Kontyû, Tokyo, **43**(4): 456–462. December 25, 1975

A New Trigonalid Parasite (Hymenoptera, Trigonalidae) Obtained from *Vespula* Nests in Taiwan[1)]

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Synopsis *Bareogonalos huisuni* sp. nov. is described based upon three males and three females obtained from three nests of *Vespula* in Taiwan, with biological notes on host colonies.

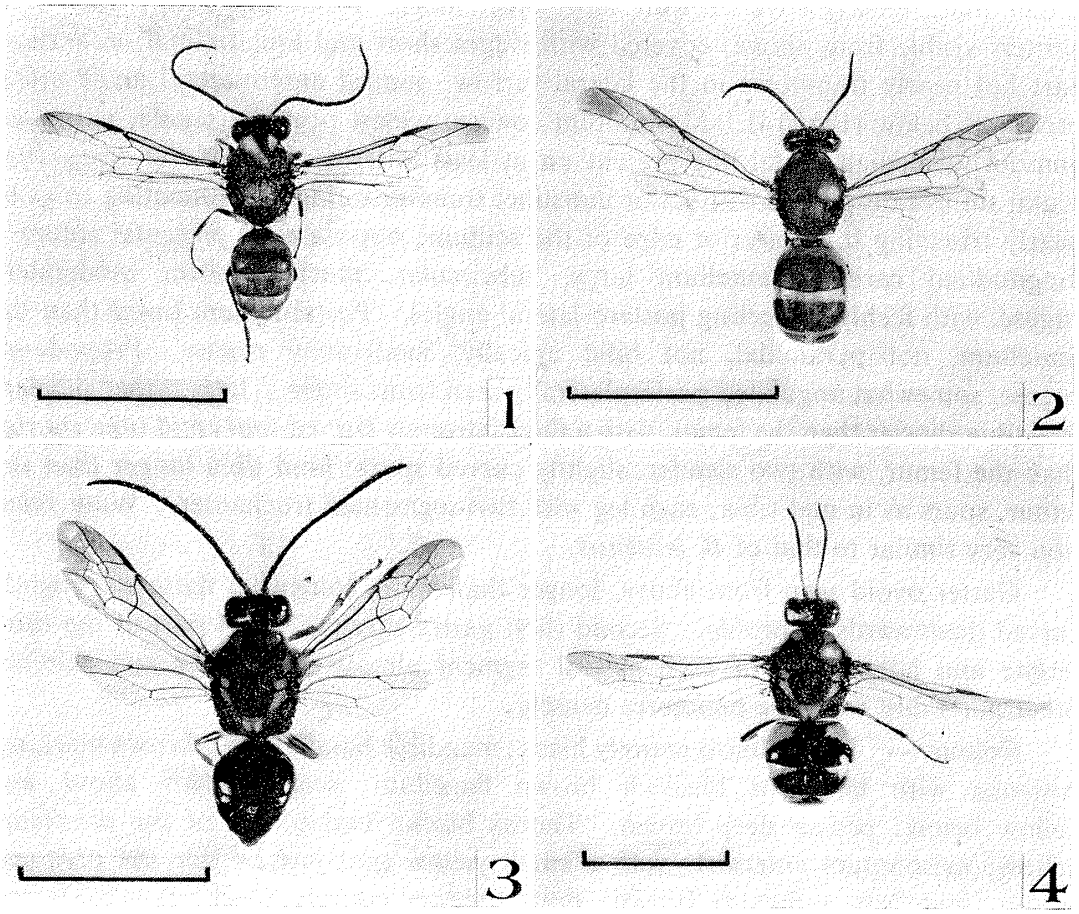
A new trigonalid wasp was obtained from three nests of "*Vespula* (*Paravespula*) *karenkona* SONAN"[2)] by one of us, Sôichi YAMANE, during his stay in Taiwan to engage in the study of taxonomy and bio-sociology of social wasps. This species distinctly differs from *Bareogonalos jezoensis* UCHIDA, which, having been known from Japan and Java as a parasite of vespine wasps (VECHT, 1957; Sk. YAMANE, 1973), may be expected to occur in Taiwan. *B. jezoensis* was, however, not collected during his stay in spite of all his efforts. In this paper the new trigonalid is described from three males and three females, with some brief notes on host colonies. It is referred to the genus *Bareogonalos* for the reasons mentioned later, in spite of its deviation from the other known congeneric species. The holotype and three paratypes are deposited in the collection of the Entomological Institute, Faculty of Agriculture, Hokkaido University, and two paratypes are deposited in the collection of the Leiden Museum.

Bareogonalos huisuni Sk. et S. YAMANE, sp. nov.

Male (Fig. 1). Structure:— Head (Fig. 5) distinctly wider than high, slightly narrower than thorax, with rather long hairs. Vertex comparatively narrow, shining with punctations feeble and sparse. Interocellar distance less than half the ocellocular distance, slightly shorter than ocelloccipital distance. Triangle formed by the ocelli flattened. Area surrounded by the ocelli with median groove. Supra-antennal area somewhat depressed, distinctly but not strongly punctate, with transverse wrinkles just above the antennae, and with a wide shallow frontal line

1) Taxonomic and bio-sociological studies on vespid wasps in Taiwan. I.

2) Taxonomic status and scientific name of this species will be discussed and settled in a separate paper.



Figs. 1–2. *Bareogonalos huisuni* sp. nov. (1, ♂; 2, ♀). Scale: 10 mm. —— 3–4. *B. jezoensis* Uchida (3, ♂; 4, ♀). Scale: 10 mm.

below. Paraocular area slanting towards depressed supraantennal area, with a pair of impressions on the border of the supraantennal area. Anterior tentorial pits deep. Interocular distance slightly longer at the upper inner corners of the eyes than at the lower inner corners seen in front. Clypeus transverse, slightly swollen in the middle, widest near the mandibular bases, abruptly narrowed towards its apical margin, shining as in the vertex; the apical margin broadly emarginate, without distinct lateral teeth; basal margin concave; punctation feeble and sparse. Mandibles (Fig. 6) remarkably projecting, quadridentate and nearly symmetrical, somewhat dull except for the shining teeth; the proximal tooth short and subdivided into two. Mouth-parts narrow in comparison with the head, which is markedly broad. Length of the oculo-malar space subequal to the diameter of the antennal base. Antenna (Fig. 8) 20- or 21-segmented, slender, very long and tapering, without tyloides; each flagellar segment somewhat thickened apically; fourth and fifth antennal segments subequal in length.

Thorax (Fig. 12) of moderate size; lateral and dorsal sides coarsely rugose and

rather dull, densely covered with short erect hairs. Pronotum steep; only hind corners visible from above; covered with ridges short and longitudinal on vertical part but nearly transverse in the lateral furrow; ventral anterolateral angle much produced below (Fig. 14). Mesonotum convex, widest near the tegula, narrowed anteriorly; median scutal line present on at least anterior third of the disc. Prescutal sutures deep, with distinct or indistinct transverse ridges, terminating so as to nearly trisecting the posterior edge of the scutum; outside each prescutal suture a longitudinal carina. Scutellum large, subcircular, much swollen, moderately rugose, with feebly projecting postero-lateral angles. Postscutellum lower than the scutellum, not pyramidal, not bifid apically, moderately rugose. Propodeum rugose, somewhat angulated posterolaterally seen from above. Legs rather slender; fore tibia shorter than the femur, with a thick, strongly curved spur; mid tibia shorter than the femur, with two slender, slightly curved spurs; hind tibia longer than the femur, spurs as in mid tibia; each leg with two-segmented trochanter. Wing venation very similar to that of *B. jezoensis*.

Gaster ovoid seen from above, longer than wide, somewhat flattened, slightly curved downwards in profile. Second (first gastral) tergite, basal part of the third tergite and lateral side of each gastral segment almost impunctate and shining; other parts dull with fine punctures densely.

Colour:— Head almost entirely black; mandible basally with a brown marking. Antenna with black or blackish brown flagellum; scape brown above and yellow below; pedicel deep brown. Thorax black; hind corner of the pronotum yellow; mesonotum anteriorly with a small yellow spot just outside the prescutal suture; scutellum yellowish brown; postscutellum entirely black; postero-lateral angles of the propodeum yellow. Coxa, trochanter and femur of the fore and mid legs for the most part black; apical part of the femur, tibia and tarsus brown, somewhat darker outside. Hind leg black or brownish black except for coxa above and trochanter yellow. Wings subhyaline; fore wing widely infuscate along the anterior margin. Gaster black, with brown or yellow in the following parts: basal half of the third (second gastral) tergite, fourth tergite partly, fifth to seventh tergites entirely, a pair of spots on the second (first gastral) sternite and major part of each gastral sternite.

In one of the two male paratype specimens the yellow and brownish markings on the thorax are much reduced in size and the mandibles are entirely black. In the other specimen all the markings of the thorax and gaster are bright yellow as in the female.

Female (Fig. 2). Structure and colour:— Very similar to the male. Antenna (Figs. 9, 10) 19- or 20-segmented, distinctly shorter than that of the male in whole length. Gaster more robust, bent at about the fifth (fourth gastral) segment so that the terminal sternites are placed opposite the anterior sternites (Fig. 16); third sternite with a median projection; fourth sternite with a similar projection which is almost hidden beneath the third sternite; the margin of the seventh sternite deflexed so as to

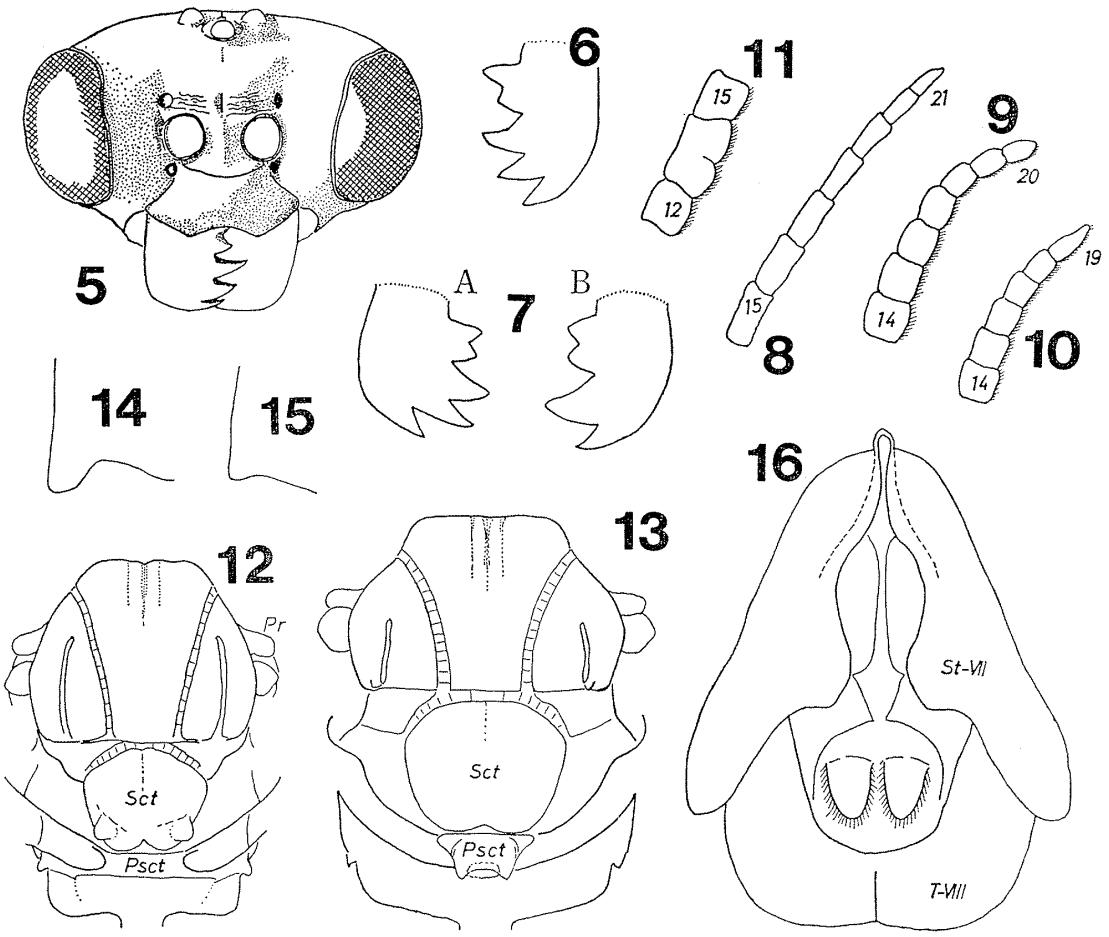


Fig. 5. Male head of *Bareogonalos huisuni* sp. nov., frontal view. —— 6. Left mandible of *B. huisuni*. —— 7 A, B. Mandible of *B. jezoensis* UCHIDA (A, right; B, left). —— 8–10. Antenna of *B. huisuni* (8, male; 9–10, female). —— 11. Female antenna of *B. jezoensis*. See text. —— 12–13. Male thorax (12, *B. huisuni*; 13, *B. jezoensis*), dorsal view. Pr: hind corner of the pronotum; Psct: postscutellum; Sct: scutellum. —— 14–15. Antero-ventral angle of the pronotum (14, *B. huisuni*; 15, *B. jezoensis*), lateral view. —— 16. Terminal segments of the female abdomen of *B. huisuni*, ventral view. St–VII: seventh sternite; T–VIII: eighth tergite.

produce into a rounded process opposite the projection from the third sternite. Body markings yellow; third to sixth tergites each with a yellow basal band; median projection of the third sternite yellow.

Holotype: 1 ♂, Kwantau-Shih (750 m alt.), Nantou, Taiwan, Feb. 6, 1973, from the nest of "*Vespula karenkona*" (Nest No. VK–12).

Paratypes: 3 ♀♀, same district (1,100 m alt.), Mar. 15, 1973, same host species (VK–13); 2 ♂♂, same district (720 m alt.), Jun. 6, 1973, same host species (VK–18).

Bareogonalos jezoensis is easily distinguished from the present new species in the following points: Antenna usually 21-segmented in both male and female; mandibles asymmetrical (Figs. 7 A, B); thorax very huge and remarkably rugose

(Fig. 13); ventral anterolateral angle of the pronotum less projecting (Fig. 15); scutellum black, laterally yellow; postscutellum yellow, pyramidal with the bifid apex; gaster thicker especially in female, almost impunctate and shining; gastral colour pattern as in Figs. 3–4; comparison in measurements, see Table 1.

Bareogonalos huisuni sp. nov. is clearly different from all the other species hitherto known of the monotypic subfamily Bareogonalinae SCHULZ in some characters adopted by authors as important ones in higher categorical classification, such as the number of the antennal segments, nonpyramidal postscutellum and dull gaster. Both mandibles are quadridentate, disagreeing with the usual number of the teeth (4 on the right, 3 on the left) in this family. However, the number of the antennal segments varies between the most closely related species *B. canadensis* HARRINGTON and *B. jezoensis*, and often intraspecifically or rarely even between the right and left antennae of the same individual in *B. jezoensis* and *B. huisuni*. In *B. jezoensis*, the number ranges from 19 to 23 in the male and 20 to 21 in the female, though it is usually 21 in both sexes. In some male specimens certain two intermediate segments are fused (Fig. 11). In *B. huisuni*, the number ranges from 19 to 21 (20 or 21 in the male and 19 or 20 in the female). The increase of the number of the antennal segments may be caused by a division of the terminal segment (Fig. 9 *vs.* 10). Thus, the number of the antennal segments is so variable in this group that it may not be appropriate to give it generic or higher categorical value. On the other hand, *B. huisuni* agrees with other species in the small head, two-segmented trochanter of the hind leg, raised scutellum, etc. Here, therefore, we treat the new species as a member of the genus.

Biological Notes

The vespine nests examined in Taiwan, excepting early solitary and vacated ones, are listed below: *Vespa analis nigrans* BUYSSON (10 nests), *V. affinis affinis* LINNÉ (17), *V. mandarinia nobilis* SONAN (1), *V. tropica pseudosoror* VAN DER VECHT (3), *V. basalis* SMITH (3), *V. velutina flavitarsus* SONAN (5), and "*Vespula* (*Paravespula*) *karenkona* SONAN" (3). Among these species the parasitism of *B. huisuni* was observed only for "*Vespula karenkona*", and all the nests observed of this species were infested by the parasites. These *Vespula* colonies were in reproductive period (*Rp*) and inertial period (*In*). The period *Rp* is tentatively defined as one lasting from the emergence of at least one of the sexuals to the end of the new queen dispersal, and *In* as one during which the nest is held by workers together with worker-born males after the end of the new queen dispersal (Table 2). The parasites were found from both worker and queen combs, and the body size is variable due to cell size (Table 1). The mode of cocoon formation was not checked in the present survey.

Table 1. Some measurements for *Bareogonalos huisuni* (H) and *B. jezoensis* (J). A, B and C are in mm.

	Host	From cells for	Sex	No. examined	Head width (A)	Interocellar distance (B)	Thoracic width (C)[1]	A/B	C/A
H	*Vespula karenkona*	worker	♂	2	2.66–2.72	0.28–0.31	2.84–2.88	8.70–9.44	1.06–1.07
		queen	♂	1	3.31	0.34	3.53	9.64	1.07
		?	♀	3	2.69–2.97	0.28–0.31	2.94–3.41	9.50–9.89	1.09–1.15
J	*Vespula* sp.	?	♂	1	2.63	0.34	2.94	7.64	1.12
	Vespa crabro	worker	♂	2	3.19–3.44	0.44	4.03–4.38	7.29–7.86	1.26–1.27
	Vespula sp.	?	♀	1	2.84	0.38	3.28	7.58	1.15
	Vespa crabro	worker	♀	3	3.34–3.75	0.47	4.19–4.97	7.13–8.00	1.25–1.33

1) Thoracic width is measured between hind corners of the pronotum.

Table 2. Biological data of the "*Vespula karenkona*" nests with notes on trigonalid parasites.

Nest No.	Date excavated	Altitude (m)	No. of adults					No. of combs	No. of total cells	Life period	Trigonalids
			☤	☿	♂	♀	T				
Vk–12	Feb. 6, '73	750	1	570	402	157	1,130	5 (2)[1]	5,500	Rp[3]	1 ♂ (C–5)[2]
VK–13	Mar. 15, '73	1,100	1	2,222	1,351	846	4,420	11 (5)	12,600	Rp	3 ♀♀
VK–18	Jun. 6, '73	720	0	148	1,977	0	2,125	10 (3)	13,300	In[3]	2 ♂♂ (C–4) and 4 pupae (C–7)

1) No. of queen combs in parentheses. 2) Comb no. parasitized in parentheses. 3) See text.

Acknowledgements

We wish to express our hearty thanks to Professor and Head Shu-Chen CHANG and Dr. Huang TSAN of the Entomological Institute, National Chung-Hsing University for their kind guidance and giving us the occasion to study social wasps in Taiwan, China. Thanks are also due to Mr. Ching-Chuan HONG, the chief of the Huisun Experimental Forest of the university, and his staff for their kind cooperation during the survey, and to Dr. J. VAN DER VECHT of the Netherlands, Dr. S. TAKAGI and Dr. Sh. F. SAKAGAMI of Hokkaido University for their critical reading through this manuscript.

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Kontyû, Tokyo, **43**(4): 462. December 25, 1975

Turranegonia chinensis WIEDEMANN の寄主

奥　俊夫

OKU, T.: Host Records of a Tachinid Fly, *Turranegonia chinensis* WIEDEMANN

筆者が盛岡市においてシロモンヤガ (*Amathes c-nigrum* LINNÉ) を飼育中，しばしば寄生蠅の 1 種が蛹から羽化したが，小茶武男氏によりこの寄生蠅は表記の種と同定された．シロモンヤガの飼育は採卵以後終始室内で行なったので，寄生蠅はヤガの幼虫食餌として野外から持ちこんだシロクローバの葉に付着して侵入したものと思われる．この飼育により 1973 年 8 月に 6 個体，10 月に 1 個体の寄生蠅が羽化したが，ほかに 1969 年 7 月に岩手県滝沢村で採集したタマナヤガ (*Agrotis ypsilon* FUFNAGEL) の終齢幼虫を蛹化させたところ，8 月に寄生蠅の羽化を見ている．本種の寄主は知られていないように思われるのでここに記録した．なお，盛岡においては，この寄生蠅の成虫は 9 月にソバの花に飛来するのがしばしば見られる．