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NEW TAXA OF THE GENUS *CROSSOCERUS* OF JAPAN, WITH A NOTE ON THE REMARKABLE MACULATION IN THE FEMALE OF *C. WALKERI* (SHUCKARD) (HYMENOPTERA: SPHECOIDEA-CRABRONIDAE)

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1. *Crossocerus* (*Blepharipus*) *dentsukanus* sp. nov.

The present species (based on the female only) very closely resembles *C. cetratus* (Shuckard), but is separable therefrom by the following distinctions:

1. Medial produced part of clypeus with the anterior margin curved (Fig. 1).
2. Head and thorax without aeneous shine.
3. Punctures on mesoscutum comparatively somewhat larger.
4. Posterior aspect of propodeum without medial hollow, flattened, with a deep paralle-sided furrow in middle.

♀. Length 7.0 mm. Colouration and morphology are otherwise as in the compared species.

♂, unknown.

Holotype: ♀, the Dentsuku Pass, South Japan Alps, 3–4. VIII. 1974, K. Tsuneki leg. (Coll. Tsuneki).

Remarks. Amongst the characters listed above that of the propodeum is rarely met with in near state in some specimens of the compared species and as the differences observed between the two are rather slight the present species may be considered a variation of *C. cetratus,* and in fact it may be a mutant of the species. However, characters 1 and 2 above mentioned are so striking and important that the specimen is dealt with here to be a distinct species.

2. *Crossocerus* (*Blepharipus*) *verhoeffi sudai* ssp. nov.

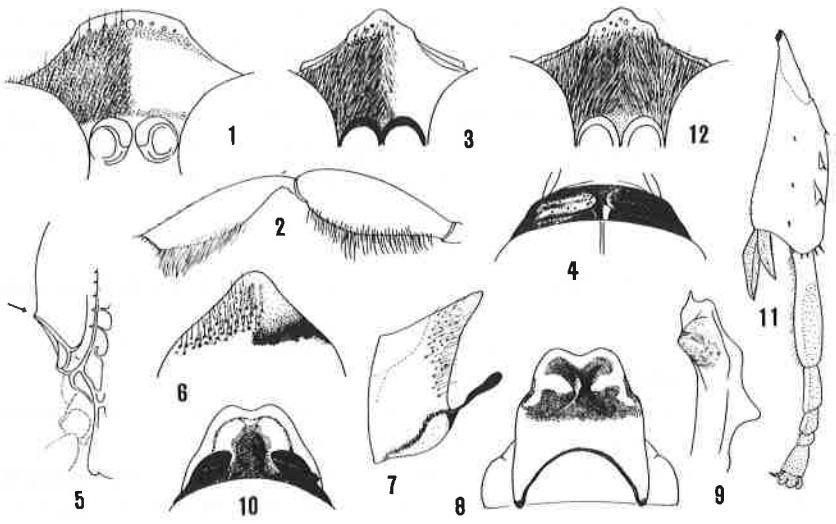
Crossocerus (*Coelocrabro*) *verhoeffi* Tsuneki, Etizenia (Fukui), 23: 14, 1967 (♂, Manchuria).

Crossocerus verhoeffi described from Manchuria is the species most closely resembling *C.* (*Neoblepharipus*) *amurensis* (Kohl) among the congeners occurring in Japan, as far as the male characters are concerned, having the same characteristic structure of abdominal segment 7, as well as those of the antenna, occipital carina and legs. It differs from this species, however, in the structure of the pronotum and in the general hairing of the body and legs. The new subspecies found in Japan differs from the typical race mainly in that the clypeus is comparatively shorter (Fig. 3) and the yellow marks on the antennal scapes and legs are much better

developed. Because of the fact that *C. verhoeffi* has for the first time been discovered in Japan the detailed description of our race will be given below :

♂. Length 7.5 mm. Black, without aeneous shine on head and thorax ; yellow are antennal joint 1 externally and beneath at base, fore tibia in front, mid and hind tibiae on basal half above and hind metatarsus at base and above. Mandible at apex, apical portions of all tibiae and all tarsi beneath more or less ferruginous ; tegula of wing slightly brownish, wings hyaline and weakly clouded except base, pterostigma and veins black, the latter posteriorly slightly brownish. Pubescence on head and thorax sparse but comparatively long, appr. as long as antennal joints 3 and 4 combined and silky white, on clypeus and sides of lower frons silvery and decumbent, on fore femur and tibia in posterior view characteristic as given in Fig. 2.

Head from above similar in form and in general configuration to that of *C. amurensis* occurring also in the northern region of Japan, ocelli in an isosceles triangle, slihgtly lower than equilateral one, OOD : POD=10 : 7, width of postocellus relatively 5, frontal impressions well-defined, elongate and narrow, much longer than in *C. amurensis* and curved, posteriorly rounded and anteriorly attenuated and almost contiguous to inner orbit, frontal median furrow distinct, a short well-defined furrow between postocelli present, without transverse furrow connecting posterior margins of postocelli. Head seen in front also similar to that of the compared species, antennal sockets contiguous to each other and to eyes, clypeus : Fig. 3, mandible bidentate at apex, without any angulate projection on inner margin ; head in profile with temple distinctly narrower than eye, occipital carina gradually ending at apices far before reaching the hypostomal carina ; antennal joint 1 twice as long as the minimum interocular distance, joint 3 in dorsal view appr. 1.7 times, in lateral view appr. twice, as long as wide at apex, subsequent joints by degrees slightly shorter apically except the ultimate which is normally narrowed at apex, all the joints fringed beneath with a row of sparse pubescence. Collar of pronotum : Fig. 4, medially distinctly excavated, with antero-lateral corners rounded and without the lateral notches, on mesoscutum median scutal suture in a fine obtuse carina within the medio-anterior impression, parapsidal sutures in fine impressed lines, posterior margin without crenation ; scuto-scutellar furrow coarsely, scutello-metanotal furrow finely foveolate. Latero-posterior corners of prosternum as in *C. amurensis* in structure (a corn-shaped protuberance on a rounded disc, free at the periphery), but the protuberance not pointed, but obtusely rounded at apex ; on mesopleuron epicnemial carina very distinct, precoxal carina weakly raised in a low triangle at anterior end, but it can not be said distinctly toothed (Fig. 5). On propodeum area dorsalis margined at base on each side by a short carina and posteriorly by a weak foveolated furrow, the furrow not reaching anteriorly the ends of the carinae, thus the area is not completely marginated, but well-defined by the difference of sculpture, the disc medianly strongly furrowed, the furrow extended down to basal ⅔ of the posterior aspect and broadened and deepened, the remaining apical ⅓ medianly strongly carinated, lateral carinae of the aspect strong and distinct up to above middle of the posterior inclination, but the accompanying furrow running up further to the level of about middle of the area dorsalis. Abdominal



Figs. 1–12. 1, *Crossocerus* (*Blepharipus*) *dentsukanus* sp. nov., ♀ ; 2–12, *C.* (*B.*) *verhoeffi sudai* ssp. nov., ♂.

1, 3 and 12 (variation), clypeus ; 2, fore femur and tibia ; 4, collar of pronotum (dorsal) ; 5, lateral margin (left side, dorsal) of meso- and metapleuron and propodeum, showing the precoxal elevation ; 6, tergite 7 (dorsal) ; 7, do. (lateral) ; 8, sternite 7 (ventral) ; 9, do. (lateral) ; 10, do. (with the folded and bent protuberances of tergite 7) ; 11, hind tibia and tarsus.

segment 1 slightly longer than wide (appr. 6 : 5), tergite 7 in dorsal view : Fig. 6, medianly weakly impressed, in lateral view : Fig. 7, sternite 7 in ventral view : Fig. 8, in lateral view : Fig. 9, hatched area markedly hollowed, the elongate finger-like protuberances near the postero-lateral corners of tergite 7 are, in the normal posture of the wasp, bent over sternite 7 and appear tooth-like processes on both sides of the medio-apical elevation of the sternite (Fig. 10, ventral view). Genitalia : Fig. 13 (dorso-lateral view) ; wing venation as in *C. amurensis* ; fore femur and tibia : Fig. 2 (posterior view), hind tibia and tarsus : Fig. 11 (frontal view), with tibial spurs dilated and lobiform.

Vertex except the finely punctured ocellar area smooth and shining, upper frons sparsely covered with pile-bearing points, scapal hollow on lower frons almost smooth and polished, temple finely, fairly closely punctured, mesoscutum anteriorly and laterally finely, somewhat closely punctured, puncture-interspaces appr. as large as punctures, punctures on the disc and posteriorly and on the main part of scutellum much sparser, on the latter posteriorly slightly coarse and close, punctuation on mesopleuron as on anterior part of mesoscutum, but the punctures somewhat irregular in size and on posterior margin large and irregular in shape. Area dorsalis at base and on median furrow crenate, disc smooth and polished, outer areas obliquely and posterior inclination transversely, somewhat irregularly rugose

and punctured, including some almost impunctate small patches, sides of the segment longitudinally, finely and closely striate, mixing a few scattered punctures. Abdomen on basal half practically impunctate, posterior tergites with the ante-apical series of sparse, fine hair-bearing punctules, tergites 5–7, further, sparsely punctulated all over, punctules on 7 slightly larger and closer than on the preceding tergite, but the difference is not so marked as in the members of *Crossocerus (Crossocerus)*.

♀, unknown.

Holotype: ♂, Mt. Daifuku, Kimitsu City, Chiba Pref., 13. V. 1974, H. Suda leg. (Coll. Tsuneki).

Paratype: 1♂, Fukenoyu Spa, Kazono City, Akita Pref., 2. VIII. 1974, T. and H. Suda leg. (Coll. Suda).

Remarks. In view of the same peculiar structure of the 7th abdominal segment, as well as the general resemblace in characters we are tempted to allocate *C. verhoeffi* and *C. amurensis* within the same subgeneric category. According to the recent study of J. Leclercq, however, the male of the subgenus *Neoblepharipus* Leclercq has sometimes the modified 7th abdominal segment as in *C. amurensis* and sometimes not, but it always has the collar of the pronotum laterally notched as in the female, one of the characters upon which the subgenus is erected. According to this definition *C. verhoeffi* must be separated from *C. amurensis* at the subgeneric rank, although the female of *verhoeffi* still remains unknown.

The paratype of the present subspecies is slightly smaller, 6.0 mm, with the clypeus more distinctly subtridentate at the medio-anterior margin (Fig. 12) and with the punctures on the mesopleuron finely uniform and much sparser than in the holotype. In this specimen the area dorsalis of the propodeum is partly obliquely, very finely striolate on the sides of the disc and the median furrow almost completely lacks crenation.

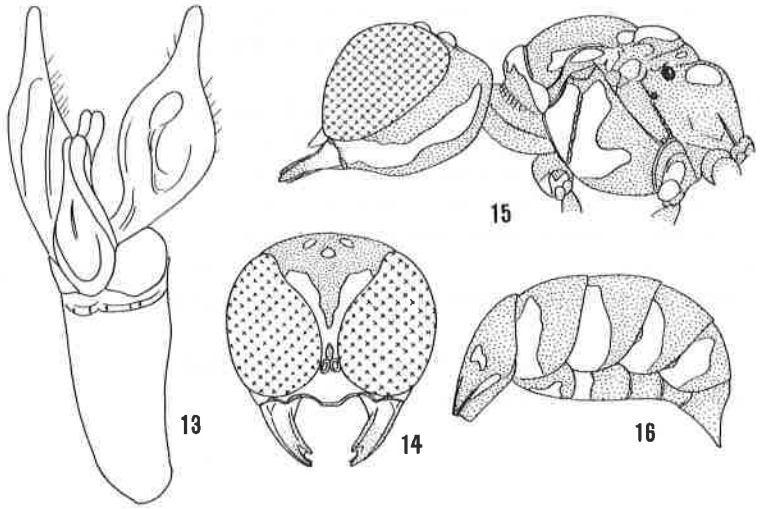
3. ***Crossocerus* (*Crossocerus*) *uchidai hondonis*** ssp. nov.

Crabro (*Crossocerus*) *uchidai* Tsuneki, J. Fac. Sci. Hokkaido Univ., II, 9 (4): 421, 1947 (♂ ♀).

The present subspecies (based on the male only) differs from the typical race occurring in Hokkaido in the median rounded protuberance on the anterior margin of the medial protruded part of the clypeus is markedly smaller, the punctures on the mesoscutum are much finer and more regularly distributed, the collar of the pronotum and the scutellum yellow maculated (? constant) and the yellow marks on the legs are more broadly extended (a complete streak on fore femur above which is broadly expanded apically, fore and middle tibiae wholly except inside, basal two joints of middle tarsus and base and a streak on outer side of hind femur) and the ferruginous parts of the legs are also much broader (fore tarsus apically yellowish brown and middle femur with a ferruginous streak above on posterior margin).

♀, unknown.

Holotype: ♂, Fukenoyu Spa, Kazono City, Akita Pref., 2. VIII. 1974, T. and H. Suda leg. (Coll. Tsuneki).



Figs. 13–16. 13, Genitalia of *Crossocerus verhoeffi sudai* ssp. nov., ♂; 14–16, well developed maculae of *C.* (*Blepharipus*) *walkeri* (Shuckard), ♀.

4. A remarkably maculated female of ***Crossocerus walkeri*** (Shuckard)

In my previous papers (1955, 1970) I called attention to the fact that the Japanese specimens of *Crossocerus* (*Blepharipus*) *walkeri* (Shuckard, 1837) bear very frequently the yellowish (♂) or whitish (♀) maculae on the abdomen. The fact is quite exceptional to the subgenus. Especially in 1970 I showed the frequency of various forms of maculation statistically and illustrated a male specimen that had the best developed maculae on the thorax and abdomen. Generally speaking the maculae are better developed in the male than in the female.

Recently I could have observed a female specimen having fairly well developed maculae and considered worth recording. The maculae are, as usual, milky white, much broader than usual on the inner orbits (Fig. 14) and, besides the dorsal aspect of the body, well developed even on the temples, mesopleurae and -sternum and abdominal sternites as given in Figs. 15 and 16. In general, in the female the maculae are restricted upon the dorsal side of the body, while in the male they are frequently developed even on the lateral and ventral sides of the head, thorax and abdomen. The present specimen is in the state of maculation close to such a male and considered rather exceptional.

Specimen observed : 1♀, Yashaga-ike, Fukui Pref., 27. VII. 1974, H. Okuno leg. (Coll. Tsuneki).

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