or very slightly greater than the length of the first two joints. Posterior ocelli a little nearer to each other than they are to the eyes. Second joint of the flagellum three-fourths longer than the third. Petiole as long as the third joint of the hind tarsus.

Tero Forest, S.E. Buddu, Uganda. September (S. A. Neave); Congo (G. L. E. Andreae). Type in the British Museum.

C. (Proterosphex) rufiscutis Turner (figs. 20 and 20a). *Loc. cit.* p. 359, ♀, ♂.

♀. 24 mm. long. Black. Mandibles excepting the apex, clypeus, scape and first five joints of the flagellum, pronotal collar, tegulae, the upper angle of the mesopleurae below them, scutellum, metanotum and the legs, excepting the coxae above, pale ferruginous. Sixth abdominal segment, apical margin of the fifth tergite and the whole of the fifth sternite, fusco-ferruginous. Wings hyaline, tinged with yellow at the base and along the costa, the apical margin fuscous; the veins brown. Clypeus and lower half of the face covered with a short golden pubescence and a sparse deep yellow pilosity. The vertex and temples with a few long, erect and fulvous hairs. Pronotum and mesothorax with a sparse yellowish grey pilosity. Epinotum with a long greyish pilosity and a fine whitish pubescence, denser on the sides and declivity than on the dorsum. Abdomen pruinose above, the last two segments with a few long, exserted, brown hairs. Clypeus very little wider than long, moderately convex, the anterior margin convex. Inner margins of the eyes parallel. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. The second joint is half as long again as the third. Pronotal collar not very short, not linear above; there is a very shallow sulcus, sometimes absent, in the middle of the dorsal face. Mesonotum, mesopleurae, scutellum and metanotum very finely and sparsely punctured. Scutellum

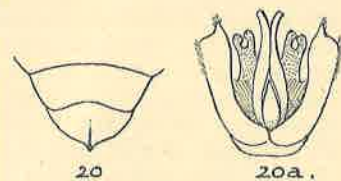


Fig. 20. *Chlorion rufiscutis*, ♂, seventh and eighth sternites; a, ♂, genitalia, dorsal view.

strongly convex, impressed longitudinally in the middle; the metanotum convex and feebly bituberculate in the middle. Dorsum of the epinotum finely, closely and transversely striate, and also with about seven or eight transverse rugae which are not very apparent unless the segment is viewed obliquely from in front. Petiole a little longer than the second joint of the hind tarsus. Fourth and fifth tergites finely and sparsely punctured. Comb of the anterior tarsi long and slender, the basal joint with ten spines on the outer margin which are more than half as long as the joint itself.

♂. 22 mm. long. Black. The only parts which are reddish are the mandibles excepting the apex, the anterior half of the clypeus, scapes, first joint of the flagellum below, tegulae, the femora below and at the apex above, tibiae, and first two joints of the tarsi. The posterior tibiae are more or less fuscous on the outer face. Wings paler than in the ♀. Lower half of the face and the clypeus covered with silvery pubescence, the sparse pilosity on those parts pale yellow. Anterior margin of the clypeus shallowly concave. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third joint. Pronotal collar thicker than in the ♀, the dorsal face flatter. Mesonotum closely rugulose and finely punctured. Dorsum of the epinotum transversely striate, but without the outstanding rugae which are present in the ♀. Petiole as in the ♀. Abdomen narrow; the apical margin of the seventh tergite semicircular, of the seventh sternite shallowly emarginate. The eighth sternite is pointed at the apex and subcarinate lengthwise in the middle. The genitalia resemble those of *incomptum*, but the outer paramera are broader at the apex. Otherwise like the ♀.

Nyasaland, Rhodesia, Zululand and Transvaal. (R.M. and T.M. colls.)

C. (Proterosphex) gorgon Kohl. *Rev. Zool. Afric.* III, p 204, ♀. 1913.

♀. 21-24 mm. long. Black. Clypeus, first five or six joints of the antennae, mandibles excepting the apex, pronotal collar, tegulae, the upper angle of the mesopleurae below the tegulae and the legs excluding the coxae, ferruginous. Pronotal tubercles and the apical tergite fusco-ferruginous. Wings reddish brown, with a violaceous lustre. Clypeus and lower half of the face with a sparse, dull silvery pubescence and a long, outstanding, reddish yellow pilosity. Vertex, temples and thorax with a pale brownish pilosity; the vertex, temples and occiput have also a decumbent brownish yellow pubescence. Epinotum with white pubescence and pilosity, the latter scanty on the dorsum but dense on the declivity. Petiole sparsely pilose. First two tergites pruinose, the rest glabrous and shining, very sparsely and very finely punctured; the apical segment with a few long reddish hairs. Vertex, pronotal collar, mesonotum and mesopleurae slightly shining, very finely and sparsely punctured, the mesopleurae somewhat less sparsely than the mesonotum. Scutellum and metanotum shining, the former flat, sparsely and finely punctured and not impressed in the middle; the metanotum very feebly impressed lengthwise in the middle. Dorsum of epinotum dull, with five or six large and very prominent transverse ridges, the spaces between the latter concave. Labrum with a strong median longitudinal carina which reaches the apical margin. Clypeus convex, the anterior margin convex and with a short transverse impression behind it. Inner margins of the eyes nearly parallel. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus two-thirds to three-quarters of the third joint. The second joint of the flagellum is half as long again as the third. Pronotal collar short but not linear above, the anterior face somewhat concave. Petiole as long as the second joint of the hind tarsus. Basal joint of the anterior tarsi with 11 or 12 very long, thin and reddish spines on the outer margin.

♂. 18-20 mm. long. Black. Mandibles ferruginous over the basal half. Tegulae fusco-ferruginous posteriorly. Wings paler than in the ♀. Pilosity and pubescence of the face and clypeus silvery. Labrum not carinate. Clypeus strongly convex, the anterior margin arcuately emarginate over the middle third; a median longitudinal carina extends over the basal third. Inner margins of the eyes slightly convergent below. Interocular distance on the vertex equal to the length of the second joint of the flagellum plus half of the third. Mesonotum and scutellum more closely punctured than in the ♀, the scutellum less shining and feebly convex. The dorsum of the epinotum with not more than four transverse ridges, which are wider and lower than those in the ♀. Petiole as long as the second joint of the hind tarsus. Seventh tergite rounded at the apex. Eighth sternite like that of *rufiscutis*. The genitalia are like those of *haemorrhoidalis*, but the inner lobes of the outer paramera are narrower.

Lukafu, Belgian Congo; Victoria Falls, Sawmills, Redbank and Bulawayo, S.R. September to January. (R.M. and T.M. colls.)

The following species which are unknown to me in nature cannot on that account be placed within their respective subgenera.

C. optimum Smith. *Cat. Hymen. B.M.* IV, p. 245, ♀. 1856.

"♀. Length 13 lines (ca. 28 mm.). Black: the face and cheeks densely clothed with rich golden pubescence; on the vertex are scattered a few erect fuscous hairs. The prothorax, sides and hinder margin of the mesothorax above, the tubercles and a spot beneath the wings, clothed with bright golden pubescence; the postscutellum has a spot on each side, and the apex of the metathorax (epinotum) is densely clothed with short silvery-white pubescence; there is also a silvery stripe on the sides at the insertion of the posterior coxae; the metathorax is thinly covered with a changeable glittering pile, observable in different lights; a similar pile also covers the legs; wings yellowish-hyaline, their apical margins clouded, the nervures black. Abdomen red, with the petiole and three apical segments black; the third segment has on each side an oblique fuscous line which unites in the middle of the segment; the fourth segment has its apical margin narrowly and obscurely ferruginous; the apical segment rugose.

"Hab. Africa (Gambia)."

C. trichionotus Cameron. *Ann. Trans. Mus.* II, p. 138, ♂. 1910.

The types of this species and of *C. jansei* can no longer be found in the Transvaal Museum. This species is very probably, to judge by the description, synonymous with *C. Simoni*. It obviously does not belong to the subgenus *Parasphex* in which Cameron places it, as the petiole is much too long, being as long as the hind femur.

C. jansei Cameron. *Loc. cit.* p. 139, ♂.

This species fits *C. rufiscutis* Turner fairly closely, but the description of the colour is too confused to permit of any certainty in this identification. It is placed by Cameron in the subgenus *Isodontia*, to which it cannot belong on account of the short petiole which is only one-fourth longer than the hind coxa. It is undoubtedly a member of the subgenus *Proterosphex*.