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XXXV. Notes on Hymenoptera, with descriptions of new species. By P. CAMERON.

[Read October 5th, 1881.]

OXYURA.

Isobrachium hispanicum, n. s.

BLACK, extreme apex of scape and flagellum, apical half of tibiæ and tarsi testaceous; basal half of tibiæ, femora and trochanters fuscous. Antennæ double the length of the head; the scape as long as the three following joints, stout, curved; two first joints of flagellum about equal; the second more globular and thicker than the first, and shorter than the third; the third and following joints subequal, cylindrical. Head broader than the prothorax, depressed, subquadrate, smooth, shining, impunctate. Prothorax three times as long as the mesothorax, smooth, shining, impunctate, narrow in front, widened behind, and compressed at the sides. Scutellum with two small foveæ at the base; behind there is a short depression, from each end of which proceeds, to the base of the metathorax, a minute depressed line. Metathorax a half longer than broad, perpendicularly truncated behind, finely striated transversely; in the centre is a straight longitudinal carina, and a slightly curved one on either side of this. Mesothorax very finely punctured. Abdomen shining, impunctate, acuminate at the apex. Terebra exerted, rufous. Wings almost hyaline, all the nervures pale fuscous. Humeral cellules unequal, the lower one being much longer than the upper, reaching to the base of the stigma. Female. Length $1\frac{3}{4}$ lin. Expanse of wings, $2\frac{1}{2}$ lin.

Allied to *I. dichotomum*, Först., but distinguished (1) by the unequal humeral cellules, (2) impunctate, glabrous head and prothorax, and (3) by the hyaline wings.

Taken on the Sierra Nevada, Spain, in July, by Dr. David Sharp.

SIEROLA, n. g.

Antennæ 13-jointed, not much longer than the head; the scape thicker than the other joints, and as long as the following, the third and fourth slightly longer than the succeeding, and produced beneath on the lower side; remaining joints not much longer than broad, distinctly separated from each other. Wings with a stigma and prostigma, the two being separated by a hyaline space, costa thickened in front of stigma; radial cellule completely closed, the nervure being united to the costa, broader, and more rounded at the apex than base; two humeral cellules unequal, and closed; from the end of the lower (and smaller) cellule there proceeds from the upper end a small oval cellule, which is united to the prostigma by a short thick nervure, so that the upper humeral cellule is thus completely closed. From the end of the radial cellule runs, to the edge of the wing, a white spurious vein; another runs in the same direction from the small oval cellule above mentioned, the two being united by a cross nervure half-way between the radial cellule and the apex of the wing; another spurious vein runs from the lower humeral cellule to the bottom of the wing. Head, legs and body formed as in *Perisemus*, *Scleroderma*, &c. Abdomen longer than head and thorax, the third and fourth segments contracted in the middle at their junction; in length subequal; the last is acuminate.

This genus differs from all the genera of *Bethyloide* in having the radial cellule completely closed, and in the presence of the small oval cellule uniting the humeral cellules. It comes nearest to *Goniozus*, Förster. In the shape of the prostigma it more resembles *Perisemus*.

Sierola testaceipes, n. s.

Black. Head and mesonotum faintly alutaceous; abdomen smooth, shining; three basal joints of antennæ and legs testaceous; abdominal segments at their junction dull testaceous. Wings deeply fringed, shorter than thorax and abdomen, hyaline; stigma and prostigma fuscous; other nervures pale. Head and thorax covered with a scattered pubescence. Female. Length scarcely $1\frac{1}{2}$ lin.

Sent by the Rev. Thos. Blackburn from the Sandwich Islands (No. 94). Mr. Blackburn tells me that the species is rare; and that the only differences between what he takes to be the male and female are that the former has the abdomen somewhat blunter at the apex.

Psilloma caudata, n. s.

Reddish testaceous, middle of mesonotum and apical half of abdomen obscured slightly with fuscous; smooth, shining, impunctate; prothorax and petiole with a fringe of white hair; sides of thorax and abdomen with scattered hairs. Antennæ as long as the head, thorax, and second abdominal segment; scape as long as the four succeeding joints; first joint of flagellum thicker and a fourth shorter than the second, which is cylindrical and double the length of the third; the remaining joints to the penultimate broader than long, and becoming gradually thicker; last joint bluntly conical, and double the length of preceding. Petiole slightly broader than long, shorter than the coxæ, and bulging out in the middle. Abdomen bulging out in the middle, sharply conical and acuminate at the apex. Ovipositor nearly as long as the abdomen. Wings shorter than the body, hyaline, ciliated; nervures obscure testaceous. Female. Length (exclusive of ovipositor) $1\frac{1}{2}$ lin. Expanse of wings, $1\frac{1}{2}$ lin.

Sierra Nevada, Spain. Dr. Sharp.

Förster, so far as I know, never described the type of his genus *Psilloma*; and the only described species are *ciliata*, Thoms. and *incrassata*, Thoms., from both of which the present species is very distinct. *Psilloma* forms section C of *Belyta* of Thomson.

Megaspilus punctulatus, n. s.

Black; basal half of scape and legs with coxæ reddish testaceous. Antennæ as long as the thorax and abdomen; scape longer than the three succeeding joints; the second joint of the flagellum a half longer than the first and fourth; the rest subequal, and becoming gradually thicker; the last as long as the two preceding, but not thicker than them. Head pilose, longer than broad, somewhat broader than the thorax, depressed, deeply and coarsely punctured, and without

any depressions. Antennæ arising from tubercles, and in front of them is a transverse suture. Mesothorax depressed and compressed at the sides. In front of the scutellum there is a deep transverse suture, from which runs on each side a deep suture to the prothorax, and a less conspicuous one in the middle, the space bounded by these sutures is deeply and coarsely punctured; the space on either side bounded by them and the scutellum is shining and almost impunctate, except at the edges. Scutellum shining and impunctate in the centre; the rest and metanotum punctured. Spines on metanotum well developed. Abdomen longer and broader than the thorax, subovate, striated at the base, and with a long distinct central carina, and a shorter less developed one on either side; the rest smooth, shining, covered at the sides and apex with long scattered white hairs. Head and thorax densely pilose. Wings rudimentary, scarcely reaching beyond the petiole. Length $1\frac{1}{4}$ lin.

Allied to *M. cursitans*, Nees, but easily known from it by the shorter and broader thorax, which is not uniformly punctured all over; more ovate abdomen, less elongated prothorax, and more pilose body.

Dalry, Ayrshire. August.

Megaspilus mullensis, n. s.

Black, shining, almost glabrous; scape, prothorax, base of abdomen and legs, with coxæ, testaceous. Antennæ longer than the body, filiform, glabrous; scape a little longer than the head; third joint a little longer than the fourth; the rest subequal; last joint broken off. Head more than a half wider than the thorax, smooth, shining, impunctate; eyes almost glabrous. Thorax less shining than the head, slightly aciculated; longer and somewhat narrower than the abdomen, which has the second segment striolated, but very indistinctly. Wings abbreviated, reaching to apex of second abdominal segment. Male. Length a little more than $\frac{1}{2}$ lin.

Similar in coloration to *M. thoracicus*, Nees, but differing in its pile-less body, much broader head, thorax longer than abdomen, &c.

Taken on a grassy slope on Ben More, Mull, at an elevation of about 2000 feet, on June 19th.

BRACONIDÆ.

Chelonus carinatus, n. s.

Black, half-shining, covered with a close microscopic silky pubescence; the greater part of the scape of the antennæ and the four following joints reddish testaceous; extreme apex of coxæ, trochanters, apex and base of anterior femora, and the posterior knees, pale red; four anterior tibiæ and tarsi pallid testaceous; hinder tibiæ broadly annulated with white, the white ring being nearer the top than bottom; tips of four anterior tarsi and the hinder pair fuscous; the greater part of the hinder metatarsus white; spurs white; basal third of abdomen white, except a blackish mark at extreme base; at the apex this white portion is rounded, and at its junction with the black colour passes into brown. Mandibles reddish. Antennæ about the length of the body, 17-jointed, the seven apical joints thicker than the basal ones. Head finely punctured, the face covered with white hair. Mesonotum finely punctured. From the usual transverse ridge at the base of the scutellum there runs a central straight carina to the base of the mesonotum; next to this is a short carina, and outside of this again are two curved outwardly, but it is only the second which reaches the edge of the thorax; these keels are united by fine cross-bars. Scutellum smooth, shining on basal half, apical half with longitudinal striations. Metathorax punctured, and with distinct coarse longitudinal striations, truncated at the apex, and with a minute tooth at each edge. Abdomen about the length of head and thorax, finely punctured, the punctures almost obsolete on the basal white portion. The second segment depressed in the centre, and produced at the sides into a leaf-like ridge, from the inner side of which runs an almost obsolete carina in the direction of the centre of the segment, but which is not reached. The union (apparent) of the second with the third segment is indicated by a fine transverse line. Wings hyaline, stigma, radial and cubital nervures fuscous; other nervures pale testaceous. Female. Length $1\frac{1}{4}$ lin.

Various localities in the island of Oahu. Sent by Mr. Blackburn as No. 57.

Monolexis ? palliatus, n. s.

Head cubital, shaped as in *Spathius*. Antennæ 32-jointed, the joints of almost equal thickness throughout, the first joint of flagellum one fourth longer than second. Wings with two cubital cellules. Anterior discoidal cellule petiolate, hinder discoidal cellule open, recurrent nervure interstitiate. Neuration of posterior wings as in *Spathius*. Fore and hinder tarsi much longer than their tibiæ; middle tarsi scarcely longer than tibiæ. Abdomen sessile; first and second segments separated by a deep transverse furrow, widest in the middle, where it projects behind; second segment shorter than first; the rest shorter, subequal. Ovipositor a little shorter than the abdomen. Pallid testaceous, a longish spot on vertex, one behind the eyes; the greater part of the lateral lobes of mesonotum and of pleuræ and abdomen fuscous; the metanotum, metapleuræ, and basal third of abdomen dark testaceous. Legs white, a line on hinder femora, base of hinder tibiæ, a broad line in middle and base of tarsi fuscous. Wings hyaline, costa testaceous; stigma fuscous, paler at base. Antennæ longer than body, fuscous at apex, and the other joints have a small fuscous ring at the apex. Head and mesonotum smooth, shining, impunctate; the head with a few longish scattered hairs; metanotum with an indistinct central carina, which bifurcates towards the middle of metanotum in two branches, which turn to the side; hinder half of metanotum slightly rugose, and sparsely covered with white hairs. The first and second abdominal segments are coarsely constricted longitudinally; on the extreme edge of first is a distinct keel, and from the base there run two central keels, which get lost in the striations in the middle of the segment; the basal half of the space enclosed by these keels is smooth, shining, not striated. The rest of the abdomen is smooth, shining, impunctate. The male has the antennæ longer (distinctly longer than the body), the metanotum and base of abdomen darker; the fuscous ring on hinder tibiæ is shorter, and the tarsi have only the apical joints fuscous. Length 2 lin. Expanse of wings, $3\frac{3}{4}$ lin.

In the form of the head, antennæ, and thorax, and in coloration, this species agrees with *Spathius*, but it differs from it in having only two cubital cellules, in the abdo-

men being almost sessile, not pedunculated, and in the number of segments of the abdomen. It comes into (through having only two cubital cellules) Förster's "family" *Hecabolidae*, and in the table which he gives (Verh. v. Rhein. xix., 237) it might belong to *Monolexis*; but as Förster only describes the neuration of the wings (and that but very slightly), and as the type-species has never been described, I am not at all sure that the present species has any connection with Förster's genus. It will in all probability form the type of a new genus. The maxillary palpi are 6-jointed, the labial 4-jointed; but I should add that the labial palpi were accidentally destroyed before I could examine them properly.

Mr. Blackburn takes this ichneumon rarely near Honolulu. (No. 63).

CHALCIDIDÆ.

Chalcis polynesiæ, n. s.

Black, covered sparsely with a longish silvery pubescence. Base of scape, a line on the pronotum behind, and the scutellum more or less ferruginous. Anterior legs with the trochanters, femora, and tibiæ reddish yellow, paler at the apex, and more or less fuscous in the middle; hinder legs with the coxæ reddish black behind; trochanters and base of femora reddish, the rest black, save a yellow spot above at the apex, which is reddish beneath; tibiæ black at the extreme base; next to this is a clear yellow ring, the centre is black, more or less reddish on lower side, the apex clear yellow on outer side, the sides and lower parts reddish-yellow; tarsi yellowish-testaceous, the extreme apex fuscous. Head and thorax covered with shallow punctures; those on the head and prothorax are smaller than those on the middle of the mesonotum, which are again slightly smaller than those on the scutellum; lateral lobes of mesonotum with finer punctures than on the head. Metanotum with larger punctures than on the scutellum. Scutellum rounded behind, and with a transverse indistinct ridge on the apex. Abdomen not much longer than the thorax, ovate, pointed at the apex, smooth, shining, impunctate, almost glabrous at the base, the four apical segments clothed at the sides and beneath with a longish white pubescence. Wings hyaline;

tegulae yellow; the teeth on femora are very strongly developed, especially at the apex. Length scarcely $1\frac{1}{2}$ lin.

Seemingly a variable species as regards coloration. One of my specimens has only the apex of the scutellum reddish; another has it entirely of that colour, as well as the apex of the mesonotum. The colour of the legs also varies.

Taken by Mr. Blackburn near Honolulu. (No. 56).

Spalangia hirta, Haliday.

Mr. Blackburn sends a specimen of this species, which was found by him in an outhouse attached to his residence in Honolulu (No. 93). It is probably introduced, being a parasite of the house-fly. Walker ('Notes on Chalcidiae,' p. 88) records the other species (*S. nigra*) from the Galapagos Islands.

FOSSORES.

CRABRONIDÆ.

Crabro polynesialis, n. s.

Black; scape beneath and basal three-fourths of mandibles reddish-yellow; calcaria testaceous; labrum and cheeks covered with a dense golden pubescence; head and thorax sparsely covered with longish hairs, fuscous on top, white at the sides; base of abdomen almost glabrous, the apical segments covered with longish silvery hairs. Head and thorax semi-opaque, finely punctured, the punctures on scutellum and post-scutellum rounded and more distinct than on the mesonotum, and very finely longitudinally striated; extreme base of metathorax longitudinally striated, and with a few short more or less indistinct carinae running from the transverse ridge at the apex of the post-scutellum; on the centre there is a furrow, which is scarcely visible on the upper half, but is more distinct on lower half. Abdomen smooth, shining, the apical segments faintly punctured and covered (especially at apex of segments) with white hairs; the last segment has two carinae at the sides, which converge at the tip, which is acute. Wings subhyaline, with a distinct violet iridescence; nervures

testaceous ; outer edge of tegulæ rufo-testaceous. Hinder tibiæ armed with thick, widely separated, blunt, fuscous-coloured spines. Length $4\frac{3}{4}$ lin. Expanse of wings, $6\frac{3}{4}$ lin.

Closely allied to *C. unicolor*, Smith, but readily distinguished by the different colour of head and antennæ, by the less dense pubescence on the thorax, by the less dense punctuation on the mesonotum, which has a blistered appearance, and by the metanotum having the central channel very much less developed. The spines on the hinder tibiæ of *unicolor* are also more numerous and more strongly developed.

Mr. Blackburn tells me that the male has dentate antennæ like the same sex in *C. denticornis*, Smith, &c.

Taken by Mr. Blackburn at an elevation of from 3000 to 4000 feet on Mauna Loa, Hawaii. (No. 75).

TENTHREDINIDÆ.

Incalia hirticornis, Cameron.

This genus wants entirely the "lanceolate cellule," this being also the case with *Syzygonia*, *Cephalocera*, and one or two undescribed genera from Central America. *Incalia*, *Syzygonia*, and *Brachytoma* have short thick palpi, the maxillary being 4-jointed and the labial 3-jointed. I know also a genus from Central America which has only 3-jointed maxillary palpi, and the labial apparently with only one joint.

Nematus scoticus, n. s.

Black ; head and thorax covered with a close pubescence, which is especially long on the face ; labrum, legs, and apex of abdomen dull testaceous ; mandibles brownish ; palpi dark testaceous ; the greater part of coxæ, a line on the under side of anterior femora, one above and beneath on middle, and the greater part of posterior, black ; apex of posterior tibiæ and tarsi fuscous. Vertex minutely punctured ; antennal fovea long, broad, and moderately deep ; frontal area indistinct. Antennæ as long as the abdomen, thickish, the third and fourth joints about equal, and not shorter than the ninth, which is sharply conical at apex ; black, brownish from the third joint beneath, and slightly pilose. Mesonotum shining, scarcely punctured ; pleuræ

opaque, punctured; sternum smooth, shining; tegulae testaceous. Wings hyaline; nervures for the greater part, costa and stigma, livid white; first submarginal nervure distinct; third submarginal cellule longer than broad. The spurs do not reach to the middle of metatarsus; claws with a minute subapical tooth; the cerci are longer than spurs; sheath of saw with a long hair fringe. Female. Length $2\frac{1}{2}$ lin. Expanse of wings, $5\frac{1}{2}$ lin.

Agrees with the *Ambiguus*-group in having the antennae brownish beneath, but differs in the punctured pleurae, black pronotum, and clypeus. It differs from *pallipes* and its allies in its more shining body, in having the antennae brownish beneath, and the pronotum black. It has the legs covered pretty much as in *lativentris*, Thoms., but the body is much narrower, and more shining and less punctured, the costa and stigma of a more livid white, the third submarginal cellule shorter, and the apex of the abdomen is more marked with testaceous colour.

Taken at Braemar by Dr. Sharp.

Tenthredo togata, Panz.

No less than five species have been referred to the *T. togata*, Pz., by different authors. A reference to the original figure and description (F. G., lxxxii., f. 12) shows beyond doubt that it is the same as *Emphytus succinctus*, Kl., which name must, therefore, sink in favour of *togata*.

All this confusion has been caused by Fabricius (S. P., 32, 15) describing a species under the name of *togata* which is quite distinct from that described by the German author. The *Tenthredo togata*, Fab., is a rare and little-known species, and it has been described under the name of *cingulatus* by St. Fargeau (Mon. 117, 243), and as *Emphytus neglectus* by Zaddach (Beschr., 27). André (Species des Hymén. i. Cat. p. 31*) sinks it as a synonym of the common *Emphytus cinctus*, but to my mind the two are quite distinct; *cingulatus* being recognised from *cinctus* by its smaller and more slenderly-built body, clearer wings, longer and thinner antennae; the mouth, pronotum, and legs marked with white; tarsi fuscous; the posterior tarsi longer compared to the tibiae, and the blotch much larger, more distinct, and

shaped like a triangle. The synonymy of the two species will then be :—

E. togatus, Pz., non Fab. = *succinctus*, Kl.

E. cingulatus, Lep. = *togata*, Fab., non Pz. = *neglectus*, Zad.

Pachyprotasis albicincta, n. s.

Black, yellowish-white beneath. Head black on the vertex from a little above the insertion of the antennæ behind, and at the sides above the upper fourth of the eyes; the eyes in front are entirely bordered with yellowish-white, and this colour is prolonged on either side behind the ocelli into two small irregular points. The yellowish-white colour is also prolonged between the antennæ into the black portion, where it terminates a little above the eyes in an oval spot. Thorax and abdomen black above, save a triangular mark on the mesonotum (as in *P. rapæ*, &c.); a small spot behind this, scutellum, post-scutellum, a longer, narrower, transverse line behind it, the apical edges of all the abdominal segments, and the greater part of the last segment above, whitish-yellow. Antennæ black, with the two basal joints yellow beneath. Tegulæ white. Mesopleuræ black beneath the wings, this black being continued as a narrow oblique line to the middle coxæ; lower down there is a broader transverse black mark. Legs yellowish-white; four anterior lined with black above; posterior pair with an oblique black line on the coxæ, a line over the trochanters and femora, and the whole of tibiæ (save an obscure pale spot in the middle beneath) and tarsi black; spurs black, paler at the base; sheath of saw black, white in the middle. Wings hyaline; costa and stigma black. Length $4\frac{1}{2}$ lin.

Hab. Himalayas.

Similar in sculpture to *rapæ* and *antennata*, but it is a broader insect. From *rapæ* it differs in the abdomen being distinctly banded with white on all the segments; in the different arrangements of the black on the mesopleuræ, and in the much longer metatarsus, which is as long as the whole of the succeeding joints; from *antennata* the black on the mesopleuræ and the black hind tibiæ distinguish it at once.

THE BRITISH SPECIES OF *TENTHREDOPSIS*, COSTA.

I have recently subjected the saws of as many forms of *Tenthredopsis* as I could obtain to a careful microscopical examination; and the result of this examination has convinced me that many of the forms, which are regarded by almost all the recent writers on the subject as varieties of one or two species, are, in reality, good species. I find that each form exhibits distinct peculiarities in the shape and arrangement of the teeth on the saws; in some cases no doubt the differences are slight, but in others they are markedly distinct. The form of the saw cannot very well be described in words, and I have not attempted to do so here; but in the Monograph of the British Sawflies I have now in preparation, figures will be given of the saws of the species enumerated here. From want of material I have not been able to assign the males to their respective females in more than eleven species. The following is a list of the British species, with descriptions of nine species which I consider to be undescribed:—

1. *T. cordatus*, Fourc. = *dimidiata*, Fab.
2. *T. microcephala*, Lep.
3. *T. femoralis*, Steph.
4. *T. caliginosus*, Steph.

5. *Tenthredopsis nigronotatus*, n. s.

Black; labrum, clypeus, mandibles, orbits of eyes, a spot behind them, scutellum and two spots behind it white; legs, and third, fourth, and fifth abdominal segments in part bright red; coxæ, trochanters, and an interrupted line down the centre of the red abdominal segments black; hinder coxæ pitchy on lower side in the middle; posterior tarsi faintly fuscous; clypeus almost truncated at the apex. Antennæ black, the four or five apical segments fuscous beneath. Wings hyaline; stigma fuscous, the extreme base white; tegulæ black. Length nearly 6 lin.

Very similar in coloration to *ignobilis*, but larger and stouter; antennæ and spurs longer; clypeus yellow and not so transverse at apex, and the abdomen has only

three segments red, and these are marked with black in the centre.

In Shuckard's collection, now in the possession of Mr. Edward Saunders.

6. *T. ignobilis*, Kl. = *stigma*, Lep., non Fab.

7. *T. nigricollis*, Cam. = *scutellaris*, Lep., non Fab.— This species is very like *ignobilis*, but it differs from it in having the hinder femora black; the red band on abdomen is narrower, and the mesonotum is quite black, and does not bear a reddish spot on lateral lobes. The three foregoing species may be known from the other red-banded species by having the pronotum, coxæ, and trochanters black; while *scutellaris*, &c., have these parts more or less marked with white, and they have also (except *picticeps*), the red on abdomen spotted with black in the middle.

8. *T. scutellaris*, Fab., non Lep.

9. *Tenthredopsis flavomaculatus*, n. s.

Black, shining, pilose; labrum, clypeus, mandibles, orbits, a longish spot behind the eyes, edge of pronotum, scutellum and the usual parts behind it, sometimes a few minute spots on mesonotum, a broad band on base of abdomen, and an irregular spot on coxæ, bright yellow. Antennæ pitchy; the edge of second, the whole of third, fourth, fifth, and sides of sixth abdominal segments bright testaceous-red; legs bright testaceous; the greater part of coxæ and the base (sometimes a line above) of hinder femora black; hinder tarsi more or less fuscous. Wings hyaline; costa and stigma fuscous, the latter white at base.

The male is similarly coloured to the female save that the abdomen has only faint indications of the testaceous colour on the middle abdominal segments and beneath; the antennæ if anything are lighter coloured on lower side; the posterior femora are entirely black, and the tibiæ and tarsi pitchy. The last segment above bears two deep depressions, and the yellow line on base is scarcely visible. Length $4\frac{1}{2}$ lin.

Very similar to *T. picticeps*, but shorter and broader; the antennæ are shorter, head wider, head and thorax

more shining, and the band on base of abdomen much wider. The saw is very different.

Not common. Mull, Rannoch.

10. *Tenthredopsis picticeps*, n. s.

Black; labrum, clypeus, orbits of eyes, a line on pronotum and scutellar spots, white, the third to sixth segments of abdomen all round, and the legs, bright red; coxæ black, largely white behind; trochanters white; posterior femora black at base; posterior tarsi fuscous at apex. Antennæ longish, pale beneath. Wings hyaline; stigma white at base. Length 5 lin.

Allied to *ornatus*, but it has the incision in clypeus not so deep, the eyes are marked with yellow all round, the antennæ are longer, with the third joint not so long in proportion to the fourth, and the pleuræ are scarcely punctured; *ornatus*, too, has the clypeus black.

Rare.

11. *T. ornatus*, Lep. = *excisus*, Thoms.

12. *T. tristis*, Steph.

13. *T. fulviceps*, Steph.

14. *Tenthredopsis lividiventris*, n. s.

Black; labrum, clypeus, mandibles, the orbits of eyes broadly, edge of pronotum, tegulæ, and scutellar spots, white; an irregular splash on mesopleuræ, and one on each side of sternum, and the edge of abdomen above testaceous; the sides and lower surface livid white; legs testaceous; coxæ black, lined at the sides and beneath with livid white; trochanters pale; hinder femora for the greater part black above; apex of hinder tibiæ and tarsi fuscous. Wings hyaline; stigma pale at base; tegulæ white. Length scarcely 6 lin.

Easily known from the other British species by the livid abdomen, and by the pale testaceous splashes on pleuræ and sternum.

Not common. Mugdock Wood, near Glasgow, early in June.

15. *Tenthredopsis albomaculatus*, n. s.

Head with the labrum, clypeus, mandibles, and the orbits of the eyes broadly, white; the rest dull brown, save the sutures on vertex and the space surrounding the base of antennæ, which are black. Antennæ dull testaceous, darker above, especially at the apex, which is somewhat attenuated. Thorax black, a line on pronotum white; mesopleuræ with a broad white mark; metapleuræ lined with white; sternum for the greater part dull brown; sutures of mesonotum dull brown; scutellar spots white. Abdomen dull testaceous, a broad black band down the back, a white transverse line at the base. Legs testaceous; coxæ black, broadly lined with white at the sides and beneath; hinder tarsi and apex of tibiæ fuscous. Wings hyaline; stigma fuscous, white at the base. Length 4 lin.

This is a somewhat larger insect than *lividiventris*; the brownish colour on head and thorax is much more extended; the marks on pleuræ are larger and clear white; antennæ paler; coxæ almost wholly white, and the legs reddish without any black on them.

Rare. Rannoch, in June.

16. *Tenthredopsis nigriceps*, n. s.

Dark rufescent. Antennæ, head below the hinder ocellus, prothorax beneath, mesopleuræ behind, metathorax, the greater part of the four anterior coxæ, and all the trochanters, deep black; scutellar spots and cenchri yellow. The front tibiæ are paler than the rest of the legs, the base of middle femora, and the greater part of the posterior femora and coxæ suffused with black; hinder knees black; posterior tarsi fuscous. Head and thorax covered with a close fuscous pubescence; sutures of the mesonotum and parapsides black; labrum dirty white; palpi dark testaceous; coxæ and apex of abdomen black. Antennæ attenuated at the apex, longer than the abdomen, the third joint distinctly longer than the fourth; spurs on hinder legs not reaching to middle of metatarsi. Wings hyaline; costa pale, except before stigma, where it is fuscous; stigma fuscous, white at the base; accessory nervure in pos-

terior wings appendiculated; tegulæ deep black. Length nearly $4\frac{3}{4}$ lin.

The dark rufescent body and the black head and pleuræ readily separate this species.

Rare. Salen, Mull; June.

17. *Tenthredopsis Saundersi*, n. s.

Dark testaceous; mandibles, labrum, clypeus, scutellar spots, yellow; sides and lower part of thorax (save a dark testaceous splash on sternum), coxæ, trochanters, base of hinder femora, the middle suture on mesonotum, metanotum, base and apex of abdomen, and a triangular mark in centre of intermediate segments, black; hinder tibiæ almost piceous; apex of tibiæ, base and apex of tarsi blackish, the second, third, and fourth joints white. Antennæ fuscous; clypeus slightly incised. Wings hyaline; costa testaceous; stigma fuscous, white at the base. Calcaria short, not reaching to middle of metatarsus. Length 4 lin.

Similar to *T. nigriceps*, but it differs in being smaller and narrower, in having the lower part of the head the same colour as the upper, in the clypeus being slightly incised at the apex, the spurs shorter, tarsi paler, &c.

A single specimen in Shuckard's collection.

18. *Tenthredopsis dorsivittatus*, n. s.

Luteous; labrum, clypeus, orbits of the eyes, a spot behind the eyes, a line on pronotum, scutellar spots, and a line on base of abdomen, bright yellow; the suture on pleuræ, the greater part of metanotum and base of abdomen, and a broad band, usually more or less interrupted on middle segments, on back of abdomen, and the sheath, deep black; the four anterior coxæ dark luteous, more or less black and white; hinder coxæ black, spotted with brown and white; trochanters pale, a black spot beneath; hinder tarsi with the joints more or less fuscous. Wings hyaline; stigma white at the base. Female. Length $3\frac{3}{4}$ — $4\frac{1}{2}$ lin.

A Scotch specimen has the antennæ entirely luteous, and the black band on abdomen very faintly indicated, the tarsi scarcely infuscated, the space surrounding the ocelli, and the middle suture on mesonotum, black. An

English specimen is much darker coloured; the black band on abdomen is represented on segments 3—5 by a triangular black mark on each, but the black extends all over the upper surface of the basal and apical segments; the hinder tibiæ and apex of femora are fuscous, and the four apical joints of posterior tarsi pale; the antennæ pitchy, and the metapleuræ are not altogether black.

A species intermediate between *T. inornatus* and *nigriceps*; from the former it may be known by having the metapleuræ black, the coxæ blacker, and (as well as the trochanters) more distinctly marked with white, the antennæ and spurs longer; from the latter, by its longer antennæ and spurs, lighter-coloured antennæ, luteous tegulæ, pale trochanters, and entirely luteous femora.

Apparently rare in England and Scotland.

19. *Tenthredopsis inornatus*, n. s.

Dark testaceous; mandibles, clypeus, labrum, scutellar spots, yellow; dorsum of abdomen with an interrupted black band; hinder tarsi fuscous; apical joints of antennæ fuscous; vertex in centre, coxæ, trochanters, and hinder femora at base, and metapleuræ largely marked with black. The middle suture on vertex is absent; there is no distinct furrow between the ocelli, only a depressed space; frontal area depressed. Antennal fovea wide. Wings hyaline; stigma white at the base.

The male black; the labrum, clypeus, orbits of the eyes broadly, tegulæ and edge of pronotum yellowish white; front coxæ with a white spot on lower side; the remainder, and the posterior coxæ and base of femora, black; trochanters pale, the rest of the legs and abdomen reddish, except the apex and a band in the centre of the latter, which are black. Length $4\frac{3}{4}$ lin.

Compared with *T. nassatus*, it is smaller; the antennæ are shorter and thicker in the middle, with the third joint longer in proportion to the fourth; the colour is darker, the pubescence (especially on the mesonotum) is denser, the hinder tarsi are shorter in proportion to the tibiæ, and the spurs shorter. *Nassatus* too wants the black on the legs and pleuræ, and the head projects more behind the eyes. *Sordidus* may be known from it by its longer and thinner antennæ; the colour of the

body is much brighter, the antennal fovea is deeper, but the frontal area is not so clearly indicated, the clypeus is more transverse at the apex, the base of the legs always paler than the rest, and the pleuræ are marked with yellow. *Dorsirittatus* may be known from it by the black metathorax and coxæ, by the band on the abdomen being broader at the base and more distinct throughout, the band in *inornatus* being not much more than a darkening in colour compared to the colour of the rest of the abdomen.

Rare on birch in June. Bishopton, Rannoch.

20. *T. nassatus*, Lin., non Thoms.

21. *T. sordidus*, Kl.

The following table will aid in the identification of our species. I should add that I am not quite satisfied about some of the names I have adopted from the older authors, whose descriptions are not always clear, and the synonymy is very confusing, owing to different species having been described under the same name:—

A. Body for the greater part black.

I. Abdomen red at apex:

Legs entirely red, *cordatus*.
Hind legs for the greater part black. *femoratus*.

II. Abdomen entirely black.

Legs red. *microcephalus*.
Legs for the greater part black. *caliginosus*.

III. Abdomen red in the middle.

a. Pronotum and coxæ entirely black.

1. Posterior femora black. *nigricollis*.
2. Legs red.

Antennæ short; hinder knees black; the red on abdomen not spotted with black. *ignobilis*.

Antennæ longish; the red on abdomen spotted with black; knees black. *nigronotatus*.

b. Pronotum, coxæ, and femora lined with white; the red on abdomen marked with black in the centre.

1. Posterior femora black. *scutellaris*.
2. Posterior femora red.

- a. Clypeus deeply incised; tegulæ white. *ornatus*.
 b. Clypeus truncated; tegulæ black or fuscous; the red on abdomen marked with black; a broad yellow band on basal segment; tegulæ black.
flavomaculatus.
 The red on abdomen not marked with black; tegulæ fuscous. *picticeps*.
- IV. Abdomen testaceous at the sides and beneath.
- a. Head and thorax black; a yellow line at base of abdomen; hinder femora black. . . . *tristis*.
 b. Head more or less testaceous.
 1. Thorax entirely black; hinder femora black.
fulviceps.
 2. Thorax lined with white on pronotum and sides; vertex for the greater part black; mesopleuræ and sternum marked with brown spots.
lividiventris.
 Vertex for the greater part testaceous; mesopleuræ with a large white mark.
albomaculatus.
- B. Body for the greater part luteous.
1. Head below the ocelli and antennæ deep black; hinder femora for the greater part black.
nigriceps.
- II. Head below the ocelli luteous.
1. Mesopleura and sternum black; coxæ and base of femora black. *Saundersi*.
 2. Mesopleura and sternum luteous.
 a. Metapleura black. *dorsivittatus*.
 b. Metapleura luteous.
 1. Coxæ and sutures of meso- and metapleuræ marked with black.
 Calcaria short; second recurrent nervure not interstitiate. *inornatus*.
 Calcaria long; second recurrent nervure interstitiate. *nassatus*.
 2. Coxæ and sutures of pleuræ marked with yellow and white. *sordidus*.

Tenthredopsis dorsatus, Spin.

Ins. Lig. ii., 17, pl. iv., f. 15.

This is a good species. It is very like *ornatus*, Lep., but is a broader and stouter-built insect, the antennæ

are shorter and stouter, the abdomen has only four of the segments red, the wings are fuscous, and the saw is different. Otherwise the coloration is the same as with *ornatus*.

Dr. Sharp found *T. dorsatus* in Spain.

Dolerus tinctipennis, n. s.

Deep black, shining, covered on head and thorax with a close white longish pubescence; head roughly punctured; the scutellum and middle lobe of mesonotum clearly but not deeply, nor closely, the lateral lobes on inner sides faintly, and on outer scarcely, punctured. Sutures on vertex scarcely visible. Antennæ not much longer than the abdomen, the third joint not much thinner than the following, and one-fourth longer than the fourth, which is a very little longer than the fifth; the joints from the fourth distinctly thickened, the two apical a very little thinner than the preceding, but still thicker than the third. Cenchri large, greyish white. Base of abdomen smooth, impunctate. Wings with deep black nervures and stigma; apical half in both wings fuscous, inner half hyaline; accessory nervure in hind wings shortly appendiculated. Spurs longish; four anterior fuscous, posterior deep black. Length $3\frac{1}{2}$ lin.

The nearest ally of this species is *D. Gesneri*, André; but that species is much larger, has the antennæ longer and more filiform, the mesonotum more deeply and uniformly punctured all over, and the wings not so deeply fuscous in colour. The saw of *tinctipennis* and *Gesneri* agrees with that of *D. dubius*, Kl., in having the surface indented with cross-bars bearing teeth. See Hartig, Blattw., pl. v., fig. 4a.

D. Gesneri, André, I found at Loch Awe last June. The front legs are sometimes entirely black.

Dolerus megapterus, n. s.

Black; head and thorax opaque, densely covered all over with a close longish grey pile, which gives these parts a greyish appearance; closely punctured all over. Antennæ not much longer than the head and thorax, short, thick, the last joint distinctly thinner than the eighth, the third much longer than the fourth. Cenchri

dull grey. Abdomen smooth, shining, the basal segment with a few scattered punctures; the sides and belly covered with a whitish pubescence, which, however, is not so long as that on the thorax. Wings almost hyaline, large; nervures and stigma black; transverse cubital, radial, and recurrent nervures white in the middle; transverse median nervure received before the middle of the cellule; accessory nervure in hind wings almost interstitiate. Length $4\frac{3}{4}$ lin.

Slightly larger than *D. fissus* (*cenchris*), but the antennæ are shorter, thicker, and not so attenuated at the apex, punctuation on mesonotum not so deep, while the pile is longer and thicker, the transverse median nervure is received nearer the base than apex of the cellule, the contrary being the case with *fissus*, and the *cenchri* smaller and dull grey. The saw too is differently indented at the edge.

Manchester district.

Dolerus intermedius, n. s.

Black, shining, covered with a short scattered pubescence. Head roughly punctured; sutures on vertex distinct and very shining; the whole of the scutellum and the middle lobe of mesonotum punctured; the lateral lobes also punctured, but not so deeply and more irregularly; *cenchri* large, clear ivory-white. Abdomen longer than the head and thorax, bulged out in the middle, the basal segment impunctate, the following finely shagreened, three basal segments glabrous, the rest slightly pilose; blotch distinct. Antennæ slightly thickened in the middle, shorter than the abdomen, the third joint a little longer than the fourth, the last sharply conical. Spurs pale at the apex, the hinder pair reaching to the middle of the metatarsus, which is pale, curved at the base, and thickened at the apex, and scarcely longer than the two succeeding joints. Wings hyaline, slightly infuscated at the extreme apex, accessory nervure in hind wings appendiculated; costa, stigma, and nervures black, save the transverse nervures and the lower part of stigma, which are milk-white. The male has the head and thorax more deeply punctured, the antennæ thicker and as long as the abdomen and half the thorax; the third joint almost shorter than the fourth. Length $3\frac{1}{2}$ —4 lin.

Agrees with *varispinus*, Htg., in having the lower part of the stigma, recurrent and transverse nervures, white, and in the form of the head; but it is smaller and narrower, the punctuation on head and thorax is finer and closer, cenchri larger and of a clearer white, the transverse radial nervure is not received close to transverse cubital, and the transverse nervures in posterior wings are wider apart. As in *varispinus*, the base of hind tarsi is generally white, but is occasionally black, and the spurs are in some cases blackish, in others wholly white. The saw is different from that of *varispinus*. It is smaller, as a rule, than *ceneus*.

Common and widely distributed.

From an extensive examination of the ovipositor in the *Tenthredinidæ*, I have become convinced that its form affords us an almost absolute test of specific distinctness, and that its examination ought never to be neglected when describing as new, any doubtful forms. This is no doubt a troublesome proceeding, but it is certainly worth the labour when we consider that it enables us to define the limits of species to a very great extent indeed. I think then that no apology is needed if I describe my method of mounting and preserving the "saw" for microscopic examination, the more especially as the method can be applied to microscopic mounting generally.

With fresh specimens the saws can be extracted very easily by pressing the abdomen, when they will be protruded and readily extracted. With old specimens it can be done equally well by placing the insect in a relaxing-dish, or, more promptly, by steeping it in water for a day, when they can be taken out in the same way as with fresh insects, the only difficulty being experienced with insects full of eggs. For their better examination the four pieces composing the ovipositor proper should be separated; after which they must be steeped in turpentine for a day or two so as to get rid of air. This is best done by enclosing them in a small folded piece of paper; and, if they be properly labelled, many different preparations can be placed in the turpentine-bottle together.*

* In the case of such organs as the mouth parts (palpi, &c.), I find it an advantage, after dissection, and when they are ready for mounting, to place the papers containing the preparation inside a book for a day or so, as by doing so the parts retain their position better, and are not so apt to curl up.

Next take a sheet of fine Bristol-board, and cut it up into pieces, say twelve lines by nine, and punch, at one end, a round or square hole four or five lines across. On the lower side of this fasten, by means of Canadian balsam dissolved in benzine, a microscopic cover glass. When this has dried fill up half the cell thus formed with the same composition, spreading it as evenly as possible, and in it arrange your preparation. Put it aside for some hours in a place where no dust will fall on it, then fill the cell with enough balsam to run over the edge of the cell, place a cover-glass over it, and press it down. All that now requires to be done is to allow the preparation to dry, taking special care to keep it flat, to label it, and stick a pin through the card, by means of which it is stuck in the cabinet alongside the insect from which the part was taken. To examine it under the microscope, all that is necessary to do is to place an ordinary glass slide across the stage, and place the card on it, in doing which it is not necessary to take the pin out of it, if a short pin be used.

The great advantage of this plan for entomological purposes is, that it does not necessitate the formation of two distinct collections, which must be the case if dissections are mounted on glass slides, which cannot, of course, be placed alongside the insects. Besides that it is cheaper, more expeditious, and safer; for the cards are so light that no injury comes to them from falling, or getting loose in the box. If desired, a coloured ring can be put round the top object-glass by the turn-table in the ordinary way, but, except for ornament, I do not think it necessary. I usually prepare two or three dozen of the cards with one cover-glass on at a time, so as to have them ready for use. I should add that the object of letting the dissections harden in the cell half filled with balsam is that three or four separate parts may be arranged in the most suitable way in the same cell without fear of their being disarranged or injured when the top cover-glass is put on, while both might happen if the whole operation was performed at once. I need scarcely add that the old barbarous method of using the undiluted balsam—a process requiring the aid of a lamp—will not apply here.

For the examination of the saws I find a quarter-inch objective the best; the teeth in some cases are so fine that they are apt to be overlooked if lower powers are used.