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NEW MATERIAL OF SPHECID WASPS FROM THE PHILIPPINES

(HYMENOPTERA)

By K. TSUNEKI

The specimens dealt with in the present paper were collected by the Fukui Party of the members of the Japan Hymenopterists Association, Miss C. Nozaka and Messrs. T. Tano, H. Kurokawa, T. Murota and K. Sabi, in their several times expeditions to the Philippine Islands and kindly sent to me for study. I express my hearty thanks to them for their kindness.

The material consists mainly of the species of Crabroninae and partly of those of Pemphredoninae and Philanthinae that were picked up at their option and does not include the large-sized wasps such as Sphecinae and Nyssoninae.

I. C r a b r o n i n a e

1. Rhopalum (Rhopalum) domesticum Williams, 1928

Rhopalum domesticum Williams, Phil. J. Sci., 35(1): 101, 1928 (♀ ♂, figs., Luzon).
Rhopalum (Rhopalum) domesticum: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 63, 1963 (1 ♀, Mindanao, 1 ♂, Luzon, 2 ♀, Negros).

Specimens examined: 5 ♀ 3 ♂, Luzon (Prov. Launion: St. Fernando and Baguio City: Mines View Park - 1500 m) all leg. T. Murota (26.XII.1979 and 26.III.1978).

Remarks. In the specimens observed mandibles are largely yellow (in the original description "largely reddish"), gaster except petiole largely reddish beneath and bases of tergites 2 and 3 are comparatively broadly reddish. This species apparently occurs in high altitude.

2. RHOPALUM (RHOPALUM) AVEXUM LECLERCQ, 1963

Rhopalum (Rhopalum) avexum Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 65, 1963 (2 ♀, Luzon: Baguio)

Specimens examined: 1 ♀ 3 ♂, Luzon: Baguio City, Mines View Park, 1-3.I.1980, T. Murota leg.

3. RHOPALUM (CALCEORHOPALUM) CANLAONI LECLERCQ, 1963

Rhopalum (Calceorhopalum) canlaoni Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 73, 1963 (♀ ♂, Luzon and Negros).

Specimens examined: 4 ♀ 1 ♂, Leyte, Imerda Lake, 19.IV.1980, T. Tano; 1 ♀ 2 ♂, Luzon, Baguio City: Mines View Park, 1500 m, 1.I.1980, T. Murota.

Remarks. In the female specimens from Leyte fore T1-4 and mid T1-3 are pale yellowish white and fore T5 and mid T4 slightly brownish white and mid T5 dark brown, while in the male mid T1-4 white as in fore tarsus. In the Luzon female fore T1 (except brownish apex) and mid T1-2 alone white, in the males fore T1 and mid T1-3 (except apices) are white. In the male A2≅3 in length and longer than others, both as well as A6 excavated at base beneath and produced at apex, from A7 to A11 gently rounded out beneath, from apical part of A2 to A6 pale yellow or yellowish white beneath and the coloration is remarkable; in fore tarsus T1 longer, flattened and curved, thus modified; hind T1 long and considerably incrassate.

4. ISORHOPALUM MAYONI LECLERCQ, 1963

Isorhopalum mayoni Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 77, 1963 (♀ ♂, Luzon: Mt. Mayon).

Specimens examined: 2 ♂, Leyte: Lake Imerda, 19.IV. 1982, T. Tano.

Remarks. This species is very characteristic in the structure of the clypeus (disc of median lobe with a highly raised longitudinal ridge on each side which is

roundly curved in lateral view and smooth and shining on top), antenna (except ultimate one each joint of flagellum short, shorter than wide, dark brown above and ferruginous beneath), pronotal collar (sides acutely triangularly incised across middle, giving rise to bidentate structure), gastral petiole (apical third strongly roundly swollen, but shorter than united length of hind tibia and T1-2), hind tibia (very strongly clavate, with short spinules sparsely scattered on outer side), following T1 (markedly incrassate) and propodeum (area dorsalis not distinctly margined, obliquely coarsely striate, posterior inclination with distinct lateral carinae, sides with an oblique stigmal carina). Colouration as in original description.

From the Philippines one other species, *I. palawanensis* Tsuneki, is known from Is. Palawan.

5. CROSSOCERUS (CUPHOPTERUS) APOSANUS SP. NOV.

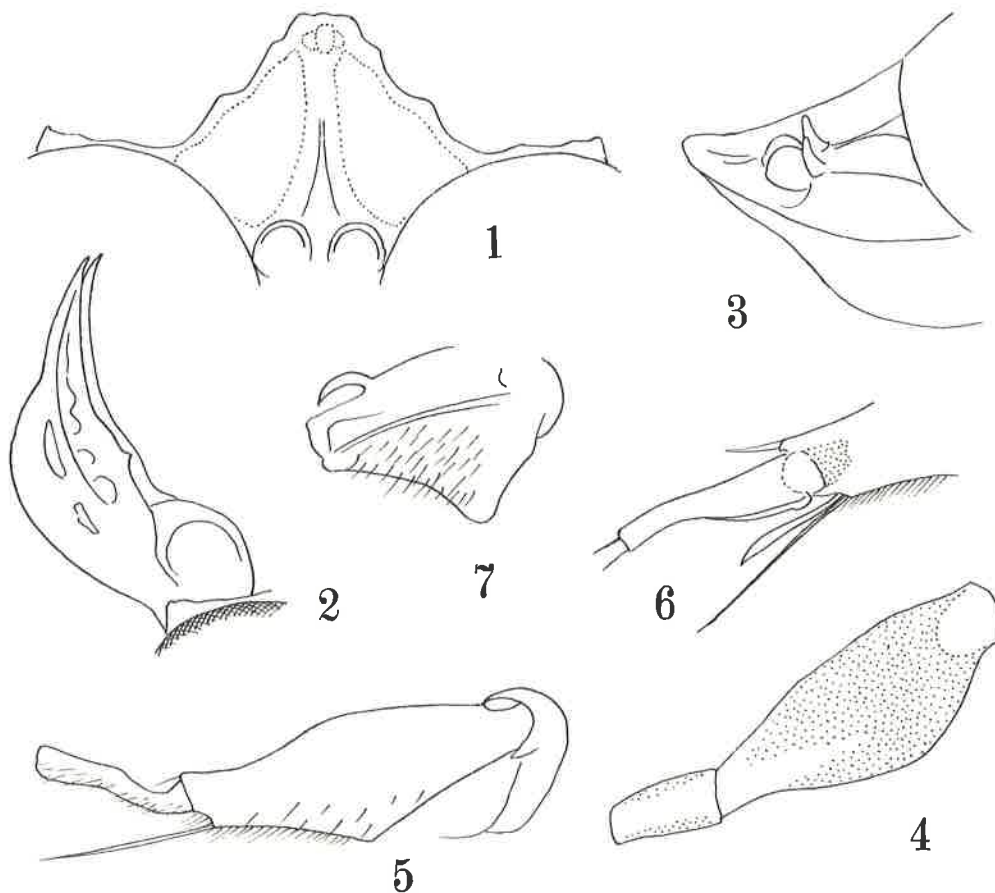
The present species (δ) is exceptional to the subgenus to which it belongs in having a well developed precoxal tooth on the mesopleuron. It is also characteristic in the combination of colouration that mandible is black, body is marked with yellow and G1 and legs are maculated with white.

δ . 8.3 mm. Shining black, without plumbeous lustre; lemon yellow are A1, clypeus except marginal areas and median line (Fig. 1), collar and tubercles of pronotum, a spot on tegula and on basal plates of fore and hind wings, axillae, a medianly constricted large mark on scutellum, postscutellum, laterally widened and medially narrowly interrupted preapical band on GT1 and 3, a thrice interrupted narrow one on GT4, a preapical narrow band on GT5, a broad one on 6 and apical half of GT7; pale yellowish white are a small patch above meso- and metacoxae, base and apical band (including two brown patches) of GT1 (on sides narrowly connected with each other), a patch at apex on outer side of each coxa, apex and fore side of each trochanter, an apical mark and underside of fore femur and a mark at apex above of mid femur. Mid femur in posterior view medianly broadly translucent reddish ferruginous. Hair on clypeus silvery.

Head above on both sides of frontal fine furrow elevated and the areas between the elevations and inner orbits depressed, outer parts of which correspond supraorbital foveae, but not margined nor descended by different of black tone, outside of each ocellus also depressed and surface between hind ocelli fairly acutely elevated, ocelli in a triangle slightly lower than equilateral one, OOD:Od:POD:OCD=10:6:5:11. Clypeus: Fig. 1, A1 ecarinate, A2-5 with relative length 5,10,5,4.7, A3=AW \times 3.3, fringe of hair of flagellum long, on A3 about twice as long as its width and gradually slightly shorter apically; mandible in frontal view: Fig. 2, outer side deeply excavated with margins acutely edged, excavation slightly twisted, genal plate behind mandibular base elongate triangular, with apex about 90°, with apical side slightly more than half the width of mandibular base; occipital carina not reaching hypostomal carina, at apex abruptly ending. Pronotal collar and scutellum raised considerably high, the former medianly finely furrowed (with bottom black) and the latter broadly so, on mesopleuron postspiracular and epicnemial carinae acute, the latter at apex suddenly ending, precoxal tooth stoutly produced, with top rounded, a short weak carina (signum) present between mesopleuron and -sternum at about middle of the length of the segment; propodeum acutely carinated on both lateral margins, area dorsalis marked off on both sides by acute carinae, accompanied just inside with a fine furrow, but on broad posterior side without carinae or furrow, only acutely verged to posterior inclination, median furrow of the area broad and shallow, margined on both sides by weak carinae and at base in middle shortly carinate; posterior inclination with surface gently roundly raised and medianly on dorsal half with an elliptic depression and on ventral half strongly carinated. G1 twice as long as wide at apex, but not nose, GT7 medianly finely impressed at apical half (shining impressed line narrowly brownish), GS6 medianly longitudinally impressed, GS7 closely bidentate at about middle and roundly swollen just behind each of the teeth (Fig. 3), right fore femur seen from above: Fig. 4, flat beneath and acutely edged at posterior margin, left fore tibia and T1: Fig. 5, medianly obliquely keeled beneath, with both sides also flattened and acutely edged at posterior margin, T1 in posterior view: Fig. 6; mid femur strongly swollen out beneath and excavated in front beneath, mid tibia obliquely excavated on outer side, posterior margin of the excavated furrow transversely carinate, right hind coxal tooth seen from outer side: Fig. 7, inner side of the tooth flattened, hind tibia subclavate, apex not rounded, with strong spines on outer side, mid and hind T1 incrassate on apical two thirds, apparently basally constricted. Abscissae I,II and

III of radius relatively 10,15,5 in length, III gently outcurved and vertical to costa, absc. I,II,III of cubitus, under same scale, relatively 14,10,5.

Upper frons and vertex very sparsely covered with fine piliferous punctures, punctures on mesoscutum somewhat stronger and closer, but still $PIS > PD$, those on mesopleuron much finer and sparser, area dorsalis at base coarsely foveate, on lateral areas weakly microcoriaceous and on median area irregularly rugulose, with a pair of long ob-



lique weak carinae, posterior inclination at dorso-lateral areas (including outside of area dorsalis) moderately largely and fairly strongly punctate-reticulate, on both sides of medial hollow nearly smooth and on both sides of medio-apical carina transversely rugoso-striate; sides of propodeum smooth, but on dorsal area longitudinally arcuately and sparsely striate, with interspaces of striae weakly rugulose. GT1 smooth and polished, GT2-7 very closely covered with short-hair-bearing punctules.

♀, unknown.

Holotype: ♂, Mindanao, Mt. Apo, 1500 m, near lake Agko, 8.VIII.1980, T. Tano leg. (Coll. Tsuneki).

6. CROSSOCERUS (APOCRABRO) AETA PATE, 1944

Crossocerus (Apocrabro) aeta Pate, Lloydia, 6(4): 285, 1944 (♀, Mindanao, Mt. Apo).
Crossocerus (Apocrabro) aeta: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 4, 1963
 (Philippines: Negros).
Crossocerus (Apocrabro) aeta: Bohart & Menke, World Sphecid., p. 400, 1976 (listed).

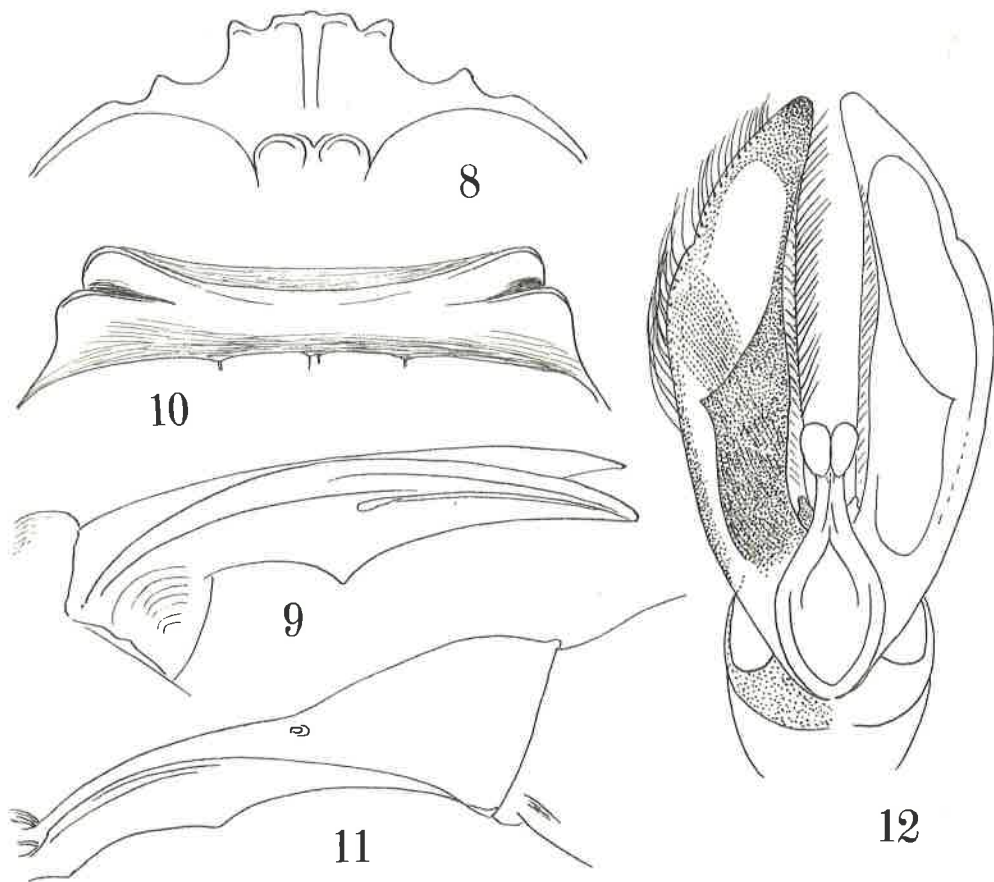
Specimens examined: 2 ♂, Mindanao, Mt. Apo, 700-1000 m, 7, 9.VIII.1980, T. Marota leg.; 1 ♂, Luzon, Baguio City, Mines View Park, 1.I.1980, T. Marota leg.

Remarks. In the male specimens the scapal basin has blunt but distinct lateral carinae (they are less distinct in the female). If the stress is placed upon this character *Apocrabro* must be considered to be a distinct genus. Certainly, in some other characters it shows considerable particularities:

Pygidial area in the female is at base triangular and narrowed and excavated apically, but basal area has a flattened, finely sculptured and opaque platform, on which a fine medial carina runs to apical smooth and gutter-like part; ultimate and penultimate tergites in the male uniformly finely punctured, without difference in size of punctures between them; mandibles uniformly bidentate at apex in both sexes; pronotal collar without medial incision and at sides acutely constricted into bidentate or bicarinate structure (Fig. 10). Furthermore, apical structure of occipital carina, strong precoxal tooth of mesopleuron, coarse sculpture of propodeum and the form of gastral segment 1 are also unusual to *Crossocerus*.

On some male (hitherto unknown) characters:

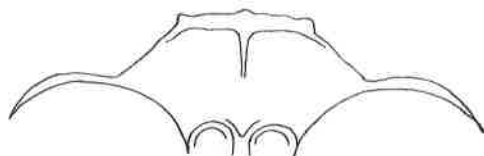
Clypeus: Fig. 8 (closely resembles that of the Formosan race, *loa* Pate); mandible: Fig. 9; Al-6 with relative length =29,6,10,6,5.5,5, A3=AW×3, flagellum without fringe of hair; OOD:Od:POD:OCD=10:5.5:5.5:17; pronotum: Fig. 10; gastral segment 1 with ratio of length to width at base, at minimum behind base, at spiracles and at apex =100:24:12:16:38, while maximum width of gaster at ♂3 is relatively 85; relative lengths of hind trochanter, femur, tibia and T1 =20:80:72:25; G1 in lateral view: Fig.11; genitalia in dorsal view: Fig. 12, pattern of distribution of the melanic pigment over paramere is considerably variable individually.



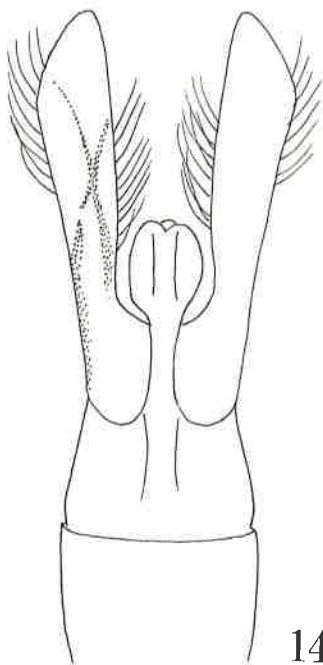
Abscissae I,II,III of radius =10,14,4 in relative length, III is vertical to costa, under same scale absc. I,II,III of cubitus =15,9,5, angle formed by I of radius and III of cubitus about 70°.

7. CROSSOCERUS (CROSSOCERUS) APONIS SP. NOV.

♂, 5.0 mm. Black; Al yellow in front, mandible apically reddish, femora and tibiae of fore and mid legs partly on folded side and in front ferruginous brown. Very remarkable is that extreme bases of both wings carry a few slender pale yellowish plates and that PIS of mesoscutum is distinctly microcoriaceous.



13



14

Head seen from above comparatively thick, wider than thorax, with temple markedly roundly convergent posteriorly, without well defined supra-orbital foveae, ocelli in a triangle slightly lower than equilateral one, occipital carina not reaching hypostomal carina, not ending in a tooth, median lobe of clypeus subtruncate at apex and minutely weakly produced in middle (Fig. 13), mandible slender and long, symmetrically bidentate at

apex, without tooth or swelling on inner margin, antenna slender and long, $A_3=AW \times 2.3$, pronotal collar with anterior margin straight, with lateral angles broadly rounded and reflected, surface nearly flat and medianly minutely incised, mesoscutum with notauli very finely carinate, posterior margin shortly crenate, scutellum and postscutellum roundly raised, without median carina or furrow, on prepectus post- and hyospiracular carina distinct, united below into omaulus, the area posterior to humeral tubercle deeply excavated, precoxal tooth of mesopleuron present, not strong, very bluntly raised; propodeum with lateral carinae, strong and thorough, area dorsalis distinctly enclosed with furrow, widest across middle and medianly finely furrowed. GT1 longer than wide, sessile and at base triangularly deeply furrowed in middle, GT7 with pygidial area, wider than long, with apical margin broadly rounded, GS4 gently, rather minutely emarginate at apex in middle (somewhat similar to the case in emarginatus). Genitalia in dorsal view: Fig. 14; legs without modification, hind tibia not clavate.

Measurements: HW at eyes, at externo-posterior orbits and at occipital carina and HL at eye and in middle relatively =100,95,54,67,61; IODv at anterior margin of hind ocelli relatively 56. OOD:Od:POD:OCD=10:6:6:11. Al,2,3,4,5,6=26,8,10,8,6,5. Gl with L:W=40:25, length of hind femur relatively 38. Abscissae I,II,III(transverse) of radius =10,16,5, III is vertical to costa, those of

cubitus =13,12,6 (same scale).

Upper frons finely, somewhat sparsely punctured, PIS 2-3 times PD; punctures on mesoscutum slightly larger, with PIS mostly 1-1.5 times PD and strongly microcoriaceous, mesopleuron much more finely and sparsely punctured with piliferous points, Area dorsalis at base strongly and closely, on marginal furrows more weakly and sparsely foveolate, disc on medio-basal part finely weakly punctured, posterior inclination smooth and shining, on central depression obliquely, sparsely and weakly striate with fine impressed lines, along lateral carinae strongly crenate. From apical half of GS2 posteriorly microcoriaceous, the sculpture gradually stronger towards apex.

♀, 5.5 mm. Very similar to ♂, even in the form and structure of clypeus and mandible, in the characteristic colouration of wings, legs and antennae and in the punc-

turation and microsculpture of mesoscutum. Measurements:

NW at eyes, at externo-posterior orbits and at occipital carina and HL at eye and in middle =100,98,56;68,60. IODv at anterior margins of hind ocelli relatively 54. OOD:Od:POD:OCD=10:6:6:13. Al,2,3,4,5,6(when A3=10)=26,7,10,7,6,6. Gl with L:W=40:25, length of hind femur relatively 38. Abcissae I,II,III of radius =10,14,4 (III vertical to costa), of cubitus =12,11,7 (same scale).

Pygidial area slightly elongate triangular, with sides very gently sinuate, with apex minutely emarginate, surface very slightly roundly raised and strongly coarsely punctured.

Holotype: ♂, Mindanao, Mt. Apo, 1500 m, near Lake Agko, 8.VIII.1980, T. Murota leg. (Coll. Tsuneki).

Paratypes: 1 ♀ & ♂, same as holotype (Coll. Murota). 1 ♂, same place and date, T. Tano leg. (Coll. Tano).

8. CROSSOCERUS (CROSSOCERUS) SLIMMATUS LECLERCQ, 1963

Crossocerus (Crossocerus) slimmatus Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 9, 1963 (many ♀ ♂, Luzon, Baguio, 1980 m and Mt. Data, 2378 m).

Specimens examined: 5 ♀ 18 ♂, Luzon: Baguio, mines View Park, 1500 m, 26.III.1978, T. Tano (1 ♀ 1 ♂) and T. Murota (1 ♂) and 1,3.I.1980, T. Murota (4 ♀ 16 ♂).

9. CROSSOCERUS (EUPLILOIDES) ALBOCOLLARIS (ASHMEAD, 1904)

Rhopalum albocollaris Ashmead, Proc. U. S. Nat. Mus., 28: 130, 1904 (♀, recte ♂, Luzon).

Crossocerus (Euplioides) albocollaris albocollaris: Pate, Ibid., 48(3): 56, 1946 (♀ ♂, Luzon).

Crossocerus (Euplioides) albocollaris: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 9 (11-12): 301, 1955 (keyed, with varr.).

Crossocerus (Euplioides) albocollaris: Leclercq, Ibid., 99(1): 12, 1963 (♀, Mindoro, Palawan - ssp. princesa Pate).

Euplioides tanoi Tsuneki, Polsk. Pism. Ent., 44: 646, 1974 (♂, Thailand)(SYN. NOV.)

Specimens examined: 15 ♀ 14 ♂, Mindanao (Davao and Bukidnon), 3,6,10.VIII.1980; 1 ♀ 1 ♂, Luzon (Laguna: Pagsanjan, 2.IV.1978).

Remarks. Body size considerably variable, ranging from 4.0 mm to 6.0 mm.

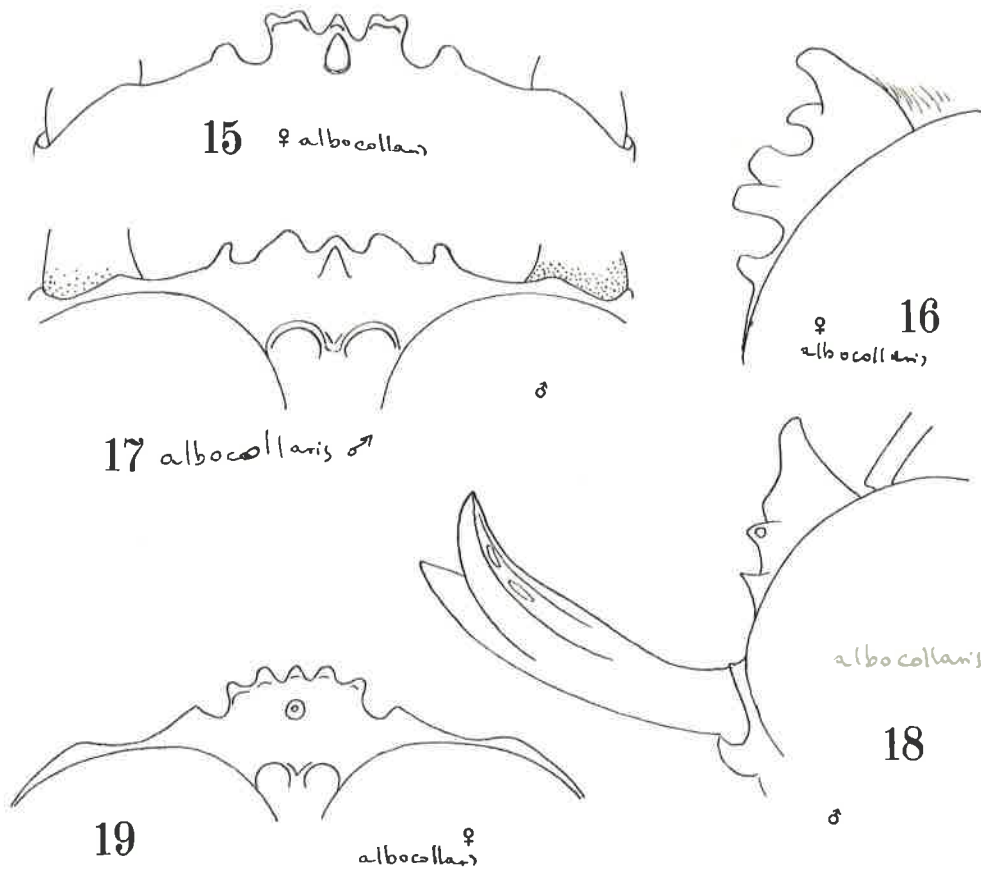
Colouration. Black, yellow are in ♂ pronotal collar wholly, axillae, scutellum, a line on postscutellum and sometimes (6/15) one or two spots on posterior part of mesoscutum; while ivory white are fore Tl-4, base of mid tibia, basal half of hind tibia and mit Tl. Al brown beneath, mandible pale brown except marginal areas. In ♀, bodily marks are ivory white, narrower than in ♂: Collar (medianly broadly interrupted), axillae, fore Tl-4, mid Tl and basal mark of hind tibia; mandible largely pale brown. Aberrant: Two female specimens captured on August 13, 1980 in Bukidnon are markedly melanic: body without whitish mark (in one of which lateral ends of collar very minutely brownish), fore Tl-4, mid Tl and base narrowly of hind tibia alone whitish. Ocellar location. In the females the ocelli are in a rather low triangle (even in ♂ not completely equilateral in this species - the tendency is common in this subgenus). If the character is accentuated, together with the deviated form of Gl, it is not unnatural that Euplioides is dealt with as a distinct genus.

Clypeus. Pate in his explanation of the clypeal form states that the apical margin of the clypeal lobe is tridentate in the male and quinquedentate in the female. This is apparently misleading. Really, apical margin of clypeus in ♂: Fig. 17, in oblique lateral view: Fig. 18, while in the female: Fig. 15, in oblique lateral view: Fig. 16 (together with mandible).

Pronotal collar. Dorsal surface without medial furrow, instead gently raised in middle, with lateral corners bluntly rounded.

Frons. Upper frons at anterior verge strongly triangularly furrowed in middle, with the banks of the furrow flattened and stepped and antero-lateral parts of the verge transversely, fairly acutely edged and subcarinated.

Another aberratio. ♀, Luzon: Pagsanjan, 2.IV.1968. Slightly larger than usual, 6.8 mm, with two yellow spots on scutellum and postscutellum, head seen from above



with temples more strongly roundly convergent posteriorly, with frontal verge on each side not so acutely edged as in typical form, clypeus with medio-apical margin much more regularly quinque-dentate (Fig. 19, cf. Fig. 15), with prominence on disc more vertically elevated (less obliquely produced) and genal tooth shorter and more strongly pointed at apex.

10. PIYUMA PROSPOIDES MAKILINGI (WILLIAMS, 1928)

Crabro prosopoides Turner, Proc. Zool. Soc. London, 30: 528, 1908 (♀ ♂, Queensland).
Crabro makilingi Williams, Phil. Jour. Sci., 25(1): 100, 1928 (♀, Luzon)
Piyuma koxingi, makilingi, iwatai, dentipleuris, prosopoides: Leclercq, Bull. Ann. Soc. Ent. Belg., 87(1-2): 51, 1951 (keyed).
Piyuma prosopoides iwatai: Tsuneki, Etizenia, 30: 14, 1968 (♀, Formosa; - Ibid., 51, 24, 1971 (♀ ♂, Formosa).
Piyuma prosopoides makilingi: Tsuneki, Steenstrupia (Copenhagen), 4: 108, 1976 (2 ♀ 1 ♂, Tawitawi).

Specimens examined: 12 ♀ 15 ♂, Luzon; 7 ♀ 18 ♂, Mindanao; 2 ♀, Negros.

Remarks. According to the original description the nominate race known from Australia has the "eyes separated at base of antennae by a distance scarcely exceeding 1/4 of the length of the scape and the postscutellum coloured yellow". While in the Philippine specimens IOD at base of antennae is about 1/2 - 1/3 of the length of scape, although antennal socket-rims are contiguous with inner orbits and with each other and postscutellum is usually immaculated.

Yellow marks on legs are considerably variable in development, sometimes except few small spots completely immaculated. The male is generally more broadly black than the female and the specimens from Luzon are generally more broadly black than those

from Mindanao.

11. PIYUMA BUTUANA LECLERCQ, 1963

Piyuma butuana Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 59, 1963 (♀ Sibuyan, Negros and Mindoro, ♂ Mindanao and Borneo).

Specimens examined: 3 ♀ 2 ♂, Mindanao: Bakidnon, Malaybalay, 800 m, 13.VIII. 1980, T. Murota; 1 ♂, Luzon, Prov. Laguna, Pagsanjan, 1.IV.1978, T. Tano.

Remarks. In the males from Luzon gaster is completely ferruginous red and legs almost completely lemon yellow (fore and mid femora very feebly ferruginous above and slightly strongly so on hind femur, same is true on inner side of tibiae, tarsi apically ferruginous), while in the Mindanao males except apical marginal areas of G1,2, 3,4,5 and whole of G6 and 7 gaster is dark brown or black and trochanters are all brown above (ferruginous on femora above much weaker) and hind tibia broadly brown on outer side. Clypeus medianly keeled, the keel at apex extended laterally into a transverse carina behind apex, which is wide in female and narrow in the male.

12. VECHTIA RUGOSA PALAWANA TSUNEKI, 1976

Vechtia rugosa palawana Tsuneki, Steenstrupia (Copenhagen), 4: 108, 1976 (♀, Palawan).

Vechtia rugosa: Leclercq, Monogr. Crabron., p. 218, 1954; Ent. Ber., 17: 106, 1957 (syn., ♀♂, Pérak, Cochinchina, Sumatra, Java, Amboina); Bull. Ann. Soc. R. Ent. Belg., 99(1): 80, 1963 (syn., ♀ ♂, Thailand, Penang, Malay Pen., Borneo, Philippines:- Luzon, Sibuyan, Panay, Mindoro, Palawan, Mindanao).

Vechtia rugosa: Tsuneki, Etizenia, 4: 40, 1963 (Thailand); Polsk. Pism. Ent., 44: 644, 1974 (Thailand).

Specimens examined: 13 ♀ 53 ♂, Luzon; 1 ♀ 3 ♂, Negros; 3 ♂, Leyte; 10 ♀ 63 ♂, Mindanao, leg. by C. Nozaka, T. Tano, H. Kurokawa and T. Murota.

NIWOH* GENUS NOV.

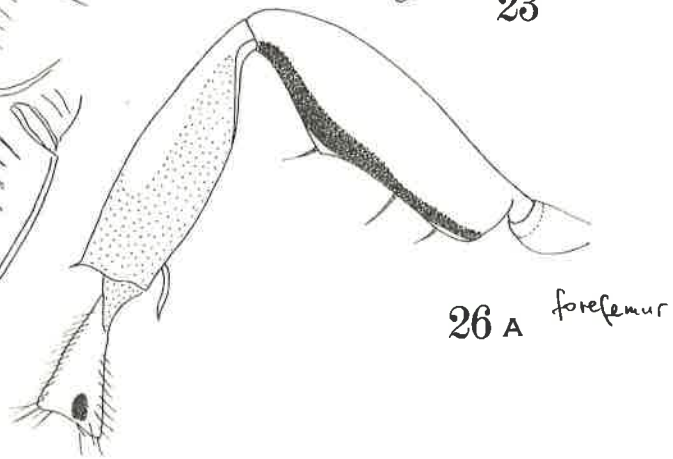
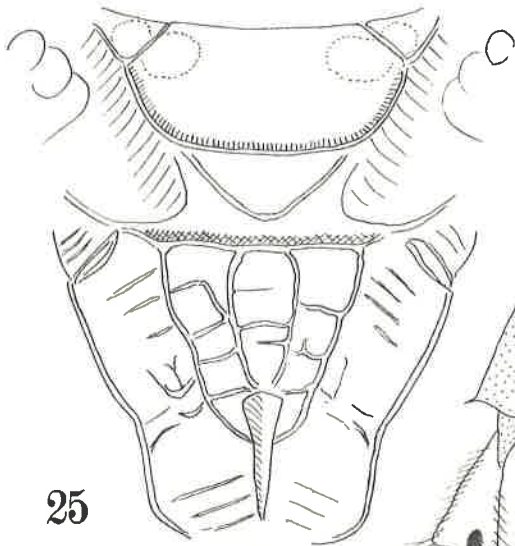
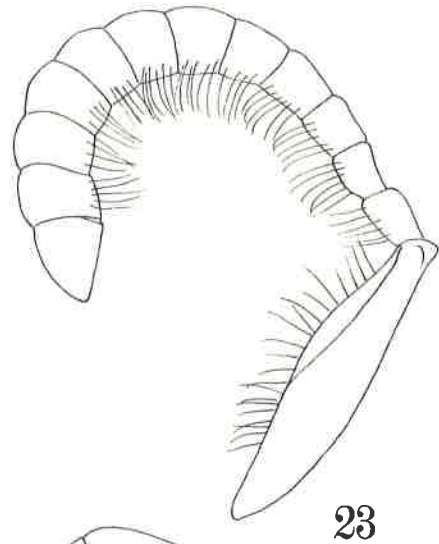
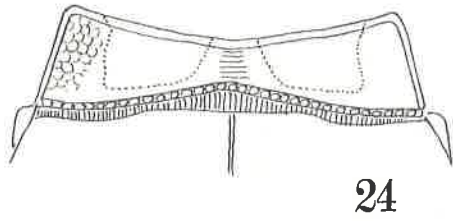
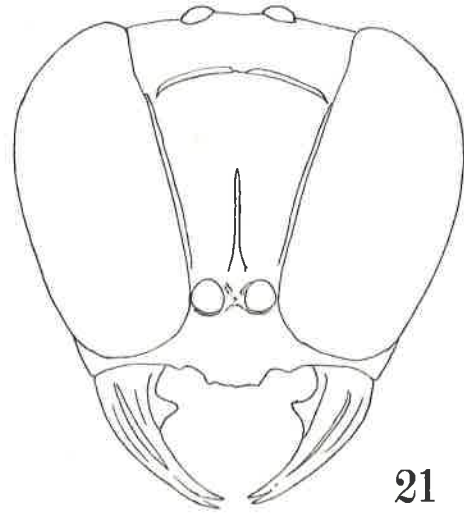
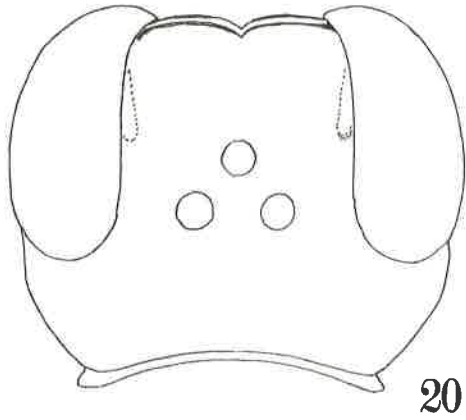
Closely related to Hingstoniola, having scapal basin margined laterally and dorsally with distinct carinae, but differs from it in that the basin is without medial carina or with only a imparfect weak one, recurrent vein of fore wing joins cubital cell only slightly beyond middle, transverse radial vein oblique to costa, ocelli not in a complete equilateral triangle and male antenna provided with fringe of long curved hair.

Generic diagnosis. Eyes bare, inner orbits convergent below, antennal sockets contiguous to inner orbits and to each other, scapal basin laterally and dorsally enclosed by distinct carina, without median carina in ♀, frequently with an incomplete weak one in ♂, frontal furrow shallow and weak, orbital foveae distinct, ocellar triangle slightly lower than equilateral, temple and gena simple, palpal formula 6-4, mandible at apex bidentate in ♂, tridentate in ♀, with a tooth on inner margin before middle in both, occipital carina almost reaching hypostomal carina, antenna subclavate, scape bicarinate, in ♂ 13-jointed, with a fringe of long curved hair on both scape and flagellum, in ♀ 12-jointed, pronotal collar flat above, carinate anteriorly, mesoscutum with admedian line and notauli indistinct, postscutellum with a lunate enclosed space on disc, postspiracular, epicnemial and acetabular carinae continuous, precoxal carina present, in vertical view appears toothed, mesosternal carina present, propodeum coarsely sculptured, lateral carina present, legs in ♂ modified, markedly so on fore tarsus, recurrent vein joining cubital cell slightly beyond middle, jugal lobe much shorter than submedial cell, gaster sessile, male without pygidial area; head and thorax rather coarsely punctate-reticulate, partly striate, gaster microgranulate and half mat.

* Deva King, guardian giant bonze of Buddha.

13. NIWOH TARSATA SP. NOV.

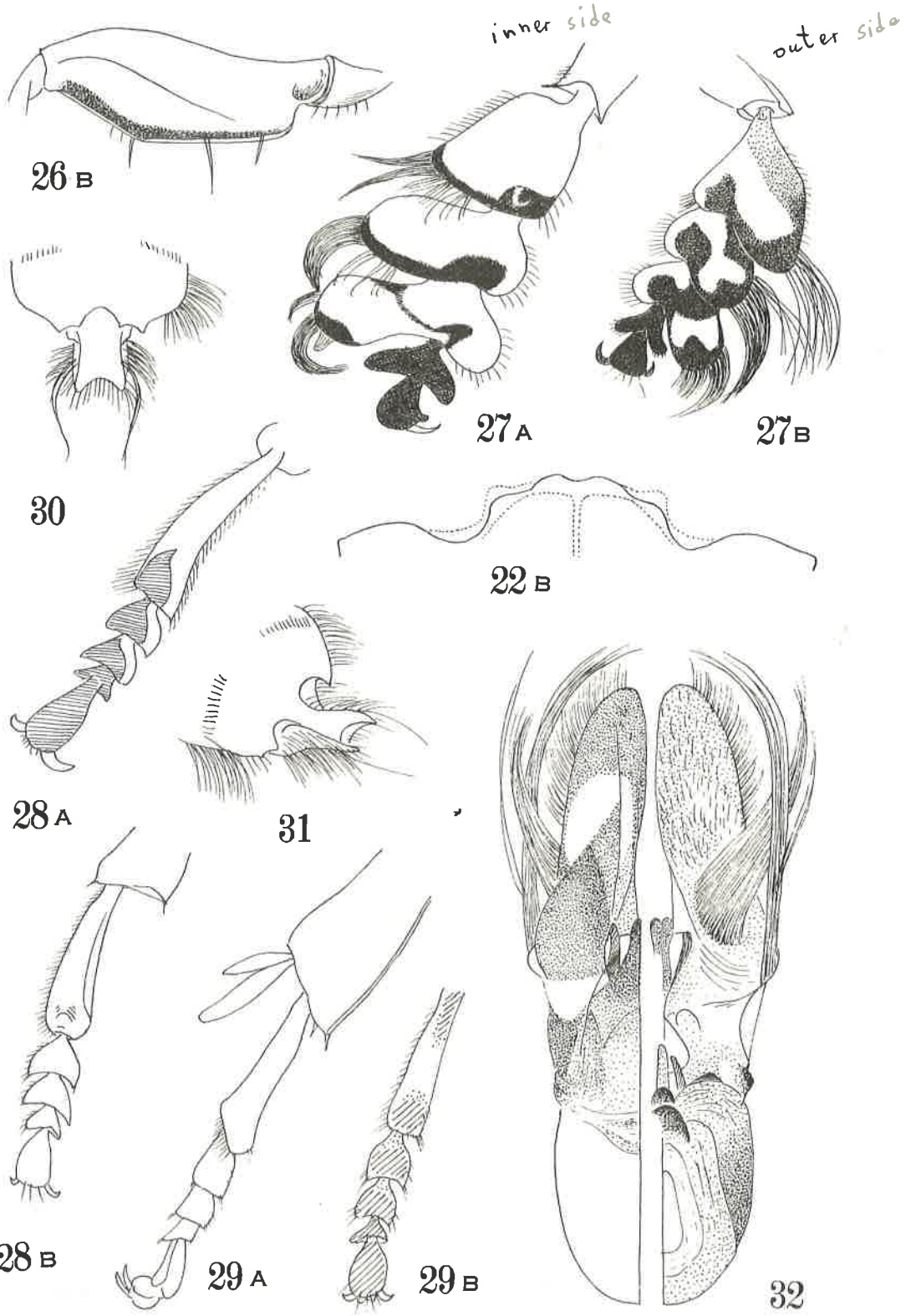
♂, 5-6 mm. Black, lemon yellow are A1 (sometimes with dorsal top brown), a pair of marks on disc (varied in development) and a spot on tubercle (sometimes lacking)



(21)

of pronotum, axillae, a pair of spots on scutellum (varied in development, but not continued into a band) (postscutellum always immaculated), a mark on each side of GT 1-4 or 1-5 (not 2-5) that are almost invisible from above and well visible from side and, as a rule, largest on 3 and smaller → 4 (sometimes =3) → 2 → 1, fore trochanter, fore femur except a fine streak beneath (Figs. 26A and B), mid femur broadly on anterior side and at apex above, an enlarged mark on hind femur apically above, a broad streak on outer side of fore tibia (Fig. 26A), narrowed apically and not reaching apex, a thorough but irregular-shaped streak on outer side of mid tibia, reaching apex, a shorter one on hind tibia, ground colour of tarsi white and black maculated as illustrated in Figs. 27A,B -fore, 28A -mid and 29B -hind tarsus; bright ferruginous brown are antennal flagellum beneath broadly, rest of fore tibia (Fig. 26A), rest of mid femur (except black posterior side beneath) and tibia, tibial spurs and a part of tarsi. Wing tegula dark brown, wings almost clear hyaline, veins and stigma dark brown. Hair on clypeus silvery, dense and appressed.

Head seen from above (Fig. 20) subquadrate, with surface flat, HW at eyes and at occipital carina and HL in middle and at eye relatively 100:70:74:82, apical margin of upper frons strongly carinate and medianly minutely triangularly incised, with both sides strongly rounded out, ocelli in a triangle slightly lower than equilateral one, OOD:Od:POD:OCD=10:7:7:21, supraorbital foveae along inner orbits, located from level of anterior margin of fore ocellus, appr. as long as A3+4. Head seen in front (Fig. 21) with HW:HL=100:83, with sides gently roundly convergent below, antennal socket-rims contiguous to inner orbits and nearly to each other, Al=A2-9, Al bicarinate, outer carina rather blunt and both weaker and indistinct basally, A3 as long as wide, Al-12 fringed with long curved hair (Fig. 23), Al3 without fringe; clypeus: Figs. 22A and B, median area thick, with other lower margin which is hidden beneath the upper, disc medianly sharply carinate, mandible uniformly bidentate at apex, with another medium-sized tooth on inner margin behind middle, scapal basin margined on top and on sides with an acute carina, stronger on top, usually provided with a short carina below above antennal sockets, only rarely top of the basin shortly longitudinally carinate, but in any specimen the basin is not thoroughly longitudinally carinate as done in the genus *Hingstoniola*, instead in some specimens even the lower carina is lacking also, thus completely without median carina. Head seen in profile also subquadrate, with eye broader above than below and with temple vice versa, at mid point both subequal in width, occipital carina highly raised, gradually lowering and almost reaching hypostomal carina; pronotal collar (Fig. 24) flat above, medianly finely furrowed, anterior margin gently emarginate and acutely carinate, with lateral corners strongly produced in tooth and reflected, posterior margin transversely finely furrowed and distinctly foveolate, axillae and scutellum margined laterally and posteriorly with carinae, postscutellum provided with a subtriangular or lunate area at base in middle which is also enclosed with carinae (in Fig. 25), on mesopleuron postspiracular and epicnemial carinae strong and acute, epicnemial area flattened and vertical to prepectus, acetabular carina present, but weak, precoxal carina runs upwards till about mid point to scrobe, with lower end not turned forwards. Propodeum with strong lateral carinae, area dorsalis subtriangular, margined with carinae, carinae extended to posterior aspect and joined with sides of its median hollow (Fig. 25), medial furrow of area dorsalis broad and margined also with carina, from postero-lateral part of area dorsalis a transverse carina runs to lateral carina, but often it is incomplete, medial furrow of posterior aspect wedge-shaped, margined also with carinae that are united at posterior end of the furrow and extended till apex; gaster almost parallel-sided and at apex of GT7 broadly rounded, while GS 7 and 8 modified, in ventral view: Fig. 30, apical part of GS7 incrassate, in ventro-lateral view: Fig. 31, genitalia: Fig. 32, left half dorsal view and right half ventral view, notice the characteristic bundles of hair, volsella not well developed. Fore femur flattened beneath on basal half and acutely edged on the margins, apical half forming another flattened area, forming a blunt angle with the basal one, in posterior view: Figs. 26A and B, notice the presence of the three spine-like hairs, fore femur nearly normal, but with only one spur which is produced more basally than usual (Fig. 26A), fore T1-3 dilated and markedly expanded as given in Figures 27 A and B (with black marks different in development), thick, long curved hair on anterior margin black, while short pubescence on posterior margin silky white, mid femur beneath, hind femur above strongly rounded out, both excavated beneath into furrow to receive tibia when it is folded, mid tibia with 4 short strong spinules at apex (outermost one slightly broader than others, with apex not pointed, possibly it represents the spur), mid T1-3 slightly dilated and expanded (Figs. 28 A and B), pubescence on anterior margin of T1 white, while short one on others dark brownish, hind tibia provided with a longitudinal flattened area on outer side which is margined



with carina, apical spurs thick, the longer one reaching slightly beyond middle of the following T1, T1-3 incrassate, in lateral view: Fig. 29A, in posterior view: Fig. 29B. In fore wing abscissae I,II,III of radius (III is transverse) with relative length in two specimens 10:16:4 and 10:19:5, III is not vertical to costa, but slightly inclined outwards, those of cubitus under same scale 14:9:6 and 17:10:7, III gently sinuate.

Upper frons rather grossly, vertex and temples slightly more finely reticulate-punctate, meshes flat-bottomed, with surface microcoriaceous and half mat, mesoscutum with reticulated punctation as large as that on upper frons and posteriorly gradually slightly finer, the meshed punctures arranged longitudinally, giving rise to longitudinal rugosed striae between puncture-series which are finer and more smoothly run posteriorly, scutellum similarly punctate-striate, enclosed area of postscutellum transversely foveate, rest of the surface very minutely reticulate-punctate, sculpture on mesopleuron generally as on scutum, but rugosed striae indistinct below and posteriorly simply microcoriaceous, metapleuron longitudinally striate, with striae-interspaces microcoriaceous, propodeum very coarsely irregularly reticulate, with surface everywhere strongly microcoriaceous, lateral areas of posterior inclination transversely, sparsely striate, sides posteriorly obliquely coarsely striate, rest of the surface microreticulate and in some light condition appearing obliquely microstriate-coriaceous; gaster very minutely, closely and regularly punctate-reticulate, with surface mat, but from G4 apically somewhat shining.

Additional notes to genitalia: Basiparamere thick, enclosing penis valve from both sides and the latter can not completely be observed even seen either from above or beneath. The hairs on paramere arise from three separate places; the fact is well perceived when seen from beneath (Fig. 32, right half). Besides above ventral surface of paramere is sparsely covered with short soft pubescence.

♀, 6.3-6.7 mm. Similar in general to ♂ except sexual characters:

Head more cubic, seen from above with HW at eyes, at occipital carina and HL in middle and at eye relatively 100:76:75:83, reticulate punctures much finer, supraorbital foveae broader and longer, appr. as long as A3,4,5 taken together, though each joint longer than wide and comparatively longer than in ♂, OOD:Od:POD:OCD=10:7:9:27.

Clypeus, strange in structure, apical margin apparently duplicate, lower and upper margins present, or the upper margin may be the lamina; seen vertically in front: Figs. 33 A and B, seen obliquely from left side: Fig. 34, upper margin, roughly say, tridentate, with median tooth large, broadly truncate and emarginate at apex, lower margin medianly broadly produced and hollowed at apical marginal area, seen vertically from beneath the hollow is triangular, with each angle minutely toothed (Fig. 35), interspace between the two margins deeply depressed and raised towards median line into a blunt carina.

Mandible tridentate at apex, median tooth strongest and slightly longer than outer (or lower) one, inner (or upper) one slightly retreated, short tooth present on inner margin before middle as in ♂.

Antenna 12-jointed, without fringe of hair, flagellum nearly clavate, but apically slightly narrowed again, in length A1=A2-8, A2,3,4,5,11,12=10,9,7,6,6,12; A3=AWx1.7.

Scapal basin almost always without medial carina, sometimes even medianly below finely furrowed, very rarely with a short indistinct carina below.

Pronotum with antero-lateral corners less acutely pointed.

Gaster more rounded, with pygidial area long gutterwise excavated apically.

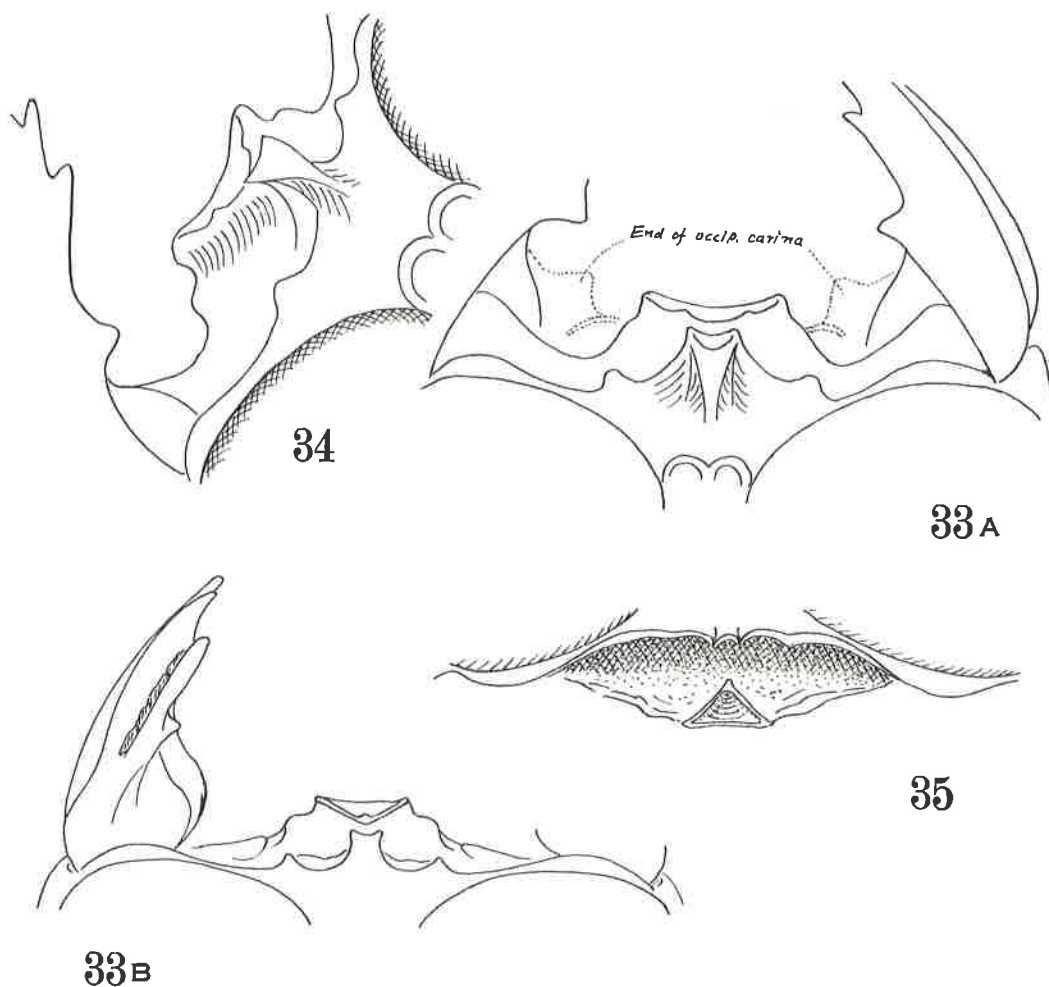
Colouration. Gastral lateral maculae on GT1-5 present (in ♂ mostly on 1-4, sometimes on 1-5), comparatively larger than in ♂, but legs more broadly blackish than in ♂ as follows: Black; yellow are a spot at apex above of fore femur, tibiae except inner side (in hind leg apically broadly darkened), fore T1 except apex and mid and hind T1-3 except each apex. Fore trochanter apically brownish.

Remarks. Postscutellum bearing the similar strange enclosed space and propodeal sculpture is also similar to that of ♂.

Holotype: ♂, Mindanao, Cagayan de Oro, Makahambus Cave, 15.VIII.1980, T. Murota leg. (Coll. Tsuneki)

Paratypes: 14 ♀ 34 ♂, Mindanao (Davao, Cagayan de Oro, 3,6,8,15,16.VIII.1980, T. Tano (1 ♀ 14 ♂), H. Kurokawa (5 ♀ 2 ♂), T. Murota (7 ♀ 14 ♂) and K. Sabi (4 ♀) (Coll. respective collector).

General remarks. In the specimens of the present species the scapal basin is usually filled with the scapes of the antennae that are stood upwards and the lateral carinae of the basin are not well visible. In such a case they are apt to be misidentified with some species of the genus Lestica. It is necessary, therefore, to examine first the scapal basin by turning the direction of scapes by means of the diluted alcohol.



Figs. 33-35. *Nivoh tarsatus* sp. nov., ♀, clypeus.

14. DASYPROCTUS AGILIS (SMITH, 1858)

Crabro (Rhopalum) agilis Smith, J. Proc. Linn. Soc., London, Zool., 3: 18, 1858 (♀, Celebes).

Dasyproctus ceylonicus Saussure, Reise Ost. Fregatte Novara etc., Zool., 2: 85, 1867 (♀, Ceylon).

Dasyproctus agilis: Leclercq, Bull. Soc. R. Sci. Liège, 1-2: 109, 1972 (list of ref., syn., distr. and variat.).

Synonyms (Leclercq, 1972): orientalis Cameron, 1890, indicus Saussure, 1892; infantulus Kohl, 1894; reveratus Cameron, 1898; impetuosus Cameron, 1901; philippinensis Ashmead, 1904; funestus Turner, 1917

Remarks. The present species is common and abundant in the Philippines as in Formosa.

Specimens examined: 49 ♀ 75 ♂, Luzon; 2 ♀ 10 ♂, Cebu; 3 ♀ 19 ♂, Negros; 36 ♀ 47 ♂, Mindanao.

15. DASYPROCTUS CEVIRUS LECLERCQ, 1963

Dasyproctus cevirus Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 16, 1963 (41 ♂ 59 ♀, Negros, Panay, Samar, Leyte, Palawan, Luzon and Mindanao).

Dasyproctus cevirus: Tsuneki, Steenstrupia (Copenhagen), 4: 112, 1976 (1 ♂ 2 ♀, Mindanao and Palawan).

Specimens examined: 16 ♀ 34 ♂ (Luzon, Negros, Leyte, Mindanao).

16. DASYPROCTUS TOWNESI LECLERCQ, 1963

Dasyproctus townesi Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 20, 1963 (♀ ♂, numerous, Luzon, Samar, Mindoro, Negros, Sibuyan, Bililan).

Specimens examined: 1 ♀, Luzon, Baguio, 1.I.1980, T. Murota; 1 ♀, Luzon, Pagsanjan, 7-9.VIII.1976, H. Kurokawa.

Remarks. In the Baguio specimen A2,3,4,5=8,10,7,6 and OOD:Od:POD:OCD=10:5.5:10:42, supraorbital foveae long, slender, with both ends rounded, about 6-7 times as long as wide, with relative length to OOD =8:10, abscissae I,II,III of radius =20,24,6, III straight, forming an angle of about 60° with costa, those of cubitus under same scale =28,11,9.

17. DASYPROCTUS TOXOPTERUS LECLERCQ, 1963

Dasyproctus toxopterus Leclercq, Bull. Ann. Soc. R. Ent. Belg., 99(1): 21, 1963 (1 ♂, Mindanao).

Specimen examined: 1 ♂, captured in the same place and time as the second specimen of townesi above listed.

Remarks. According to the description of the present species the original author is apparently tempted to associate it with townesi as its other sex (as ssp.). In our case we are as much more tempted to do so, because it is collected together with one of the females of townesi. Apparently, however, the specimen is considerably different from the female of townesi in the puncturation and colouration (somewhat different also from the Leclercq's male) as given below and, therefore, association with townesi is shelved here also.

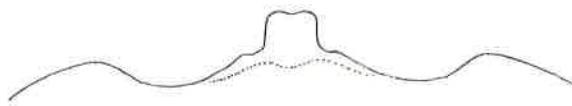
♂. Punctures on head above, mesoscutum and anterior half of scutellum large, distinctly spaced (PIS mostly 0.5-1 times PD), from posterior half of scutellum posteriorly without mat appearance, longitudinally, rather coarsely striate (scutellum) or coarsely subgranulate (postscutellum) or radiately or obliquely coarsely subreticulate or foveate; metapleuron longitudinally and coarsely, sides of propodeum slightly more closely and obliquely or arcuately striate.

Black, yellow are A1, A2 beneath, two spots on collar, tubercle largely (with a black window in middle), axillae minutely, a small spot near antero-lateral corners of scutellum, lateral marks on GT2 and 3, a band across middle of GT4 and 5, apices of

fore and mid trochanters, bases of fore and mid tibiae, all tibial spurs and fore T1. Ferruginous are tegulae, A2 at apex (rest dark brown) and tarsi basally (apically dark brown).

Clypeus: Fig. 36, A2,3, 4,5 with relative length =9, 10,8,6, A3=AW×1.8, OOD:Od:

POD:OCD=10:5:10:18. Supraorbital foveae small, oval in form, less than as long as fore ocellus, impressed, narrowly margined with shining surface as on bottom, GT1 in dorsal view with relative width at base, at minimum before spiracles, at spiracles and at apex (when medial length is 100) =30,19,20,45 (maximum width and relative length of hind femur 25 and 100), abscissae I,II,III of radial vein relatively 20, 27 and 8, III is slightly sinuate, forming with costa an angle of about 60°, those of cubital vein (under same scale) 25,15 and 10 (III slightly sinuate).



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18. DASYPROCTUS YORKOIDES LECLERCQ, 1972

Dasyproctus yorki: Leclercq (nec 1956), Bull. Ann. Soc. Roy. Ent. Belg., 99(1): 25, 1963 (♀ ♂, Negros).

Dasyproctus yorkoides Leclercq, Bull. Soc. R. Sci. Liège, 1-2: 122, 1972 (♀ ♂, Luzon, Mindanao, Leyte and Palawan).

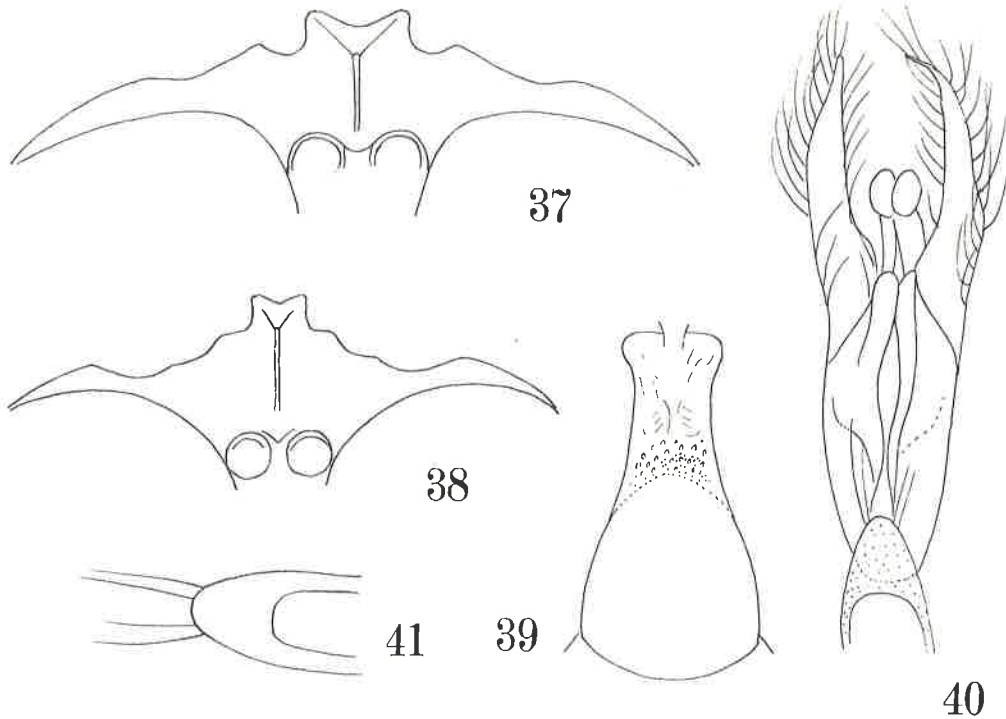
Specimens examined: 22 ♀ 5 ♂, Luzon (Pagsanjan, Asin Spa, Los Banos); 5 ♀, Negros (Mambukal); 1 ♀, Leyte; 20 ♀ 2 ♂, Mindanao (Davao, Zamboanga), C. Nozaka, T. Tano, H. Kurokawa and T. Murota leg.

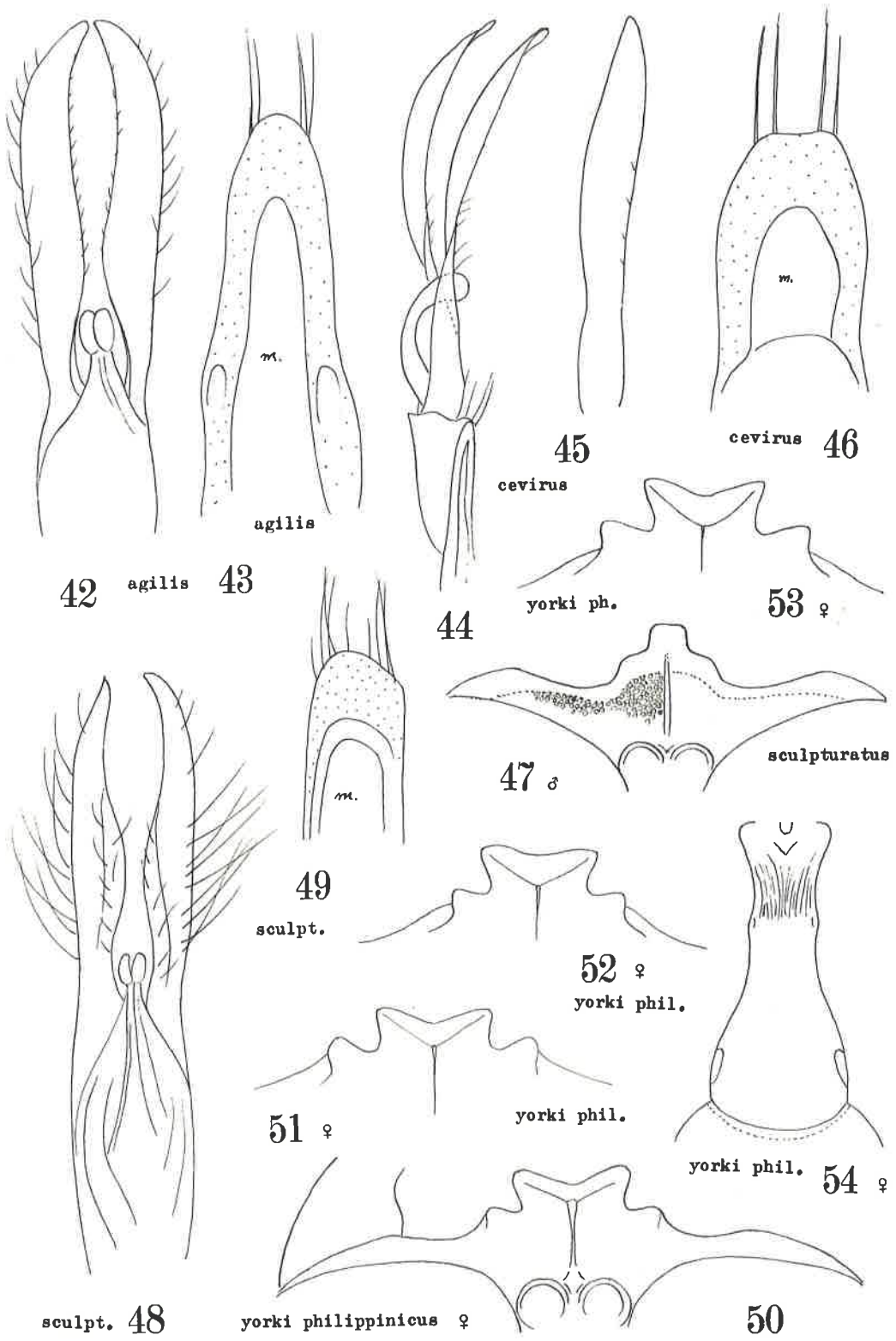
Remarks. Clypeus: Fig. 37 (♀) and 38 (♂), in ♀ median carina on disc raised forwards and at its end where it meets with the blunt carinae running up obliquely from each of apical teeth distinctly toothed, in ♂ forward raising of medial carina weaker, with end tooth low and sometimes rather indistinct. Gastral petiole is in ♂ short and robust (Fig. 39), considerably different from that of ♀. Genitalia and GS8 in ventral view: Fig. 40, separated GS8: Fig. 41.

Colouration. In ♀ the mark on prepectus varied in size, sometimes fills whole the space, but sometimes covers upper half only, that on scutellum also variable in development, sometimes even separated in two, postscutellum usually immaculated, rarely maculated, GT1-5 always laterally maculated, varied in size and relative width, but in so far as observed never united into a band. Fore and mid femora from apex to underside broadly yellow, hind femur completely black, at most at apex narrowly yellow.

In ♂ mark on prepectus always on upper half only, on scutellum never separated in two, always well developed, postscutellum always maculated with yellow, GT1 always immaculated, marks on GT2 and 3 broad, in middle closed together and GT4,5,6 always banded. Fore and mid femora on about apical half yellow, hind one at knee only narrowly yellow, A2-3-4 yellow beneath. In two male specimens from Mindanao maculae abnormal:

(1), from Bukidnon: A2-3-4 black, except A2 beneath, marks on pronotal collar interrupted into 4 spots, on prepectus turns into a fine longitudinal line above, scutellum with a minute point near each axilla, postscutellum black, lateral marks on GT2-5 very small, especially so on 2, rather point-like, legs black, only an incomplete line on fore tibia in front and spurs yellow.





(2), from Cagayan de Oro: Antenna, prepectus, axilla similar to those of (1), each of two marks on pronotal collar only medianly constricted, antero-lateral small spots of scutellum slightly larger, gastral marks generally similar, but comparatively somewhat larger, fore knee, fore and mid tibiae in front yellow; tibial spurs and fore and mid metatarsi ferruginous.

Punctuation. In ♀ head above and mesoscutum closely covered with very fine piliferous punctures, surface mat, frequently, however, very large, rounded but shallow punctures somewhat sparsely superimposed, sometimes on scutum only, sometimes on head only or both; usually they are not distinct, defined only in oblique light; but in the three specimens from Mindanao (Davao, Matina Height; Zamboanga, Pasonanka Park) they are considerably deep and distinct, with interspaces appearing somewhat raised and they become the main punctures - apparently as if the specimens belong to a different species.

Clypeus. In ♀ apical emargination of median produced part is considerably varied in depth, sometimes gentle as given in Figure 37, but sometimes much deeper, with lateral teeth frequently reflected outwards; in general, in the specimens from Mindanao the emargination is shallower than in those from Luzon, negros and Leyte.

19. DASYPROCTUS SCULPTURATUS TSUNEKI, 1976

Dasyproctus sculpturatus Tsuneki, Steenstrupia (Copenhagen), 4: 113, 1976 (4 ♂, Tawitawi Is.).

Specimens examined: 52 ♂, Mindanao (Davao, Zamboanga, Cagayan de Oro, Mt. Apo, Bukidnon); 1 ♂, Negros Is.; 17 ♂, Luzon (Pagsanjan, Los Banos, Baguio, Asin Spa).

Remarks. The present species is characteristic in the very coarse punctuation on head and thorax. Clypeus: Fig. 47, paramere of genitalia (Fig. 48) moderate in length (compared with paramere) (cf. Figs. 40 yorkoides, 42 agilis, 44 cevirus), marginal hair of paramere is long (cf. Figs. 42, 44 - notice that the hair is very few in cevirus - Fig. 45), GS8: Fig. 49 (cf. Figs. 43 agilis, 46 cevirus). Black, yellow are: a line on mandible, A1 in front, medianly broadly interrupted band on collar and whole of tubercle, apices above of fore and mid femora and outer side of all tibiae (gaster completely black and tarsi brown to dark brown); but in about half of the specimens examined mandibles are completely black and rarely axillae yellow, very rarely a small yellow spot present on each side of GT3 or GT3 and 4 respectively.

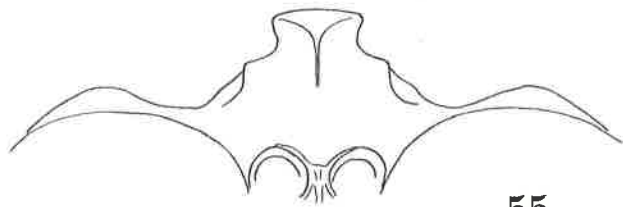
20. DASYPROCTUS YORKI PHILIPPINICUS SSP. NOV.

? Dasyproctus buddha: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 92(7-8): 149, 1956 (♀ from Manila, non others).

D. yorki is originally an Australian species, but once it was recorded from the Philippines by Leclercq (1963), later, however, in his 1972 paper he corrected the error and named it yorkoides, saying that je ne pense plus, comme en 1963, que yorki existe aussi aux Philippines; c'est yorkoides n. sp. qu'on trouve là. However, in the material before me from the Philippines there exists surely yorki, in addition to yorkoides, though it belongs to a different subspecies. It can easily be separated from yorkoides by having the yellow A2.

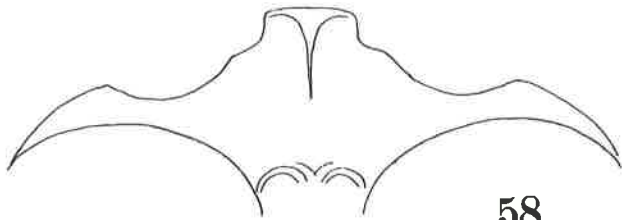
On the other hand, D. yorki belongs to the group of buddha and closely related to it, differing in ♀, apart from the slight difference in form of the clypeus (ref. variation in yorki, Figs. 50-53), mainly in the gastral and femoral maculation (in yorki GT1 and 2 always bimaculated, marks on GT2 not particularly small and fore and mid femora broadly yellow beneath, while hind one largely black). In connection with the discovery of yorki from the Philippines the following account of abnormal buddha from Manila is especially interesting:

In his detailed explanation of buddha, Leclercq (1956, p. 148-149) cited an abnormally maculated female specimen of this species from Manila in which "les tergites I-V sont maculés latéralement, mais les tachés ne sont pas allongées vers le milieu, celles de II sont presqu'aussi larges et longues que celles de III, et le deuxième article de funicule, le mésonotum et la base des fémur III ne sont pas tachées" (the first joint of flagellum (=A2) yellow?). Since then, however, he does not refer to this interesting specimen, completely neglecting its occurrence, saying that (1972, p. 114) "...; il s'avère donc que buddha n'est pas connu des Philippines".



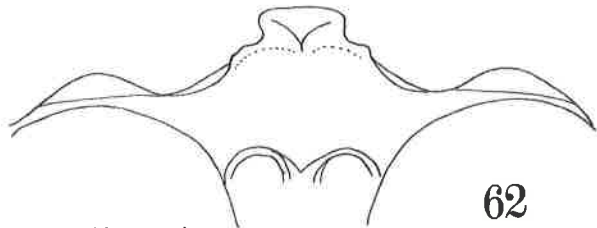
yorki phil., ♂

55



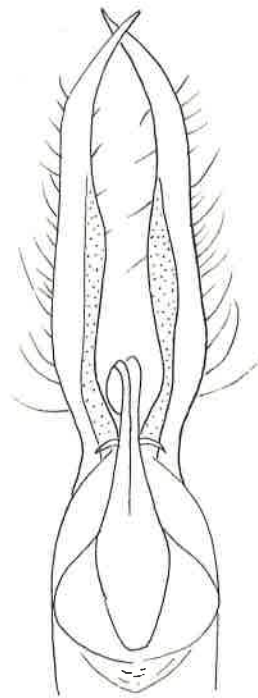
naguilianus ♂

58

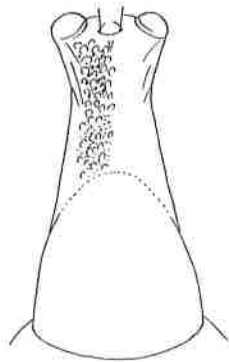


puncticeps ♂

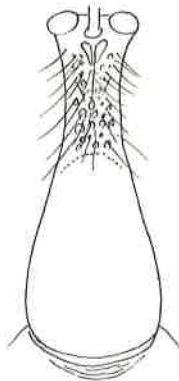
62



yorki phil. 56



59 naguilianus ♂

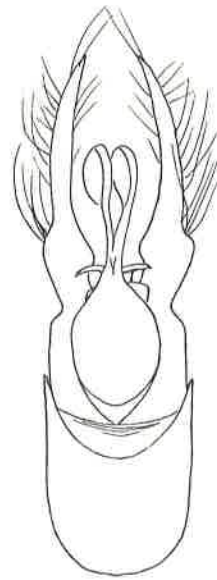


puncticeps ♂ 63



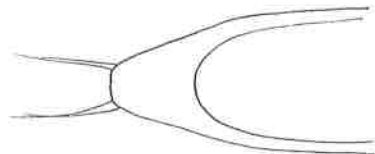
naguilianus

60



yorkoides

57



naguilianus

61

Judging from the present knowledge it seems highly probable that the so-called abnormal female of buddha is a female of yorki. If really so it becomes that yorki was collected from Luzon far before the present discovery.

The Philippine representative of yorki differs from the original and later descriptions of the species in the form of the supraorbital foveae, in the ratio of OOD:POD and slightly in maculation that are considered worthy of separation of them at the subspecific level: The fovea is not so slender (*étroite et longue*, beaucoup plus étroite que le diamètre d'un ocelle - 1956, or presque linéaire - 1958), but nearly as wide as Od, OOD:POD=6:5 (not 3:2) and the marks on prepectus and scutellum are much better developed (the former covering nearly whole, at least upper half, of the area and the latter is not two spots, but a large mark) and fore and mid tibiae are not completely yellow, but bearing a narrow dark brown streak on inner side.

♀. Length 8.5-10.0 mm. Black and mat, lemon yellow are mandible except narrow marginal areas, antennal joints 1 and 2, collar and tubercles of pronotum, axillae, prepectus largely, scutellum nearly wholly, a spot at apex on each side of GT1, a somewhat obliquely elongated large lateral mark on each side of GT2-5, fore and mid femora from apex to underside broadly, knee narrowly of hind femur, all tibiae except narrow streak on inner side, tibial spurs and tarsi except blackish arolia. Wing tegulae and marginal areas of gastral segments, especially broad on GT5 and 6, translucent ferruginous brown, wings slightly darkened throughout, stigma and veins brown to dark brown. Short appressed hair on clypeus silvery, on marginal areas of scapal basin, upper frons near anterior carina and on temples in some light with golden shining.

Clypeus: Fig. 50, variation of apical margin: Figs. 51-53, transverse carina on top of scapal basin usually roundly incurved, but sometimes subtriangularly so, supraorbital foveae nearly as wide as and about twice as long as Od, with bottom gently concave and smooth and shining, A1 acutely bicarinate in front, A2-5 with relative length 7,10,8,6, $A3=AW \times 2.2$, in some small specimens $=AW \times 2.0$, mandible tridentate at apex, apical two subequal (the median slightly larger and longer strictly), inner (or dorsal) one far retreated, on inner margin without distinct tooth, but with a blunt subtriangular swelling-out near middle, OOD:Od:POD:OCD=10:4:9:21. Occipital carina completely reaching hypostomal carina. Pronotal collar structured as in buddha or in yorkoides and medianly deeply furrowed; precoxal carina of mesopleuron turning into so-called verticulus, reaching upwards near scrobe, thence posteriorly surface shining, scrobe not large, but till there a fine shining streak bearing an impressed line in middle runs from mesopleural suture. Propodeum with lateral carinae, in dorsal view strongly narrowed from base till about middle, thence running parallel along lateral margins of posterior inclination, area dorsalis only faintly margined posteriorly with weak broad crenate furrow, G1: Fig. 54, pygidial area as in buddha. In fore wing abscissae I,II,III of radius =20:21:6, of cubitus =26:11:7 (under same scale), III of radius oblique to costa, forming an angle of about 150°, apical angle of radial cell between II and III about 30°.

Head above and mesoscutum finely, closely punctured, surface mat, only on upper frons near anterior carina punctures slightly larger, with surface shining, mesoscutum at posterior margin longitudinally shortly striate or simply crenate, scutellum longitudinally finely and closely striate, with length and strength of striae individually fairly variable, area dorsalis somewhat more coarsely and somewhat radiately so and at medio-posterior part rugoso-reticulate, oblique striae slightly rugosed and mixed with some stronger ones which become much stronger near lateral margins.

♂, 6.5-7.5 mm. In colouration generally similar to ♀, but yellow area of mandible considerably variable individually, but always present, mark on prepectus smaller, at most covering upper half only and frequently completely lacking, mark on scutellum medianly constricted or separated in two, lateral mark of gaster on GT1-6 present; A2 not completely yellow, but dark brown above.

Similar in structure also, but supraorbital foveae shorter, slightly elongate circular, distinctly smaller than ocellus, OOD:Od:POD:OCD=10:4:10:19, mandible uniformly bidentate at apex, clypeus: Fig. 55, A2,3,4,5=7,10,8,7 in relative length, $A3=AW \times 2.7$ (dorsal) or $=AW \times 2.0$ (lateral), in lateral view flagellar joints gently rounded out beneath, pronotal collar with anterior marginal carina at sides turned posteriorly towards tubercles as in the male of yorkoides, but propleurae transversely coarsely striate (not in yorkoides), mesopleural structure similar to ♀, G1 slightly slenderer, relative length to widths at base, minimum, spiracles and apex =100:26:15:18:38, genitalia: Fig. 56 (dorsal view). Abscissae I,II,III of radius relatively 10,13,3, III oblique to costa, forming an angle of about 130°, postero-lateral angle of radial cell between II and III about 60°, absc. I,II,III of cubitus under same scale 15,7,5, antero-apical

angle of cubital cell about 80°.

Punctures on head and thorax larger and coarser than in ♀ and also than usual (e.g. agilis), but much smaller than in sculpuratus and slightly so than in palawanensis, on upper frons anteriorly near frontal carina larger and closer, posterior margin of mesoscutum longitudinally striate or simply strongly crenate (variable in length and strength), scutellum posteriorly longitudinally coarsely striate (also considerably variable in strength), propodeum strongly, coarsely and irregularly rugoso-reticulate, with the meshes larger laterally, side, together with metapleuron and the area posterior to verticulus, longitudinally, strongly, somewhat coarsely striate; gaster closely covered with fine piliferous points.

Holotype: ♀, Luzon, Prov. Launion, San Fernando, sandy shore, 27.III.1978, T. Murota leg. (Coll. Tsuneki).

Paratypes: 7 ♀ 1 ♂, same place and time, T. Murota and C. Nozaka leg.; 1 ♀, Luzon, Prov. Albay, Manito, 18.VIII.1978, T. Murota; 1 ♂, Samar, Basay, 21.IV.1982, T. Tano; 2 ♀ 1 ♂, Cebu, Danao, 29.III.1979, C. Nozaka; 4 ♂, Cebu, Argao, 31.III.1979, C. Nozaka and H. Kurokawa (Coll. each collector).

21. DASYPROCTUS NAGUILIANUS SP. NOV.

In the key by Leclercq (1972) the present species runs to couplet 46, but is inconsistent either with yorkoides or with buddha, but rather closer to yorkoides. It differs from yorkoides in that clypeus with median lobe not incised at apex (Fig. 58), posterior swelling of G1 weaker and more gradual (Fig. 59, cf. Fig. 39), parameral hair of genitalia distinctly shorter (Fig. 60, cf. Fig. 57) and considerably in colour: A3 and 4 not yellow beneath, postscutellum black, GT2,3,4 laterally marked and 5,6 banded posteriorly (in yorkoides postscutellum yellow banded, GT2,3 broadly bimaculated and 4,5,6 banded).

♂, 7.5 mm. Black and dull, yellow are A1 wholly and 2 beneath, collar and tubercle of pronotum, dorsal half of prepectus, axillae, scutellum largely, gastral marks as above mentioned, apical part of femora (in fore and mid broad), tibiae except inner side and T1,2 of fore and mid legs and T1 of hind leg.

Supraorbital foveae elongate, much narrower than Od, with L:W=3:1, L=Od, it is enclosed with similar wide smooth and shining marginal gentle swelling, as a whole including marginal area nearly as wide as Od and subcircular, slightly longer than wide, OOD:Od:POD:OCD=10:5:10:17, occipital carina reaching hypostomal carina, relative length of A2,3,4,5=9,10,8,7, A3=AW×2.0(dorsal), G1: Fig. 59, genitalia: Fig. 60 (dorsal), GS8: Fig. 61. Abcissae I,II,III of radius =20:25:7, III forming an angle of about 110° with costa, postero-apical angle of radial cell about 80°, absc. I,II,III of cubitus under same scale =29:12:10.

Punctures on head above medium-sized, deeper and stronger than in yorkoides, and sparse, with PIS mostly >PD, partly (in front of fore ocellus) ≤ PD, on mesoscutum finer, weaker and sparser, with posterior margin shining and moderately grossly foveolate, yellow marked part of scutellum finely, very sparsely punctured, posterior marginal area strongly and coarsely foveate, postscutellum longitudinally, moderately grossly punctate-striate, area dorsalis margined with carinae, surface obliquely, very coarsely and reticulately striate, sides longitudinally, strongly, moderately closely (not very finely and very closely) striate.

♀, unknown.

Holotype: ♂, Luzon, Prov. Launion, Naguilian, 4.I.1980, T. Murota leg. (Coll. Tsuneki).

22. DASYPROCTUS PUNCTICEPS SP. NOV.

In the 1972 key by Leclercq the present species also runs to couplet 46, but runs out, agreeing neither with yorkoides nor with buddha, rather more resembling naguilianus. But it differs from this in that medium-sized punctures on head above closer and much closer and larger anteriorly, punctures on mesoscutum and mesopleuron much larger (as large as those on vertex) and on scutum much closer, mandible largely yellow, GT1 bimaculated, GT5 and 6 not yellow banded, but bimaculated, yellow on fore and mid femora broadly extended beneath, all T1-3 yellow and abscissa III of radius much more strongly inclined (about 120°) against costa.

♂, length 8.0 mm. Black and dull, yellow are mandible except marginal area, A1

wholly, 2 at apex and beneath, collar and tubercle of pronotum, a mark on prepectus above (similar in size to tubercle), axilla, a large medianly constricted mark on scutellum, a comparatively large mark on each side of GT1 (as large as tubercle), 2 (largest), 3, 4, 5, 6, (gradually smaller posteriorly), fore femur from apical part to beneath, mid femur similar but shorter, knee narrowly of hind femur, all tibiae except inner side of fore and mid ones and T1-3 of all legs.

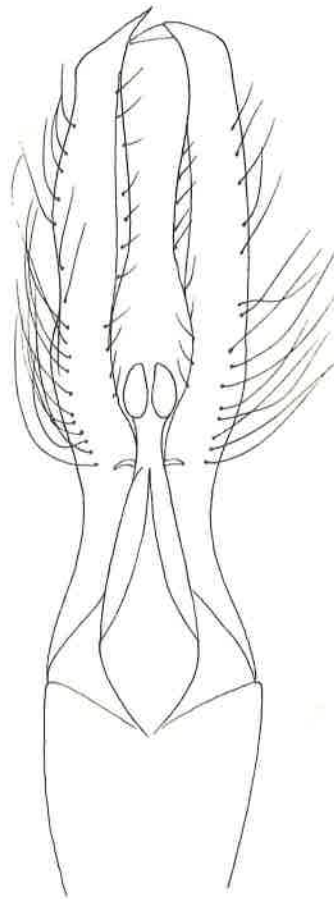
Clypeus: Fig. 62, median lobe wider and shorter than in sculpturatus, with lateral excavations stronger, A1 strongly bicarinate in front, A2-5 with relative length =7,10,8,6, A3=AW×2.5, mandible bidentate at apex, inner margin with a gentle swelling-out, G1: Fig. 63, genitalia: Fig. 64, very similar to those of sculpturatus; length of abscissae of radius relatively I,II,III=20,25,7, angle formed by III with costa about 120°, abscissae I,II,III of cubitus under same scale 29,13,10.

Punctures on upper frons slightly smaller than in sculpturatus, similarly close, irregularly rugoso-punctate, but punctures much clearer than in sculpturatus, those on mesoscutum slightly finer, sparser and weaker than on frons, smaller, sparser and less rugose than in sculpturatus, with posterior margin distinctly crenate, scutellum on yellow area simply sparsely punctured, posterior black area longitudinally, coarsely, but not acutely striate, postscutellum longitudinally, finely, closely striate and punctate, propodeum coarsely and irregularly reticulate. Gastral petiole with shining basal part more strongly sculptured and more richly covered with thicker hair than in sculpturatus.

♀, unknown.

Holotype: ♂, Luzon, Prov. Launion, Naguilian, 4.I.1980, T. Murota leg. (Coll. Tsuneki).

Remarks. The present species can easily be distinguished from sculpturatus by the richly maculated gastral segments.



puncticeps

64

ON THE MALE GENITALIA OF THE SPECIES OF DASYPROCTUS

DEALT WITH HERE

Even in the rough comparison the relative length between paramere and penis valve and relative length of marginal hair of paramere to parameral width are useful to identify the species.

D. agilis: Fig. 42. In comparison with penis valve paramere is long, with fringe of hair sparse and short.

D. cevirus: Fig. 44. Paramere long, with hair of fringe only a few and short.

D. yorkoides: Figs. 40 and 57. Paramere comparatively short, with fringe of somewhat sparse and long hair.

D. sculpturatus: Fig. 48. Paramere long, with fringe of very long sparse hair on outer margin and with a line of sparse short hair on inner margin.

D. yorkei philippinus: Fig. 56. Paramere long, with fringe of moderately long hair on outer margin, hair on inner margin only a few and very sparse.

D. naguilianus: Fig. 60. Paramere short, with fringe of short hair.

D. puncticeps: Fig. 64. Paramere long, with hair of marginal fringe also long.

In dorsal view penis valve is provided with a pair of small sickle-shaped appendages. They are the apices of the volsella, but the structure of which is not well visible, because it is enclosed by basiparamere and penis valve.

ECTEMNIUS (METACTEMNIUS) SUBGENUS NOV.

Type: Ectemnius (Metactemnius) apo sp. nov.

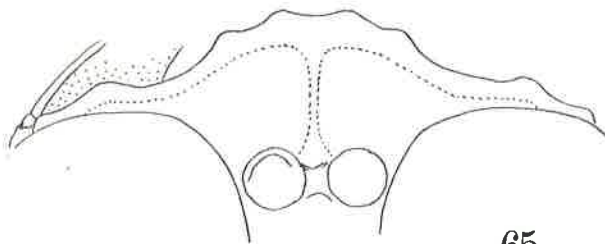
Subgeneric diagnosis (based upon male only): Antenna in ♂ 13-jointed, without modification, A1 unicarinate, A3 much shorter than A4, mandible uniformly bidentate at apex, without tooth on inner margin, acetabular carina present, precoxal carina of mesopleuron in the form of Z (right side), signum present, legs modified, mid tibia without spur, mesothorax generally sculptured as in Metacrabro, propodeum not dull and opaque, GT7 simple, GS8 markedly modified, genitalia similar in general to those of Metacrabro.

The new subgenus is similar in general appearance to Metacrabro, but male antenna 13-jointed and mid tibia without spur as in Protoctemnius, in the present subgenus, however, legs are modified, mandible without tooth on inner margin and male GS8 markedly modified.

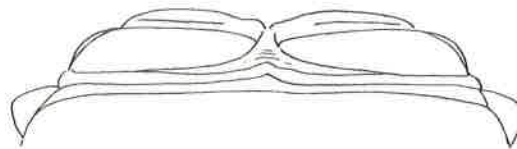
23. ECTEMNIUS (METACTEMNIUS) APO SP. NOV.

♂, 9.0 mm. Shining black all over, not dull and opaque on propodeum as in many members of Metacrabro; yellow are A1 on antero-outer flat area, mandible except broad marginal area, collar (median incision dark brown) and tubercle of pronotum, axilla, two marks on scutellum, postscutellum, a large mark on each side of GT1 and 2, a short narrow band on GT4, a basal band on GT5,6,7, an apical spot of fore femur, basal spot of following tibia, mid trochanter wholly and -tibia except anterior side, two patches on mid tibia, scattered patches on hind coxa and trochanter and basal half of hind T1; pale ferruginous brown are rest of A1, whole of A2 and 3, anterior side of rest of flagellum, posterior margin of collar, tegula (translucent), apical discoloured margin of each gastral tergite and sternite (translucent), rest of fore leg from trochanter apically (vague streak beneath femur and T5 apically dark brown, arolium black), fore side of mid femur except a central black streak, rest of mid tibia largely (basal, median and apical marks black or dark brown), mid tarsus beneath and hind tibial spurs. Wings weakly clouded throughout, slightly darker along costa on radial cell and its outer area, veins and stigma dark brown. Hair on clypeus silvery, on sides of and above scapal basin golden, on temple either golden or silvery according to the direction observed (due to that each hair basally silvery and apically golden), hair on head and thorax above erected, pale brownish yellow, on sides of and beneath thorax and on propodeum silky white, on GT1 long, erected, silky whitish, on the following tergites short, half appressed and pale brownish yellow, hair on legs till femur beneath long and silky white.

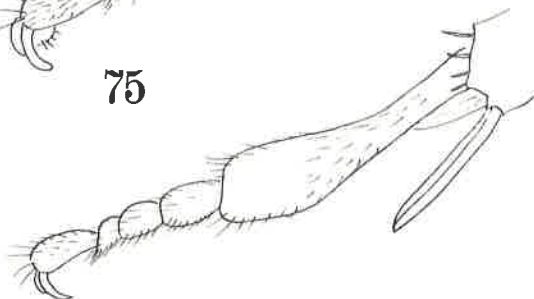
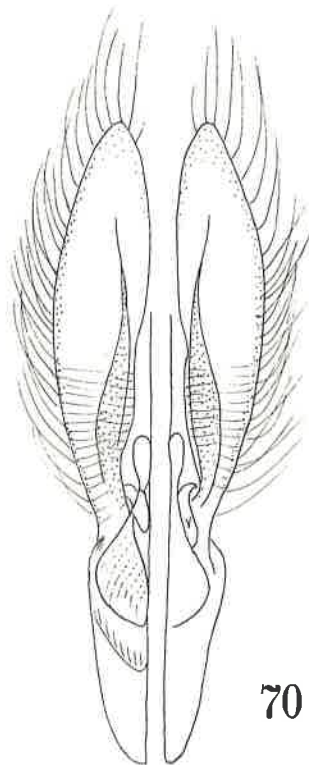
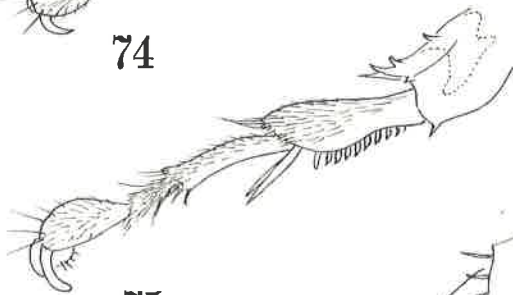
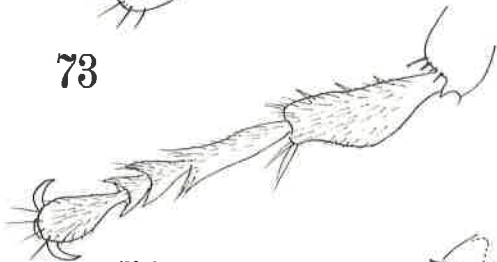
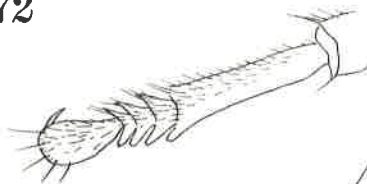
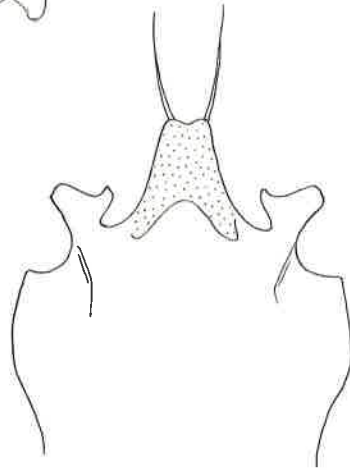
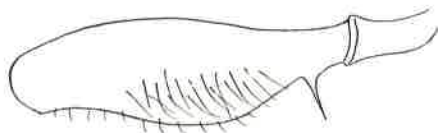
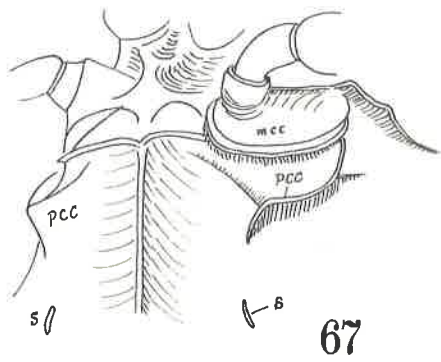
Head from above comparatively thick, width at eyes, at posterior orbits and at occipital carina, length in middle and at eye relatively 100,96,66, 60,69, frons anteriorly minutely strongly roundly, occiput posteriorly broadly roundly emarginate, ocelli in low triangle, OOD: Od:POD:OCD=10:5:6:15, supraorbital foveae indistinct, clypeus: Fig. 65, disc medianly finely and acutely carinated, a deep fine furrow present between inner orbit and antennal socket-rim, between the socket-rims of antennae a raised, somewhat broader furrow present, no tooth on scapal basin above antennal base, inner margin of mandible gently and minutely rounded out behind middle, but not



65



66



toothed. Head seen in profile with eye as broad as temple, but eye narrowed below and temple parallel-sided and, therefore, the latter appears wider than the former, occipital carina not high, reaching close to hypostomal carina, lowering gradually. Pronotal collar highly elevated, in dorsal view: Fig. 66, anterior part acutely, transparently carinate on top, posterior part bluntly ridged on top, only at rounded lateral corners shortly transparently carinate, on mesoscutum admedian line distinctly carinate, carina reaching beyond middle of scutum, parapsidal suture is a short raised and comparatively broad line, not marked, scutellum roundly and highly raised, together with postscutellum without medial furrow; on mesopleuron postspiracular, epicnemial and acetabular carinae forming a continued line, scrobal area not hollowed, instead raised into a minute tubercle (? just below the area), precoxal carina in the form of Z (on right side), with upper end turned towards mesocoxal rim and lower end forwards, seen obliquely from beneath: Fig. 67 (seen from right front side, mcc mesocoxal condyle, pcc precoxal carina, s signum), signum present (in Fig. 67). Propodeum with lateral carinae, not strong but distinct, area dorsalis enclosed with carinae (Fig. 68) that are weaker and rather indistinct medio-posteriorly, posterior inclination broadly excavated medio-dorsally and highly carinated medio-posteriorly; G1 slightly longer than wide at apex (8:7), mat mark on GS2 large, oval, but posteriorly not distinctly outlined, in front of the mark, at antero-lateral corner of GS2 the other mat mark present, GS8 with basal lamellate part very strange in form (Fig. 69 - seen from beneath and from anterior side). Genitalia: Fig. 70 (left half ventral and right half dorsal), volsella thick hook-shaped, bearing a stout process at apex on ventral side (Fig. 71, lateral view). Fore femur in posterior view: Fig. 72, with a long spine near base beneath, covered with long, erect hair on posterior side and with short soft hair beneath, fore T1 dilated and slightly enlarged apically and longer than T2-5 united (Fig. 73), mid femur markedly inflated, -tibia with a few short spines at apex, but without spur, mid T1 flattened or rather slightly excavated beneath, bearing two spur-like spines at apex, in external view crooked (Fig. 74, left leg), on anterior margin bordered with a row of short teeth and a tuft of long spiniform hair (Fig. 75, left leg in posterior view), hind tibial spurs thick, hind T1 apically dilated and excavated on outer (anterior) side, T2-4 more strongly incrassate than usual (Fig. 76). In fore wing abscissae I,II,III of radius with relative length 10,17,4, III outcurved and vertical to costa, those of cubitus under same scale relatively 14,6,5.

Upper frons anteriorly closely covered with medium-sized strong piliferous punctures, but punctures posteriorly and on vertex finer, weaker and sparser, mesoscutum anteriorly transversely, posteriorly longitudinally, somewhat rugosely, strongly and fairly closely striate, scutellum anteriorly transversely, coarsely striate, posteriorly, together with postscutellum, longitudinally, strongly rugoso-punctate; prepectus of mesopleuron obliquely-longitudinally and coarsely striate, mixed with sparse punctures, episternum obliquely or longitudinally finely, closely, somewhat rugosely striate, on epimeral area striae weaker, sparser, partly smooth and polished, metapleuron longitudinally (upper area obliquely) strongly and coarsely striate; on propodeum area dorsalis at base very coarsely foveate (or shortly longitudinally striate), posteriorly more weakly, grossly rugoso-reticulate, outsides of the area and dorso-lateral part of posterior inclination strongly reticulate, main part of inclination transversely rugoso-striate, sides longitudinally, partly obliquely, finely and closely striate; gaster rather sparsely covered with fine piliferous punctures.

♀, unknown.

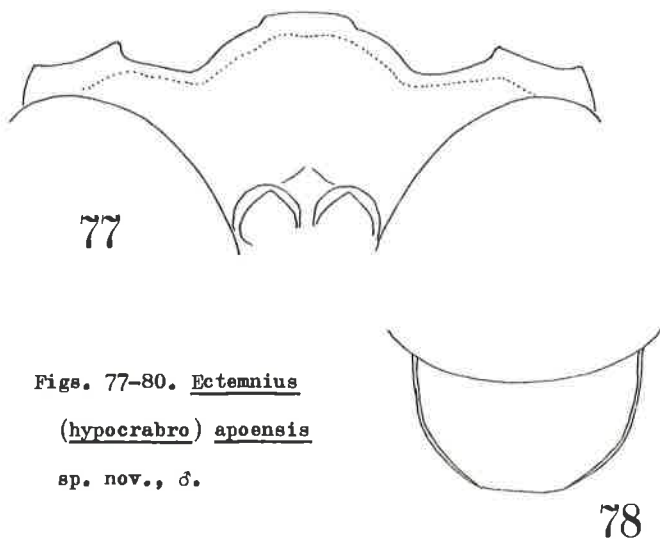
Holotype: ♂, Mindanao, Mt. Apo, 1500 m, near Lake Agko, 8.VIII.1980, T. Murota leg. (Coll. Tsuneki).

24. ECTEMNIUS (HYPOCRABRO) APOENSIS SP. NOV.

Diagnosis. ♂, 6.5 mm, mesoscutum closely rugoso-punctate with medium-sized punctures, main course of rugae on anterior portion transverse and on posterior portion longitudinal, mesopleuron closely, obliquely rugoso-punctate, on epimeral area punctures weaker and longitudinal striae stronger, while on lower episternal area rugae indistinct and punctures stronger, G1 subpetiolate, twice as long as wide at apex, but not nodose apically and whitish on basal half, flagellar joints of antenna very weakly rounded out beneath, without excavation, pygidial area semicircular in outline, translucent ferruginous, erect hair on head and thorax above pale brown, body luxuriously yellow maculated.

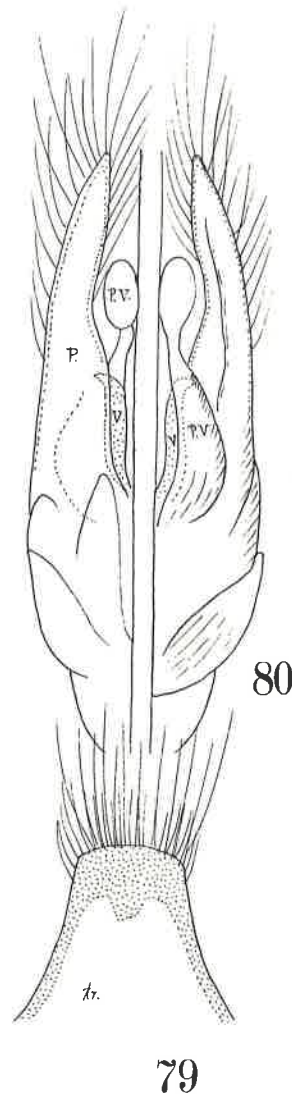
Black, yellow are A1, mandible except marginal area, mouth parts (slightly brown-

ish), collar (except median notch) and tubercle of pronotum, axillae, a medianly interrupted band on anterior part of scutellum, a band on postscutellum, a large mark on area dorsalis, large lateral marks on GT2,4,5, a medianly narrowly interrupted band on anterior part of GT3, a narrow band on GT6, a broad streak from apex to lower part of posterior side of fore femur, mid femur on posterior side and beneath (except a short brown streak), hind femur narrowly at apex, fore and mid tibiae except inner side, a streak on outer side of hind tibia, all tibial spurs and fore and mid T1; rest of fore tarsus ferruginous and rest of mid and hind tarsi dark brown; wings slightly smoky, tegula ferruginous and marginal area broadly hyaline, stigma pale- and veins dark brown. Hair on clypeus silvery, comparatively long, mixed with a few much longer erect hairs, hair on sides of thorax and propodeum long, appressed and silky white, on GT1 long, sparse, erect and also silky white, short appressed hair on other tergites and apical hair of sternites yellowish brown.



Figs. 77-80. Ectemnius
(hypocrabro) apoensis
sp. nov., ♂.

Supraorbital foveae indistinct, OOD:Od:POD:OCD=10:4:11:13, A1 ecarinate, relative length of A2,3,4,5=7,10,8,7, A3=AW×1.7, ultimate joint (A12) narrowly attenuate apically and minutely rounded at apex, clypeus: Fig. 77, disc of median area roundly elevated, without medial carina, mandible bidentate at apex, lower (or posterior) tooth shorter and retreated, the tooth on inner margin long, slender and curved, occipital carina not high, running close to hypostomal carina and ended gradually. Pronotal collar without transverse carina, medianly finely furrowed (black), with antero-lateral corners rounded, tubercle roundly raised, admedian line finely carinate, not reaching mid point of scutum, parapsidal suture short and comparatively broad shining line, prescutal furrow deep, not foveolate, on mesosternum acetabular carina absent, on mesopleuron precoxal carina present, vertical, not toothed, not running high, not turned anteriorly at lower end; on propodeum area dorsalis vaguely margined with feeble furrow, nearly semicircular in outline, lateral carinae of propodeum indistinct, except apical half of posterior inclination, medial furrow of inclination fine, deep and slightly enlarged upwards; G1 with relative width at base, at minimum behind base and at apex, when length is 40, =11,7,19 and width of G2 at apex relatively 41. Pygidial area: Fig. 78, GS8: Fig. 79, genitalia: Fig. 80 (left half ven-



tral, right half dorsal; V volsella, PV penis valve, P paramere, tr transparent). Legs without modification. Abscissae I,II,III of radius relatively =10:12:4, III slightly oblique to costa and slightly sinuate, those of cubitus under same scale =24:6:5.

Upper frons punctate-reticulate, punctures not very fine, vertex more finely and somewhat weakly, but closely punctured, punctures on mesoscutum larger than those on upper frons, scutellum longitudinally punctate-striate, mesopleuron also punctate-striate, striae more distinct posteriorly, metapleuron longitudinally closely striate; area dorsalis strongly, closely and radiately striate, outsides of the area and posterior inclination coarsely, irregularly, but uniformly rugoso-punctate-reticulate, sides obliquely, finely and closely striate and on postero-dorsal part closely punctate-reticulate. GT1 on basal white area coarsely punctured and rugose, rest smooth and shining and very sparsely scattered with very fine piliferous points, from GT2 apically closely covered with fine, short-hair-bearing punctures and not shining.

♀, unknown.

Holotype: ♂, Mindanao, Mt. Apo, 1500 m, near Lake Agko, 8.VIII.1980, T. Murota leg. (Coll. Tsuneki).

25. ECTEMNIUS (CAMERONITUS) NIGRITARSUS PAXINUS LECLERCQ, 1963 (n. comb.)

Ectemnius (Cameronitus) nigritarsus Herrich-Schaeffer subsp. palitans Bingham: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 94(5-6): 144 (key), 152, 1958 (♀ ♂, India, Ceylon, Luzon) (partim).

Ectemnius (Cameronitus) paxinus Leclercq, Ibid., 99(1): 29-30, 1963 (2 ♀ Negros, 1 ♂ 3 ♀ 1 ♂, Luzon).

Specimens examined: 7 ♀ 32 ♂, Luzon: Bagui, Mines View Park, 1500 m, 1.I.1980, T. Murota; 1 ♀ 1 ♂, Leyte: Lake Imerda, 19.IV.1982, T. Tano.

Remarks. Leclercq in his first study (1958) placed the Philippine specimens under the specific category of palitans Bingham (1896), but later (1963) he separated his palitans into 3 different species, namely, palitans (S. India and Ceylon), palitoides (N. India) and paxinus (Philippines). It seems to me, however, better to allocate them as local races under the specific category of nigritarsus Herrich-Schaeffer, as done by him with respect to palitans s. l., because the differences between them are only slight and rather superficial and, moreover, distinctly connected with the localities they occur.

Of the colour of the mid femur Leclercq (1958) says "Fémurs II largement jaunes, presqu'entièrement jaune chez des ♀ ♀ de Luzon". In the above listed specimens that are collected in the same place and on the same day, however, the development of the yellow colour over the mid femur is markedly variable, though in general more broadly yellow in the female than in the male.

Of the specimens from Luzon above listed 4 ♀ 4 ♂ are considerably different from others in the puncturation on the upper frons. In them punctures on the area are much stronger and coarser, especially markedly so in the male. Furthermore, they are generally distinctly larger in body size and have the mid femur less broadly yellow maculated than in others. Otherwise, however, no noteworthy difference can be discovered upon them and they must be mere variants in this subspecies.

The male specimen captured at the lakeside of Imerda, Is. Leyte, is much larger in body size than those from Luzon. This may be due to the difference in the season of the year when they were captured.

In this subspecies the male has the first gastral segment relatively much longer than in the female. This is just the case in the nominate race of nigritarsus H.-S.

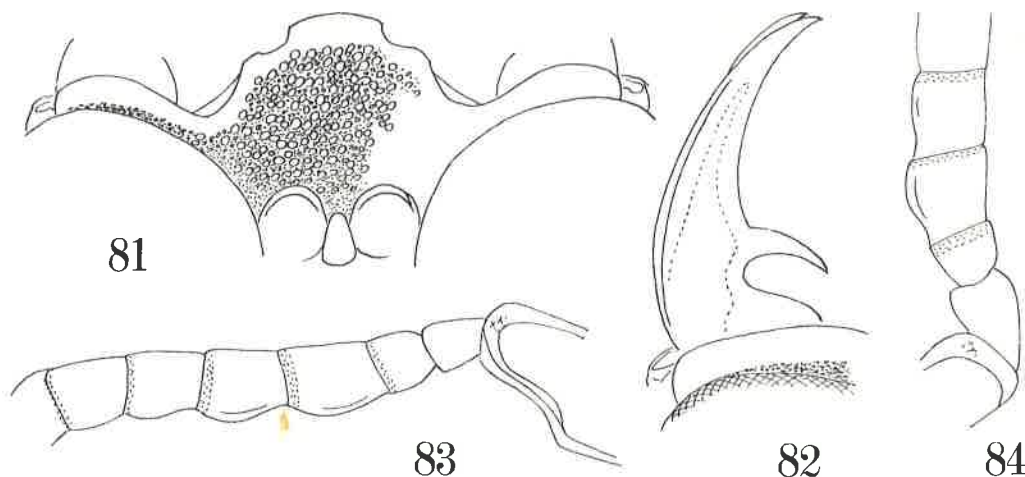
26. ECTEMNIUS (CAMERONITUS) DJURDZIN* SP. NOV.

Comparative notes. Somewhat resembles peterseni Tsuneki, known from Palawan, but is distinguished therefrom by the differences in the structure of the clypeus and gastral segment 1 and in the maculation of the area dorsalis and gaster. It is also somewhat similar in appearance to flavohirtus Tsuneki occurring in Japan and Formosa, but can easily be separated from it by the much smaller body size, more highly raised pronotal collar and tubercle, axillae and scutellum and not yellowish and less abundant covering hair.

* One of seven Deities of Good Luck in an old tale of Japan.

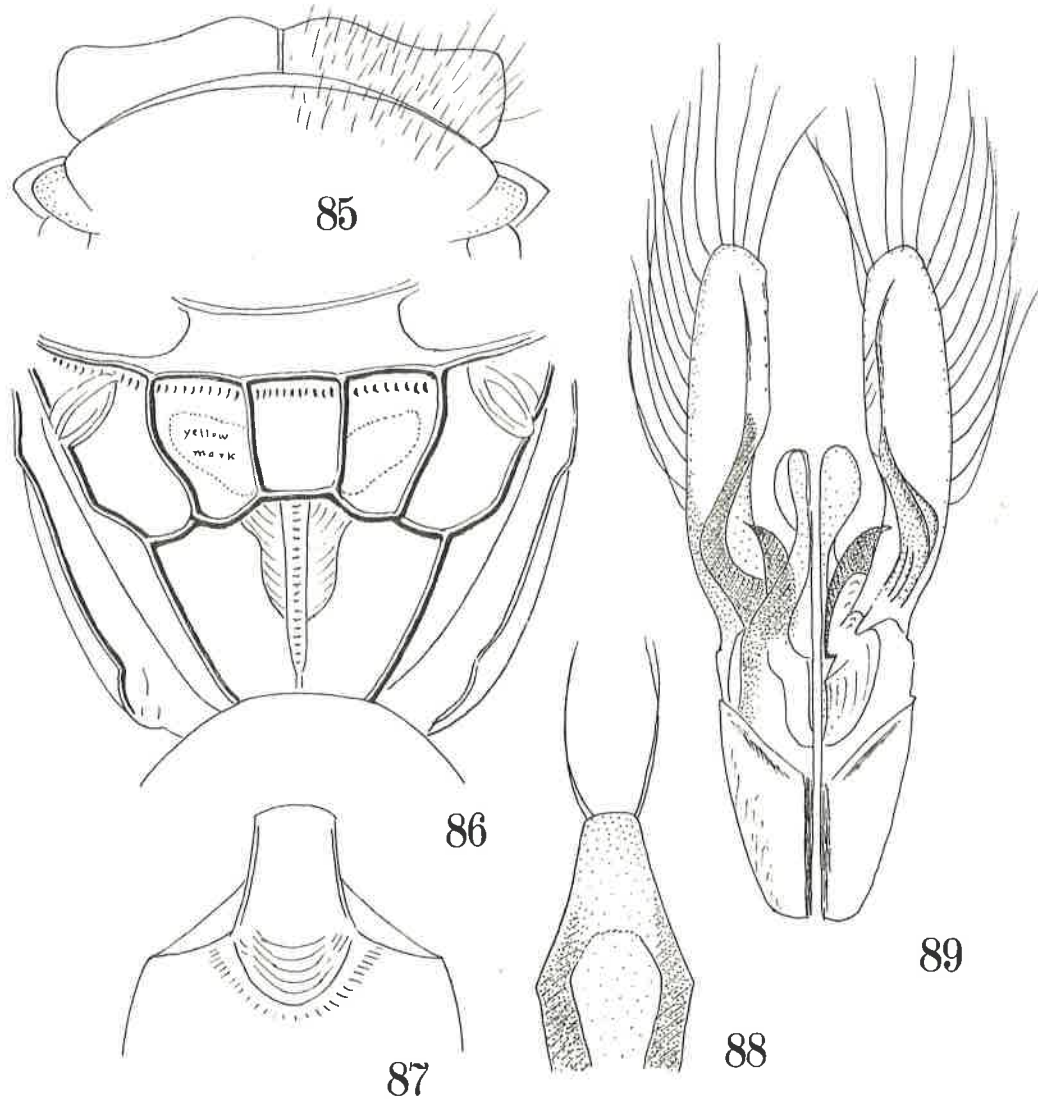
♂, 6.5-7.0 mm. Black and shining, without plumbeous lustre. Lemon yellow are A1-5 (or A1-7, 4-7 brown above), mandibles broadly except marginal areas, pronotal collar and tubercles completely, a mark on tegulae, axillae, a medianly constricted (sometimes narrowly interrupted) band on scutellum with its latero-posterior ridges, postscutellum completely, two spots on area dorsalis (sometimes lacking), a band on GT1, a pair of lateral marks on GT2 (small), GT3-5 (large) and legs except following black: coxae (except apices), mid trochanter above, hind trochanter, all femora beneath (in mid femur rather on front side and in hind femur much broader), fore tibia beneath, apical patch of mid and hind tibiae, fore T5 and mid and hind T2-5. Wings hyaline, stigma brown and veins dark brown. Hair on clypeus and temples silvery, on sides of and above scapal basin brassy, on vertex and thorax comparatively long, erected and slightly yellowish white.

Head from above transverse, with temples markedly roundly convergent posteriorly, relative width at occipital carina to HW = 63:100, supraorbital foveae located along inner orbits, long, ranging from level of fore ocellus to anterior oblique verge to scapal basin, distinctly impressed, but not acutely margined and not deep, OOD:Od:POD:OVD = 20:11:16:30, head seen in profile with eye wider than temple, occipital carina highly raised, not reaching hypostomal carina, suddenly ended and distinctly angled at apex, but not toothed, head seen in front with lateral margins gently roundly convergent below, clypeus: Fig. 81, surface very gently roundly raised, nearly flat, with sides of median produced part incrassate, shining, bearing upper and lower margins, mandible bidentate at apex, the tooth on inner margin markedly slender, long and curved (Fig. 82) antennal socket-rims contiguous to each other and to eyes, A1 strongly bicarinate, A2-7: Fig. 83 (tr. transparent carina), sometimes basal part appearing as Fig. 84; A12 laterally compressed and obliquely truncate at apex. Pronotal collar highly raised (the raised area wholly yellow), without carina on top, but roundly produced at lateral cor-



ners, in posterior view: Fig. 85, tubercles also highly raised, nearly corn-shaped, mesoscutum roundly elevated, admedian line is a raised line, notauli are impressed lines, all not reaching mid point of the scutum, parapsidal sutures not marked, postscutal furrow deep, coarsely foveate, axillae and scutellum remarkably highly elevated, with lateral hollows very deep, postscutellar furrow also deep, coarsely foveate, on mesopleuron postspiracular-epicnemial carinae acutely raised, while on mesosternum acetabular carina weak, but surely present, episternal furrow fine and foveolate, but scrobal furrow indistinct, precoxal carina runs upwards at a short distance apart from coxal margin, lower end of which is turned forwards, but usually not far extended, but rarely vaguely extended forwards and near acetabular carina becoming distinct again as signum, propodeum with distinct lateral carinae, area dorsalis margined with carina and sectioned into three parts by two longitudinal carinae (Fig. 86), from latero-posterior corners of area dorsalis a transverse carina runs to lateral carinae of the segment, letting the outsides see as if outer parts of area dorsalis (Fig. 86), posterior inclination flat, medianly with a wedge-shaped deep furrow. G1 as long as wide at apex,

GT2,3,4,5 gently depressed at base and apex, apparently weakly constricted (not so marked as in members of subgenus *Iwataia*), GT7 with pygidial area (Fig. 87), lamellate on the surface and thickened at each side, deeply depressed into base, sternite 8: Fig. 88, genitalia: Fig. 89 (left half from beneath, right half from above), volsella at apex hook-shaped. In fore wing abscissae I,II,III of radius with relative length 10,16,3, III perpendicular to casta, abscissae I,II,III of cubitus under same scale relative-

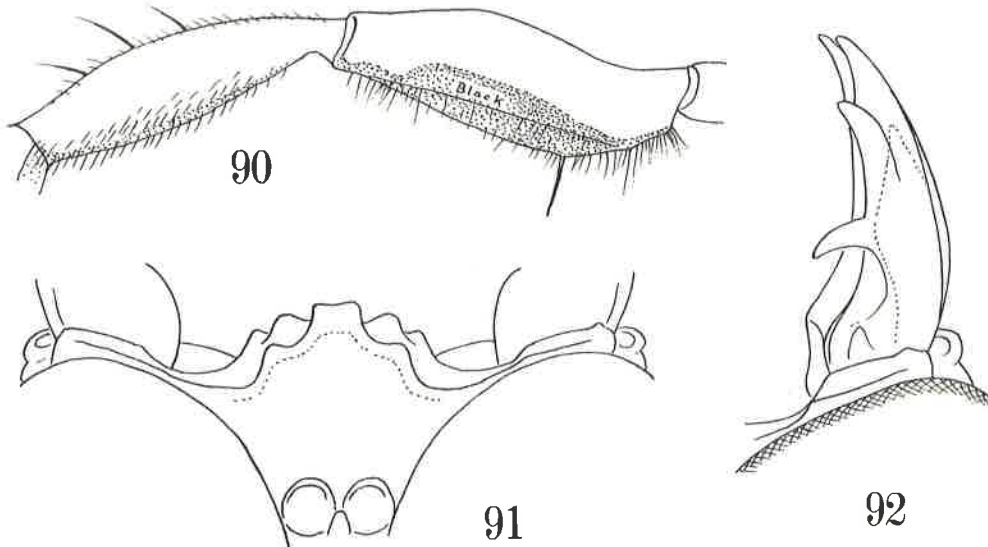


ly 14,7,6, III oblique to radius as well as to cubitus. Legs not strongly modified, but fore femur acutely carinate at posterior margin and somewhat bluntly so beneath and with a long spine near base beneath (Fig. 90), fore tibia with a row of 3 spines on outer side, hind tibia with several short strong spines on outer side, brown in colour and all T1 very long, longer than each following T2-5 united.

Frons above scapal basin at obliquely inclined area very closely covered with fine piliferous punctures, on flat dorsal area of frons punctures weaker, sparser and vertex almost impunctate, mesoscutum and -pleuron very finely, sparsely punctured and at epimeral area without puncture, propodeum almost completely impunctate, shining,

only on median part of area dorsalis and its outer side with feeble rugae, gaster moderately closely covered with fine piliferous punctures, surface not so strongly punctured as on head and thorax.

♀, 7.5 mm, similar in general to ♂, but antenna not modified, thick and short, clypeus more robustly made, with sides of median produced part duplimargined more thickly than in ♂ (Fig. 91), mandible tridentate at apex, with the tooth on inner margin shorter (Fig. 92), gaster bearing gutterwise excavated pygidial area and legs more broadly yellow, without special long spines on fore femur and tibia and generally with tibiae more strongly spined.



Head from above with HW at eyes, at posterior orbits and at occipital carina, and HL at eye and in middle relatively 100,96,64;64,54. OOD:Od:POD:OCD=20:11:16:35. Supra-
orgital foveae as in ♂, frontal median line not impressed, but raised into carina also
as in ♂, A1 strongly bicarinate anteriorly, A2-7 and 12 with relative length 6,6,10,7,
6,5.5,10. A3 slightly longer than wide at apex (6:5), A4=AW×1.8, pronotal collar and
tubercles and axillae and scutellum highly raised as in ♂, propodeal structure also
similar, but gentle constriction of gastral segments weaker and less distinct. Fore
femur acutely bicarinate at posterior margin and beneath, with a very minute tooth near
base beneath, but not long spined, fore tibia with 4 long strong spines anteriorly, mid
tibia apically and hind tibia on outer side much more strongly spined than in ♂.

Holotype: ♂, Luzon, Asin Spa, 600 m, 16 km from Baguio, 5.I.1980, T. Murota leg.
(Coll. Tsuneki).

Paratypes: 4 ♂, same place, 2,3,3,5.I.1980, T. Murota (Coll. Murota); 1 ♀, Min-
danao, Bukidnon, Malaybaly, 800 m, 13.VIII.1980, T. Tano (Coll. Tano).

27. ECTEMNIUS (IWATAIA) BOGORENSIS LECLERCQ, 1958

Ectemnius (Cameronitus) bogorensis Leclercq, Bull. Ann. Soc. R. Ent. Belg., 94(5-6):
142 (keyed), 151, 1958 (♀ ♂, Java; ♂, Singapore).

Ectemnius (Cameronitus) bogorensis: Leclercq, Ibid., 99(1): 26, 1963 (1 ♀, Mindanao;
1 ♂, Sibuyan; 1 ♀, Negros and ♀, South India).

Ectemnius (Cameronitus) bogorensis tarawakanus Tsuneki, Steenstrupia (Copenhagen), 4:
104, 1976 (1 ♀, Tawitawi).

Specimens examined: 2 ♀ 4 ♂, Mindanao (1 ♀ 2 ♂, Cagayan de Oro, Makahambus Cave,

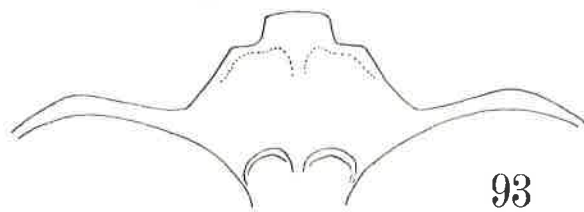
15,16.VIII.1980, T. Murota; 3 ♂, Cagayan de Oro, Cagayan river side, 17.VIII.1980, T. Murota; 1 ♀, Lucidnon, Malaybalay, 800 m, 13.VIII.1980, T. Murota); 1 ♀ 1 ♂, Luzon, (1 ♀, Prov. Laguna, Pagsanjan, 7-9.VIII.1978, H. Kurokawa; 1 ♂, Asin Spa, 16 km from Baguio, 2.I.1980, T. Murota).

1 ♂ (var.), Prov. Laguna, Pagsanjan, 7-9.VIII.1980, H. Kurokawa.

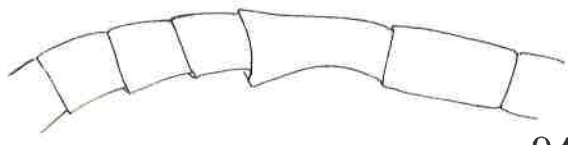
Remarks. For the comparison of the following species the characters of the Philippine representative of the present species are given in some detail below:

♂, 6.0-6.5 mm. Black, lemon yellow are Al except brown spot above, a large mark on mandible, pronotal collar and tubercles, axillae, two large marks on scutellum (often fused together), postscutellum, a large mark on prepectus, a large lateral mark on each side of GT1-5, gradually slightly smaller posteriorly, apical margin narrowly of each trochanter, large apical mark of fore and mid femora, a streak above at apex of hind femur, all tibiae except inner margin, mid T1 on basal half and hind T1 except apex; brown to dark brown are mandible at apex and on inner marginal tooth, sometimes antenna beneath, tibial spurs and rest of tarsi (fore T1 pale brown). Wings hyaline, veins and stigma dark brown. Hair on clypeus, marginal parts of scapal basin and temple silvery and on body silky white, fairly long, but rather sparse.

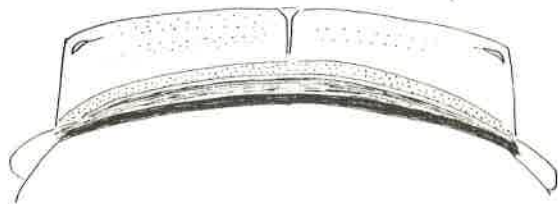
Head from above with NW at eyes, at anterior ends of temples, at occipital carina and III. at eye and in middle relatively 100:96:62:64:58. OOD:Od:POD:OCD=20:10:15:34. Supraorbital foveae slender and long, longer than A2+3, but shallow, clypeus: Fig. 93, longer in middle than wide at medio-apical margin, mandible bidentate at apex, lower tooth slightly longer, the tooth on inner margin strong and robust, A1 acutely bicarinate in front, relative length of A2-7=8,10,9,8,9,5, A3=AW×2.0, A6 roundly excavated beneath and obliquely produced at apex (Fig. 94), A7 and 8 show similar tendency, but very slightly so, A12 (ultimate) rounded at apex, but in lateral view acutely pointed apically. Pronotal collar highly raised, in dorsal view: Fig. 95, in posterior view: Fig. 96, almost rounded dorsally in longitudinal section, anterior inclination perpen-



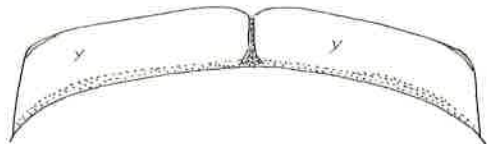
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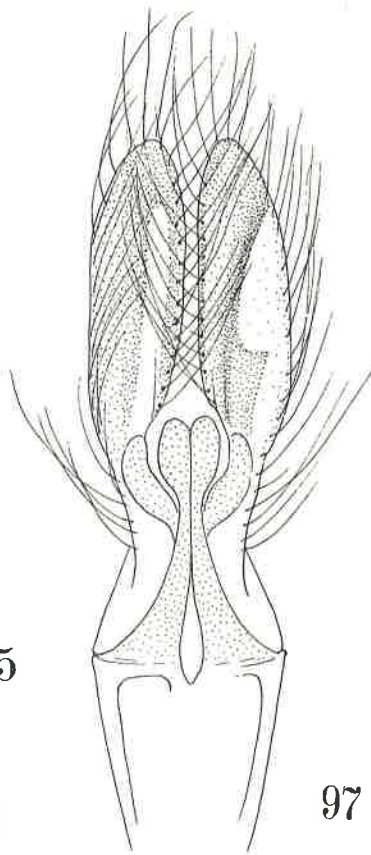
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dicular and very deep, raised area except median fine furrow completely yellow, with lateral corners angled and slightly produced where in posterior view with top transparently shortly carinated (Fig. 96), the furrow between collar and mesoscutum comparatively broad, markedly deep, but not foveolated, on mesoscutum admedian line is a fine carina, but notauli indistinct, on mesopleuron and -sternum postspiracular-epicnemial-acetabular carina and medio-sternal carina distinct, precoxal carina runs upwards till near mid point to scrobe and below turned forwards in hook-shape, but not far extended forwards; propodeum with lateral carinae thorough and distinct, dorsal aspect margined posteriorly with transverse carina which reaches lateral carinae, area dorsalis enclosed laterally with outcurved carinae, considerably apart from lateral carinae of the segment, but the carinae not reaching posterior marginal carina, thus remaining postero-lateral parts of area dorsalis open, posterior inclination nearly flat, with median furrow wedge-shaped, acutely margined with fine carinae, G1 as long as wide at apex, GT2 and 3, besides constrictions at apical areas, at base also depressed, GT7 with pygidial area, margined on both sides with carinae, apex lamellate and gently roundly emarginate. Genitalia: Fig. 97 (dorsal view, 4 examples examined), pattern formed by brownish pigment in paramere is quite inconstant, two instances are given in right and left, characteristic are the long marginal hair and comparatively broad paramere. Legs without particular modification, but each T1 long, longer than T2-5 united, hind tibia not strongly clavate, produced at apex on outer margin and provided with a few strong spinules on outer side.

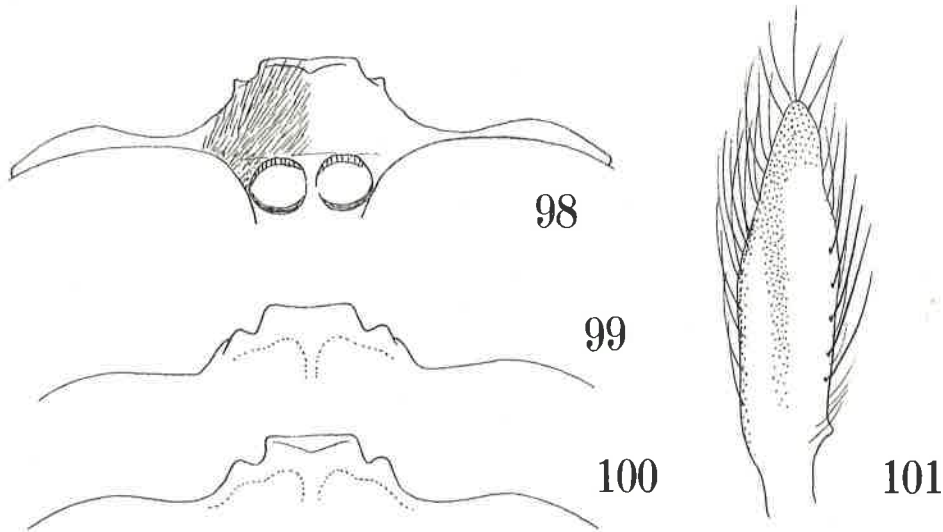
Upper frons covered with shallow medium-sized punctures, PIS mostly smaller than PD, punctures partly obliquely arranged in weak furrows, giving somewhat rugosed appearance, on anterior obliquely inclined verge punctures stronger, closer, subreticulate, on vertex smaller, sparser and on ocellular areas almost lacking, punctures on mesoscutum medium-sized, deep, strong and close, each more or less longitudinally elongate and some longitudinally arranged, with PIS turning to longitudinal carinules or carinae, as a result surface as a whole appearing longitudinally, somewhat convergently, punctate-rugose or punctate-striate, the tendency is stronger posteriorly and on posterior marginal area purely longitudinally striate; scutellum anteriorly finely and sparsely punctured, posteriorly closely, longitudinally rugoso-punctate; on mesopleuron punctures somewhat finer, weaker than on scutum and sparser, with PIS larger than PD and without striae, on epimeral area punctures much finer and sparser; on propodeum area dorsalis very finely and sparsely punctured, but posteriorly punctures somewhat larger, stronger and closer, frequently mixed with some transverse rugae or striae (size and density of punctures on the disc considerably varied individually), outsides of area dorsalis obliquely or transversely, coarsely rugoso-striate, posterior inclination transversely, closely striate, sides longitudinally closely striate. GT1 covered with somewhat small punctures, PIS 1-2 times PD, but on posterior constricted area punctures finer and much sparser, GT2 more closely (PIS 0.5-1 times PD) punctured on raised area, on basal and apical depressed areas punctures very fine and sparse, GT3 similarly punctured in pattern, but punctures much finer and sparser and on constriction almost absent, on GT4 and 5 punctures very fine, merely piliferous weak points even on raised area, but on GT6 and 7 punctures stronger again; pygidial area strongly punctured except medio-apical weak ridge and apical lamellate part.

♀, 6.5-9.8 mm. Similar to ♂ in general, but head seen from above much thicker, HW at eyes, at anterior ends of temples and at occipital carina and HL at eye and in middle relatively 100,96,56,67,61; OOD:Od:POD:OCD=20:9:19:31. Clypeus: Fig. 98, variation of apical margin: Figs. 99 and 100, characteristic is shorter than in ♂, as long in middle as wide at medio-apical margin, with median carina stronger; mandible thicker, tridentate at apex, the tooth on inner margin smaller and shorter; A1 acutely bicarinate as in ♂, relative length of A2-7=10,10,8,7,6,6, A3=AW×1.8, flagellum without modification, gradually thicker till A11. Supraorbital foveae, pro- and mesothoracal structure, propodeum and gaster similar, except sexual difference.

Coloration generally similar to ♂, variable in development individually, gastral lateral marks usually on GT1-5, but in less developed case on GT1-4 only, fore T1 usually pale brown, sometimes yellow, mid and hind tarsi sometimes on T1 only, sometimes on T1 and 2 yellow. Marks on prepectus and scutellum markedly variable in development.

Punctuation on head above considerably varied among 3 specimens observed: (1) Makahambus specimen, largest, 10 mm, with best developed maculae. Punctures on upper frons fine, shallow, indistinct in outline, even in distribution, close, PIS less than PD, anteriorly larger, stronger, closer, on obliquely inclined verge subreticulate, with a few fine rugae anteriorly (supraorbital foveae nearly as wide as Od and about 4 times as long as Od, with a few piliferous points within), punctures posteriorly on vertex

finer, sparser, but on posterior vertex becoming distinct in outline and somewhat deep. (2) Malaybalay specimen, smallest, 6.5 mm, with worst developed maculae. Punctures on upper frons larger than in first specimen, close, stronger, but indistinct in outline, anteriorly closer (but not larger), subreticulate, in general somewhat rugosely arranged, posteriorly sparser (supraorbital foveae slightly narrower than Od, about 4 times as long as Od, more distinctly outlined than in 1, without puncture within), on and around ocellar area surface impunctate, on ocellular areas with a few weak arcuate striae, mixed with sparse weak punctures between, on posterior vertex punctures as large as on frons, indistinct in outline, but close, longitudinally, somewhat rugosely arranged. (3) Pagsanjan specimen, 7.5 mm, with normally developed maculae. Punctures on upper frons generally as in 2, but shallower, obliquely subrugosely arranged, anteriorly stronger, closer and subreticulate (supraorbital foveae as in 2), posteriorly from before level of fore ocellus punctures becoming indistinct, replaced with weak rugae and on ocellular areas longitudinally weakly, somewhat arcuately striate (ocellar area very finely punctured and around each ocellus impunctate), on vertex posteriorly punctures as large as those on frons, indistinct in outline, but somewhat deep and close.



Mesoscutum: (1) Punctures medium-sized, slightly elongate, close; except lateral marginal areas, first obliquely, then longitudinally, convergently arranged, PIS between puncture-series turning into rugosed striae, on posterior area punctures sparser and surface purely longitudinally, closely striate. (2) Similar in general, but somewhat more coarsely punctate-striate on disc. (3) Similar, but striae stronger and more remarkable than punctures.

Scutellum: (1) As in ♂. (2) and (3) Punctures much larger and close and posteriorly rugoso-punctate as usual.

Mesopleuron: (1) Punctures medium-sized, on central area PIS larger than PD, but below punctures closer, on antero-ventral area longitudinally punctate-striate as on scutum, on epimeral area punctures fine and close. (2) Punctures larger, irregular in distribution, mixed with some smaller ones, on antero-ventral area strongly, coarsely punctate-striate, punctures on epimeral area very fine and close. (3) Punctured as in 1, but even on antero-ventral area without mixed striae.

Area dorsalis: (1) Very finely and closely punctured, but anteriorly punctures sparser (outer sides transversely, strongly, fairly closely striate). (2) Similar in pattern, but punctures comparatively larger and stronger. (3) Finely, very sparsely punctured, but on posterior half punctures close, mixed with oblique or transverse rugae or striae.

Gaster: (1) GT1 and 2 very finely and sparsely punctured, on constrictions much more sparsely so, GT3 and 4 much more finely and sparsely punctured, while GT5 distinctly punctured, punctures posteriorly stronger and closer except marginal lamellate area. (2) Similar in pattern, but punctures on GT1 stronger, medium-sized, on GT2 slightly smaller, while on GT5 comparatively smaller, but distinct. (3) Similar to 1.

An aberrant male. In the male specimen captured at Pagsanjan, Prov. Laguna, Is. Luzon, together with the 3rd specimen of the above mentioned females, mandible and fore and hind femora black, the maculae on prepectus, scutellum and tibiae of legs are not well developed and punctures on the raised parts of GT1-3 large and strong, but GT 2,3,4 each carrying a pair of small lateral marks and puncturation and/or sculpture on mesoscutum, mesopleuron and area dorsalis are as in other specimens of bogorensis. Thus it shows quite intermediate character between bogorensis and the following species, but the structure of the genital organs, especially relative width of the paramere (Fig. 104) agrees with that of bogorensis.

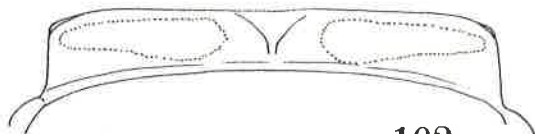
28. ECTEMNIUS (IWATAIA) RUGOSUS SP. NOV.

The present species resembles bogorensis very closely in the general structure and, furthermore, they are collected together frequently in the same place and at the same time, and so it may be the extreme variation of bogorensis, but it can be distinguished from this by different sculpture and/or puncturation on head, mesopleuron, area dorsalis and gastral tergites and by the much less developed maculation of body and appendages and, moreover, they are separable from each other by the relative width of paramere of male genital organs (though both show a certain range of variations). Based on these differences the present species is dealt with as distinct from bogorensis.

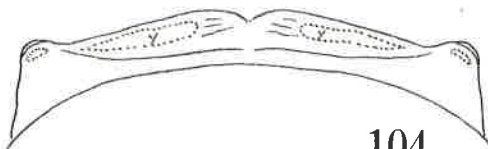
♂, 5.5-6.5 mm. Mandible, prepectus and gaster black, upper frons obliquely weakly striate, mixed with scattered shallow punctures, but anteriorly on inclined verge strongly subreticulate-punctate, mesopleuron except epimeral area longitudinally rugoso-punctate, area dorsalis at base obliquely, apically transversely rugoso-striate and sparsely punctate, GT1-3 distinctly, comparatively much more grossly punctured on the raised areas.



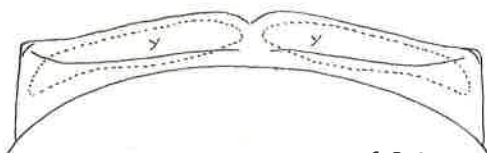
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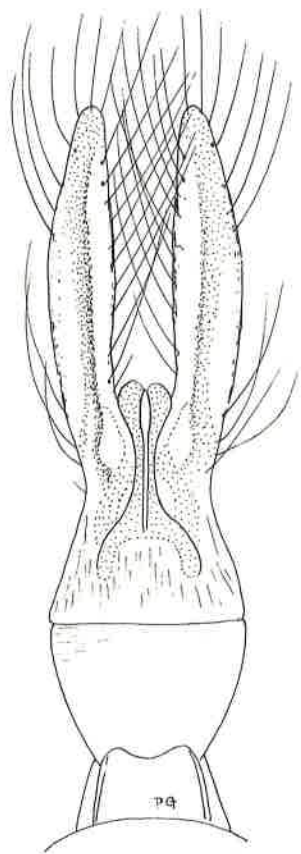
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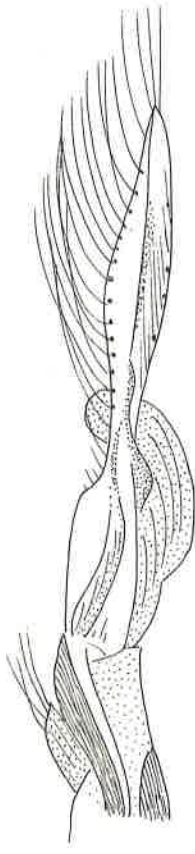
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Black; lemon yellow are Al in front, medianly interrupted band on collar and tubercle of pronotum, axilla, a spot on scutellum near axilla (in some specimens both or the latter alone completely black), rarely a pair of minute lateral spots on GT1 or GT1 and 2, a patch near apex on outer side of mid femur and a streak on outer side of each tibia. The tooth on inner margin of mandible, fore tibia on inner side and apex, tibial spurs and fore tarsus ferruginous- or reddish brown. Hair on clypeus silvery, dense and appressed, on body and legs comparatively long, silky white, fringe of hair of paramere of genitalia markedly long, shining ferruginous (Fig. 106).

Head from above with sides rounded, with top broadly flat, HW at eyes, at anterior ends of temples and at occipital carina and HL at eye and in middle relatively 100,90,62;67,58; OOD: Od:POD:OCD=20:11:15:33, occipital carina highly raised, foveolate, running close to, but not reaching hypostomal carina, not toothed at the end. Supra-



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postspiracular-epicnemial-acetabular carina and medio-sternal carina distinct, precoxal carina runs upwards till near mid point to scrobe and below turned forwards in hook-shape, but not extended forwards; propodeum with lateral carinae thorough and distinct, dorsal aspect margined posteriorly with strong transverse carina which reaches lateral carinae, area dorsalis enclosed laterally with outcurved carinae, considerably apart from lateral carinae, but the carinae not reaching posterior marginal carina, thus postero-lateral parts of area dorsalis are left open, posterior inclination nearly flat, with median furrow wedge-shaped, acutely margined with carinae, G1 as long as wide at apex, GT2 and 3, besides the constriction at apical area, at base also depressed, GT7 with pygidial area, margined on both sides with carinae, apex lamellate and gently roundly emarginate, Genitalia in dorsal view: Fig. 106, in lateral view (from left side): Fig. 107 (6 examples examined), always with paramere distinctly narrower than in *bogorensis*, but the pattern formed by melanic pigment in paramere is considerably varied individually. Legs without particular modification, but all T1 long as in *bogorensis*.

Upper frons at anterior inclined part above scapal basin closely covered with medium-sized punctures, subreticulate, at flat dorsal part punctures weaker, sparser and almost completely replaced with arcuate rugae or striae, ocellar area finely, closely punctured, ocellular area finely, somewhat closely striate and near eye mixed with weak punctures, from vertex posteriorly punctures first fine, close and distinct, but then slightly larger, sparser and weaker, temples sparsely covered with fine piliferous points; pronotal collar finely, sparsely punctured, mesoscutum punctate and striate just as in *bogorensis*, but generally punctures slightly larger, scutellum at base sparsely, somewhat grossly punctured, punctures posteriorly stronger and closer, mixed with rugae, punctures on postscutellum finer, weaker, more indistinct, area dorsalis

orbital foveae located along eye from level of fore ocellus forward, slender and long, about half as wide as and about 3 times as long as Od, but longer than A2+3, with inner margin distinctly raised, frons anteriorly roundly inclined to scapal basin, outer depressions of ocelli weak, in fore ocellus extended forwards into wide, shallow frontal furrow, seen in front with lateral margins roundly convergent below, antennal sockets contiguous to each other and to inner orbits, clypeus: Fig. 102, mandible bidentate at apex, lower tooth slightly longer, the tooth on inner margin strong and robust, A1 bicarinate in front, relative length of A2, 3, 4, 5, 6, 7=10, 10, 9, 8, 9, 6, in lateral view A6 roundly excavated beneath and obliquely produced at apex, A7 also shows similar tendency slightly, A12 with apex rounded, but in lateral view pointed at apex. Pronotal collar except lateral parts flatly raised forwards, with apical margin bluntly edged and medianly acutely incised, with lateral corners angulated and slightly reflected (Fig. 103), in posterior view with top waved (Figs. 104 and 105), mesoscutum with admedian line distinctly carinate, but not reaching mid point of scutum, notauli indistinct among similar longitudinal striae, parapsidal sutures also indistinct, prescutellar furrow fine, not foveolate, while postscutellar furrow broad and foveolate, scutellum without median ridge or furrow, on side and beneath thorax

on broad basal and apical furrows coarsely, but rather shallowly foveate and medianly longitudinally carinate, disc transversely or obliquely finely and weakly striate, with interspaces filled with shallow weak punctures, posterior inclination transversely, finely and closely rugoso-striate; gastral tergites except nearly smoothed apical constricted areas comparatively strongly and closely punctured, PIS on GT1 feebly microstriolate, punctures in general gradually finer, weaker and sparser posteriorly, not becoming strong again on GT6, but on pygidial area large and fairly close except smooth marginal areas.

♀, 8.0 mm. Black; yellow are a mark on mandible (less than half), A1 in front, pronotal collar except medial incision and posterior margin, tubercle, axilla, a spot on scutellum near axilla, a line on postscutellum, a comparatively small mark on each side of GT1-4, on 2 largest, on 3 smaller and on 4 very small, a patch on apical outer side of mid femur and a streak on each tibia, not reaching apex.

General structure very similar to that of *bogorensis*, but frontal foveae slightly wider than Od and more than 4 times as long as Od, OOD:Od:POD:OCD=10:4:8:19.

Upper frons till anterior oblique verge somewhat irregularly subreticulate with medium-sized, distinct punctures, on sides of fore ocellus punctures fine, but close, mixed with a few rugae, on sides of hind ocelli from posterior end of frontal fovea till behind eye punctures very large, shallow and slightly elongate, with PIS turning to weak, broad and arcuate striae, on vertex behind ocellar area punctures larger, but shallow, not distinct in outline and somewhat sparse; mesoscutum strongly punctate-rugoso-striate as in ♂ and on posterior margin purely longitudinally striate, scutellum rather grossly and closely punctured, mixed with rugae posteriorly, prepectus of mesopleuron longitudinally, coarsely striate, with shallow punctures scattered between striae, episternum closely covered with gross punctures, subreticulate, punctures partly obliquely arranged, with PIS continued to rugosed striae, somewhat markedly so on antero-ventral area; area dorsalis obliquely, divergently, finely and closely striate, with interspaces sparsely covered with fine, shallow punctures, posterior inclination transversely and sides longitudinally, finely and closely striate. Gaster similar in punctuation to ♂, but punctures shallower and sparser (marked on GT1) and on GT6 slightly stronger again.

Holotype: ♂, Luzon, Asin Apa, 600 m, 16 km from Baguio City, 5.I.1980, T. Murota leg. (Coll. Tsuneki).

Paratypes: 1 ♀, same as in holotype (Coll. Murota); 1 ♂, Mines View Park, Baguio City, 1500 m, 1.I.1980, T. Murota; 2 ♂, Mindanao, Cagayan de Oro, Makahambus Cave, 15,17.VIII.1980; 1 ♂, Mindanao, Bukidnon, Malaybalay, 800 m, 13.VIII.1980, all leg. T. Murota (Coll. Murota).

Other specimen: 1 ♂, same as in holotype and ♀ (Coll. Murota).

Remarks. Other specimen listed above is an aberrant male which is markedly different from other males in punctuation: Upper frons coarsely, irregularly subreticulate, anteriorly on inclined verge punctures finer, closer and mixed with transverse rugae, posteriorly on ocellular areas punctures shallower and sparser and replaced with arcuate rugae, on posterior vertex punctures weaker, but comparatively large and fairly close, subrugosely arranged; on mesoscutum punctures large, with more or less PIS, but subreticulate, almost not rugosely arranged convergently, only posterior margin longitudinally shortly striate, scutellum grossly and closely punctured all over, mesopleuron more grossly punctured, PIS larger than PD, only on antero-ventral area punctures show a tendency to arrange obliquely; area dorsalis typically striate, but the striae stronger than usual; gastral punctuation normal. Genitalia structure typical in the present species.

29. LESTICA (SOLENIUS) CONSTRICTA KROMBEIN, 1949

Crabro (Ceratocolus) quadriceps: Yasumatsu, Mushi (Fukuoka), 12: 153, 1939 (nec Bingham, ♂, Palau).

Lestica (Solenius) constricta Krombein, Proc. Hawm. Ent. Soc., 13(3): 389, 1949 (Palau).

Lestica (Solenius) constricta: Leclercq, Bull. Inst. R. Sci. Nat. Belg., 32(29): 5, 1956 (1 ♀, Samar).

Lestica (Solenius) constricta: Leclercq, Bull. Ann. Soc. R. Ent. Belg., 94(3-4): 81, 1958 (keyed).

Lestica (Solenius) constricta: Leclercq, Ibid., 99(1): 48, 1963 (10 ♂ 50 ♀, Luzon,

Samar, Bohol, Mindoro, Negros, Mindanao, Sibuyan, Basilan).
Lestica (Solenius) constricta: Leclercq, Bull. Soc. R. Sci. Liège, 11-12: 678, 1972
 (Luzon, Leyte, Mindanao).

Specimens examined: 1 ♀ 1 ♂, Mindanao, Davao (near beach), 5.VII.1980, T. Murota;
 5 ♂, Luzon, Asin Spa, 16 km from Baguio City, 2,5,5,5,5.I.1980, T. Murota; 2 ♂, Cebu,
 Cantaboco, 30.III.1979, H. Kurokawa; 1 ♂, Negros, Mambucál, 2-3.IV.1979, T. Tano.

II. Pemphredoninae

1. CARINOSTIGMUS TAWITAWIENSIS TSUNEKI, 1976

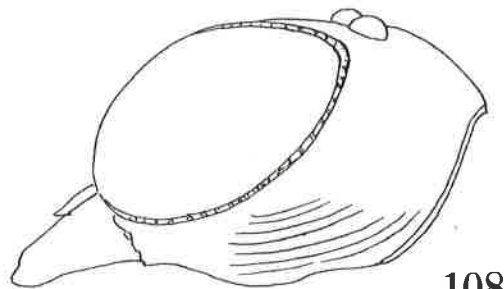
Stigmus (Carinostigmus) tawitawiensis Tsuneki, Steenstrupia (Copenhagen), 4: 100,
 1976 (♀, figs.).

Specimens examined: 3 ♀ 2 ♂, Mindanao: 1 ♀, Zamboanga, Pasonanca Park, 30-31.
 VII.1980; 2 ♀ 2 ♂, Cagayan de Oro, Makahambus Cave, 15-16.VIII.1980, all leg. T. Muro-
 ta (Coll. Murota).

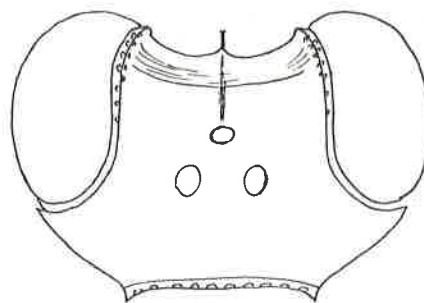
Some supplementary notes to ♀. Mandible bidentate at apex, inner margin gently
 roundly produced near middle, but not toothed, $A1 \approx A2-4$ (20:22), relative length of $A2$,
 $3,4=6,8,8$, $A3 \approx AW \times 4$. Collar of pronotum broadly roundly impressed on both sides of med-
 ial rounded elevation, notauli of mesoscutum deeply impressed and foveolate, in Zambo-
 anga specimen foveoles are weaker than in the specimen from Cagayan de Oro, posterior
 marginal area of scutum longitudinally, comparatively long striate with about 11-14
 striae, but lateral ends of the area not striate, but broadly, deeply depressed, scu-
 tellum at base transversely deeply furrowed, the furrow interrupted in middle by a ca-
 rina, whence a fine impressed line runs till apical margin. The form of head seen in
 profile in the Mindanao specimen: Fig. 108, colouration of antennae and legs more or
 less varied among the specimens in the tone of ferruginous (sometimes more yellowish)
 and in the extent of the ferruginous area, especially on antennae beneath.

Description of ♂. Markedly differs from ♀ in the form of head (Figs. 109 from
 above, 110 in profile, cf. Fig. 108), clypeus (Fig. 111) and mandible (Figs. 110,111)
 and more or less so in the relative length of antennal joints, in the sculpture of pro-
 podeum and in the brighter colouration of antennae and legs.

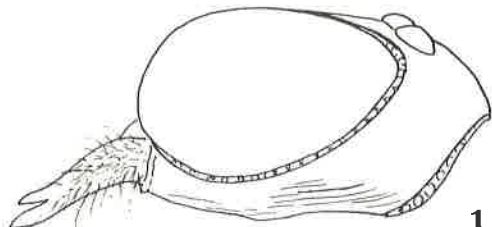
Apical margin of clypeus densely covered with long whitish hair which is produced



108

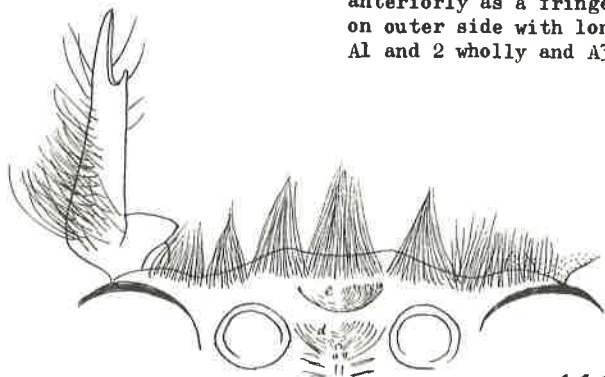


109



110

Figs. 108-110.
Carinostigmus tawitawiensis
 Tsuneki, 1976.
 108 ♀, 109, 110 ♂.



anteriorly as a fringe (Fig. 111), mandible also covered on outer side with long whitish hair (Figs. 110, 111), A1 and 2 wholly and A3-13 beneath completely ferruginous, relative length of A1-5=20, 7,11,12,11, A3=AW×5, from A2 to base of A4 fringed with whitish hair which is approximately as long as the width of A3. Dorsal and posterior aspects of propodeum very coarsely, irregularly reticulate, sides also broadly reticulate, except anterior and ventral parts where surface microcoriaceous and posteriorly partly coarsely obliquely striate.

Ferruginous colour on legs broader: Apical part of coxae, all trochanters, base broadly of fore and mid femora, narrowly of hind femur and whole of fore and mid tibiae and following T1; rest of fore and mid tarsi brown. Length 6.5 mm.

2. PSEN (PSEN) CORIACEUS VAN LITH, 1959

Psen (Psen) coriaceus van Lith, Zool. Abh. (Leiden), 39: 34, 1959 (♀ ♂, Luzon, Negros and Mindanao; Zamboanga).

Specimens examined: 5 ♂, Mindanao, Mt. Apo, 1500 m, near Lake Agko, 8.VIII.1980, T. Murota and C. Nozaka leg.

3. PSENNULUS SCUTATUS SCUTATUS (ROHWER, 1921)

Diodontus scutatus Rohwer, Philip. Jour. Sci., 18(3): 310, 1921 (♀ ♂, Luzon)

Diodontus scutatus: Rohwer, Ibid., 22(6): 596, 1923.

Psenulus scutatus scutatus: van Lith, Zool. Verh., 52: 23, 1962 (♀ ♂, figs., Luzon, Samar, Negros).

Psenulus scutatus scutatus: van Lith, Tijds. Ent., 115(3): 161, 1972 (♀ ♂, Luzon).

Specimens examined: 1 ♂, Luzon, Naguilian, near Baguio, 28.III.1978, T. Murota.

4,a. PSENNULUS XANTHOGNATHUS XANTHOGNATHUS ROHWER, 1910

Psenulus (Neofoxia) xanthognathus Rohwer, Proc. U. S. Natn. Mus., 37: 660, 1910 (♂, Diodontus xanthognathus: Rohwer, Philip. Jour. Sci., 18(3): 312, 1921 (♀ ♂, Luzon, Palawan, Mindanao) (partim).

Psenulus carinifrons xanthognathus: van Lith, Zool. Verh. (Leiden), 52: 104, 1962 (♀ ♂, redescr., figs., Luzon, Samar, Mindanao, Palawan, Sibuyan) (partim).

Psenulus xanthognathus xanthognathus: van Lith, Tijds. Ent., 112(7): 206, 1969 (♀ ♂, Luzon).

Psenulus xanthognathus: Bohart & Menke, World Sphecid., p. 174, 1976 (listed).

Specimens examined: 7 ♀ 9 ♂, Luzon:

1 ♀ 5 ♂, Prov. Laguna (Los Banos, Pagsanjan, Alaminos, 31.III. - 4.IV.1978; 7-9.VIII.1978); 2 ♀ 2 ♂, Prov. Mountain (Bontoc, 850 m, 29-30.XII.1979); 1 ♀ 1 ♂, Prov. Albay (Tobaco, 19.VIII.1978); 2 ♀ 1 ♂, Prov. Launion (Naguilian, 27-28.XII.1979; San Fernando, 28.III.1978); 1 ♀, Prov. Camarinessur (Dato, 16.VIII.1978), leg. by T. Murota and T. Tano.

4,b. PSENNULUS XANTHOGNATHUS CENTRALIS VAN LITH, 1969

Diodontus xanthognathus: Rohwer, Philip. Jour. Sci., 18(3): 312, 1921 (partim, ex.

from Palawan and Mindanao).
Diodontus xanthognathus: Rohwer, *Ibid.*, 22(6): 601, 1923 (partim, ex. from Mindanao).
Psenulus carinifrons xanthognathus: van Lith, *Zool. Verh.*, 52: 104, 1962 (partim, ex. from Samar, Mindanao, Palawan and Sibuyan).
Psenulus xanthognathus centralis van Lith, *Tijds. Ent.*, 112(7): 206, 1969 (forme A and B).
Psenulus xanthognathus centralis: van Lith, *Steenstrupia* (Copenhagen), 1: 104, 1970 (♀ ♂, Mindanao, Palawan and Balabac).
Psenulus xanthognathus centralis: van Lith, *Tijds. Ent.*, 115(3): 196, 1972 (♀, Culion).
 Specimens examined: 6 ♀ 4 ♂, Mindanao (Zamboanga, Davao), 1,5.VIII.1980; 1 ♀ 1 ♂, Negros (Nambucal, Taytay), 2-5.IV.1979; 2 ♂, Cebu (Cantabaco), 30.III.1979. Leg. by T. Tano, H. Kurokawa, C. Nozaka and T. Murota.

III. Philanthinae

1. PHILANTHUS NOTATULUS FORMOSANUS TSUNEKI, 1963

Philanthus notatulus: van der Vecht, *Proc. Kon. Ned. Akad. Wet.* (Amsterdam), Ser. C, 69(4): 421, 425, 1963 (sspp., Burma, Sumatra, Celebes, Flores, figs.).
Philanthus formosanus Tsuneki, *Life Study* (Fukui), 17(3-4): 40, 1973 (1 ♀, Formosa, 7 figs.).
Philanthus notatulus formosanus: Tsuneki, *Hymen. Comm.*, 1: 28, 1974.

Specimen examined: 1 ♀, Luzon, Baguio City, Mines View Park, 26.III.1979, C. Nozaka leg.

Remarks. In the Philippine specimen above listed the yellow marks on the vertex are medium-sized two (instead of small three), the mark on the temple is much better developed, obliquely extending upward to side of posterior vertex (instead of a rounded mark) and axilla bears a yellow spot (not completely black). Otherwise very similar in characters to the Formosan specimen.

2. CERCERIS LUZONENSIS CRAWFORD, 1910

Cerceris luzonensis Crawford, *Proc. U. S. Natn. Mus.*, 38: 120, 1910 (♂, Luzon).
Cerceris fukaii Rohwer, *Ibid.*, 39: 482, 1911 (♂, Formosa).
Cerceris luzonensis: Scullen, *Pan Pac. Ent.*, 36: 80, 1960 (fukaii is a synonym).
Cerceris fukaii: Giner Mari, *Arb. morphol. taxon. Ent. Berlin-Dahlem*, 10(4): 209, 1943.
Cerceris luzonensis: Baltazar, *Pac. Ins. Monogr.*, 8: 351, 1966 (listed).
Cerceris luzonensis: Tsuneki, *Etizenia* (Fukui), 29: 21, 1968 (19 ♂, Luzon, variation).
Cerceris pleuralis Tsuneki, *Ibid.*, 29: 23, 1968 (1 ♀, Luzon) (SYN. NOV.).
Cerceris luzonensis fukaii: Tsuneki, *Ibid.*, 44: 13, 1970 (15 ♂, Formosa).
Cerceris luzonensis fukaii: Tsuneki, *Ann. Hist. Nat. Mus. Natn. Hung.*, 69: 263, 1977 (1 ♂ 4 ♀, Formosa).

Cerceris luzonensis: Tsuneki, *Steenstrupia* (Copenhagen), 4: 36, 1976 (4 ♂, Palawan).

Specimens examined: 3 ♀ 6 ♂, Luzon; 1 ♀, Negros; 1 ♂, Cebu; 1 ♀, Leyte; 3 ♀ 4 ♂, Mindanao. Detailed comparative data of ♂ and ♀ are given in Table 1.

Remarks. The male of the present species is markedly variable in maculation (Tsuneki, 1968). The states in the present material are as follows:

Constantly yellow are A1, two marks on face, two marks on pronotal collar, tegula, postscutellum, a mark at median base of GT2 and a band on GT3. The marks that are sometimes present and sometimes absent are shown in Table 2.

The specimen from Leyte is exceptionally brightly maculated: The marks on pronotal collar is fused into a band, scutellum with a yellow mark, GT2 with three large marks at apex, GT4 distinctly banded, GT5 with four linearly arranged apical spots, GS 2,3,4 except apical depressed marginal areas completely yellow (but the mark on clypeus comparatively smaller than usual and trochanters are except apices black).

One of the Apo specimens is also broadly yellow maculated: Two large marks on pronotal collar are contiguous to each other, scutellar mark is large, a yellow spot is present on tubercle, GT2 with three large marks at apex, GT4 with a medianly narrowly interrupted band, GT5 (narrow), 6 (broad) each with a band, GS2 and 4 largely, 3

Table 1. Collecting data of *Cerceris luzonensis* ♂ and *C. pleuralis* ♀.

Island	Prov.	Locality	Date	<i>luzonensis</i> ♂	<i>pleuralis</i> ♀
Luzon	Laguna	Pagsanjan	2.IV.1978	+	+
		Pagsanjan	7-9.VIII.1978	+	+
Luzon	Launion	Naguilian	4.I.1980	+	+
Luzon	Albay	Manito	18-20.VIII.1978	+	
		Manito	18.VIII.1978	+	+
Negros		Mambucal	2-3.IV.1979		+
Cebu		Cantabaco	30.III.1979	+	
Leyte		Lake Imerda	19.IV.1982	+	
Mindanao	N. Cotabato	Mt. Apo	9.VIII.1980	+	+
Mindanao	Davao	Matina H.	4.VIII.1980	+	+
Mindanao	Cagayan de Oro	Makahambus	14.VIII.1980		+
		Makahambus	15-16.VIII.1980		+

Table 2. Variation in maculation (♂)

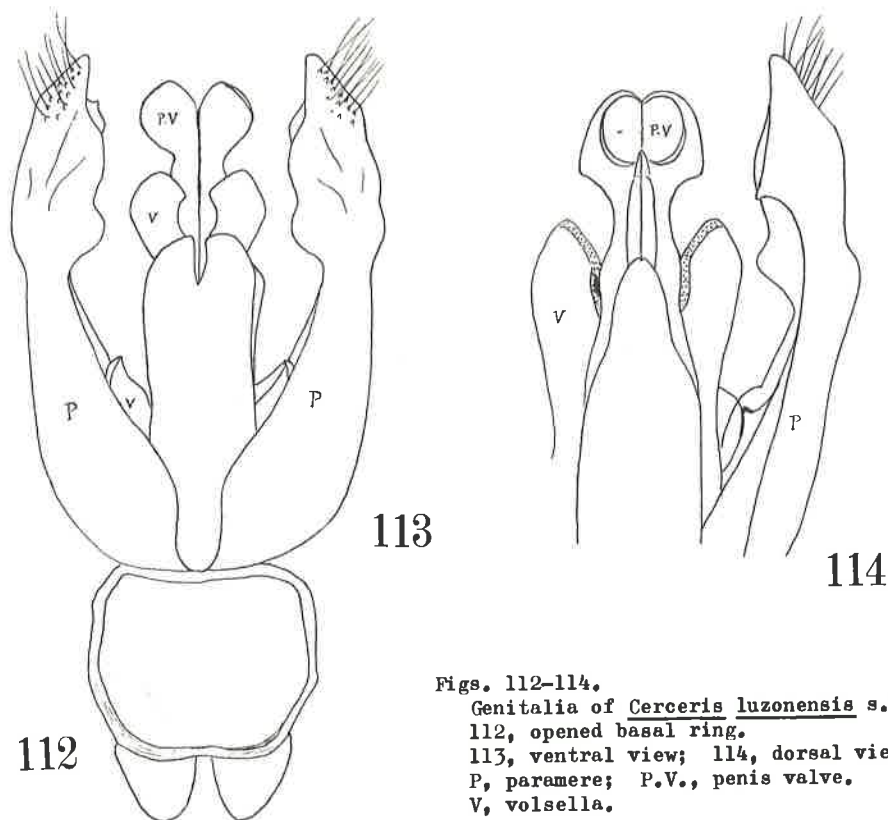
Mark	Present	Absent
A mark on clypeus	11	1
A spot on pronotal collar	1	11
A mark on scutellum	7	5
A spot on each side of GT1	1	11
A mark on each side of GT2	7	5
A mark at median apex of GT2	3	9
A band on GT4	2	10
A mark on each side of GT4	10	2
Spots (2 or 4) on GT5	3	8
A band on GT5	1	11
A band on GT6	11	1
GS2 with a spot on each side	6	2
completely bright yellow	1	
largely bright yellow	1	
largely brown	2	
GS3 with a band	9	
with a mark on each side	3	
GS4 with a band	2	
with a spot on each side	1	9
Trochanters wholly yellow	2	
mid and hind partly yellow	2	
all with apices brown	4	
all partly yellow	1	
fore partly, others largely yellow	3	

completely yellow and trochanters are wholly yellow (clypeal mark is very large in this specimen).

On the female of luzonensis

Cerceris luzonensis was described with the male in 1910, and thenceforth a fair number of the male specimens of this species has been collected from the Philippines, but no record has been made regarding the female. On the other hand, as to its Formosan race, *l. fukaii* Rohwer, the female was discovered by me in 1966 and described in detail (Tsuneki, 1970, *Etizenia*, 44: 13, figs.). Since then it has been believed that the female of the nominate species must be close to the female of *fukaii*, because the males of both the races are very similar to each other. However, no such female specimen has been discovered from the Philippines until now. This was also the case as to the material newly sent to me, although 12 male specimens were included that were collected from various islands. The fact seemed very strange and I thought that the female of *luzonensis* might have been dealt with as a different species. So I reexamined all the females of

the species in which the male remained unknown. As a result I could arrived at the opinion that *C. pleuralis* Tsuneki, 1968 has high probability to be the female of *luzonensis*, although it is considerably different in the mesopleural structure from *fukaii* ♀.



Figs. 112-114.

Genitalia of Cerceris luzonensis s.l.

112, opened basal ring.

113, ventral view; 114, dorsal view.

P, paramere; P.V., penis valve.

V, volsella.

The reasons for this are that pleuralis is very similar in many nonsexual characters to luzonensis, except mesopleuron, and that both the species are frequently collected in the same place and at the same time (Table 1).

But, here a problem has arisen. It is whether luzonensis and fukaii are really conspecific or not, because the difference of the mesopleural structure between the females of both the forms deviates the usual range of variation between the subspecies. Hereupon, the male genital organs of both forms were compared in more detail. No note-worthy difference could be discovered between them (Figs. 113 and 114). Surely they are conspecific as far as the males are concerned. I then compared in more detail the structure of the mesopleuron in the males of both the forms and favourable enough, I could find out that the episternum below the scrobal furrow was slightly more strongly rounded out in the Philippine specimens than in the Formosan, parallel to the case in the females, though much less in degrees.

Thus it has been concluded that pleuralis is the female of luzonensis luzonensis and that the marked difference between the females of luzonensis luzonensis and luzonensis fukaii is only the exceptionally large local character of this species.

(Notice. The above conclusion is based upon the indirect evidences only. So that if the fukaii-similar ♀ or pleuralis-similar ♂ is discovered from the Philippines in future, the sex association of luzonensis has to be altered and pleuralis may revive.)

3. CERCERIS PICTIVENTRIS NOVARAE SAUSSURE, 1867

Cerceris pictiventris novarae: Krombein, Smithson. Contr. Zool., 343: 26, 1981 (ref., redescr., figs.).

Specimens examined: 4 ♀ 9 ♂ from Luzon, 1 ♀ 1 ♂ from Leyte, 2 ♀ 2 ♂ from Cebu and 1 ♂ from Mindanao.

Remarks. The Philippine specimens well agree in maculation with the redescription of Krombein of *novarae*, except that the scutellum is frequently immaculated, and can be placed under the category of *ssp. novarae*, differing from *ssp. formosicola* in that the yellow maculae are much better developed, especially in regard to the propodeum and meso- and metasterna (in *formosicola* propodeum is very frequently immaculated and if present maculae are very small and narrow, and metapleural apical pair of yellow spots are completely absent even in the female specimens).

4. CERCERIS DOWI TSUNEKI, 1968

Cerceris dowi Tsuneki, Etizenia, 29: 25, 1968 (1 ♂, Luzon, figs.: head in frontal and lateral view, pronotum, pygidial area, gastral maculae).

Cerceris dowi: Tsuneki, Steenstrupia, 4: 36, 1976 (2 ♀ 1 ♂, Palawan; 1 ♂, Balabac; 2 ♂, Mindanao, description of ♀, figs.)

Specimens examined: 6 ♂ 3 ♀, Luzon; 1 ♂ 2 ♀, Negros; 2 ♂, Cebu; 2 ♂, Leyte; 7 ♂ 2 ♀, Mindanao:

Luzon: Pagsanjan, 1 ♂, 2.IV.1978, T.Tano; 1 ♂, 7-9.VIII.1978, H.Kurokawa.

Naguilian near Baguio, 1 ♀ 2 ♂, 28.III.1978, T.Murota and C.Nozaka.

Bontoc, 850 m, 1 ♂, 29-30.XII.1979, T.Murota.

Manito, 1 ♀ 1 ♂, 18.VIII.1978, T.Murota.

Alaminos, Hidden Valley Spring, 1 ♀, 3-4.IV.1978, T.Tano.

Leyte: Palo, 1 ♂, 16,22.IV.1982, T.Tano; Talosa, 1 ♂, 17.IV.1982, T.Tano.

Cebu: Argao, 2 ♂, 31.III.1979, T.Tano.

Negros: Taytay Beach, 1 ♀ 1 ♂, 4-5.IV.1979, C.Nozaka & T.Tano; 1 ♀, Mambucal, 2-3.IV.1979, H.Kurokawa.

Mindanao: Cagayan de Oro, Opol beach, 1 ♀ 3 ♂, 14.VIII.1980, T.Nurota, C.Nozaka, T.Tano.

Davao, near beach, 1 ♀ 2 ♂, 5.VIII.1980, T.Tano, H.Kurokawa, K.Sabi.

Davao, Matina Height, 1 ♂, 4.VIII.1980, K.Sabi.

Mt. Apo, 1 ♂, 7-9.VIII.1980, T.Murota.

Variation of yellow marks in ♂

Constantly present: Face below antennae except marginal areas, clypeus except apical margin, basal half of mandible, A1 except apex, two large marks on collar, tegula except inner margin, two spots or a band on scutellum (markedly variable in development), postscutellum, a mark on epimeral area of mesopleuron, two large marks on propodeum, baso-lateral mark and postero-lateral marks on GT2, broad band on GT3, narrow band on GT4,5,6, two marks or a band on GS2, band on GS3, band or two lateral marks on GS4, two small lateral marks on GS5 (rarely absent), mid and hind coxae beneath and at apex, all trochanters at least largely, a large mark on fore and mid femora, fore tibia and tarsus, mid tibia at least largely and T1 and hind tibia roughly on basal half.

Variable maculae in 18 specimens:

Mark on scutellum: lacking 2, very minute lateral spots 4, medium-large-sized two marks 9, a band 3.

Mark on epimeral area: lacking 2, very small 4, medium-large-sized 12.

Latero-apical mark on GT1: present 6, absent 12.

Medio-apical mark on GT1: present 1, absent 17.

Medio-apical mark on GT2: present 5, absent 13.

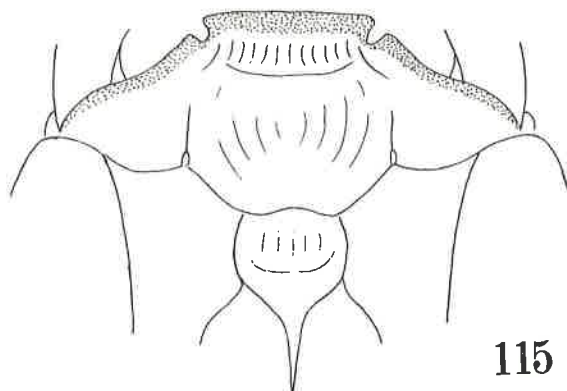
GS2: with a band 5, with two spots 13.

GS4: with a band 14, with two spots 4.

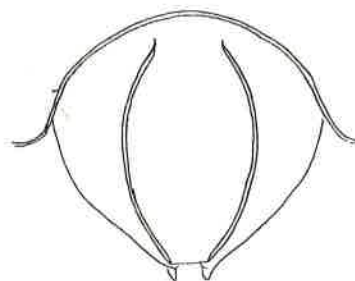
GS5: with small lateral marks 15, without the marks 3.

Observation of newly examined females.

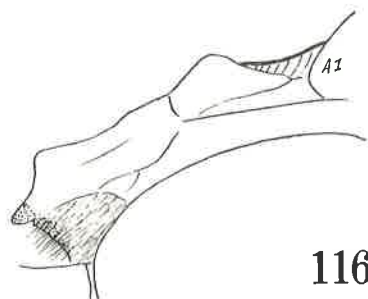
Length 8.5-10.0 mm. In colouration similar to ♂ in general, but G6 (bearing pygidial area) corresponds to G7 of ♂ and G6 of ♂ is lacking; in addition a mark above temple and a mark on episternum of mesopleuron below scrobal furrow are present and in 2 specimens from Negros a yellow patch is further present on ocellular space along inner orbit. Generally the yellow marks are better developed than in ♂, frontal marks extended laterally upwards above level of antennal sockets and median carina between antennae is also yellow, scutellar marks are always present, apical margin of GT1 frequently banded with ferruginous colour, including sometimes a pair of lateral yellow spots, GS2 and 5 more frequently yellow banded and if it is separated in two maculae they are always fairly large. Ferruginous brown are inner margin of mandible, A2-12 beneath broadly, G6 wholly and apices of mid T1-5; hind tarsus dark brown; wings hyaline



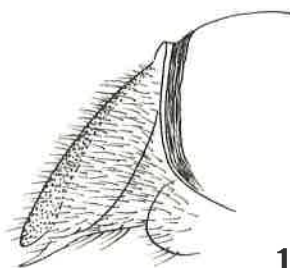
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with apical margin slightly clouded, especially markedly so on outer area of radial cell. Hair on lateral lobes of clypeus silvery.

Clypeus with a transverse ridge at 2/3 below from base, thence apically deeply excavated, in frontal view from dorsal side: Fig. 115, in lateral view from left side: Fig. 116 (in Negros specimens the ridge is medianly slightly incised), supraclypeal area raised high as in *pictiventris*; OOD:Od:POD:OCD=10:4:7:11. On propodeum area dorsalis triangular, with lateral and medial furrows foveolate, disc finely punctured, sometimes partly, obliquely, feebly striate; Gl as long as wide, pygidial area: Fig. 117, in lateral view: Fig. 118.

5. CERCERIS VARIAESIMILIS MAIDL, 1926 = *pulchra variaesimilis*

Cerceris variaesimilis Maidl, Zool. Meded., 9: 223, 1926 (♀, Java).

Cerceris (*Apiratrix*) *spinicollis* Giner Mari, Eos, 18: 126, 1942 (China); —: Tsuneki, Trans. Shikoku Ent. Soc., 9(4): 107, 1968.

Cerceris fukaii basiferruginea Tsuneki, Etizenia, 4: 28, 1963 (Thailand).

Cerceris variaesimilis: Van der Vecht, Zool. Meded., 39: 350, 357, 1964 (♀ ♂, figs. Java, Malaya); —: Tsuneki, Etizenia, 29: 21, 1968 (SE China, Formosa, Philippines); —: Tsuneki, Life Study, 14(1): 14, 1970 (1 ♂, Japan, Kyushu); —: Tsuneki, Etizenia, 44: 21, 1970 (Formosa); —: Tsuneki, Polsk. Pism. Ent., 44: 592, 1974 (1 ♂, Thailand); —: Tsuneki, Ann. Hist.-Nat. Mus. Natn. Hung., 69: 263, 1977 (1 ♂, Formosa); —: Tsuneki, Steenstrupia, 4: 36, 1976 (2 ♀, Mindanao); —: Nagase, Hym. Comm. (Mishima), 14: 67, 1982 (3 ♂, Japan).

Specimens examined: 6 ♀ 4 ♂, Luzon (Pagsanjan, Naga, Naguilian); 1 ♀ 2 ♂, Negros (Taytay, Mambucal); 1 ♀ 1 ♂, Leyte (Talosa); 1 ♀ 1 ♂, Mindanao (Cagayan de Oro).

Remarks. T. Tano discovered that in the specimens from Mindanao (Cagayan de Oro, Opol Beach, 14.VIII.1980) punctures on the gaster is weaker, finer and much more widely separated than in the specimens from other Islands. This is especially marked on GT3 and 4 where PIS larger than PD.

In the male specimens GT1 is, except apical margin, broadly black.

6. CERCERIS TRIMACULATA MAIDL, 1926

- Cerceris trimaculata Maidl, Zool. Meded., 9: 234, 1926 (♂, Java).
Cerceris trimaculata: Schultess, Rev. Swiss Zool., 42: 305, 1935 (♀ ♂, Java).
Cerceris trimaculata: Van der Vecht, Zool. Meded., 39: 356, 1964 (♀ ♂, Java).
Cerceris trimaculata: Tsuneki, Etizenia, 29: 22, 1968 (2 ♀, Luzon).

Specimens examined: 2 ♂, Luzon (Pagsanjan), 2.IV.1979; 7-9.VIII.1979, H.Kurokawa and T. Murota.

Remarks. C. coelicola Giner Mari known from Formosa and China is the species that is closely allied to the present species, but can be separated from this by the much larger punctures on gaster and by the lack of maculae on GT5. Further, in coelicola supraclypeal area is more broadly and more distinctly raised upwards and completely yellow in colour (in the above listed specimens only medianly longitudinally and narrowly yellow).

7. CERCERIS SOBO APONIS SSP. NOV.

Cerceris sobo Yasumatsu et Okabe, Festschr. 60. Geburtst. E. Strand, I: 497, 1936 (♀, Japan, Kyushu).

Cerceris sobo: Yasumatsu, Ins. Jap. Ill. Icon., p. 373, 1937.

Cerceris sobo: Tsuneki, Mem. Fac. Lib. Arts Fukui Univ., II, 11(1): 31, 39, 1961 (♀ ♂ Japan and Korea).

Cerceris sobo: Tsuneki, Etizenia, 9: 32, 1966 (taxonomical and biological comment).

Cerceris sobo: Haneda, Life Study, 16 (3-4): 54, 1972 (Japan, Honshu - biology in Jap.)

Cerceris sobo: Tsuneki, Ibid., 17(3-4): 127, 1973 (biol. in Japanese).

Cerceris sobo: Tano, Kurokawa and Nozaka, Hym. Comm., 14: 33, 1982 (50 ♂ 17 ♀, Kyushu, Japan).

Specimens examined: 5 ♀ 3 ♂, Mindanao, Mt. Apo, near Lake Agko, 1500 m, 8.VIII. 1980, T.Tano, C.Nozaka, H.Kurokawa and T.Murota.

Subspecies aponis ssp. nov.

In the Philippine representatives of Cerceris sobo the general puncturation is much sparser than in the Japanese nominate species and they are more richly maculated. The yellow maculae that are absent in the Japanese and Korean specimens and that are present in the Philippine's are as follows:

♀ ♂. A large spot on each side of vertex along top of eye, a spot on upper temple, an elongate transverse mark on gena behind base of mandible (in ♂ often lacking), a medianly narrowly interrupted band on pronotal collar, a minute spot on propleuron (often absent), a large mark on tegula, two large spots on scutellum, a band on postscutellum, a large mark on epimeral area of mesopleuron, two large marks extending from posterior aspect of propodeum to its sides, a patch on antero-dorsal part of propodeal side (frequently lacking), a large mark at base (in ♂ often ferruginous) and three transverse marks at apex of GT2, a medium-large mark of GS1 and a large mark of GS2 extending from base till beyond middle, a small patch at postero-lateral part of GS3, 4, 5 and coxal and femoral marks of legs (femoral mark sometimes present in mid leg in sobo sobo also). Further, in aponis apical margins of GT1 (broad), 2 and 3 (narrow) and apical area broadly of GS2, 3, 4, 5 and nearly whole of G6 reddish ferruginous. But in aponis antennal base broadly black beneath, while in sobo sobo the place is yellow.

On the other hand, yellow marks that are common to both races are as follows:

Face below antennae except apical margin of clypeus (the mark extended upwards medianly and laterally slightly over level of antennal bases), a spot at base of outer side of mandible, broad band on GT2, apical margin narrowly of GT4 (often lacking in sobo), apical narrow band on GT5 (in ♂ a short band on GT6 also), a streak on fore and mid tibiae and a line on fore T1.

Holotype: ♀ (one of the female specimens above listed, leg. by T.Tano) (Coll. Tsuneki).

Paratype: 4 ♀ 3 ♂ (rest of the specimens above listed) (Coll. each collector).

Remarks. It seems very interesting that this species is discovered in the high altitude of Mindanao, passing over the Ryukyus, Formosa and Luzon. Possibly it is a relict species in the Philippines, telling us the climatic change during the geological time. In Japan this species is broadly spread over Kyushu and southern half of



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Honshu, though everywhere, except certain districts of Kyushu, it is not common.

Morphologically this species is characteristic in the structure of the clypeus in the female (Fig. 119, oblique lateral view from left side), it is broadly excavated, bearing bilobed lamina, apical margin of main part is broadly black and medianly bluntly toothed, upper median ridge between antennal bases is topped by a transparent carina. Length ♀ 13-15 mm, ♂ 9-11 mm.

In Japan and Korea this species is known to hunt Curculionid beetles (genera *Cyrtopistomus*, *Myllocerus*, *Anosimus*, *Macrocorynus*) as food for the young. On Mt. Apo the collectors of the specimens of this subspecies observed also that the female wasps hunted Curculionids of the same subfamily as that hunted by the nominate race.

The number of the prey collected in one larval chamber by the typical race is from 13 to 23 and the egg of the wasp is laid on the prey hunted last. It is 3.5x0.8 mm in size and attached with its caudal end to the ventral side of gaster of the prey, with its anterior end reaching central part of the thorax of the prey whence it begins

to eat when hatched.

8. CERCERIS SPECIFICA ALTICOLA SSP. NOV.

Cerceris specifica Turner, Jour. Bombay Nat. Hist. Soc., 21: 495, 1912 (♀ ♂, Ceylon).

Cerceris nagamasa Tsuneki, Etizenia, 4: 32, 1963 (♂, Thailand, syn. after Krombein).

Cerceris specifica: Bohart and Menke, World Sphecid., p. 587, 1976 (listed).

Cerceris specifica: Krombein, Smithsonian Contr., Zool., 343: 44, 1981 (♀ ♂, Ceylon, syn. figs.).

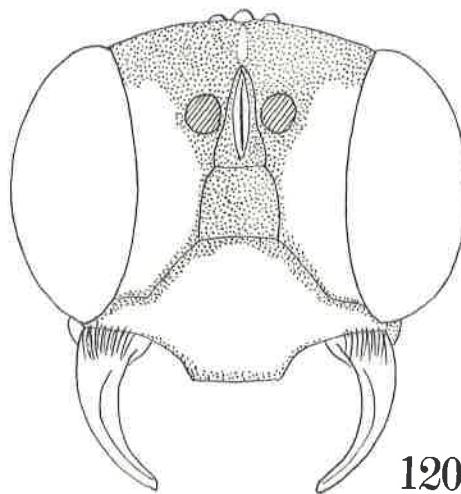
Holotype: ♂, Mindanao, Mt. Apo, 700-1000 m, 7-9.VIII.1980, T. Tano (Coll. Tsuneki).

According to Krombein (1981) the male of this species is markedly variable in the relative length to maximum width of G1 (L=Wx1.7-2.3) and in maculation (especially between the Ceylonese specimens and the Thailand one :- nagamasa Tsuneki).

The Philippine specimen (♂) well agrees in the general structure and punctuation but differs from the typical race in the relatively smaller POD and in the medianly not furrowed area dorsalis and, further, considerably so in the general colouration, and seems to be worthy of separation at the subspecific level.

Subspecies ALTICOLA nov.

♂, 7.5 mm. Black; yellow are: Mandible except reddish brown apical half, clypeus except marginal areas (Fig. 120) frontal lateral marks (do.), interantennal carina, a short stripe above it and in front of fore ocellus (do.), Al in front, two spots on vertex, a spot on upper temple (seen from above the four spots arranged in a transverse line), medianly narrowly interrupted band on pronotal collar, tegula except inner margin, a patch on propleuron, a medianly constricted broad band on scutellum, a large mark on epimeral area of mesopleuron, a large lateral mark on propodeum extending to posterior part of side, a large basal mark of GT2, broad band of GT3 and 6, narrow one on GT4 and 5, py-



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gidial area, greater part of GS2, sides and apex of GS3, nearly whole of GS7, greater part of trochanters, fore and mid knees, frontal stripes of fore and mid tibiae and base of fore T1. Antennal flagellum beneath, apical margins of gastral segments, hind knee and apices of tibiae reddish ferruginous, rest of fore tarsus dark brown. Hair on clypeus and apico-lateral fimbria as in typical race.

Head seen in front: Fig. 120, HW:IODm=100:46, relative length of A1,2,3,4,5,13=12,5,10,8,7,10, A3=AW×1.8, ultimate joint conical at apex, =BW×1.8. OOD:Od:POD:OCD=10:4:5:11. Area dorsalis on propodeum triangular, roundly raised, without medial furrow, finely sparsely punctured, with surface shining; G1 long, about twice as long as its maximum width, GS2 without basal platform, GS7 with apex roundly emarginate, hind coxa without longitudinal carina.

Head above closely punctured with comparatively large punctures, subreticulate, but surface shining, mesoscutum similarly, but somewhat sparsely, except anterior area, punctured, with PIS micropunctulate, not polished but fairly shining. Surface of gaster also fairly well shining.
