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STUDIES ON THE FORMOSAN SPHECIDAE (III)
THE SUBFAMILY PEMPHREDONINAE
(HYMENOPTERA)

BY K. TSUNEKI

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STUDIES ON THE FORMOSAN SPHECIDAE (III)
THE SUBFAMILY PEMPHREDONINAE
(HYMENOPTERA)*

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The specimens of Pemphredoninae collected by us are comparatively meagre in individual as well as specific number. This is due in the main to that we could not go to the areas where there was high possibility of their occurrence. This seems to be proved by the fact that the greater part of our specimens were obtained at the roadside of the mountains and valeys left open for the general people, Judging from the specimens captured by us in such areas it seems possible that a number of interesting Pemphredonine wasps might remain undiscovered in Formosa.

Among our scanty collection *Stigmus* (*Carinostigmus*) *iwatai* formed the sole exception. It was quite abundant in certain areas of the lowland countries.

The following species are dealt with in the present investigation:

1. *Psen* (*Psen*) *lieftincki lieftincki* Van Lith, 1959
2. *Psen* (*Psen*) *exaratus taiwanus* Tsuneki, 1966
3. *Psen* (*Psen*) *hakusanus seminitidus* Van Lith, 1965
4. *Psen* (*Psen*) *alishanus* sp. nov.
5. *Psen* (*Psen*) *longicornis* sp. nov.
6. *Psen* (*Psen*) *tanoi* sp. nov.
7. *Psen* (*Psen*) *nitidus takasago* subsp. nov.
8. *Psenulus* (*Psenulus*) *formosicola* Strand, 1913
9. *Stigmus* (*Carinostigmus*) *taiwanensis* Tsuneki, 1966
10. *Stigmus* (*Carinostigmus*) *iwatai* Tsuneki, 1954
11. *Stigmus* (*Carinostigmus*) *saigusai* Tsuneki, 1966
12. *Passaloecus monilicornis taiwanus* subsp. nov.
13. *Passaloecus formosus* sp. nov.

DESCRIPTIONS AND RECORDS OF THE SPECIES

1. *Psen* (*Psen*) *lieftincki lieftincki* Van Lith, 1959

Psen (*Psen*) *lieftincki* Van Lith, Zool. Verh., 39: 23, 1959 (♀♂, Sumatra and Malaya).
Psen (*Psen*) *lieftincki lieftincki* Van Lith, Ibid., 73: 21, 1965 (Malaya)

Specimen collected: 1 ♀, Nantou Pref. (Penpuchi), 26. VIII., K. Tsuneki leg.

Remarks. The specimen well agrees with the original description of *Psen lieftincki*, differing only in that the body is slightly smaller (14.0 mm), with the wings much darker (slightly purplish dark brown) and the 2nd recurrent vein is received by the 2nd cubital cell slightly before the 2nd transverse cubital vein.

Some supplementary notes. Median lobe of clypeus strongly raised above the surface of lateral lobes and very incrassate apically, apical portion narrowly produced, with anterior margin gently emarginate, seen from beneath the underside of the produced portion roundly hollowed out, somewhat similar to the apical lamina of some species of *Cerceris*, but without the doubled

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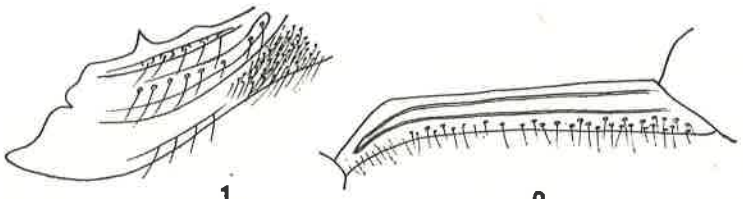
margins. Antennal joint 1 curved, joint 3 nearly as long as 1, distinctly longer than 4, 2.7 times (in the narrowest view) or 2.3 times (in the broadest view) as long as wide at apex, succeeding joints progressively slightly reducing in length up to penultimate joint which is slightly longer



Figs. 1-2. *Psen* (*Psen*) *lieftincki lieftincki* Van Lith. (♀).
1, Mandible. 2. Petiole of abdomen.

than wide. Head seen in profile with eye slightly broader than temple. Mandible (Fig. 1) very characteristic in form, the inner median tooth strongly inclined inwards. Petiole seen in profile (Fig. 2) suddenly bent at base, with upper bending point fairly angulated.

This species has been known to occur in Malaya and Sumatra, and its discovery in Formosa seems very interesting.

The specimen was captured on a bamboo leaf, when it came to lick the nectar of a bamboo aphid.

2. *Psen* (*Psen*) *exaratus taiwanus* Tsuneki, 1966

Psen (*Psen*) *exaratus taiwanus* Tsuneki, Etizenia, 14: 6, 1966 (♀).

Specimen: 1 ♀, Nantou Pref. (Penpuchi), 13. VII. 1966.

Remarks. In this specimen the fine punctures on abdominal tergites 1 and 2 are much more abundant and distinct than in *exaratus* s. str. wherein they are very sparse and weak. This is much more markedly so on tergites 3 and 4, where the hairs arising from the punctures are much closer accordingly and they are all erected. On apical margins of tergites 2–4 the hairs are arranged in a line and regularly curved, approaching the state in *P. dzimm* or *curvipilosus*, although the hairs are not stiff.

In the type of this subspecies the abdomen was stained and the greater part of the hairs was glued to the surface of the tergites and the character could not be confirmed. Upon the reexamination the fact was ascertained through the areas left free from the staining.

In *P. exaratus intermedius* (♂) the same character could not be observed.

3. *Psen* (*Psen*) *hakusanus seminitidus* Van Lith, 1965

Mimesa kohli Gussakovskij (nec *Psen kohli* Fox, 1898), Ark. Zool., 27 A: 7, 1934 (♀, China).
Psen (*s.* str.) *kohli*: Gussakovskij, Trav. Inst. Zool. Acad. Sci. URSS, 4: 633, 1937.
Psen (*Psen*) *seminitidus* Van Lith, Zool. Verh., 73: 40, 1965 (♀, China).
Psen (*Psen*) *hakusanus seminitidus*: Tsuneki, Etizenia, 14: 9, 1966 (♂, Formosa).

Specimen collected: 1 ♀, Nantou Pref. (Tsuifeng), 10. VII., K. Tsuneki leg.

Remarks. In my previous paper (1966) I identified a male specimen from Formosa with *seminitidus* Van Lith in which the male had remained unknown. The capture of a female specimen which completely agrees with the descriptions of *seminitidus* (= *kohli* Gussak.) proved that the identification was not incorrect.

The female specimen differs from *hakusanus* s. str. mainly in that the punctuation on the vertex behind the ocellar region is very sparse and the surface is polished. Further, the specimen is much smaller in the body length than the representative of the nominate race, measuring only

about 8.5 mm.

4. *Psen* (*Psen*) *alishanus* sp. uov.

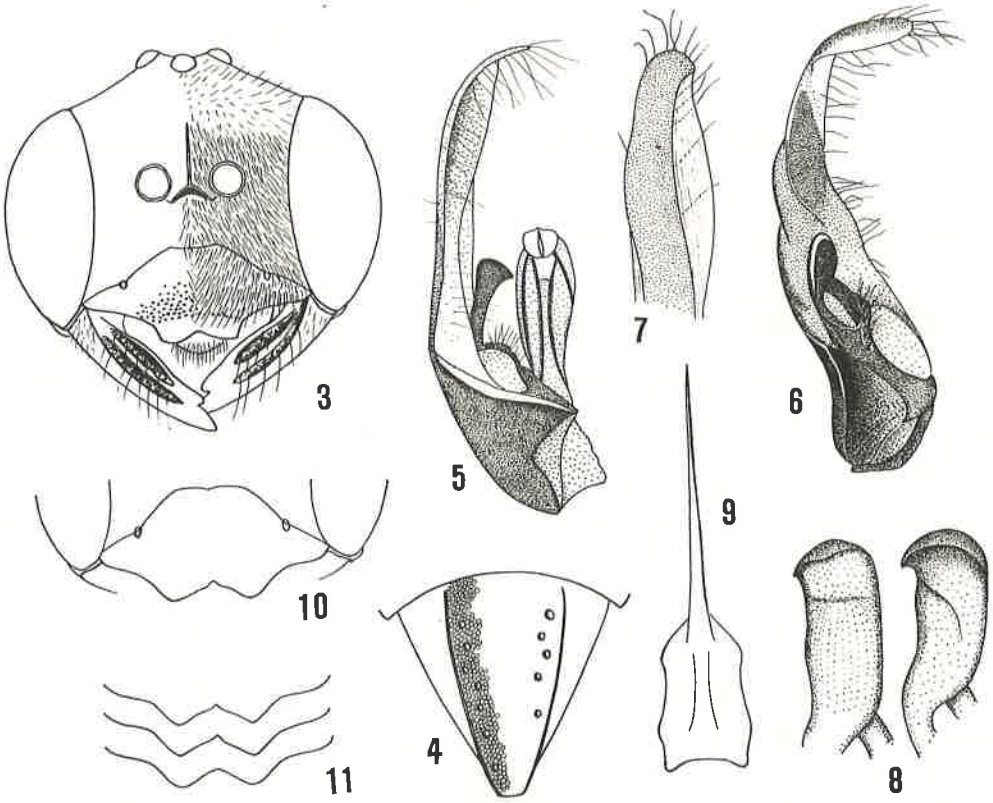
The female of this species, in the key of Van Lith (1965), meets with the first inconsistency at No. 33, and if dare proceed it reaches *yomasanus*, but it distinctly differs from this species in many characters not appeared in the key; while the male comes to a deadlock at No. 40, since it has the distinct tyloidea on the antennal flagellum. Further, among the known species of other regions none could agree with the specimens.

♀. Length 9.0 mm (paratypes 8.5–9.5 mm). Black, with aeneous shine on head and thorax (propodeum not so). Ferruginous: A patch near apex of mandibles, antennal joints from 4 apically beneath (in basal several joints, only in part), tibial spurs of all legs and front tarsi apically. Dark brown: Palpi, mid and hind tarsi apically. Antennae with basal two joints shining and the rest opaque. Wings hyaline, without apical dark, veins and stigma nearly black. Lower frons and clypeus covered with golden pubescence, pubescence on vertex and mesonotum greyish white, comparatively long and sparse, on other parts of body white to silvery.

Head above with ocellar region somewhat raised, OOD : POD = 11 : 8.5, while width of postocellus relatively 4 (in the inclined state), head seen in front: Fig. 3, OAD : WSA : IAD = 6 : 5 : 8, interantennal longitudinal carina reaching upwards about middle of the distance to anterior ocellus, median top of the transverse carina where the longitudinal one joins raised, but not spinose; median lobe of clypeus gently roundly raised, with anterior margin slightly produced and subtriangularly emarginate; mandibles not broadened. Head in profile temple as wide as eye. Antennal joint 3 nearly as long as joint 1 and far less than half as long as minimum interocular distance at antennal base (ratio 13 : 34), approximately 1.5 times as long as joint 4 and 3.2 times as long as wide at apex, succeeding joints progressively slightly reducing in length up to penultimate joints which is wider than long, joint 8 nearly as long as wide. Thorax-complex similar in structure to that of *P. affinis*: Pronotum with antero-lateral angle not produced into a tooth, mesopleuron with scrobal furrow deeper on posterior half, but subalar epimeral area seems slightly less in degree of high convexity, propodeum with dorsal and posterior aspects well distinguished in lateral view, on area dorsalis median furrow sharply carinated on both sides and divergent posteriorly, always accompanied with a longitudinal weak carina in middle; posterior limb of area dorsalis not well outlined posteriorly, laterally broadened and polished, and near median line narrowed, on the limb a transverse furrow always runs along the anterior margin which is always attenuate laterally; posterior aspect medianly with a crenate furrow, on both sides the areas usually broadly impressed, the impression inclined towards median furrow and bordered posteriorly and laterally with carinae; in some specimens, however, the impression quite indistinct, rather flattened; lateral margins of the aspect without bordering carinae. Petiole of abdomen slightly less than (in some specimens nearly) as long as tergite 1, ending far before apex of hind femur, in cross section subcircular, with top slightly roundly raised and bluntly carinate on its lateral margins, but in some specimens the surface below the carina weakly furrowed and the petiole comes apparently to subquadrate; always without the median carina on the underside. Pygidial area elongate triangular, with sides distinctly carinate and feebly rounded out, and with apex narrowly truncate (Fig. 4). Legs normal, but tarsal joints slenderer and longer than in *affinis*, joint 2 of mid legs longer than wide at apex, all tarsal joints of hind legs longer than wide. In fore wings recurrent vein 2 interstitial, 1 received by cubital cell 2, but the point more or less varying in distance from transverse cubital vein 1.

Upper frons in front of median ocellus and ocellar region finely closely, more or less ru-

gosely punctured, on lateral portion of upper frons and vertex more sparsely punctured, clypeus finely closely punctured, apical margin rather broadly impunctate and polished; mesonotum anteriorly finely closely, posteriorly slightly coarsely and more sparsely punctured, punctures on scutellum larger and sparser than on mesonotum, mesopleuron very finely weakly and very sparsely punctured, polished, metapleuron smooth and polished. Area dorsalis with sparse longitudinal strong carinae, the carinae more or less convergent posteriorly and some of them disappear on the way, on posterior aspect main trend of strong carinae oblique, convergent posteriorly, the carinae sparse, more or less rugose, with interspaces finely irregularly reticulate, near



Figs. 3–11. *Psen* (*Pen*) *alishanus* sp. nov. (3–4, ♀. 5–11, ♂)
3, Head seen in front. 4, Pygidial area. 5, Genitalia (left half, ventral view). 6, Ditto (right paramere and volsella seen from inside). 7, Apical portion of paramere, vertical view. 8, Cuspis of right volsella (ventral view); left, vertical view; right, seen from slightly outside. 9, Eight sternite. 10, Clypeus. 11, Variation in the from of anterior margin of clypeus.

median impressed area the striae rather longitudinal, finer and closer, the reticulation generally finer and weaker on the medial and upper regions (in some specimens near the polished area of the limb the surface finely closely rugoso-striate), and laterally coarser and stronger, and extended to the posterior half of the sides of the segment, with anterior end margined by a stronger, curved, more or less rugose carina; rest of the sides anteriorly polished, then finely sparsely punctured and posteriorly obliquely finely punctate and rugoso-striate. The feature of the segment except for the general trend considerably varied with individual. Abdominal tergites 1 and 2 practically impunctate, 3 and 4 minutely sparsely punctured, 5 with a rough line of distinct, hair-bearing punctures before apex; pygidial area finely coriaceous, with an irregular line of

scattered punctures along lateral margins (Fig. 4).

♂. Length 6.7–8.0 mm. Similar to ♀ in general, but the pubescence on clypeus and lower frons silvery, tarsi sometimes more broadly blackish and different in sexual characters.

Antenna. Joints 1 and 2 glossy and from 3 apically mat as in ♀, joint 2 deeply inserted in the hollow at top of joint 1, joint 3 about 2.5 times (dorsal view) or 2.3 times (lateral view) as long as wide at apex and slightly longer than 4 (ratio 11 : 10), joints 4–8 subequal in length, thence very slightly reducing in length up to penultimate joint, each joint somewhat thickened before apex, joints 3–9 carrying tyloidea, a glittering keel, occupying whole span of the segment, but progressively shorter towards apex, altimate joint about as long as joint 3 and attenuate at apex.

Abdomen. Ventral segment 4 only with a tuft of close long hairs on apical margin in middle, the tuft not so dense and not so long as in *P. aurifrons*.

Genitalia. Seen from beneath (left side): Fig. 5, right paramere and volsella seen from inside: Fig. 6. Paramere slender and long, apical portion with inner (or dorsal) half turned into a semitransparent membrane (Fig. 7), outer (or ventral) margin and apex provided with a fringe of sparse long hairs. Volsella in middle region divided into two branches, the dorsal and ventral, each roundly curved and unites with each other again at the base of the apical elongate body, the cuspis, which is flattened, hollowed ventrally, its apical portion a little twisted, with apex gently rounded and turned ventrally and on inner apical area slightly produced (Fig. 8, perpendicuiar view, the left from slightly outside); therefore, quite different in form according to the direction observed; from apex of the basal body (lamina volsellaris) to basal area of the dorsal (or outer) branch of the central region a series of 3–4 small tubercles present, each carrying a sparse tuft of hairs. Eight sternite: Fig. 9.

Head in profile with eye much broader than temple (ratio nearly 16 : 11). Head in front, AOD : WSA : IOD = 5 : 5 : 7.

Clypeus. Similar to ♀ (Fig. 10), but the apical emargination or incision somewhat varies in form with individual (Fig. 11).

Petiole. Similar to ♀, including the variation regarding lateral furrows, but with length relatively much greater, amply twice as long as tergite 1 and reaching with its apex much nearer the apex of hind femur.

Holotype: ♀, Chiayi Pref (Mt. Ali, about 2400 m) 27. VII. 1966. K. Tsuneki.

Paratypes: 4 ♀♀ 8 ♂♂, the same place and time, K. Tsuneki and T. Tano.

Remarks. All the specimens except one were collected on the leaves of a tree when they came flying, probably during their leisure flight. The exceptional one was captured at the entrance to its nest which was dug in the bank of the roadside. Unfortunately the nest was at the beginning of the construction, containing no cell nor prey.

5. *Psen* (*Psen*) *longicornis* sp. nov.

This species (♂) is so close in many characters to the same sex of the preceding species that the description of the differences alone from this species seems to be sufficient to sketch the species.

Coloration. Tarsi of all legs more broadly ferruginous.

Structure. Clypeus with apical portion of median lobe apparently more broadly raised, but the difference is delicate, perceivable only by the direct comparison of the specimens. Antennae with flagellar joints much longer. Joint 3 longer than 1 which is nearly as long as 4, ratio of 3 : 4 approximately 16 : 13 (on dorsal side), joint 3 slightly more than thrice as long as wide at apex

in dorsal view, in lateral view 2.7 time so, joints 4-6 subequal, from joint 4 to 12 slightly shorter apically, but 12 approximately twice as long as wide (dorsal view), 13 slightly longer. Each joint slightly constricted toward spex and gently roundly swollen ventrally as in the compared species. Tyloidea observable on joints 3-12, similar in shape to those of *alishanus*. Petiole roughly quadangular in cross section, having a broad furrow on each side which is margined on both sides by carinae, ventral aspect longitudinally roundly raised, but not carinated in middle, it is twice as great in length as tergite 1, reaching near the apex of hind femur. Ventral segments 3 and 4 each with a sparse tuft of hairs on apical margin in middle, not so dense, but distinct. Sternite 8 ver ysimilar. Genitalia: Very closely resembles and it is difficult to find differences. But (1) paramere with chitinized part of apical portion rather attenuate apically, not so rounded as in *alishanus*, (2) volsella with the branches of central portion somewhat thicker, (3) fringe of hairs on outer margin of paramere apparently sparser, (4) the elliptic wad at base of paramere which is situated just outside the base of volsella and is marked by the difference in brightness and by the more or less swelling in the fresh specimens is much more conspicuous in their contrast. Propodeum quite similar.

Punctuation. Very similar.

♀. Unknown.

Holotype: ♂, Chiayi Pref. (Mt. Ali), 27. VII. 1966. K. Tsuneki leg.

Paratypes: 3 ♂♂, the same place and time, K. Tsuneki and T. Tano leg.

Remarks. The specimens were captured with the examples of the preceding species and it was a question which of the male-groups should be combined with the female of *alishanus*. But the character of the petiole led me to separate the present group from the female of this species. *P. longicornis* is also similar to *P. affinis*, but is easily separable from it by the state of tyloides and by the presence of apical fringe of hairs on two sternites.

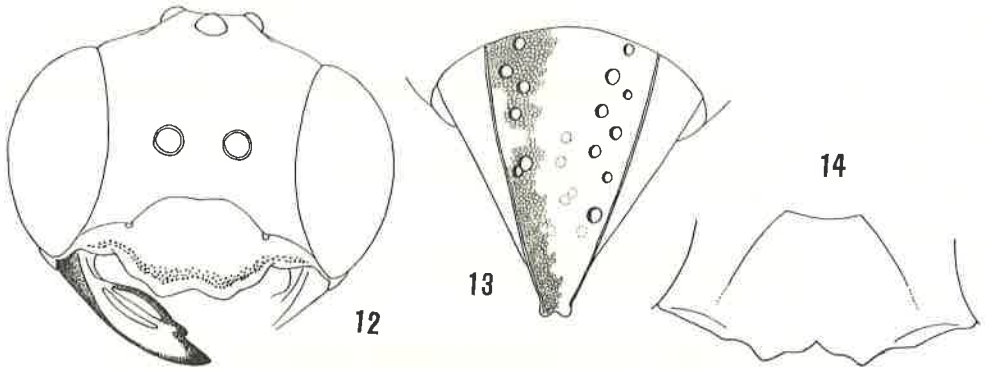
6. *Psen* (*Psen*) *tanoi* sp. nov.

Both sexes of the present species, in the key of Van Lith (1965) comes to a deadlock at No. 36. The female of this species is characteristic in the form of clypeus with its golden pubescence, in the colour of legs, in the structure of antennae, propodeum abdominal petiole and pygidial area, and by the combination of these it is easily separated from the known species of the subgenus. The male is characterized by the non-carinate antennal flagella, colour of legs, structures of propodeum and abdomen.

♀. Length 9.2 mm. Black with aeneous shimmer on head and thorax, not shining on aeneous area. Ferruginous to reddish yellow: Mandibles on middle portion very broadly except marginal areas, antennal flagella beneath largely, tegulae of wings (semitransparent), sides of abdominal tergite 1 more or less, apices of all femora, whole of the tibiae and tarsi of all legs. Middle of front tibiae externally and middle of hind tibiae internally somewhat darkened; antennae above slightly brownish; wings hyaline, feebly darkened, with radial cell anteriorly darker, stigma and veins black. Frons and clypeus covered with close long golden pubescence, sparse long hairs on other portions of head, thorax and legs also golden (different from *alishanus*), hairs on propodeum white, on abdomen anteriorly white and posteriorly yellowish.

Head from above more than twice as broad as long in middle, with temples roundly convergent posteriorly, ocellar region raised, OOD : POD = 12 : 9, width of postocellus relatively 5. Head in front OAD : WSA : IAD = 8 : 6 : 10; interantennal carinae normal, not highly pointed on top, with median branch reaching more than half the distance to anterior ocellus; clypeus with median lobe gently raised and markedly widened towards apex, apical margin subtriangularly

broadly emarginate and the surface of the lateral margins somewhat waved (Fig. 12). Mandibles slightly widened (Fig. 12), but not so strong as in *ussuriensis*. Antennal joint 3 long, nearly as long as joint 1, slightly more than half as long as minimum interocular distance (ratio 19 : 36) and nearly 5 times as long as wide at apex and approximately 1.5 times as long as joint 4 (19 : 13); succeeding joints progressively slightly shorter and thicker towards apex, joint 7 about 1.7 times as long as wide, penultimate joint nearly as long as wide, ultimate joint slightly longer than penultimate joint, normally attenuate at apex. Head in profile with temple as wide as eye, with occipital carina strong, accompanying a crenulate furrow in front and reaching completely hypostomial carina (similar to *alishanus*), on lower half of temple the occipital carina runs nearly



Figs. 12–14. *Psen* (*Psen*) *tanoi* sp. nov. (12–13, ♀. 14, ♂).
12, Head seen in front. 13, Pygidial area. 14, Clypeus.

parallel with the outer margin of the eye. Pronotum without lateral spine, mesopleuron with other portions of thorax and propodeum structured as in *alishanus* (limb of area dorsalis also furrowed and laterally widened into smooth spaces, seen in profile dorsal and posterior aspects distinctly angulate). Abdominal petiole about twice as long as tergite 1, reaching nearly the apex of hind femur, dorsal aspect gently roundly raised and the ventral surface without median carina, lateral surfaces longitudinally distinctly furrowed and the furrow marginated on both sides with carinae. Pygidial area elongate triangular (Fig. 13), with lateral carinae thin, not particularly high and indistinct apically, the apex with two lateral rounded projections as in *kuligensis* or *yomasanus*, but apparently more conspicuous. Legs with all coxae, trochanters and femora beneath long pubescent, and tibiae much more hairy than in *alishanus*, tarsi seems slightly thicker, but length relation similar. In fore wings recurrent vein 2 interstitial.

Upper frons and vertex more closely punctured than in *alishanus*, sides of vertex and the area posterior to ocelli with punctures very sparse, fairly shining, on occiput and temples punctures sparse, finer and weaker than on vertex, and the temples below practically impunctate. Punctures on mesonotum as large as on head, closer anteriorly and slightly sparser posteriorly and on scutellum much sparser and coarser, on postscutellum finer and very much sparser. Mesopleuron sparsely covered with fine hair-bearing points, metapleuron impunctate, highly polished. Sculpture of propodeum very similar to that of *alishanus*, but on posterior aspect oblique striae sparser and weaker in the specimen and greater part slightly more coarsely reticulate, the reticulation similarly extended to the posterior portion of the sides of the segment; rest of the sides rather sparsely punctured, the punctures finer and sparser anteriorly. Punctuation on abdomen as in *alishanus*, but the punctures on the finely coriaceous surface of pygidial area slightly coarser, nor regularly arranged in a line along lateral margins, but more or less scattered and, further,

some very shallow impressions, not so distinct as to be called punctures, are scattered even over the medial area.

♂. Generally similar in characters to ♀, including colour of legs; but antennae wholly black, OOD : POD = 11 : 8 (postocellus 4), AOD : WSA : IAD = 5 : 4.5 : 9, median lobe of clypeus not so broadly raised on anterior portion, with anterior margin different in form (Fig. 14). Antennae with joint 3 slightly longer than joint 1, much slenderer, more than half as great as interocular distance (ratio 16 : 26), 3.2 times as long as wide at apex and approximately 1.3 times as long as joint 4, from joint 5 apically progressively, rather imperceptibly, reducing in length, joint 7 about 2.3 times, joint 12 about 1.8 times as long as wide at each apex, ultimate joint nearly as long as joint 4, normally attenuate at apex, each joint beneath slightly roundly swollen and no tyloidea on any joint. Characters of propodeum and petiole as in ♀. Abdominal sternites 3 and 4 with a tuft of hairs on apical margin in middle, hairs of the tufts not long, rather inconspicuous as in *P. affinis*. Punctuation on head and thorax sparser than in ♀, reticulation on posterior aspect of propodeum stronger and coarser than in ♀. Length about 8.0 mm.

Holotype: ♀, Chiayi Pref. (Mt. Ali, about 2400 m), 27. VII. 1966, T. Tano leg. (Coll. Tsuneki).

Paratype: Captured with the holotype, K. Tsuneki.

Remarks. The specimens were also captured with those of the two preceding species on the foliage of a tree at the road-side.

7. *Psen* (*Psen*) *nitidus takasago* subsp. nov.

(*Psen* (*Psen*) *nitidus* Van Lith, Zool. Verh. 39, p. 78, 1959)

The new subspecies differs from the original description of the typical form mainly in that it is slightly larger, with the coloration somewhat brighter and the acetabular carina only half as long as the distance between the ends of epicnemial carinae.* Such slight differences are not so important as specific and the specimen was dealt with as a geographical race.

♀. Length 9.3 mm. Black, without aeneous shimmer on head and thorax. Mandibles on middle area broadly, apex of antennal joint 1, joint 2 wholly and underside of joints 3–6 and 12, tegulae, articulations of legs, front tibiae nearly wholly, base and apex of mid and hind tibiae more or less broadly and apical joints of tarsi ferruginous. Apex of mandibles reddish black. Palpi, tibial spurs and remaining joints of all tarsi pale yellow.

Apical margin of medial produced area of clypeus with lateral angles slightly more angulated, but not toothed, with medial incision similar. OOD : POD = 10 : 9, width of postocelli relatively 6, OAD : WSA : IAD ≒ 4 : 6 : 9, Antennal joint 3 slightly shorter than joint 1 (12 : 14), less than half as long as interocular distance at antennal base, and 1.3 times as long as joint 4, and 2.5 (or 2.7) times as long as wide at apex, joints 4–7 subequal, thence gradually slightly shorter apically, joint 11 slightly longer than wide, ultimate joint longer (relative length 11). Tarsal joints except apical ones of all legs thick, much thicker than in *alishanus*, similar to those of *affinis*, and joints 2–4 of front and mid tarsi and joint 4 of hind tarsi wider than long.

Sculpture of propodeum somewhat differs from the description on posterior aspect in that its lateral areas fairly coarsely reticulate. But this may be a variation. Sides of the segment posteriorly finely punctate, anteriorly smooth and polished. Pygidial area with apex narrow and gently emarginate.

♂. Length 9.3 mm. In colour similar to ♀, but tibial yellow more brownish and tarsi rather

* In the key of his 1965 paper he altered that it is about as long as half the distance between epicnemial carinae, instead of "longer than half the distance...".

ferruginous. Clypeus with medio-apical incision weaker and its lateral protuberances simply rounded. Punctures on mesonotum similarly sparse but somewhat coarse. Petiole with underside simpley flattened, not furrowed. Abdominal sternites 3 and 4 (not 4 and 5, as given in the original description of *nitidus* ♂) with a tuft of markedly long hairs on apical margin in middle. Other characters as in ♀.

Antennae of the specimen seems to be abnormal. In the original description no mention was given except "without typoidea" and I can not guess the character in the male. However, according to my knowledge the antennae of the male specimen before me are considered nothing else than those of the female. In comparison with the antennae of the female above described they differ only in that the ultimate joint is relatively slightly shorter. But the head of the specimen is considered to be of the male, since puntcures much finer and sparser, and the clypeal characters are doubtlessly of the male. Probably this specimen is an instance of the partial gynandromorph.

Holotype: ♀, Nantou Pref. (Puli), 13. VII. 1966, T. Tano leg (Coll. Tsuneki).

Other specimen: 1 ♂, Pingtung Pref. (Taishan), 24. VII. 1967, B. S. Chang leg.

8. *Psenulus* (*Psenulus*) *formosicola* Strand. 1915

Psenulus formosicola Strand, Arch. Naturg., Abt. A, 7: 21, 1915 (♀♂, Formosa).
Psenulus (*Psenulus*) *formosicola*: Tsuneki, Etizenia, 14: 12, 1966 (Formosa).

Specimens examined: 22 ♀♀ 4 ♂♂, Nantou Pref. (Penpuchi and Lihyuehtan), 10–13. VII, 26–30. VIII. 1966, K. Tsuneki et T. Tano. 1 ♀, Chiayi Pref. (Fenchihu), 24. VII. K. Tsuneki. 1 ♀, Taitung Pref. (Chulu), 12. VIII. K. Tsuneki. 1 ♀, Miaoli Pref. (Hsinhsing), 28. VI. 1967, B. S. Chang leg.

Remarks. This species was comparatively frequently met with in the valey of Penpuchi. The specimens came to the flowers of *Licinus communis* L., escaped and flourished at the roadside.

9. *Stigmus* (*Carinostigmus*) *taiwanensis* Tsuneki, 1966

Stigmus (*Carinostigmus*) *taiwanensis* Tsuneki, Etizenia, 14: 15, 1966 (Formosa)

Specimens collected: 3 ♀♀ 2 ♂♂, Nantou Pref. (Chienching, about 2000 m high), 9. VII.; 4 ♀♀, Chiayi Pref. (Fenchihu and Alishan, about 1500–2000 m), 24, 29. VII. K. Tsuneki et T. Tano.

Remarks. This species is apparently confined to the high altitude and rather rare. We could not capture any specimen well agreeing with *S. formosanus*.

10. *Stigmus* (*Carinostigmus*) *iwatai* Tsuneki, 1954

Stigmus (*Carinostigmus*) *iwatai* Tsuneki, Mem. Fac. Lib. Arts, Fukui Univ., II, 3 (1): 15, 1954 (Hainan Is. and Hongkong).

Specimens collected: 58 ♀♀ 62 ♂♂:- 26 ♀♀ 22 ♂♂, Nantou Pref. (Chienching), 9. VII.; 25 ♀♀ 33 ♂♂, Nantour Pref. (Puli), 11. VII.; 1 ♀, Nantou Pref. (Penpuchi), 12. VII.; 4 ♀♀ 5 ♂♂, Chiayi Pref. (Chuchi), 20–22. VII.; 2 ♀♀ 2 ♂♂, Hualien Pref. (Tienhsiang), 17. VIII. K. Tsuneki et T. Tano.

Remarks. This species was very common and abundant in Nantou Pref. as listed above. It was possible to collect hundreds of specimens if we wanted.

11. *Stigmus* (*Carinostigmus*) *saigusai* Tsuneki, 1966

Stigmus (*Carinostigmus*) *saigusai* Tsuneki, Etizenia, 14: 17, 1966 (♀, Formosa).

Specimens collected: 2 ♀♀, Chiayi Pref. (Chuchi), 22. VII. K. Tsuneki.

12. *Passaloecus monilicornis taiwanus* subsp. nov.

The Formosan specimen (♀) of *P. monilicornis* Dahlbom differs from the typical race in that the flagellar joints of antennae slightly longer and the humeral angles almost wholly black.

♂. Unknown.

Holotype: ♀, Chiayi Pref. (Mt. Ali, about 2400 m), 27. VIII. K. Tsuneki.

Remarks. The specimen was captured on the leaf of *Artemisia vulgaris* when it came to hunt the aphid inhabiting on the plant.

13. *Passaloecus formosus* sp. nov.

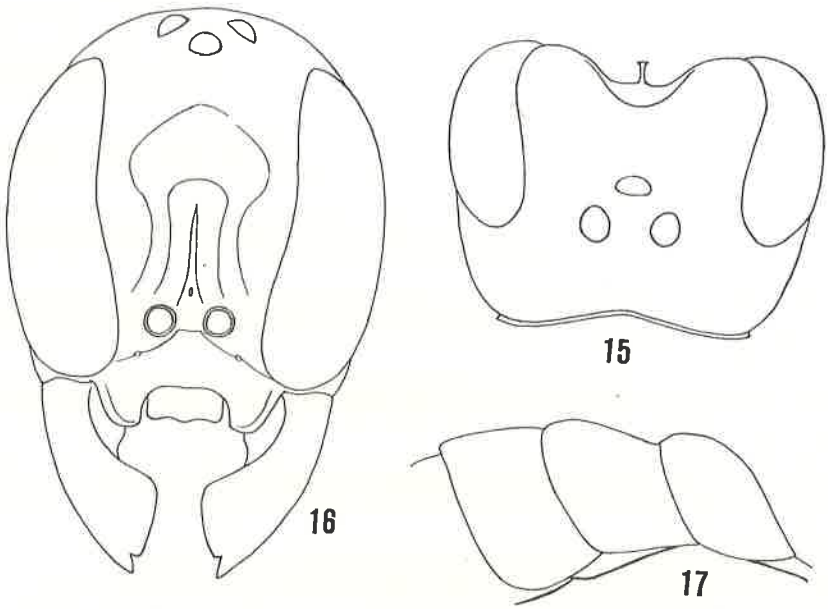
Very small species, measuring about 4.0 mm and belongs to the group of *sumatrensis* Maidl (Sumatra), *siamensis* Cockerell (Thailand), *annulicornis* Tsuneki (Ryukyus) and *abnormis* Kohl (Palaearctic region). It can be separated from the first two by the rectangular labrum (not triangular, not pointed) and by the head and thorax without aeneous or greenish hue. While, it is closest to the last-mentioned species, known from Europe and Japan, including characters of mandibles, labrum, facial appearance, antennae, mesopleuron and wing venation. But it can be distinguished from *abnormis* by having the propodeum differently formed and sculptured, abdominal segments 1 and 2 much more strongly constricted between them, the mandibles and legs much brighter and the body smaller.

♀. Length 4.0 mm. Black; antennal joints 1 and 2 in front (beneath) and front tibiae in front yellow; humeral angles posteriorly whitish. Mandibles on apical portion, labrum, palpi, basal several joints of flagellum beneath, articulations of legs, base and apex of anterior four tibiae, and their tarsi ferruginous; tegulae, hind tarsi dark brown. Wings hyaline, stigma black, veins dark brown.

Head seen from above: Fig. 15, OOD : POD ≒ 6 : 4.5, postocellus relatively 3. Head in front (Fig. 16) OAD : WSA : IAD approximately 2 : 3 : 3, structure of clypeus and labrum very similar to those of *abnormis*, clypeus with apical margin provided with a stout protuberance on each side which is larger than in *sumatrensis*. Mandible as in *abnormis* (Fig. 16), interantennal carina and the spine on top of its elevation near base (Fig. 15) as in *abnormis* (Tsuneki, 1955, p. 13), antennal joints 2–12 approximately as long as wide, ultimate joint long, 1.7 times as long as penultimate point and attenuate apically. Structures of mesothorax as in the compared species, prescutal furrows distinct, crenulate, reaching on the dorsum about 1/4 of scutum, median scutal furrow broader but shorter than prescutal furrows, mesopleuron with scrobal furrow alone. Propodeum on dorsal aspect with median third horizontal and each lateral third inclined laterally, the former carrying reticulate sculpture, while the latter obliquely closely striate, posterior aspect medianly above with a deep longitudinal impression, not distinctly outlined, on both sides of the impression the surface broadly, very finely coriaceous, nearly smooth, the area marginated below by a roundly curved carina, further posterior area of the aspect coarsely reticulate, sides of the segment above and posteriorly coarsely reticulate, remaining portions obliquely finely closly striate. Abdominal segments 1 and 2 in the lateral view: Fig. 17; wing venation as in *abnormis* or *annulicornis* (Etizenia, 16, p. 19).

Impressed area of lower frons medianly transversely finely closely striate, rest of lower frons dorsally arcuately, laterally longitudinally punctate-striate, upper frons and vertex sparsely finely punctured, intervals very minutely coriaceous; mesonotum finely closely punctured, sculpture on scutellum and mesopleuron as on vertex, but the punctures somewhat closer. Abdomen very finely and sparsely punctured with hair-bearing points.

Holotype: ♀, Chiayi Pref. (Fenchihu), 26. VII. 1966. K. Tsuneki leg.



Figs. 15–17. *Passaloecus formosus* sp. nov. (♀).
15, Head seen from above. 16, Head seen in front. 17, Basal abdominal segment seen in profile.

Remarks. As to the relationship of this species to *P. annulicornis* (♂) described from the Ryukyus nothing definite can be said. Judging from the structure of the clypeus of both species, however, they seem t o belong to a different species respectively.

After investigation the mandibles and one of the antennae of the specimen were accidentally partly damaged.

LITERATURE

Tsuneki, K. Contribution to the knowledge of the Pemphredoninae fauna of Formosa and the Ryukyus (Hymenoptera, Sphecidae). Etizenia, 14 : 21 pp (with a list of literature).

Addendum

Recently I received further Formosan specimens of Sphecoidea from Mr. B. S. Chang, Kuanyin, Formosa, and Professor T. Shirozu, Kyushu University, in which some specimens of Pemphredoninae were included which will be added here. I wish to thank the two gentlemen above mentioned for their kindness.

(1) *Psenulus formosicola* Strand, 1915
1 ♀ 1 ♂, Taishan, Pingtung Pref., 24. VII. 1967, B, S, Chang leg.

(2) *Stigmus* (*Calinostigmus*) *saigusai* Tsuneki, 1966
1 ♀, Tshu, Miali Pref., 9. IV. 1967, T. Shirozu leg.

Erratum

In my previous paper on the Formosan Pemphredoninae (Etizenia, 14) in the description of *Stigmus saigusai*: ♂ on page 17, line 13, top, and on page 19, line 2, should be read as ♀.