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NO. 5

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M I S H I M A

MAY 25, 1977

TAXONOMIC NOTES ON SOME SPECIES OF CRABRONINE  
WASPS OF JAPAN AND KOREA  
(HYMENOPTERA, SPHECIDAE)

By K. Tsuneki

I. CAPITOSUS-group of CROSSOCERUS (BLEPHARIPUS)

In my 1960 paper on the subspecies and their distribution of Crossocerus (Blepharipus) capitosus (Shuckard) occurring in Japan, I separated two subspecies, namely, C. c. yezo and C. c. yamato on the basis of morphological differences and discussed the condition of their sympatric occurrence in Hokkaido. At that time C. c. yezo was known from Hokkaido only.

Since that time, however, it has been made clear that C. c. yezo is not rare in Honshu (Japan proper) also and the sympatric distribution of both the forms in both islands without accompanied by the intermediate forms let the basis of my previous consideration disappear and, to the contrary, justifies to reconsider them as a different species respectively.

The morphological and colorific differences of yezo and yamato from capitosus s. str. are considerable that it is not strange to separate each of them from capitosus at the specific level, but here I retained yezo within the category of capitosus and split yamato from this to raise it to a different species.

(a) Crossocerus (Blepharipus) capitosus yezo Tsuneki, 1960

It differs from capitosus s. str. occurring in Europe mainly in that the body is larger (♀ 8-9, ♂ 7-7.5 mm), median tooth of clypeus broader, flagellar joints of antenna longer (joint 3 amply twice as long as wide at apex) and hind trochanter is wholly white. Further, it has the temples better developed (in ♀ seen from above the head is widest at the temple than at the eyes and temple slightly longer than eye), frontal fovea shallower and less distinct and the short spines on the outer side of hind tibia much more distinct and more numerous (about 10). It is similar to the nominate race, however, in the other general morphological characters (including sculpture on head, mesoscutum and propodeum) and colorific distinctions (excepting that of hind trochanter).

Specimens examined: 12 ♀ 5 ♂, Hokkaido; 1 ♀ 17 ♂, Aomori Pref.; 1 ♀ 2 ♂, Ishikawa Pref.; 3 ♀ 22 ♂, Fukui Pref.; 2 ♀, Saitama Pref.; 1 ♀ 4 ♂, Mie Pref.

(b) Crossocerus (Blepharipus) yamato stat. nov.

Crossocerus (Coelocrabro) capitosus yamato Tsuneki, Kontyu, 28: 195, 1960

C. yamato is different from C. capitosus in that the postocelli are far more posteriorly located, frontal foveae much more distinctly impressed, pygidial area narrower, antennal joints slightly longer (joint 3 appr. 1.8 times as long as broad at apex) and the legs much more brightly maculated. The differences above mentioned, together with the distributional evidence, seem to be sufficient enough to raise it to the species rank.

Specimens examined: 2 ♀ 1 ♂, Nikko (including holotype and allotype); 1 ♀ 2 ♂, Hokkaido (Sapporo); 1 ♀, Ishikawa Pref. Ichinose, foot of Mt. Haku, 1000

m); 6 ♀ 5 ♂, Fukui Pref. (montanic region of Arashi, about 900 m).

Supplemental description. ♀. Length 5-6 mm. Head in dorsal view slightly wider than in *capitosus*, relative width at eyes, temples and occipital margin 40, 38 and 26, relative length at eye (maximum) and in middle 30 and 25, (in *capitosus* s. str. from Holland they are respectively 40, 39.5, 28 and 31, 27); relative eye length and temple length 30 and 21; OOD : POD : OCD = 10 : 6.5 : 18 (in *capitosus* 30, 23 and 10:7:21, and in *c. yezo* 30, 32, and 10:6:23) (all are measured under the standard of head width 40), emargination of occipital margin somewhat stronger than in *capitosus* s. str., but not so much as in *c. yezo*. Frontal fovea elongated oval, slightly smaller than antennal joint 3, located along eye and slightly anterior to oculocellar space; inner orbits at upper frons not so strongly impressed as in *capitosus*. Head seen in front with face comparatively broad, minimum IOD at antennal socket slightly more than half the length of antennal scape, clypeus (Fig. 5 of my 1960 paper) with the disc transversely gently rounded, not medianly tectinate as in *capitosus*, antennal joint 3 in dorsal view about 1.8 times as long as wide at apex (in the Hokkaido specimens nearly twice so). Gastral tergite 1 slightly longer than wide (6:5), pygidial area (Fig. 8 of my 1960 paper) narrower than in *capitosus*, but the lateral carinae not always curved inwards at base as given in the figure, rather straightened usually. Hind tibia provided with 3-4 short spinules on outer side. Vertex and upper frons smooth and shining, with sparse fine punctures, mesoscutum distinctly microcoriaceous and sparsely and somewhat more largely than on vertex punctured, mesopleuron smooth and polished and on lower portion scattered with fine hair-bearing punctures; propodeum at base finely crenate and on the disc longitudinally, very delicately striolate partly.

♂. Length 4.5-5.0 mm. Generally similar to ♀. On vertex between postocelli a fine longitudinal groove is sometimes observed. Mandible bidentate at apex. Antennal joint 3 1.8-2.0 times as long as wide at apex. Hind tibia almost without spinule on outer side.

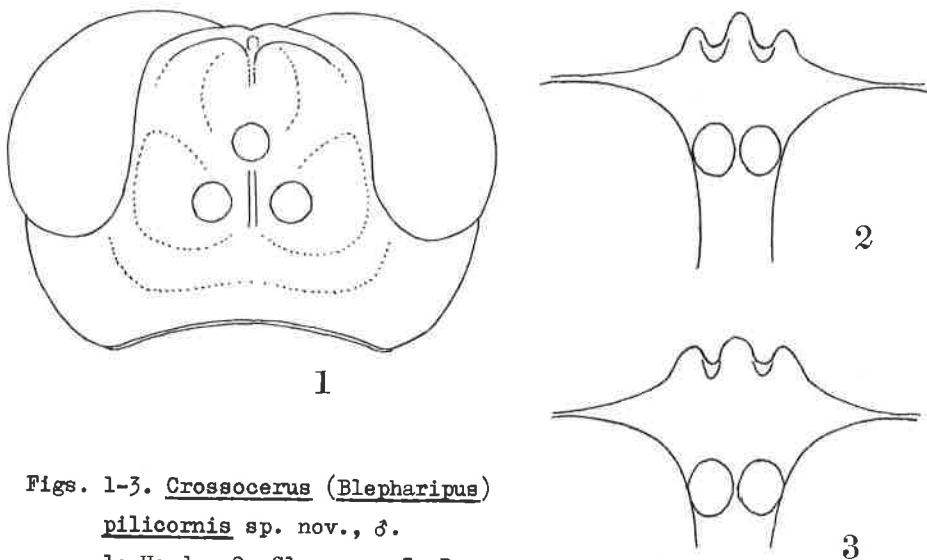
Variation in coloration (♀ ♂). The holotype (♀) is a rather melanic specimen, having following portion only pale ferruginous or yellowish white: antennal scape in front on basal third, fore tibia in front (medianly constricted), mid tibia externally on basal third, fore and mid tarsi except brown apical joints and apex of coxa, trochanter wholly, basal third of tibia of hind leg. Hind tarsus castaneous brown with apices of joints 1-4 paler. Flagellum brownish black, spically ferruginous beneath. In the allotype male scape black, at base in front only ferruginous. Yellowish white: fore tibia in front broadly, a spot at base of mid tibia, basal 4th of hind tibia, fore and mid tarsi except brownish apical joints. Tibial spurs and hind tarsus pale ferruginous, with apical joint slightly castaneous. In the bright coloured specimens (♀ ♂) yellowish white are antennal scape except upper side, medianly interrupted band on pronotal collar, broad areas of legs (fore and mid legs: apex of trochanter, knee, tibia except inside and tarsi except brownish apical joint; hind leg: apex of coxa, trochanter wholly, narrow base and apex of femur and basal third of tibia). The developmental degrees of whitish colour are markedly varied on the antennal scape, pronotal collar and on the mid tibia, and various intermediate states are observed. Apparently it bears some connection with the localities of the specimens. The specimens from Hokkaido and Nikko (more than 1400 m) belong all to the melanic form, while those from the montanic regions around Mt. Haku (less than 1000 m) are, so far examined, all to the brightly maculated form.

(c) Crossocerus (Blepharipus) pilicornis sp. nov.

The present species (♂) is closely related to *C. (B.) yamato*, but is distinguished from it by the following distinctions: Antennal flagellum fringed with pubescence beneath, face much narrower, mesoscutum without microsculpture and well shining, gastral segment 1 relatively much longer, frontal fovea indis-

tinct and hind trochanter black.

♂. Length about 5 mm. Black, with weak plumbeous shine on head and thorax, legs brownish black. Pale ferruginous yellow or pure yellow: antennal scape at base and at apex in front, palpi (more ferruginous), articulations of legs, fore and mid tibiae externally (in middle pale brownish), fore and mid tarsi except apical joints, hind tibia broadly at base, all tibial spurs, base of hind metatarsus and the following 3 tarsal joints. Castaneous brown to pale brown: Mandible at apex, antennal flagellum beneath narrowly, pronotal tubercle, tegula and basal plate, stigma and veins of wings. Wings hyaline, iridescent. Hairs on clypeus silvery, on other parts of body silky white, rather sparse.



Figs. 1-3. Crossocerus (Blepharipus)  
pilicornis sp. nov., ♂.  
1: Head. 2: Clypeus. 3: Do.,  
variation.

Head from above: Fig. 1, surface nearly flattened and broadly impressed on oculocellar areas, along inner orbits and in front of anterior ocellus, the last said area inclined towards the median line that becomes deeper anteriorly and ends just below the anterior verge into a well outlined elongate impression. OOD : POD : OCD = 10 : 6 : 7, postocellar diameter relatively 5.5; frontal fovea indistinct, temples roundly convergent posteriorly, occipital margin not so strongly emarginate as in yamato, the carina low, suddenly ending at the apex far before reaching hypostomal carina, but not toothed. Head in frontal view with face markedly narrow, much narrower than in yamato, or in capitosus s. str., minimum IOD at above socket of antenna slightly less than a third the length of antennal scape (in the two species compared slightly more than half the length of it), frons at the verge of upper frons weakly bituberculate between frontal furrow and inner orbital impression, but not so strongly raised as in capitosus. Clypeus: Fig. 2, with medial tooth much less in length and breadth than in capitosus or in yamato and with disc transversely gently roundly raised as in yamato, not medianly raised as in capitosus. Relative length of apical three joints of maxillary palpus  $6 > 4 > 5$  (in yamato similar, in capitosus s. str. subequal to each other, in c. yezo  $4 = 5 > 6$ ). Antennal joint 3 in dorsal view about 1.7 times as long as broad at apex, joint

7 slightly wider than long, ultimate joint slightly longer than wide at base, flagellar joints fringed with pubescence beneath and on apical half provided further with an impressed line along the row of pubescence except the ultimate joint. Collar of pronotum medianly impressed and laterally weakly notched just behind the antero-lateral corner ( somewhat similar to the notch in Crossocerus amurensis Kohl), the corner not toothed nor angulated. Mesoscutum medio-anteriorly strongly impressed, scuto-scutellar furrow distinctly crenate (in the three forms compared not crenate), mesopleuron without precoxal tooth, propodeum without enclosure, on dorsal aspect medianly weakly furrowed, the furrow on posterior half broadened and deepened, lateral carinae defined on posterior fourth of the total length of the segment. Gastral tergite 1 long, appr. twice as long as broad, legs as in capitosus, hind tibia strongly clavate, with only a few short spinules scattered on outer side, the following metatarsus also incrassate.

Vertex and mesoscutum finely and sparsely punctulate, the latter without ground microsculpture, shining (markedly contrasted with capitosus and yamato); mesopleuron except lower portion and metapleuron wholly smooth and polished, episternal furrow coarsely foveolate, meso- and metapleural sutures finely crenate; propodeum at base with short striae, roundly raised areas on both sides of medial furrow smooth and shining, outside the areas and posterior aspect sparsely and finely punctured, punctures on upper part of posterior aspect somewhat stronger, sides largely smooth and polished.

♀, unknown.

Holotype: ♂, mountain path (700 m) near Hatogayu, Fukui Pref., 16. VII. 1973, K. Tsuneki leg.

Paratype: 1 ♂, Mt. Haku, 3-4. VII. 1962, K. Tsuneki leg.

Other specimen: 1 ♂, Is. Okushiri (Horonai), S. Hokkaido, 15. VI. 1959, M. Munakata leg.

Remarks. In the specimen from Is. Okushiri the form of the anterior margin of clypeus is considerably varied as given in Fig. 3 and the mandible except upper and lower margins and humeral tubercle wholly bright ferruginous.

## II. A colour variant of CROSSOCERUS (BLEPHARIPUS)

HEYDENI NIPPONIS Tsuneki, 1966

Crossocerus (Coelocrabro) heydeni nipponis Tsuneki, Life Study, 10: 35, 1966.  
Crossocerus (Blepharipus) heydeni nipponius: Bohart and Menke (lapsus calami),  
World Sphecid Wasps, p. 401, 672, 1976.

Specimen examined: 1 ♀, Hatogayu-Mt. Akato, Fukui Pref., 16. IX. 1976, T. Murota leg.

In the specimen in question the ferruginous colour is so much developed that it appears as if to be a different species. Ferruginous are antennal joint 1 in front, joint 2 at apex, mandible except extreme base, palpi, pronotal tubercle, tegulae, apical half of caudal segment, articulations of legs, fore trochanter broadly beneath, all tibial spurs, fore and mid tibiae except inside and tarsi, hind tibia at basal third and at apex and both ends of following tarsal joints 1-4. Rest of tibiae and tarsi of all legs dark brown.

## III. CRABRO USSURIENSIS GUSSAKOVSKIJ in Korea

with the redescription of the male

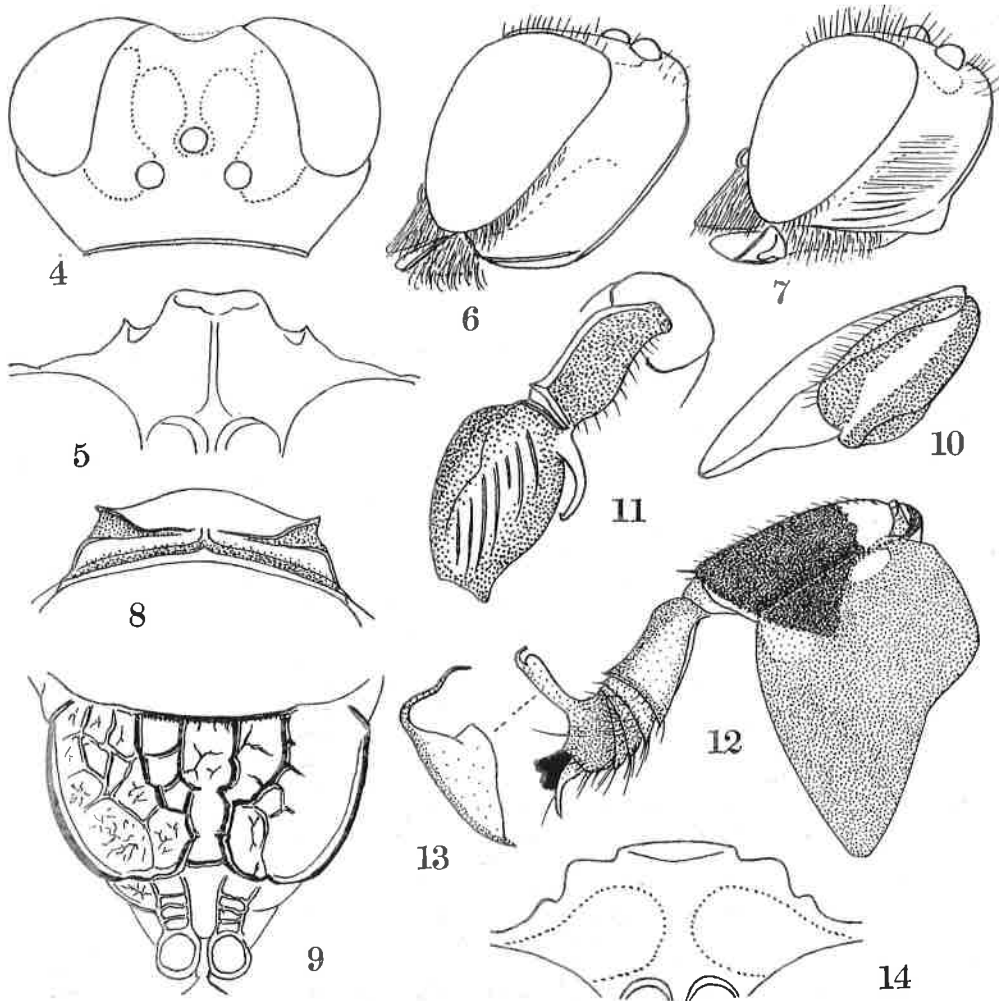
Crabro (Thyreopus) ussuriensis Gussakovskij, Ark. Zool., 24 A 10: 18, 1932 (♀).  
Crabro (Crabro) ussuriensis: Leclercq, Monogr. Crabro., p. 251, 1954 (listed).  
Crabro (Crabro) ussuriensis: Tsuneki, Akitu (Kyoto), 12: 36, 1965 (♂).



Crabro ussuriensis: Bohart and Menke, World Sphecid Wasps, p. 409, 1976 (listed)

Crabro (Crabro) ussuriensis was described with a female specimen from the Ussuri region. In 1965 I described the probable male of this species with a query because in this group the sexual combination is difficult. In the present case the specimens of both sexes are collected together and could have confirmed the correctness of my previous presumption. Because of the rare species and in order to supplement the previous description the characters of the Korean specimens will be given in the following.

Specimens examined: 1 ♀ 1 ♂, Mt. Sudosan, 1000 m, Keisho-hokudo (Kyongsang pekdo), 13-14. VII. 1971, S. Korea, K. Yamagishi leg. (Coll. Meijo Univ., Nagoya).



Figs. 4-14. 4-6, 8-14. Crabro ussuriensis Guss. 1-13, ♂; 14, ♀. 7. Crabro scutellatus (Scheven), ♂. 4, 6, 7: Head. 5, 14: Glypeus. 8: Pronotum. 9: Propodeum. 10: Fore femur and tibial shield (white part) from above. 11: Fore trochanter and femur from beneath. 12: Fore tibia with shield and tarsus. 13: Deformed claw seen vertically.

Redescription of the male. Resembling considerably the male of Crabro scutellatus (Scheven), but is different from it in the structure of the tibial shield of fore leg, clypeus, temples and pronotum, in the finer and closer punctuation of the head and thorax, in the shorter and much sparser hairs on the mesosternum and also somewhat in maculation, especially of the tibial shield of the fore leg.

Length 7.5 mm. Black, with plumbeous shine on mesopleuron alone. Yellow: antennal joint 1 on outer side irregularly, a patch near base of mandible, (thorax completely black), medianly closely approaching two large lateral marks on tergite 2, a narrow transverse mark on each side of tergite 3 (wider than the interspace), ante-apical narrow waved bands on tergites 4 and 5, a broad streak on fore femur (Fig. 10), basal patch of all tibiae, apical ring of fore and mid tibiae, two small marks on the shield of fore tibia (Fig. 12), fore and mid metatarsi and a spot at base of hind metatarsus; antennal flagellum ochreous yellow beneath. Mandible at apex and rest of tarsal joints ferruginous. Wings hyaline, pale brownish throughout, stigma and viens ferruginous brown. Hairs on upper frons and vertex moderately long (but shorter than in scutellatus), pale brownish, on clypeus dense, appressed and silvery, on baso-external area of mandible and lower orbit dense, long and curved, silky white and on mesoscutum close, short, stiff and blackish (in scutellatus close, long, soft and greyish white), hence the surface sculpture of head and thorax better visible than in scutellatus. The dense hairs on mesosternum also much shorter than in this and silky white; hairs on propodeum long, not dense, but irregularly curved, glittering white and the surface sculpture not well visible.

Head from above: Fig. 4, median area broadly raised, with a broad furrow in front of anterior ocellus, OOD=POD, frontal fovea indistinct, included in the smooth polished area along inner orbit as a vaguely outlined small rounded impression, located obliquely in front of postocellus. Head seen in front with inner margins of eyes markedly convergent below, minimum interocular distance at above base of antenna slightly less than half as long as antennal joint 1. Clypeus: Fig. 5, mandible with an oblique strong carina on outer side near the base, but without the tooth there, the long curved hairs on the area is very striking (in scutellatus the oblique carina present, but without the hair, instead a strong tooth produced). Antennal flagellum as in the compared species, slightly broadened and excavated beneath, with the fringe of long hairs, joint 3 slightly longer than wide at apex, 4 wider than long. Head seen in profile (Fig. 6) with temple subparallel, slightly narrower than eye, with lower half gently hollowed out, somewhat strongly so near mandibular base (but much less than in scutellatus), temple more broadly extended downwards and much less strongly carinated at the lower margin than in the compared species and the carina not so obliquely inclined and not so markedly produced into a tooth at its posterior end as in this species (Fig. 6, cf. Fig. 7 in scutellatus); as a result temple in the present species is much higher and the area between the carina and hypostomal carina (= lower surface) is much narrower than in scutellatus (in this species this area densely covered with long pubescence, but in ussuriensis the area polished, having only a few hair-bearing punctures on anterior portion). Collar of pronotum: Fig. 8, generally similar to that of the compared species, but relatively slightly broader, with the anterior and lateral margins slightly more acutely edged and with the excavation behind anterolateral tooth deeper. Mesopleuron similar in structure to scutellatus, a large polished triangular area present, enclosed by the coarsely foveolated episternal, hyposternal and mesopleural furrows. Propodeum: Fig. 9. Gastral segment 1 slightly longer than wide, no pygidial area on caudal tergite. Wing venation as in scutellatus. Fore femur from above (left leg): Fig. 10 (dotted part including yellow streak, white part is the tibial shield), the same with trochanter and apical part of coxa seen from beneath: Fig. 11, having a marked hook at base and the surface coarsely striated; fore tibia with accessory shield and the following tarsus: Fig. 12, the shield semitransparent, dark bro-

wish, apical joint of tarsus with one of the claws markedly deformed, seen vertically: Fig. 13; mid and hind metatarsi thickened, the former slightly curved, longer tibial spur of hind leg less than as long as the following metatarsus, slightly dilated.

Head above moderately largely and very closely, on upper frons obliquely, rugosely, punctured, only on inner orbital areas and oculocellar areas punctures very sparse and the surface shining; temple very finely, closely, somewhat obliquely punctate-striate, on lower excavated area punctures larger and sparser, but without striae (in scutellatus striate); mesoscutum moderately largely, very closely punctured, punctures slightly larger posteriorly, scutellum somewhat more largely punctate, scuto-scutellar furrow distinctly crenate; mesopleuron smooth and polished, only on hypoepimeral area very minute punctures sparsely scattered, metapleuron somewhat finely and closely punctate, with a few weak striae below; sculpture on propodeum: Fig. 9, sides longitudinally, very indistinctly punctate-striate, with distinct striae on lower portion; gastral tergite 1 finely sparsely, following tergites more finely and closely punctulate.

Some remarks on ♀. Clypeus: Fig. 14, covered with golden hairs (in the original description hairs silvery) and the disc medianly carinated, occipital carina suddenly ending at postero-ventral corner of temple and produced into a short obtuse tooth as in ♂. Antennal joint 3 appr. 2.3 times as long as broad at apex, 4 slightly longer than half the length of 3 and appr. 1.3 times as long as broad at apex. Pronotum as in ♂, mesopleuron with a distinct precoxal tooth. Sides of propodeum almost smooth and polished, only on marginal areas except anterior part longitudinal striae can be seen, somewhat marked on posterior margin.

IV. Relationships of ECTEMNIUS (METACRABRO) KONOWI (KOHL)  
to E. (M.) FOSSORIUS (LINNAEUS)

Since Kohl (1905, 1915) separated his Crabro konowii from C. fossorius at the specific level all the hymenopterologists have followed his authority. According to him the differences of konowi from fossorius are as follows:

♀. Striae and rugae on propodeum sparser and coarser; yellow marks on gastral tergites much less developed (in fossorius tergite 1 always carries yellow marks, lateral marks on tergites 2 and 5 often connected into a band and caudal tergite frequently with lateral marks).

♂. Head from above with temples less strongly and less straightly (roundly) convergent posteriorly and relatively somewhat shorter; frons in front of anterior ocellus only gently (not steeply as in fossorius) inclined towards the scapal hollow; antennal joint 3 more strongly swollen out beneath at apex and appears more strongly excavated beneath in middle; mid metatarsus distinctly enlarged before apex at the antero-interior corner.

According to my observations of the numerous Japanese and Korean specimens of konowi (judged by the male character of mid metatarsus), of the distinctions mentioned by Kohl the sculpture of the propodeum (♀) is in the Japanese specimens generally as given by him, but in the Manchurian and Korean specimens (= manchurianus Tsuneki, 1976) quite similar to that of fossorius and in a considerable part of the Hokkaido specimens it is similar or very close to it. The form of the head (♂) is variable among the specimens. Generally in the large-sized specimens the upper frons and temples well developed as mentioned by Kohl, but in the small specimens they are not well developed as in fossorius. The 3rd antennal joint (♂) is certainly deeply emarginate beneath in middle almost invariably, but the dilatation of mid metatarsus (♂) is considerably variable in the N. Korean specimens, in some of them very weak and in some others completely unobservable. While, the gastral maculation is certainly much less developed. In none of the specimens could I find out yellow marks



on tergite 1 and yellow band on tergite 2. The marks on tergite 5 are not fused into a band in ♀, though very closely approaching to each other in some of the specimens, but in ♂ occasionally they become a band. Yellow marks on tibiae are much less developed, but the yellow on tarsi is apparently constant to the species (joint 1 in fore leg and joints 1 and 2 in mid and hind leg are always yellow in all the specimens observed of konowi and fossorius) and the apical mark (s) on mid femur is, to the contrary better developed in konowi (frequently a broad streak from apex to underside till base).

Thus the differences between fossorius and konowi are mainly quantitative and mostly within the specific variations, and those hitherto considered qualitative are connected together with each other by the variations within a population or by the intermediate characters of the specimens of the intermediate localities. The fact is just the same as in the case of Crossocerus (Acanthocrabro) vagabundus vagabundus and C. v. yamatonicus. In the former (♂) the fore femur provided beneath at base with a distinct spine, while in the latter the femur is completely unarmed. In the Korean specimens (C. v. koreanus m.) a very short vestigial apine is present, showing an intermediate state between the two. The instance of Crossocerus capitosus capitosus and C. c. yezo treated earlier in this paper is another case of similar cline, although in this case the intermediate representative has not as yet been discovered in the intermediate regions.

On the other hand, on the part of fossorius the yellow marks on the gaster are also variable. The bands on tergites 2 and 5 are sometimes interrupted into two lateral marks and the yellow on the tibiae is considerably variable. Of the specimens that I observed in comparison, a female from Zsitomir (SSSR) is considered typical, having two large contiguous marks on tergite 1 and a band on 5, but on 2 the band is broadly interrupted in the middle. A female from Outer Mongolia lacks marks on tergite 1 and a female from Bologh, Amur, is similarly immaculated on tergite 1 (the three specimens in Coll. Mus Nat. Hung.). In the last specimen marks on tergites 2-5 are all broadly separated in middle as in the case of konowi. Two females from Manchuria (Coll. Calif. Acad. Sci.) lack the mark on tergite 1 and carry lateral marks on 2-5. In all of the last four specimens, however, the propodeum is sculptured as in the first typical one. But the Manchurian specimens were identified by me with E. konowi as a subspecies, manchurianus m., based on the similarly maculated and sculptured specimens from North Korea which were accompanied by the males having the mid metatarsi more or less thickened before the apex.

As to the distribution of E. fossorius, Kohl (1915) recorded, besides Europe, Turkey, Ural, Transcaucasus, Turkestan, Transbaikal and Amur.

According to Leclercq (1954, p. 290) a female specimen from Transbaikal is in the maculation of the gaster similar to E. konowi.

Judging by the characters of the Manchurian and Korean specimens it seems probable that the recorded specimens (females so far reported) from the various regions of Asiatic Continent fall within the category of manchurianus or some other closely related races.

From the material presented as above it seems natural to draw the following conclusion:

311. Ectemnius (Metacrabro) fossorius fossorius (Linnaeus, 1758)

Striae and rugae on propodeum fine, close and weak (especially in ♀); tergite 1 maculated, tergites 2 and 5 frequently banded (♀); emargination of antennal joint 3 beneath weak (♂); mid metatarsus normal (♂).

Distribution: Europe and West Asia.

2. Ectemnius (Metacrabro) fossorius konowi (Kohl, 1905), stat. nov.

Striae and rugae on propodeum, on an average, coarse, sparse and strong; tergite 1 immaculated, 2 always laterally maculated (♀); emargination of antennal joint 3 beneath deep and marked (♂); mid metatarsus thickened before apex

at the antero-interior corner ( $\delta$ ).

Distribution: Japan (Hokkaido, northern parts of Honshu and the Kuriles).

3. Ectemius (Metacrabro) fossorius manchurianus Tsuneki, 1976, stat. nov.

Striae and rugae on propodeum fine, close and weak (especially in ♀); tergite 1 immaculated and tergite 2 laterally maculated (♀); emargination of antennal joint 3 beneath deep and marked ( $\delta$ ); mid metatarsus variably (generally weakly) thickened before apex, sometimes normal ( $\delta$ ).

Distribution: Korea, Manchuria, the Ussuri and Amur regions and possibly till West Asia.

Examined specimens of Japan and Korea: 117 ♀ 184 ♂, Hokkaido; 37 ♀ 93 ♂, Central and Northern Japan-proper; 5 ♀ 21 ♂, Northern Korea.

R e f e r e n c e s

- Bohart, R. M. and A. S. Menke. 1976. Sphecoid wasps of the world. A generic revision. Univ. Calif. Press, 695 pp.
- Gussakovskij, V. 1932. Verzeichnis der von Herrn Dr. R. Malaise im Ussuri und Kamtschatka gesammelten aculeaten Hymenopteren. Ark. Zool., 24 A 10: 1-66.
- Kohl, F. F. 1915. Die Crabronen der paläarktischen Region. Ann. Naturh. Hofms. Wien, 29: 1-351.
- Leclercq, J. 1954. Monographie systématique, phylogénétique et zoogéographique des Hyménoptères Crabroniens. Liège, 371 pp.
- Tsuneki, K. 1947. Crabronidae Fauna of Korea. J. Fac. Sci. Hokkaido Univ. VI, Zool. 9 (3): 281-295.
- 1947b. On the wasps of the genus Crabro s. l. from Hokkaido, with descriptions of new species and subspecies. Ibid., 9 (4): 397-435.
- 1957. Some Crabronids collected by Dr. S. Asahina in Korea. Kontyu (Tokyo), 25: 77-78.
- 1960. Subspecies and their distribution. A case in Crossocerus capitosus Shuckard (Hym., Sphecidae) in Japan. Ibid., 28: 193-197.
- 1965. Some fossorial wasps from Manchuria (Hymenoptera). Akitu (Kyoto), 12 (3-4): 35-38.
- 1966. The Japanese subspecies of Crossocerus heydenii Kohl and a description of a new species of Crossocerus (Hym., Sphecidae, Crabroninae). Life Study (Fukui), 10: 35-37.
- 1974. Sphecidae (Hymenoptera) from Korea. Ann. Hist. Nat. Mus. Nat. Hung., 66: 359-387.
- 1976. A fourth contribution to the knowledge of Sphecidae (Hymenoptera) of Manchuria, with remarks on some species of the adjacent regions. Kontyu (Tokyo), 44 (3): 288-310.
- Yasumatsu, K. 1942. Contribution to the knowledge of the Crabronidae-fauna in Eastern Asia. 1 (Hymenoptera). Mushi (Fukuoka), 14 (2): 87-92.
- 1965. Sphecidae in Iconographia Insectorum Japonicorum Colore naturali edita, II: 297-302.