

Contribution to the knowledge of the Bornean Psenini (Hymenoptera, Sphecidae)

by

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Until recently only twenty Psenine wasps (specimens, not species!) were recorded from Borneo. Collecting expeditions on behalf of the Bernice P. Bishop Museum, Honolulu, in 1958/1959 and 1962, yielded eight more specimens. I take this opportunity to express my sincere thanks to Dr. Carl M. YOSHIMOTO, Honolulu, who kindly sent me these wasps for study.

The collection is small but it is certainly a valuable contribution to our knowledge of the Indo-Australian Psenini, especially if the scarcity of Psenini in Museum collections is considered. Six species of *Psenulus* are represented. One is a new species and another species, originally described from Java, is recorded here for the first time from Borneo. The number of species of *Psenulus* found in Borneo now amounts to eleven. Six species appear to be restricted to Borneo (it is too early, of course, to conclude that these are really endemic), the remaining five forms also occur in Java, Sumatra and Malaya; one species is also recorded from Basilan. The group of *Psenulus scutatus* is, except for one peculiar species which occurs in Java, restricted to Borneo (two forms) and the Philippines (six forms).

Nearly all the specimens which are now known have been collected in North Borneo, with the exception of one specimen from Sarawak. The genus *Psen* has not yet been recorded from Borneo, but as one species has been described from Celebes it is likely that this genus will also be discovered in Borneo in future.

In view of the importance of the material collected by the Bernice P. Bishop Museum all specimens are fully recorded here and the description of the new species and supplementary morphological details of some other species are given.

Group of *Psenulus scutatus*

Psenulus scutatus borneensis (Rohwer)

1923, ROHWER, *Phil. Jl. Sc.* 22 : 596, ♀ (*Diodontus scutatus* var. *borneensis*; Sandakan, Borneo).

1962, VAN LITH, *Zool. Verb. Leiden* 52 : 28 (*Psenulus scutatus borneensis*).

A female from Sandakan Bay undoubtedly belongs to the form described by ROHWER in 1923 from one female. I have not seen the type, which is in the United States National Museum at Washington, but this second female agrees quite well with the original description which is concise, but sufficiently clear in regard to the colour marking. The gaster is not piceous, but reddish, as in the other forms of the group of *scutatus*. It is likely that in the holotype the gaster is discoloured.

A more detailed description, based on this second female, is given below.

Head black; mandibles except dark tips yellow, palpi pale yellow, scape of

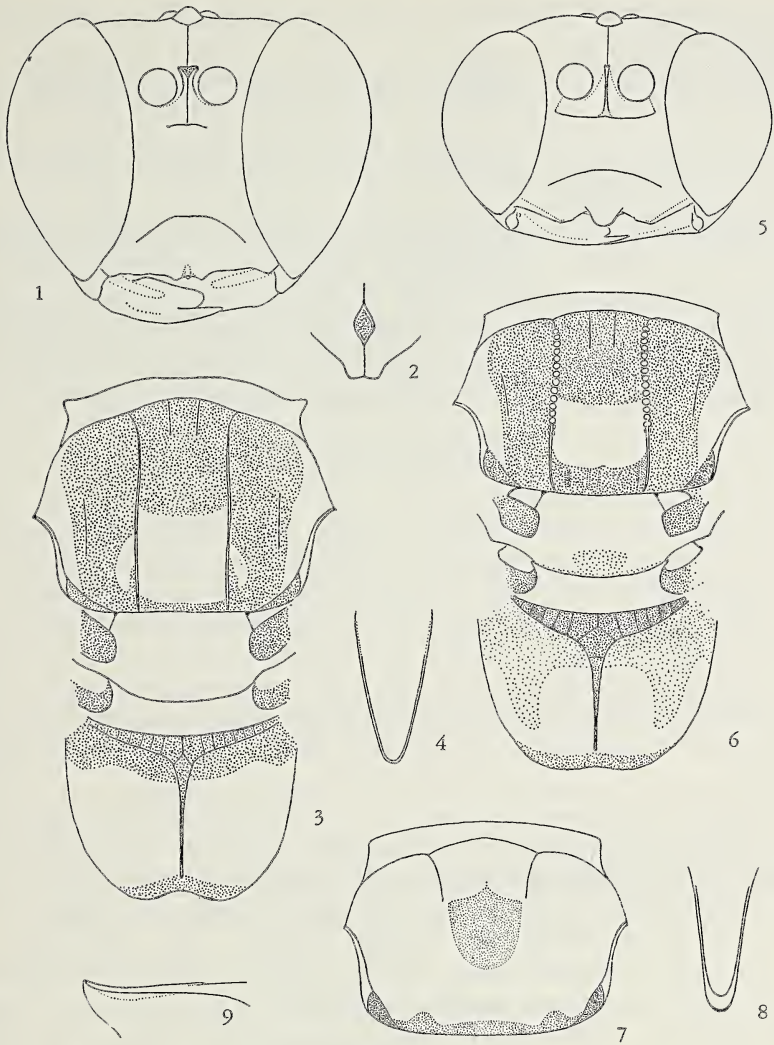
antennae yellow except brown upper tip, dorsal side of flagellum dark brown, underside paler on outer half.

Thorax black; the following parts of it are bright yellow: upper part of front and dorsum of pronotum, pronotal tubercles, slightly more than posterior three eighths of area between prescutal sutures with narrow adjacent areas (fig. 3), lateral parts of scutum, scutellum with axillae and metanotum (not the depressed lateral areas of scutellum and metanotum), back of propodeum except a black band at base which is as broad as the enclosed area medially, a narrow black band at apex of propodeum and the complete sulcus, anterior plate of mesepisternum and the parts above the hypo-epimeral area. Fore and mid legs yellow, rest of hind legs brown, base of tibiae paler, inner side of hind femora darkened. Tegulae pale brown. Veins of wings brown. Petiole black, also greater part of ventral plate of petiole, gaster red, basal half of first gastral tergite dark brown.

Head thick. Clypeus smooth and shining, with some fine punctures; median part of anterior margin weakly emarginate with lateral teeth and with a small median tooth on a lower level (as in *P. scutatus scutatus* but smaller). Between the lateral teeth the margin is triangularly depressed (fig. 1). Interantennal carina broadened between antennae into a broad oval which is slightly depressed (fig. 2). Below the antennae the carina ends in a protruding plate margined anteriorly by a short and arched transverse carina. This carina is about as long as one fourth of the distance between the eyes. Frons somewhat depressed below anterior ocellus, area between oculi and ocelli therefore appearing somewhat raised. Frons and vertex smooth and shining, finely and scarcely punctate, a hooked groove against the outer side of the posterior ocelli. Mandibles broad, lamellate above, lamellae broader than in *P. scutatus scutatus*. Antennae clavate, shortest articles about as long as they are broad.

Pronotum with distinct antero-lateral teeth. Scutum very finely punctate with a few larger punctures and very fine longitudinal striation. Prescutal sutures extending to scutellum. Parapsidal sutures straight, distinct, slightly more distinct than in *P. scutatus scutatus*. Scutellum and metanotum nearly smooth, almost impunctate. Scutellar suture not foveolate. Enclosed area of propodeum normal with forked median carina and oblique lateral carinae. Propodeal declivity smooth, laterally with shallow furrow, median sulcus narrow. Anterior oblique suture simple. Scrobal suture complete but weak.

Legs thick. Apex of mid tibiae with a short longitudinal row of four red spines on outer side. Median femora on outer side with a slight elevation, as in *P. scutatus scutatus*. In latero-dorsal view basal half of hind femora depressed. Base of hind tibiae depressed and bare; a longitudinal lamina on inner side of this depression, a blunt long spine at the base and a number of short red spines on outer side. Posterior half of hind tibiae with a row of five short spines on outer side, also outer margin of apex with a number of spines. Inner spur of hind tibiae angularly bent, both spurs shorter than basitarsus. First recurrent vein of fore wings received by first, second recurrent vein received by third submarginal cell. Petiole cylindrical, dorsally flattened, not sharply separated from postpetiole. Gaster except petiole finely punctate. Pygidial area elongate triangular, base broader than in *P. scutatus scutatus* (fig. 4) and dull, apical part shining.



Figs. 1—4. *Psenulus scutatatus borneensis* (Rohwer) ♀; 1, head, 2, interantennal carina in dorsal view, 3, thorax, 4, pygidial area. Figs. 5—6. *Psenulus maai* sp. nov. ♂; 5, head, 6, thorax. Fig. 7. *Psenulus sandakanensis* (Rohwer) ♂, pronotum and scutum. Figs. 8—9. *Psenulus separatus* van Lith ♀; pygidial area in dorsal (8) and lateral view (9).

Face with silvery pubescence which is appressed below transverse carina, clypeus almost bare. Base of mandibles below with a tuft of long, yellowish hairs. Vertex, thorax and gaster with whitish or yellowish pubescence. Petiole laterally with long straight hairs, dorsally near the margin with a row of minute hairs. Hind margin of fourth and fifth gastral sternites with dense white pubescence, base of sixth sternite with a large patch of short white pubescence, apex with some long backwardly directed hairs. Groove of mesosternum with long and dense brownish tinged pubescence. Rest of mesosternum with shorter and paler pubescence. Lower

part of epicnemial areas with patch of dense, appressed, silvery pubescence.

Length about $7\frac{1}{2}$ mm.

British N. Borneo: 1 ♀, Sandakan Bay (SW), Sapagaya Lumber Camp, 2—20 m, 4 Oct. 1957, coll. J. L. GRESSITT. (The holotype was also collected in Sandakan).

A straw-coloured mite is attached to the first gastral tergite (postpetiole) and also one to the pronotum.

The median part of the clypeal margin of the Bornean female differs somewhat from that of the nominate subspecies from Luzon, Samar and Negros. The colour marking very much resembles that of *P. hemicyclius* from Palawan and the depression on the anterior margin of the clypeus forms a transition to the deep emargination of *P. hemicyclius*. As long as the male has not been discovered I still prefer to consider the Bornean form as a subspecies of *P. scutatus*.

Psenulus maai, sp. nov.

The group of *P. scutatus* shows a notable sexual difference in the colour marking, the thorax being darker in the male than in the female. In the male from Borneo described below the colour marking differs in such a way, however, from the preceding female from Borneo, that I do not expect it will be the opposite sex of *P. scutatus borneensis*. Notably the yellow epicnemial areas and the partly brown fore and mid femora are peculiar. As furthermore the structure of the clypeal margin differs completely from that of the males of the Philippine species *P. scutatus* and *P. hemicyclius*, the male from Borneo is treated here as a separate species.

If, contrary to my present opinion, the male described here as *P. maai* should later prove to be the opposite sex of *P. scutatus borneensis*, this would result in *borneensis* being a good separate species. The shape of the clypeus of *P. scutatus* s.l. ♂ and *P. maai* ♂ is so different that they cannot be conspecific.

Description. Head black; mandibles yellow with reddish tips, palpi testaceous, scape of antennae yellow, flagellum dorsally dark brown, underside of flagellum pale yellow, last segments brownish at apex, apex of last segment completely brown. Thorax (fig. 6) largely black but the following parts yellow: upper half of front of pronotum and dorsal side of pronotum, sides of scutum and a large spot on posterior half of scutum between the scutellar sutures and a narrow black hind margin. Scutellum yellow including axillae but depressed lateral areas black and a vague brown spot against posterior margin. Metanotum yellow except lateral depressions which are black. Enclosed area of propodeum black, back of propodeum yellow with brown upper margin projecting backwards laterally. Hind margin of propodeum black. Epicnemial areas almost completely yellow, also anterior plate of mesepisternum. Mesosternum in front of hind coxae with narrow yellow margin. Fore and mid legs yellow including coxae and trochanters, femora largely dark brown especially on the back, tarsi reddish. Hind coxae and trochanters yellowish-red, rest of hind legs reddish-brown. Tegulae pale brown. Veins of wings dark brown. Gaster red with black petiole, ventral plate of petiole also red.

Clypeus with large emargination and large blunt median tooth (not on a lower level), tridentate in frontal view (fig. 5). Disk of clypeus short, finely and densely punctate. Carina between antennae slightly broadened and depressed, ending in a transverse protruding carina nearly as long as the distance between the eyes. Frons and vertex smooth and shining, almost impunctate. A narrow groove round outer side of posterior ocelli. Mandibles narrow and pointed, with sharp upper ridge, ends bidentate. Antennal segments flattened below, rounded on fore side, segments 8—13 also rounded on back and moreover segments 4—11 with a narrow shining carina (tyloidea) posteriorly.

Pronotum with very small antero-lateral teeth. Scutum smooth and shining, with minute punctures, no longitudinal striation. Prescutal sutures extending to scutellum, foveolate. Parapsidal sutures very narrow, straight. Scutellum and metanotum smooth and shining, extremely finely punctate. Enclosed area of propodeum normal, depressed, with short oblique carinae, median carina very short and forked, as is usual in the group of *scutatus*. Back of propodeum smooth and shining, sides with reticulate carination. Anterior oblique suture slightly foveolate. Scrobal suture weak. Legs normal, mid tibiae without conspicuous thorns and hind tibiae without long spine at base. Femora of normal shape. First recurrent vein of fore wings received by first, second recurrent vein by third submarginal cell. Petiole cylindrical, a short lateral carina at base. Gaster shining, very finely punctate.

Face, including lower part of frons with silvery, partly appressed pubescence. Rest of body whitish pubescent. Petiole with indistinct lateral rows of short hairs.

Length about $7\frac{1}{2}$ mm.

Borneo: 1 ♂ (holotype), Sarawak, Kapit distr., Merirai V., 30—300 m, 1—6 Aug. 1958, coll. T. MAA.

As in the male of *P. scutatus* from the Philippines the scutum is smooth and shining. The scutum of the female of the latter species being very finely longitudinally striate it is to be expected that the female of *P. maai* has the same sculpture of the scutum.

Group of *Psenulus quadridentatus*

Psenulus separatus van Lith

1962, VAN LITH, *Zool. Verb. Leiden* 52: 38.

P. separatus was described from a single female from W. Java. The species is closely allied to *P. quadridentatus*, having the same structure of the clypeus, but it is somewhat larger and the shape of the propodeal enclosure and of the pygidial area is different.

A female collected in Borneo certainly also belongs to this species. It is still larger (10 mm) and differs in some minor details from the holotype. The tegulae are reddish. The interantennal carina ends below in a low tooth. The transverse carina below the antennae is indistinct. The first recurrent vein of the fore wings ends just in the second submarginal cell. The pygidial area is slightly broader than in the holotype (fig. 8 and 9).

As there is only one specimen available from each island, it would be premature

to decide now whether the Bornean female belongs to another subspecies.

British N. Borneo: 1 ♀, Mt. Kinabalu, Kambaranga, 2140 m, 22—30 Oct. 1958.

Group of *Psenulus sandakanensis*

Psenulus sandakanensis (Rohwer)

1923, ROHWER, *Phil. Jl. Sc.* 22 (6) : 597—598 (*Diodontus sandakanensis*; Borneo).

1962, VAN LITH, *Zool. Verb. Leiden* 52 : 73—76.

A male from British N. Borneo, Keningan, 12—17 Jan. 1959, collected by T. C. MAA probably belongs to *P. sandakanensis*. The yellow scutum has a large, central black spot, the black band on the posterior margin of the scutum is broadened on both sides (fig. 7). The central part of the anterior plate of the mesepisternum is yellow. The black marking of the mesosternum continues on the posterior part of the mesopleura along the metapleura. The upper one third of the latter is yellow. Length about 8 mm.

Psenulus esuchus (Rohwer)

1923, ROHWER, *Phil. Jl. Sc.* 22 (6) : 600—601 (*Diodontus esuchus*).

1962, VAN LITH, *Zool. Verb. Leiden* 52 : 79—80.

Two males were captured in 1962 in the SE of N. Borneo. Another two males, from Sandakan, had already been described earlier. The female has not yet been found. The venation of the left fore wing of one of the males (21 Nov. 1962) is irregular, the first recurrent vein being interstitial. In the right wing the first recurrent vein ends in the first submarginal cell, as is usual in this species.

The scutellum is yellow in both specimens with a narrow brown longitudinal median line. The axillae are yellow. The posterior half of the petiole is dark brown.

N. Borneo (SE): 2 ♂, Forest Camp 19 km N. of Kalabakan, 60 m, 30 Oct. 1962, light trap, coll. Y. HIRASHIMA and 21 Nov. 1962, coll. K. J. KUNCHERIA.

Group of *Psenulus pulcherrimus*

Psenulus carinifrons rhoweri van Lith

1923, ROHWER, *Phil. Jl. Sc.* 22 (6) : 601 (*Diodontus xanthognathus*, partim; Singapore).

1962, VAN LITH, *Zool. Verb. Leiden* 52 : 108.

1966, ———, *Tijdschr. Entom.* 109 : 45.

It seems that the specimens from Borneo have darker legs than those from Buru, Java and the Kangean Islands.

Material examined: 1 ♀, British N. Borneo, Keningan, 12—17 Jan. 1959, coll. T. C. MAA; 1 ♂, North Borneo (SE), Forest Camp 9.8 km SW of Tenom, 19 Dec. 1962, coll. Y. HIRASHIMA.

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