

Moth-Flies From Formosa (Psychodidae, Diptera)

By

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Since 1953, I have studied on the Japanese Psychodidae and the results of this work have been reported mainly on the Philippine Journal of Science and in this time I intend to report the Formosan species as the datum to understand the Japanese fauna of the Psychodidae in comparison with the faunas of the neighbouring territories.

So far as I know, Formosan Psychodidae are little known hitherto and in this paper I intend to describe 15 species of the genus *Psychoda* and two species of *Pericoma*; of which four species are common to Philippine, one to Micronesian Islands and four to Japan including three cosmopolitan species and seven endemics are new to science.

I am very much indebted to Dr. Toyohi Okada of Tokyo for the privilege to freely study the invaluable specimens collected by Captain H. Barnett.

Psychoda alternata Say

Say, Th. 1824. Long's Exp. St. Peter's River. App., 1824 : 358.

Tokunaga, M. 1957. Philip. Jour. Sci. (in press).

Specimen : -A female; Mt. Ari; Dec. 27, 1934; M. Tokunaga at light.

Distribution : -Cosmopolitan.

Psychoda acanthostyla Quate (MS)

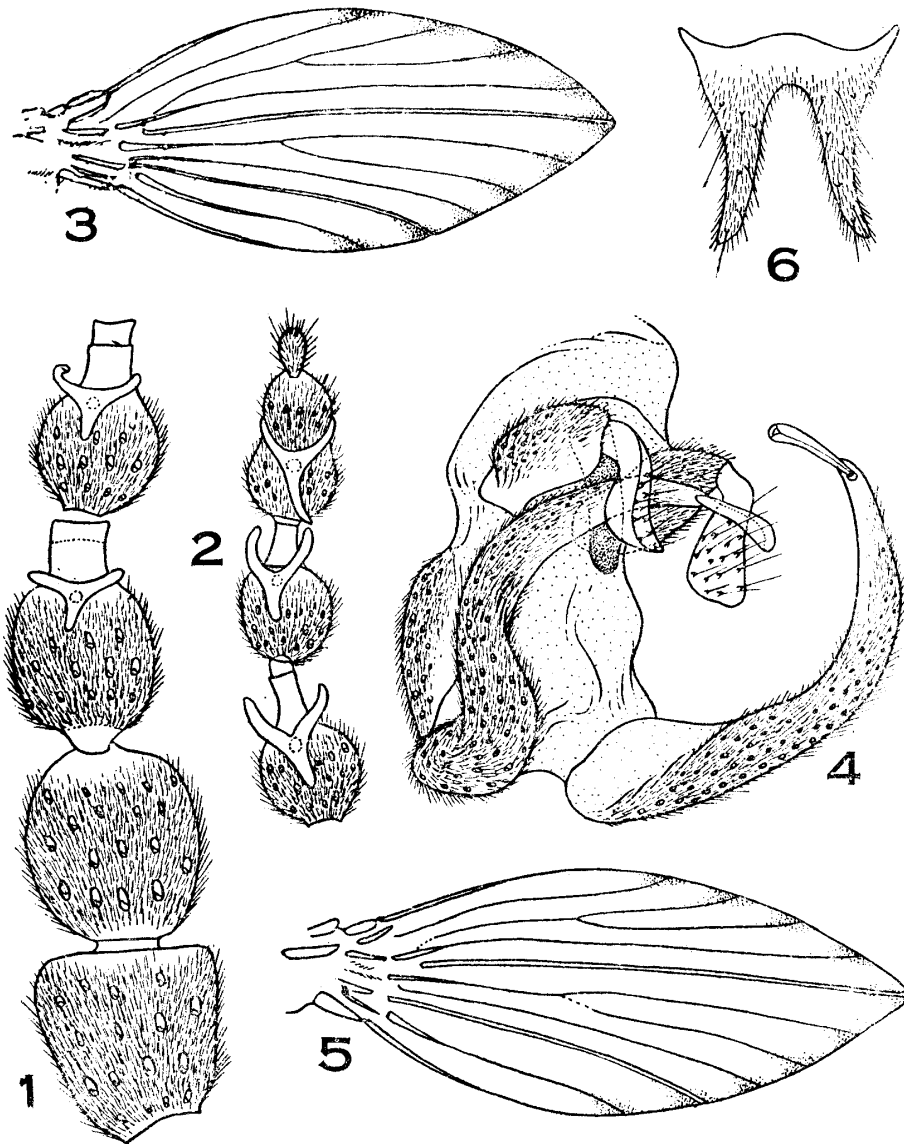
A rather small brownish gray species, with wings spotted along margins and rather widely distributed in tropical regions of Pacific Ocean. Antennae 15-segmented and closely similar to those of *Psychoda alternata* Say; ascoids all Y-shaped, rather small, present on segments 3 to

13, thirteenth and following segments firmly fused with each other and both segments with verticils and without neck parts, ultimate minute, oval or round, pubescent and without verticils and ascoids. Wings lanceolate in both sexes, R_1 ending at level of tip of Cu_1 or slightly beyond it, radial fork above or slightly beyond median fork; brownish clouds arranged along wing margin at ends of ten main veins. Male hypopygium with cerci slender, not strongly swollen basally and with a slender retinaculum at each end; styles flattened and with many setae on dorsal surface. Subgenital plate subdivided into paired long horn-like caudal lobes which are setigerous and slightly curved laterad.

Male : - Body length 1.2 (1.11-1.33) mm. Wings about 1.01mm by 0.43mm. General coloration closely similar to that of *Psychoda pseudalternata* Williams.

Head with eyes separated above as wide as a facet or slightly more from each other. Maxillary palpi with four segments in relative lengths of 17.3 : 18.3 : 14.7 : 19.7. Antennae (Figs. 1 and 2) 15-segmented, with rather small Y-shaped ascoids on segments 3 to 13, closely similar to those of *Psychoda alternata* Say, flagellar segments with rather short neck parts; thirteenth segment round, without neck part and fused broadly with following round smaller segments and these two segments with verticils; ultimate segment oval, minute, completely separated by a suture from preceding one and without verticils; relative lengths of basal four and distal eight segments about 16 : 15 : 17 : 15.5 and 14 : 13.5 : 12.8 : 12 : 9.8 : 7 : 4 : 3 respectively.

Legs with femora, tibiae and tarsal segments in proportion of 82.5 : 73.5 : 25.5 : 13.5 : 11.5 :



Psychoda acanthostyla Quate (MS)

Fig. 1 : Basal segments of male antenna. 2 : Distal segments of male antenna. 3 : Male wing. 4 : Male hypopygium. 5 : Female wing. 6 : Female subgenital plate.

11 : 14 in fore, 86 : 102 : 32 : 14.5 : 11.5 : 11 : 15 in middle and 90.5 : 109 : 32 : 15.5 : 13 : 11 : 14.5 in hind leg. Wings (Fig. 3) lanceolated, with brown clouds at ends of ten main veins, R_1 ending above or slightly beyond tip of Cu_1 , radial fork also above or slightly beyond median fork; venation: relative lengths of R_{2+3} , R_2 and R_3 about 19.8 : 21.3 : 29.7, those of M_{1+2} , M_1 and M_3 about 24.7 : 37 : 32.3.

Hypopygium (Fig. 4) with ninth sternite sub-

square (42.5×42), cerci slender, about twice as long as sternite ($84.5 : 42.5$), not distinctly swollen basally and with a slender retinaculum at each tip; tergite small, round at caudal margin and with several minute tubercles along caudal margin, coxites rather stout (25×12.5) and setigerous, styles as long as coxite, gradually dilated apically, flattened on dorsal surface, convex on ventral side and with about 20 erect setae on dorsal side of each style; aedeagus with caudal

thick part yellow, clavated and about as long as coxites and external basal part slender, dark and longer than caudal part (24 : 22).

Female : -Body length 1.45 (1.17-1.65) mm. Wings 1.38 (0.95-1.3) mm. by 0.48 (0.36-0.55) mm. General colouration and structure closely as in male with usual sexual differences.

Head with four maxillary palpal segments in relative lengths of 17.6 : 18.6 : 16 : 19.7. Antennae closely as in male, relative lengths of basal four and distal eight segments about 16 : 13.8 : 15 : 13.5 and 14 : 13.8 : 13.4 : 12.4 : 11 : 7.9 : 4.1 : 3.1 respectively.

Leg-segments, except for coxae and trochanters, about 84 : 78.1 : 26.9 : 14.2 : 12.2 : 11.1 : 16.1 in fore, 89.8 : 107.8 : 34.5 : 15.3 : 13.1 : 11.8 : 16.8 in middle and 98.9 : 116.7 : 34.6 : 16.9 : 14 : 12 : 17.3 in hind leg in relative lengths. Wings (Fig. 5) rather slender, closely similar in structure, marking and venation to those of male, relative lengths of veins R_{2+3} , R_2 and R_3 about 22.7 : 23.4 : 34.1 and those of M_{1+2} , M_1 and M_2 about 27.1 : 44.5 : 37.7 respectively.

Subgenital plate (Fig. 6) rather small, subdivided into two slender caudal lobes, which are straightly extended caudad or slightly curved laterad, tapered, setigerous and longer than basal width of common base ; ovipositor rather long and about 3.5 times as long as subgenital plate.

Specimens : -Two males and six females ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap. A male and three females ; Kanoa, Chalan, Saipan Island ; Jan. 15, 1949 ; K. L. Maehler by light trap.

Distribution : -Formosa and Micronesia Islands.

This is closely allied to *Psychoda alternata* Say in the structure of antennae and colouration, but highly specific in the shape of female subgenital plate and in the structure of styles of the male hypopygium from the other known species of the genus.

Psychoda erminea Eaton

Eaton, A. E. 1893. Ent. Month. Mag., 29 : 130.

Eaton, A. E. 1894. Ent. Month. Mag., 30 : 261.

Eaton, A. E. 1898. Ent. [Month. Mag., 34 : 156-157.

Tonnoir, A. 1922. Ann. Soc. Ent. Belg., 62 (89) : 64-65.

Freeman, P. 1950. Handbook for the identification of British insects. Dipt., 9 (2) : 91 and 96.

Tokunaga, M. and Komyo, E. 1954. Philip. Jour. Sci., 83 (3) : 310.

A rather large dark brownish gray species, with about ten dark spots on a wing and 15-segmented antennae as distinct specific characters. Antennal segments all well separated, with ascoids all Y-shaped ; thirteenth without neck part, but with a small cone and ascoids ; distal two segments far smaller than thirteenth, oval, equal, but penultimate with a small cone. Wings with about ten dark spots, R_1 ending above or slightly beyond tip of M_4 , both forks complete, radial fork slightly before tip of Cu_1 and distinctly beyond median fork. Male hypopygium with cerci longer than ninth tergite, not distinctly swollen basally and each with a long apical retinaculum ; styles without scales on basal parts and each with a rather long sub-basal seta ; aedeagus almost straight and not pointed apically ; paramere slightly curved, tapered and almost as long as aedeagus. Female subgenital plate far shorter than basal width, setigerous, with basal part rather broad and transverse, caudal lobes small and widely separated by caudal lunate incision ; inner rod rather slender and cylindrical.

Male : -Body about 2.2mm. long. Wings 2 mm. by 0.88 mm. General colouration dark brownish gray in dry state.

Head with segments of maxillary palpi in proportion of 29 ; 29 ; 29 ; 42. Antennae (Fig. 7) 15-segmented, with all segments distinctly separated, ascoids all Y-shaped and developed on segments 3 to 13, neck parts generally longer than basal nodes and present on segments 3 to 12 ; thirteenth segment short-oval, as large as basal node of preceding segment and with a small sensory cone ; following two oval, equal, far shorter than preceding and with several verticils and a small cone on penultimate ; relative lengths of distal eight segments about 38 :

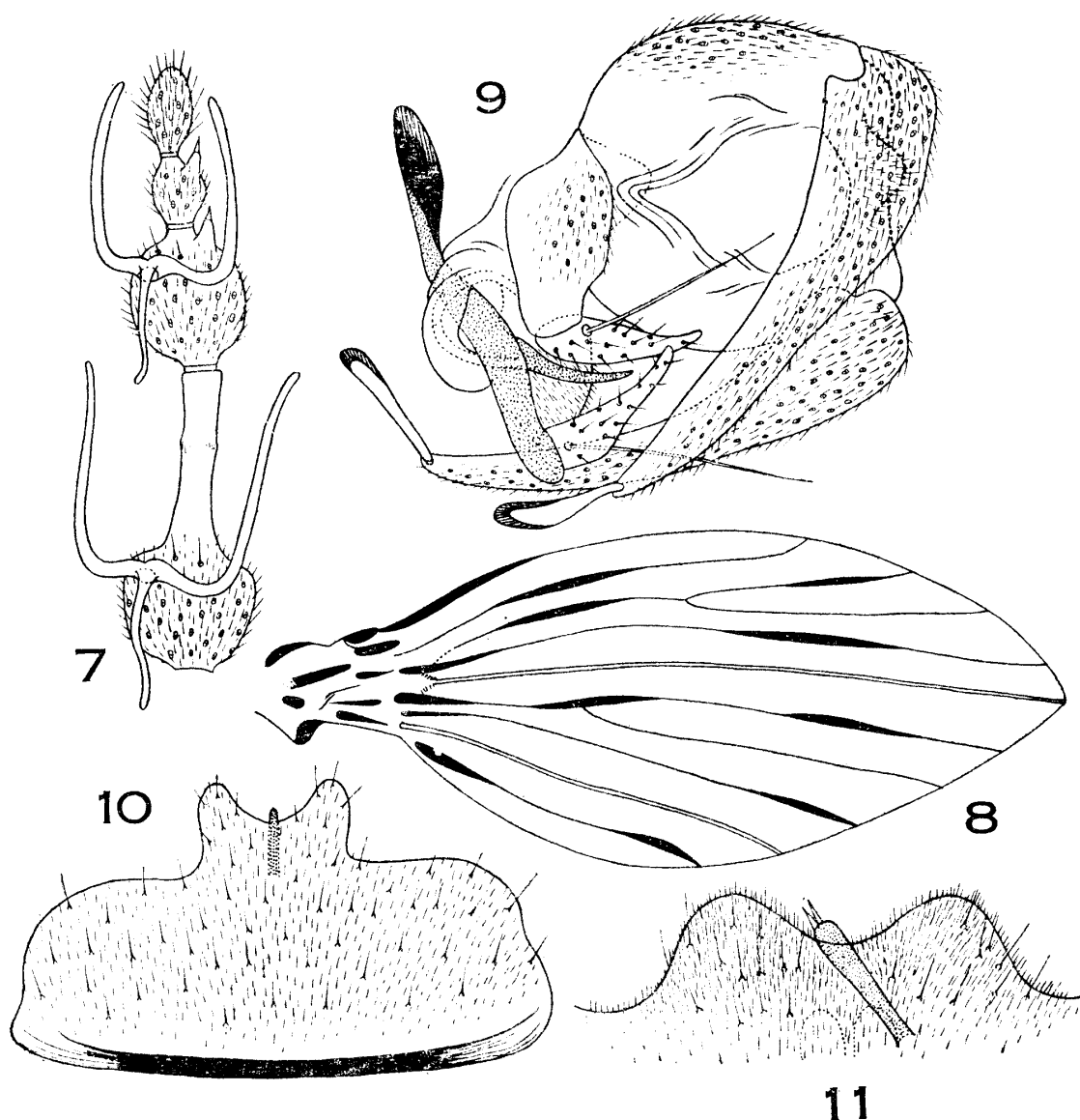
36.5 : 37 : 36 : 31 : 13 : 7 : 8.5.

Wings (Fig. 8) with about ten dark spots on veins, R_1 ending above or slightly beyond tip of M_4 , radial fork complete, slightly before tip of Cu_1 and distinctly beyond complete median fork, relative lengths of R_{2+3} and R_2 about 50 : 43.5.

Hypopygium (Fig. 9) with cerci longer than ninth tergite (90 : 55), not distinctly swollen basally, tapered and each with a rather long apical retinaculum which is about a quarter or one-fifth as long as cercus (22 : 90); coxites

about 0.4 as long as cerci and scaly on lateral swollen parts; styles a little shorter than coxites (30 : 35), beak-like, with minute scattered setae and single rather long sub-basal seta, but not scaly; aedeagus and apodeme almost straight, with tip round or slightly clavated and each as long as coxites; paramere rather slender, claw-like, as long as styles and divergent caudad from aedeagus.

Female : -Body about 2.02mm. long. Wings about 1.95mm. by 0.85mm. Generally as in



Psychoda erminea Eaton

Fig. 7 : Distal segments of male antenna. 8 : Male wing. 9 : Male hypopygium. 10 : Female subgenital plate.

Psychoda phalaenoides Linnaeus

Fig. 11 : Female subgenital plate.

male with usual sexual differences, but colour somewhat paler.

Head with eyes very slightly separated above from each other, four maxillary palpal segments in proportion of 20 : 22 : 24 : 28. Antennae with thirteenth segment subspherical and fourteenth segment separated from or united with preceding, relative lengths of distal eight segments about 27 : 27 : 26 : 25 : 22 : 11 : 7.5 : 8, other structures closely as in male.

Legs with femora, tibiae and five tarsal segments in relative length of 113 : 135 : 44 : 25 : 20 : 17 : 21 in fore, 132 : 178 : 59 : 29 : 20 : 16 : 21 in middle and 153 : 216 : 51 : 26 : 21 : 16 : 21 in hind leg. Wings with R_{2+3} , R_2 , R_3 and M_{1+2} in proportion of 47 : 40 : 57 : 36.

Subgenital plate (Fig. 10) far wider than long (55 : 30), setigerous, with basal part transverse, caudal part small, shorter than wide (12 : 15), caudal lobes small and widely separated by semicircular caudal incision from each other; inner rod rather long, cylindrical and almost as long as caudal part of subgenital plate.

Specimens : -A female; Mt. Ari, Formosa; Dec. 27, 1934; M. Tokunaga. A female; Kagi, Formosa; Dec. 28, 1934; M. Tokunaga.

Distribution : -Europe, Formosa and Japan (1954).

Psychoda phalaenoides Linnaeus

Linnaeus, C. 1758. Syst. Nat. Ed. 10, 32 : 588 (*Tipula phalaenoides*).

Kincaid, T. 1897. Ent. News, 8 : 143 (*Psychoda pacifica*).

Kincaid, T. 1899. Ent. News, 10 : 31 (*Psy. pacifica*).

Tonnoir, A. 1922. Ann. Soc. Ent. Belg., 62 (89) : 76-78.

Dyar, H. G. 1926. Insec. Inscit. Menst., 14 : 105. (*Ps. tonnoiri*).

del Rosario, F. 1936. Philip. Jour. Sci., 59 (1) : 97-100.

del Rosario, F. 1936. Philip. Jour. Sci., 59 (4) : 560.

Freeman, P. 1950. Handbook for identification of British insects. Dipt., 9 (2) : 93 and 96.

Satchell, G. H., 1953. Aust. Jour. Zool., 1 (3) : 361.

Tokunaga, M. and Komyo, E. 1954. Philip. Jour. Sci., 83 (3) : 310-312.

A medium-sized or rather large brownish gray species, rather widely distributed in the world. The specimens collected in Japan and Formosa are all females and belong to subspecies *elongata* Tonnoir. Tonnoir thought this subspecies is parthenogenetic, but according to Freeman, Satchell confirmed that this subspecies is not parthenogenetic as a result of breeding experiments.

Body rather large, 1.93mm. long, being variable from 1.63 to 2.24mm. Wings about 1.97 mm. by 0.8mm. Colouration generally brownish gray in dry state. Head with eyes separated above as wide as one to two facets from each other, four maxillary palpal segments in proportion of 19.8 : 23.5 : 21.5 : 25.3. Antennae 15-segmented, with all segments completely separated, ascoids all Y-shaped and developed on segments 3 to 13, neck parts present on segments 3 to 12; thirteenth fully as large as basal node of preceding segment, a little longer than wide and with a minute cone; following spherical, far smaller than preceding, with several verticils and a minute cone; ultimate short-oval, smaller than preceding, with several verticils and its basal joint part spherical. Wings with normal venation, R_1 ending at level between tips of Cu_1 and M_4 , both forks complete, radial fork distinctly beyond median one and before tip of Cu_1 , relative lengths of M_{1+2} , R_{2+3} , R_2 and R_3 about 29.1 : 51.8 : 34.5 : 49.8. Subgenital plate (Fig. 11) closely similar to that of *Psychoda severini* Tonnoir, but different in the following points: caudal lobes shorter and inner rod rather longer being about five- or six-times as long as wide; spermathecae without sculpture on surface, united into a rather small oval mass and with a pair of rod-like structure.

Specimens : -Five females; Mt. Ari, Formosa; Dec. 27, 1934; M. Tokunaga at light.

Distribution : -Europe, Formosa and Japan (Honsyu).

Psychoda makati del Rosario

del Rosario, F. 1936. Philip. Jour. Sci., 59 (4) : 568-569.

Satchell, G. H. 1950. Proc. Roy. Ent. Soc. Lond., B 19 : 180-181. (*Psychoda infurcis*).

Satchell, G. H. 1953. Aust. Jour. Zool., 1 (3) : 372.

A small grayish pale brown species, rather widely distributed on certain regions of Pacific Ocean, including Formosa, Philippines and Australia. Antennae 16-segmented, thirteenth and following segments without neck-parts, fourteenth and following two segments far smaller than preceding and without ascoids; wings without coloured marking, radial and median forks incomplete; female subgenital plate large, cordiform, very narrowed at base and bilobed caudad.

Female : -Body about 1.33mm. long. Wings about 0.52mm. by 1.14mm.

Head with eyes separated above as wide as 1.5 facets from each other, without eye bridge. Maxillary palpi with four segments in proportion of 17 : 13 : 13 : 19. Antennae (Fig. 12) 16-segmented, with relative lengths of basal four and

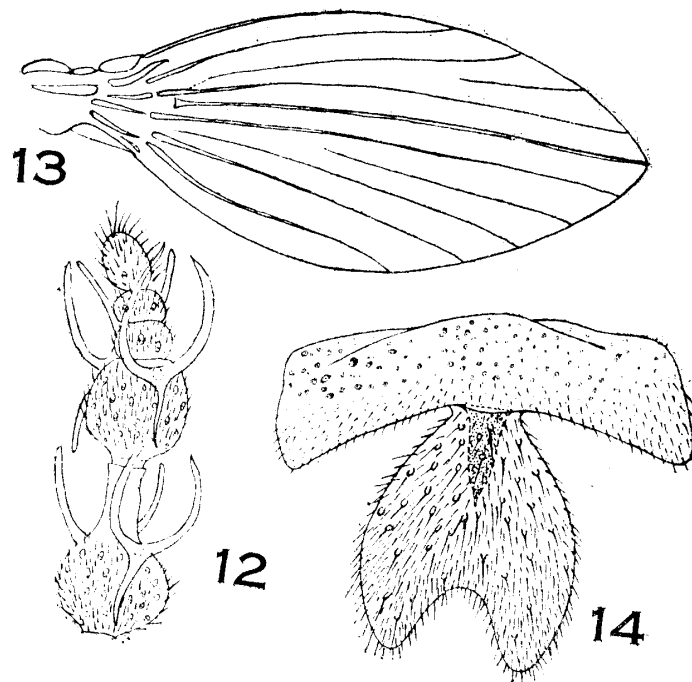
apical eight segments about 19 : 13 : 14 : 16 and 16 : 16 : 16 : 15 : 7 : 2.5 : 2.5 : 4.5, penultimate two segments not distinctly segmented, last segment longer than preceding two.

Legs with relative lengths, except for basal two, about 73 : 64 : 24 : 13 : 10 : 10 : 14 in fore, 87 : 93 : 28 : 15 : 13 : 11 : 14 in middle and 91 : 97 : 25 : 15 : 11 : 10 : 13 in hind leg. Wings (Fig. 13) about 2.2 times as long as broad; venation : R_1 and R_2 ending beyond tip of Cu_1 and of M_4 respectively, relative lengths of R_{2+3} and R_2 taken together and R_3 about 52 : 20 and those of M_{1+2} and M_1 taken together and M_2 about 73 : 41.

Subgenital plate (Fig. 14) obcordate (22×15), caudal incision rather deep about a quarter as its length (8 : 30), inner rod arising from base of subgenital plate and about one-third as long as the plate (9 : 30); sternite transverse, without setae and about 4.7 times as broad as length (49 : 9); ovipositor about 2.3 times as long as subgenital plate.

Specimen : -A female; Szechun, near Chaochow, Formosa; Oct. 27, 1951; Captain H. Barnett by light trap.

Distribution : -Philippines, Samoa, Raratonga,



Psychoda makati del Rosario (Female)

Fig. 12 : Distal segments of antenna. 13 : Wing. 14 : Subgenital plate.

Fiji, Australia and Formosa.

According to del Rosario and Satchell, the male is provided with following main specific characters; the distal three antennal segments are diminutive and distinctly separated or penultimate two completely fused with each other, the wings are rather broad and about half as wide as long (calculated from Satchell's figure), the cerci of the hypopygium are 1.5 (del Rosario) or 2 (Satchell) times as long as the ninth tergite, the coxites are well developed, styles are a little longer than coxites, almost straight, conical and with scattered minute setae but without special long setae, and the accessory piece of the aedeagus (paramere) is sharply pointed and strongly curved before the tip.

Psychoda duplilammata sp. nov.

A small very pale brownish gray species. Antennae 16-segmented, four apical segments all distinctly separated from each other; thirteenth segment subspherical and without neck part; following two small and discoidal; ultimate segment small and oval; ascoids all Y-shaped and present on segments 3 to 13. Wings with radial and median forks incomplete, R_1 ending above or sometimes extending beyond tip of Cu_1 ; male wings very broad, only about 1.8 times as long as width; female wings about twice as width. Male hypopygium highly characteristic in presence of a large sac-like setigerous projection on the base of each style; aedeagus with basal inner rod rather short; cerci slender, not swollen basally and each with a slender retinaculum. Female subgenital plate broader than length, basal half semicircular, caudal half W-shaped being bilobated into paired triangular lobes which are separated by V-shaped caudal median incision from each other.

Male: - Body about 1.09mm. long. Wings about 0.57mm. by 1.0mm. Colouration grayish very pale brown in dry state and very pale brown in mounted specimen.

Head with eyes narrowly separated above from each other less than a facet. Maxillary palpi with four segments in proportion of 16 :

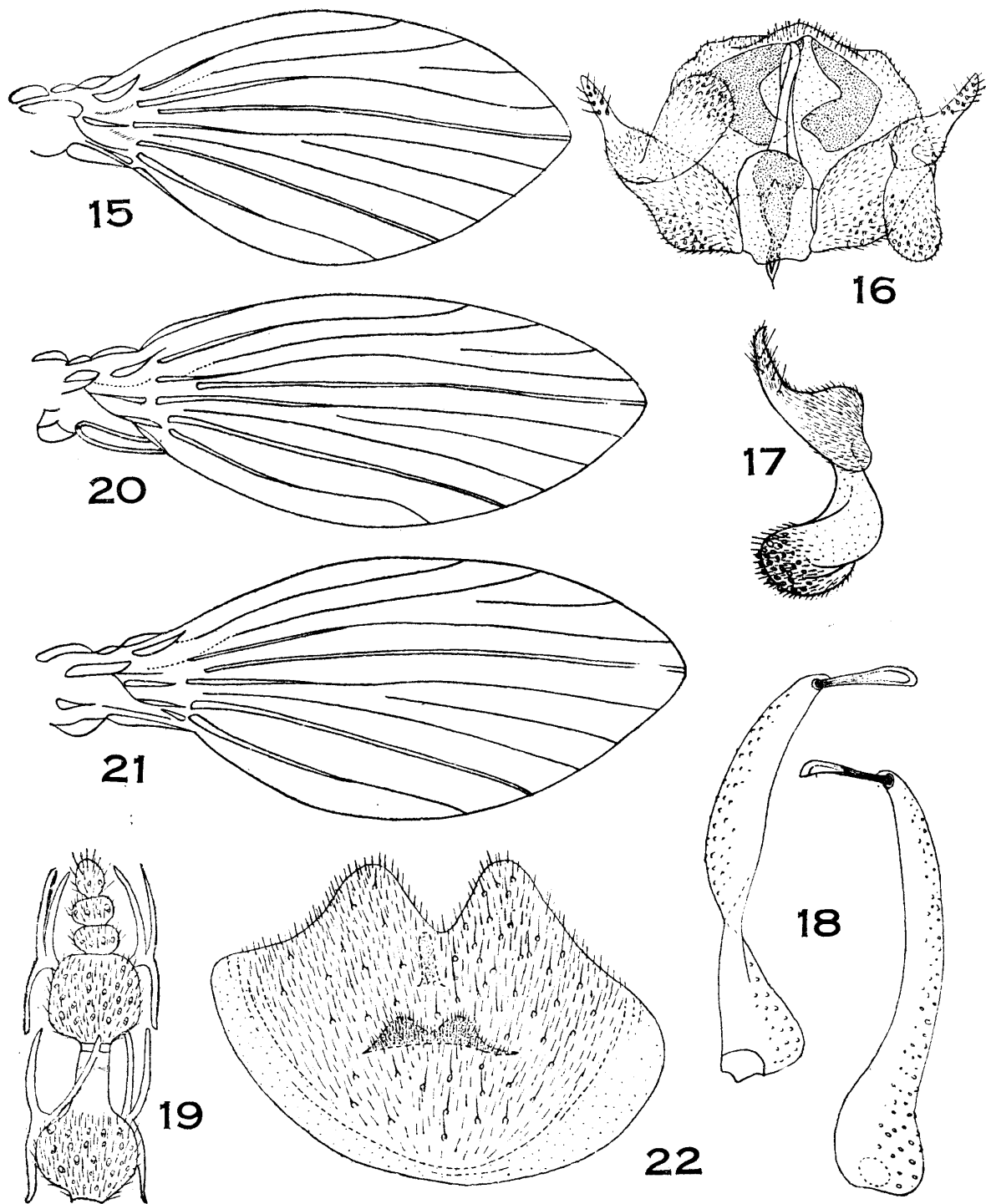
14 : 16 : 22. Antennae 16-segmented, with Y-shaped ascoids on segments 3 to 13; thirteenth segment subspherical and without neck part; following two discoidal and far smaller than preceding; ultimate oval and small; relative lengths of basal four and distal eight segments about 20 : 15 : 20 : 20 and 21 : 21 : 21 : 18 : 11 : 4 : 3 : 5 respectively.

Legs with segments, except for basal two, in proportion of 73 : 68 : 23 : 13 : 10 : 9 : 12 in fore, 79 : 88 : 25 : 15 : 11 : 10 : 12 in middle and 86 : 88 : 22 : 13 : 11 : 10 : 12 in hind leg. Wing (Fig. 15) very broad and short, about 1.8 times as long as width. Venation: radial and median forks incomplete, R_1 ending just beyond tip of Cu_1 , R_3 broadly atrophied on basal part and M_2 very narrowly atrophied at base, relative lengths of R_{2+3} and R_2 taken together, R_3 , M_{1+2} and M_1 taken together and M_2 about 48 : 15.5 : 64 : 36.

Male hypopygium (Figs. 16, 17 and 18): ninth tergite somewhat subsquare, slightly shorter than width (44 : 49) and somewhat narrowed basally; cerci long, slender, not distinctly swollen basally, about 1.8 times of ninth tergite (77 : 44) and each with a slender apical retinaculum which is about one-fifth as long as cerci; ninth sternite small and glabrous; coxites well developed (30 × 16), scaly on lateral sides; styles about two-thirds as long as coxites (19 : 30), basal half broad and pubescent but apical half narrowed, tapered and with several minute setae, a peculiar large sac-like expansion, which is about as long as style (20 : 19) and bears many scales at tip, arising dorsad from base of each style; aedeagus with distal external part almost as long as coxites (28 : 30), straight and somewhat clavated at tip and basal inner rod short and about half as long as distal part (13 : 28).

Female: - Body length 1.16 (1.08-1.24)mm. Wings about 1.06mm. by 0.51 mm. Colouration and general structure closely as in male with usual sexual differences.

Head with eyes almost contiguous above with each other. Relative lengths of maxillary palpal segments about 15.2 : 14.8 : 14 : 20. Antennae (Fig. 19) very closely as in male, relative lengths of basal four and distal eight segments about



Psychoda duplilammata sp. nov.

Fig. 15: Male wing. 16: Male hypopygium (cerci omitted). 17: Lateral aspect of style. 18: Cerci. 19: Distal segments of female antenna. 20: Slender type of female wing. 21: Broad type of female wing. 22: Female subgenital plate.

15.7 : 13.7 : 15.3 : 16 and 16.7 : 16.7 : 15.3 : 13.3 : 6.2 : 2.5 : 2.5 : 3.7 respectively.

Proportional lengths of femora and following segments of fore and hind legs about 73 : 69 : 23 : 13 : 10 : 9 : 12.5 and 87 : 100 : 24 : 14 : 12 : 10 : 13

respectively. Wings (Figs. 20 and 21) longer than in male, with venation generally similar to that of male, showing two types: one rather broader (76.5×42) and one rather narrower (83.5×42); in the former wing R₁ ending above

tip of Cu_1 , relative lengths of R_{2+3} and R_2 taken together, R_3 , M_{1+2} and M_1 taken together and M_2 about 52 : 17 : 68 : 36 ; in the latter wing R_1 extending beyond tip of Cu_1 , relative lengths of the same veins about 45.5 : 18 : 67 : 36.3, in either case both forks incomplete as in male wing.

Subgenital plate (Fig. 22) far broader than length (35 : 24), uniformly setigerous, broadly fused with sternite, basal half semicircular, caudal half bilobed into paired subtriangular lobes which are separated from each other by a deep V-shaped median incision ; thus caudal margin of this plate W-shaped ; there is a small bilobed plate-like projection on the middle of dorsal side of the subgenital plate ; inner rod cylindrical, small and not extending into median incision.

Holotype : - Female ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap. *Allotype* : - Male with holotype. *Paratypes* : - Two females and one male with holotype.

Locality : - Formosa.

This species is very closely allied to *Psychoda malleola* Tokunaga et Etsuko in the venation of wings and the structure of the male hypopygium ; but in the allied species, the three antennal segments from thirteenth to fifteenth are fused together and not segmented, the styles of the male hypopygium are rather slender and not distinctly broadened basally and the female subgenital plate is not provided with a dorsal small plate-like projection and its caudal lobes are not subtriangular but semicircular, all being different from the new species.

Psychoda formosana sp. nov.

A small pale brownish gray species. Antennae 16-segmented ; penultimate three segments, from thirteenth to fifteenth, incompletely segmented ; thirteenth subspherical and with paired ascoids ; following two small, discoidal and without ascoids ; ultimate distinctly separated from the preceding one and oval ; all ascoids Y-shaped. Wings broad, about half as wide as long ; radial and median forks incomplete, R_1 ending distinctly beyond tip of Cu_1 ; R_3 very short and shorter than

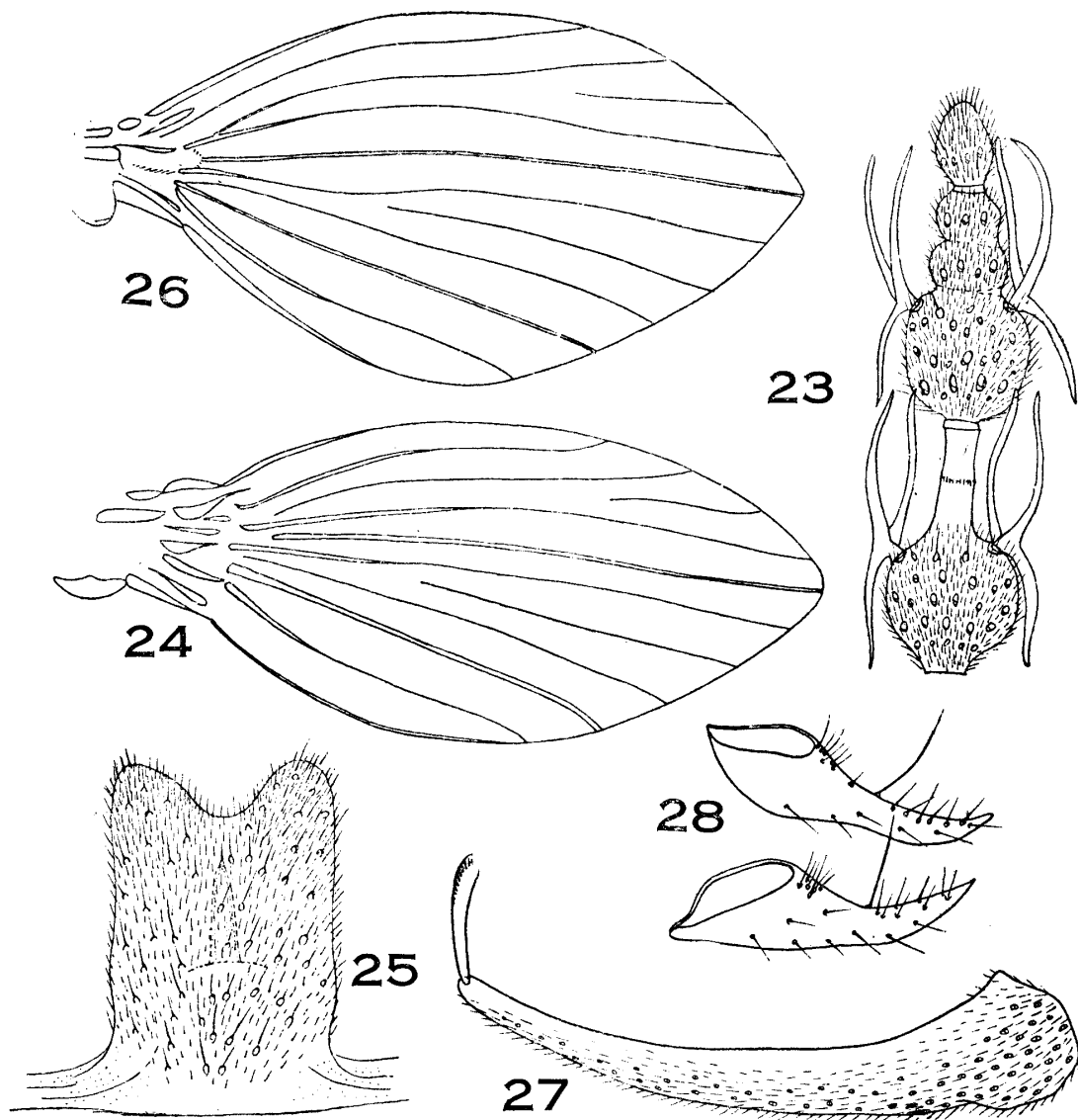
half of M_2 . Female subgenital plate longer than width, subrectangular, its caudal lobes blunt and caudal incision U-shaped and widely opened caudad. Male hypopygium with cerci longer than ninth tergite and not distinctly swollen basally ; styles rather short, beak-like, with scattered minute setae and each with a group of several minute setae on basal part and a little longer seta at middle.

Female : - Body length about 1.34mm. Wings about 1.4mm by 0.68mm. Colouration almost uniformly pale brownish gray in dry state and pale brown in mounted state.

Head with eyes separated above at most as wide as a facet from each other, eye-bridge simple and very short. Maxillary palpi with four segments in proportion of 18.7 : 18 : 16.7 : 21.3. Antennae (Fig. 23) 16-segmented, with ascoids all Y-shaped and present on segments 3 to 13, neck parts present on segments 3 to 12 and somewhat shorter than basal swollen parts ; segments 13-15 incompletely segmented ; thirteenth segment subspherical, without neck part and with paired ascoids ; following two discoidal, small and equal in size and shape ; ultimate distinctly separated from preceding, oval and longer than preceding ; relative lengths of basal four and apical eight segments about 25.7 : 16 : 20 : 21 and 19.3 : 19.3 : 18 : 17 : 9 : 3.5 : 3.5 : 5.5.

Legs with segments from femora to tarsi in proportion of 101.5 : 92 : 35 : 16.5 : 14 : 11.5 : 17 in fore, 107 : 119 : 36 : 18.5 : 13 : 11.5 in middle and 123 : 136 : 37.3 : 17 : 14 : 13 : 17.3 in hind leg. Wings (Fig. 24) broad-oval, about half as long and with radial and median forks incomplete. Venation : R_1 ending before tip of M_4 , R_3 about half as long as M_2 and very slightly undulated, relative lengths of R_{2+3} and R_2 taken together, R_3 , M_{1+2} and M_1 taken together and M_2 about 65 : 22.3 : 89.3 : 45.

Subgenital plate (Fig. 25) entirely setigerous, longer than width (31.7 : 20.7), lateral sides almost parallel, caudal median incision semicircular, two caudal lobes blunt and round at tips ; inner rod about 0.3 as long as plate and cylindrical ; sternite membranous and vestigial. Oviposi-



Psychoda formosana sp. nov.

Fig. 23 : Distal segments of female antenna. 24 : Female wing. 25 : Female subgenital plate. 26 : Male wing. 27 : Male cercus. 28 : Male styles.

tor long and about 1.75 times as long as subgenital plate.

Male : - Body length about 1.43mm. Wings about 1.17mm. by 0.5mm. General structure closely as in female with usual sexual differences. Head with maxillary palpal segments in relative length of 15 : 16 : 14 : 22. Antennal distal eight segments about 17 : 16 : 15 : 13 : 7 . 3 : 3 : 6 in relative length. Legs with segments excepting basal two about 80 : 85 : 27 : 14 : 10 : 10 : 14 in fore, 90 : 106 : 31 : 17 : 12 : 11 : 15 in middle and 98 : 116 : 29 : 16 : 13 : 11 : 15 in hind leg in relative length. Wings (Fig. 26) very broad, with R_1

ending slightly before tip of M_4 , M_3 basally atrophied rather broadly and arising from level of tip of R_1 , M_2 very narrowly atrophied at base, relative lengths of R_3 and M_2 about 22 : 40. Hypopygium with ninth tergite wider than long (55 : 41) and somewhat oval ; cerci (Fig. 27) about twice as long as tergite (80 : 41), not distinctly swollen basally, tapered, slightly arcuated and each with a slender terminal retinaculum which is about one-fifth as long as cercus ; coxites rather large, about 0.3 as long as cerci and scaly on lateral swollen sides ; styles (Fig. 28) a little shorter than coxites (22 : 24), rather thickened

basally, tapered apically, beak-like, with scattered minute setae and each with a group of several minute setae at base and a little longer seta at middle, but without scales even on basal parts.

Holotype : - Female ; Szechun, near Chao-chow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap. *Allotype* : - Male ; Kagi, Formosa ; Dec. 28, 1934 ; M. Tokunaga. *Paratypes* : - Two females with holotype.

Locality : - Formosa.

The wing venation and the antennal structure of the present species are very closely allied to those of Japanese *Psychoda malleola* Tokunaga et Etsuko, but the genital structures of both sexes are quite different from allied one. The female subgenital plate of the new species is closely similar to that of *Psychoda itoco* Tokunaga et Etsuko, but in the allied species the wings are provided with complete radial and median forks. The male hypopygium is somewhat similar to that of *Psychoda longiseta* Tokunaga et Etsuko, especially in the structure of the coxites and styles, but the cerci of the allied species are relatively shorter and the isolated long setae of the styles are far longer, differing from the present species.

Psychoda alabangensis del Rosario

Del Rosario, F. 1936. Philip. Jour. Sci., 59 (4) 566-567.

A small grayish pale brown species, distributed in Philippines and Formosa. Antennae 15-segmented, thirteenth segment round, without neck part but with paired Y-shaped ascoids and not distinctly separated from fourteenth, fourteenth discoidal and far smaller than preceding, last segment oval and distinctly separated from penultimate ; male antennae with normal Y-shaped ascoids on flagellar segments, but female with dimorphic ascoids : those of third and fourth segments spindle-shaped or subtriangular and not extending into slender branches. Wings with both forks incomplete, R_3 broadly and M_2 very narrowly atrophied at base. Male hypopygium with styles well developed, claw-like, somewhat longer than coxites, slightly scaly at bases and

with many small spinules on apical two-thirds ; cerci slender, not strongly swollen basally and each with a slender retinaculum at tip. Female subgenital plate somewhat Y-shaped, stem part subsquare and subequal in length to caudal arms.

Male : - Body about 1.04mm. long. Wings about 0.39mm. by 1mm.

Head with eyes separated above as wide as about a facet from each other. Maxillary palpi 4-segmented (14 : 16 : 14 : 13). Antennae with Y-shaped ascoids on third to thirteenth segments ; basal five segments in proportion of 19 : 12 : 21 : 21 : 21 ; apical antennal segments and legs broken off.

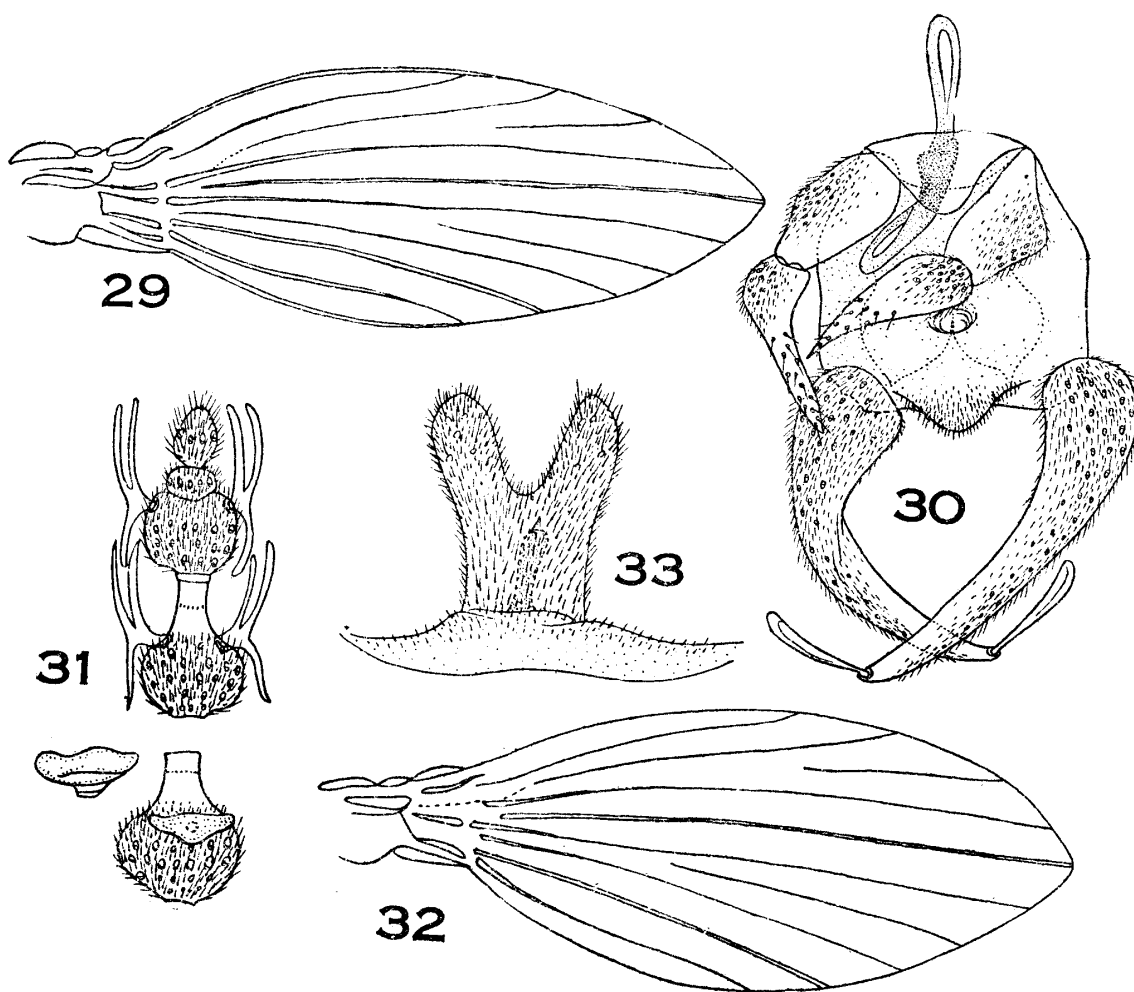
Wings (Fig. 29) about 2.6 times as long as broad. Venation : radial and median forks incomplete, R_1 ending above tip of Cu_{11} , R_2 ending above tip of M_4 , relative lengths of R_{2+3} and R_2 taken together and R_3 about 39 : 18, R_3 broadly atrophied on basal part, relative lengths of M_{1+2} and M_1 taken together and M_2 about 62 : 29, M_2 very shortly atrophied at base.

Hypopygium (Fig. 30) : ninth sternite somewhat small, triangular, round at tip and glabrous ; ninth tergite subsquare and slightly narrowed basally ; coxites about half as long as ninth tergite ; styles claw-like, a little longer than coxites (29 : 22), only slightly scaly at base, apical two-thirds with minute scattered setae ; cerci twice as long as styles (60 : 29), tapered, not suddenly swollen basally and with a slender retinaculum at each tip ; aedeagus with apical part as long as coxites (23 : 22), round at tip and basal part rather short and shorter than apical part (19 : 23).

Female : - Body length 1.2 (1-1.3) mm. Wings about 0.92mm. by 0.42mm. Colouration pale brownish gray in dry state and pale brown in mounted state.

Head with eyes almost contiguous above with each other or separated above less than a facet from each other.

Maxillary palpi with four segments in proportion of 12.6 : 12.4 : 11.7 : 17.4. Antennae (Fig. 31) 15-segmented ; flagellar ascoids dimorphic. those of third and fourth segments somewhat fusiform or subtriangular and without long



Psychoda alabangensing del Rosario

Fig. 29 : Male wing. 30 : Male hypopygium. 31 : Four distal segments and a basal flagellar segment and an ascoid of basal flagellar segment of female antenna. 32 : Female wing. 33 : Female subgenital plate.

arms or stems, those of following nine segments Y-shaped as usual ; distal eight segments with following relative lengths : 14 : 13.5 : 12.5 : 12 : 10.3 : 6 : 3 : 4.1 ; thirteenth segment without neck part, with a pair of ascoids and not distinctly separated from penultimate ; fourteenth discoidal and small ; last segment oval and small.

Leg segments, except for coxae and trochanters, about 65.3 : 58 : 21 : 11.3 : 8.7 : 8.3 : 10.7 in fore, 70 : 77.8 : 22.8 : 11.5 : 9.5 : 7.8 : 10.5 in middle and 77 : 82.3 : 21 : 10.3 : 9.3 : 7.8 : 11.5 in hind leg. Wings (Fig. 32) rather broad and oval, with both forks incomplete. Venation : R_1 ending more or less beyond tip of Cu_1 , R_3 broadly atrophied at base, M_2 very shortly atrophied at base, relative lengths of R_{2+3} and R_2

taken together, R_3 , M_{1+2} and M_1 taken together and M_2 about 39.9 : 16 : 57.4 : 30.

Subgenital plate (Fig. 33) Y-shaped, rather small, setigerous only at caudal parts, basal foot-part subsquare and about half as long as entire length, caudal arms divergent and round at tips ; inner rod cylindrical, about as long as caudal arms of plate ; sternite membranous, vestigial and without setae. Ovipositor long and fully thrice as long as subgenital plate (50.4 : 15).

Specimens : - A male and five females ; Szechun, near Chaochow ; Oct. 24, 1951 ; Captain H. Barnett by light trap.

Distribution : -Philippines and Formosa.

Del Rosario has reported only the male sex of this species, and then this description may be

the first on the female. Of the above-mentioned female characters, the dimorphic ascoids of female antennae may be a noteworthy specific character differing from those of the majority of *Psychoda* species.

Psychoda platilobata sp. nov.

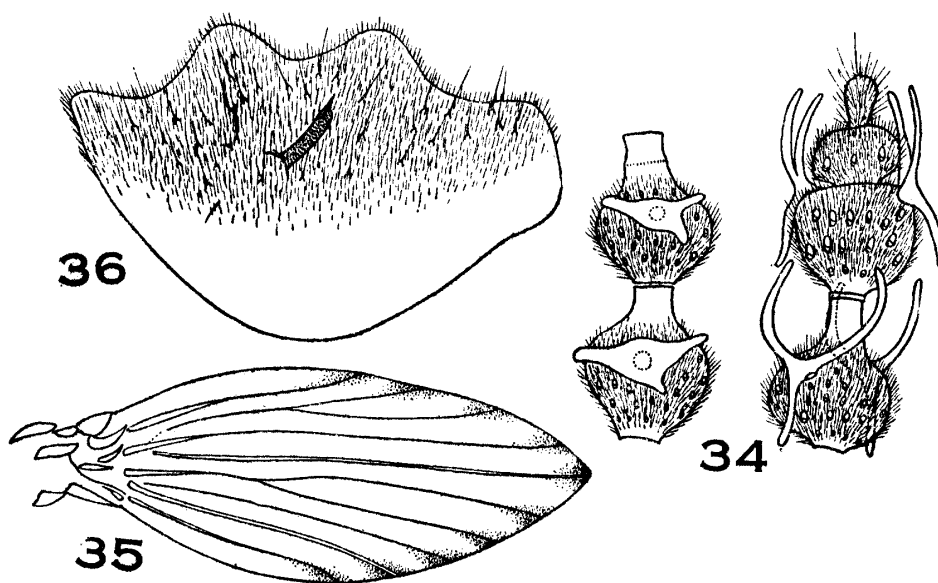
A small pale brownish gray species, wings with pale brownish obscure small clouds at ends of ten main veins. Antennae 15-segmented, with two forms of ascoids in female; ascoids of third and fourth segments somewhat triangular, arms and stems being very short, other ascoids all Y-shaped; thirteenth segment subspherical, without neck part but with Y-shaped ascoids; following segment about half as long as preceding, somewhat discoidal, without ascoids, with several verticils and separated from thirteenth by a distinct suture; last segment far smaller than penultimate, distinctly separated from penultimate and subspherical or oval. Wings with two forks complete, small very pale brown clouds at ends of ten main veins, Cu_1 ending before tip of R_1 and median fork distinctly before radial fork. Female subgenital plate very broad, with caudal lobes blunt, small and round at tips; inner rod small.

Female: - Body length 1.17-1.47mm. Wings 1.14-1.27mm. by 0.46-0.51mm.

Head with eyes separated above as wide as a facet from each other. Maxillary palpal segments about 15:15:16:26. Antennae (Fig. 34) 16-segmented, with all segments separated from each other by distinct sutures, ascoids dimorphic: those on third and fourth segments subtriangular or subrhombic, arms and feet being very short, those on following nine segments Y-shaped as usual, last two segments without ascoids; thirteenth segment subspherical, large and without neck part; fourteenth far smaller than preceding, discoidal and with several verticils; ultimate oval or round, very small, entirely pubescent but without verticils; relative lengths of distal eight segments about 15.8:15.8:14.8:14.5:11.8:8:3.5:3.3.

Leg-segments, except for coxae and trochanters, with relative lengths of 85:101:32:14:11:9:12 in middle and 95:113.5:33:14.5:13:10.5:13.5 in hind leg. Wings. (Fig. 35) entirely very pale brownish hyaline, with tips faintly brownish, small brownish clouds at tips of main veins very much obscure; venation: R_1 extending just at or slightly beyond level of tip of Cu_1 , radial fork distinctly beyond median fork, relative lengths of R_{2+3} , R_2 and R_3 about 29.5:23:36 and those of M_{1+2} , M_1 and M_2 about 25.5:51:45.

Subgenital plate (Fig. 36) far broader than



Psychoda platilobata sp. nov. (Female)

Fig. 34: Distal and basal flagellar segments of antenna. 35 Wing. 36: Subgenital plate.

length (54 : 35), fused with sternite, with caudal half setigerous and pubescent, basal margin semicircular, caudal lobes very blunt and separated by a shallow but wide median incision ; inner rod rather short, about 0.3 as long as subgenital plate (10 : 35), arising at middle of the plate and not extending beyond caudal margin of the plate : ovipositor about twice as long as the plate (69 : 35).

Male : - Unknown.

Holotype : - Female ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap. *Paratype* : - A female with holotype.

Locality : - Formosa.

This species is somewhat allied to *Psychoda crassipennis* Tonnoir in the structure of the antennae, but highly different in the shape of the female subgenital plate and in the presence of small brownish spots at ends of all main veins of the wings from the allied species. The most distinctive specific characters of the present species are the 15-segmented antennae which are provided with dimorphic ascoids, the presence of small brownish clouds at tips of main veins of the wings and the very broad subgenital plate which is bilobated bluntly at caudal part.

Psychoda formosiense sp. nov.

A medium-sized brownish gray species, colouration similar to that of *Psychoda alternata* Say except for wing marking. Antennae 15-segmented, with ascoids all Y-shaped and present on segments 3 to 13 ; ultimate three segments separated by sutures ; thirteenth segment oval and without neck part ; fourteenth far smaller and oval ; ultimate minute and oval ; distal two segments without verticils. Wings lanceolate, with small brownish clouds at ends of longitudinal veins and without other marking ; both forks complete and radial fork more or less beyond median fork, Cu_1 ending before end of R_1 . Female subgenital plate far broader than length and very broadly fused with sternite, paired caudal lobes subtriangular, setigerous, and very broadly separated by a wide U-shaped caudal

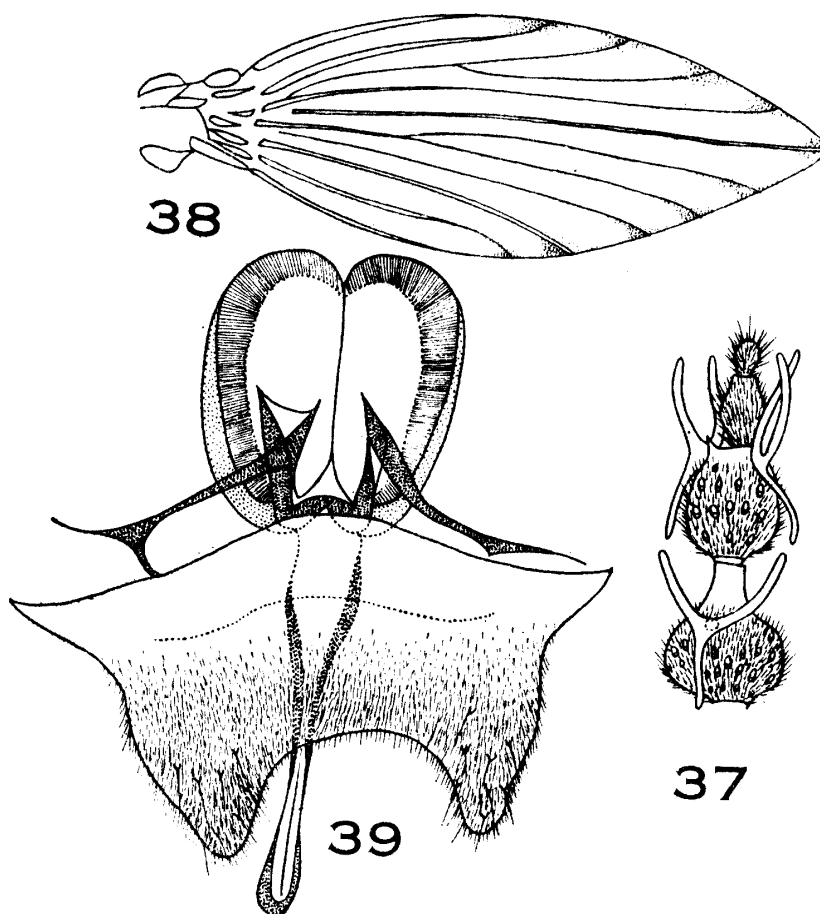
median incision ; a long chitinized rod extending from base of subgenital plate and far beyond tips of caudal lobes.

Female : - Body length 1.69-1.95mm. Wings 1.4-1.59mm. by 0.6-0.65mm. Colouration brownish gray in dry state and pale brown in mounted specimens. Wings with small brownish clouds at ends of ten longitudinal veins.

Head with eyes separated above as wide as two facets from each other. Maxillary palpi with four segments in proportion of 22 : 20 : 17.5 : 26. Antennae (Fig. 37) 15-segmented, with ascoids all Y-shaped and present on segments from third to thirteenth, segments third to twelfth each with a rather short neck part ; thirteenth segment large, oval and with a pair of ascoids but without neck part ; following two segments small and without verticils and ascoids, of these two penultimate long-oval and ultimate minute and oval ; relative lengths of basal four and distal eight segments about 18 : 17 : 17 : 14 and 14 : 14 : 14 : 11 : 10 : 9 : 4 : 3.

Leg-segments, except for basal two, about 108 : 90.5 : 31 : 17 : 14 : 12.5 : 19 in fore and 122.5 : 148.5 : 41.5 : 20 : 15 : 12.5 : 18.5 in hind leg. Wings (Fig. 38) lanceolate, with membrane brownish hyaline, veins pale brown but R_5 and M_4 brown, small brownish clouds at ends of ten main veins and without other coloured marking. Venation : radial and median forks complete, radial fork just or slightly beyond other fork, R_1 ending just at or slightly beyond tip of Cu_1 , relative lengths of R_{2+3} , R_2 and R_3 about 31.5 : 29.5 : 41.5 and those of M_{1+2} , M_1 and M_2 about 35.5 : 58 : 49.5, R_{2+3} longer than R_2 (31 : 25) in one female and shorter (32 : 34) in the other female.

Subgenital plate (Fig. 39) far shorter than width (30 : 41), basally fused with sternite broadly, setigerous only on apical lobes, lateral sides convergent caudad, with two caudal lobes rather small, subtriangular and very broadly separated by semicircular large median caudal incision ; a long chitinized rod arising from base of subgenital plate and extending distinctly beyond tips of caudal lobes. Spermathecae large, oval and with characteristic chitinized accessory frame-



Psychoda formosiense sp. nov. (Female)

Fig. 37 : Distal antennal segments. 38 : Wing. 39 : Subgenital plate with spermathecae.

work.

Male : - Unknown.

Holotype : - Female ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap. *Paratype* : - A female with holotype.

Locality : - Formosa.

This species is closely allied to *Psychoda acanthostyla* Quate and *Psychoda platilobata* sp. nov. in the structure of the antennae and the marking of the wing spots, but these three species is rather easily distinguished by the characteristic shape of the subgenital plate. *Psychoda crassipennis* Tonnoir and *Psychoda phalaenoides* Linnaeus are other related species which have similar antennae to the present species, but these two species are provided with unmarked wings and differently shaped subgenital plates differing from this Formosan species.

Psychoda subquadrilobata sp. nov.

A rather small very pale brownish gray species, with small very faint brown clouds at ends of main veins of the wings. Antennae 15-segmented, with Y-shaped ascoids on segments 3 to 13, distal three segments separated from each other by a suture, penultimate far smaller than preceding and ultimate minute. Wings with costal cell more brownish than others, veins R_5 and M_4 far more brownish, ten small faint brown clouds arranged along wing margin at ends of main veins, R_1 ending just at or slightly beyond tip of Cu_1 and radial fork distinctly beyond median fork. Male hypopygium with styles rather slender, tapered and angulately curved, ninth tergite broad and quite grabrous, aedeagus with two accessory pieces: one straightly extended and one strongly curved at apical part. Female

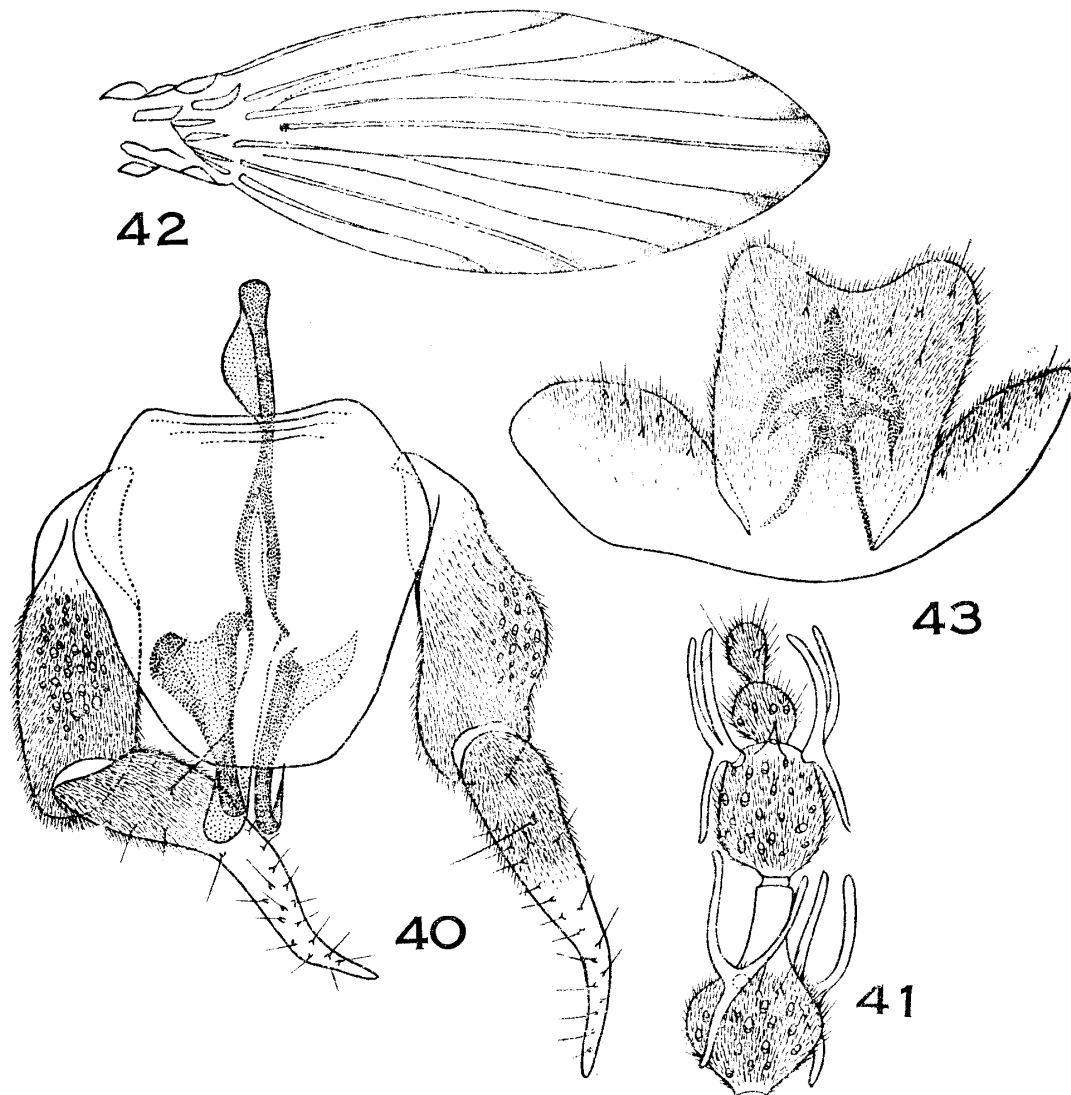
subgenital plate subsquare, longer than wide, slightly concave at caudal margin, with inner rod slender, rather long but not extending beyond caudal margin of the plate and arising from middle of the plate; sternite strongly concave at middle of caudal margin where subgenital plate arises.

Male: - Body about 1.11mm. long. Wings about 1.0mm. by 0.42mm. Colouration very pale brownish gray in dry state and very pale brown in mounted specimen; wing marking closely similar to that of *Psychoda acanthostyla* Quate and *Psychoda pseudalternata* Williams.

Head with eyes separated above as wide as a facet from each other. Maxillary palpi with

four segments in relative lengths of 14 : 14 : 15 : 22. Antennae 15-segmented, with all ascoids Y-shaped and present on segments 3 to 13; thirteenth segment subspherical and without neck part; following segment far smaller, with several verticils and pubescent; ultimate minute, oval and pubescent but without verticils; proportional lengths of basal four and apical eight segments about 18 : 14 : 19 : 18 and 18 : 18 : 17 : 16 : 14 : 7 : 3.5 : 3.5 respectively.

Hind legs with segments from femora to tarsi in proportion of 84 : 100 : 31 : 14 : 11 : 9 : 13; other legs broken off. Wings with small obscure pale brown clouds at ends of main veins, R_1 ending slightly beyond tip of Cu_1 , radial fork



Psychoda subquadrilobata sp. nov.

Fig. 40 : Dorsal aspect of male hypopygium (ninth tergite and cerci omitted). 41 : Distal segments of female antenna. 42 : Female wing. 43 : Female subgenital plate.

distinctly beyond median fork, M_4 and R_5 more brownish than other veins; relative lengths of R_{2+3} , R_2 and R_3 about 24 : 21 : 31 and those of M_{1+2} , M_1 and M_2 about 21 : 42 : 37.

Hypopygium (Fig. 40) rather large; ninth sternite very broad, as long as wide (30 : 30), widest at basal one-third, then tapered, round at caudal margin and quite grabrous; coxites well developed, almost as long as sternite (29 : 30) and setigerous on lateral sides; styles rather slender, as long as coxites, tapered, angulatedly curved and each with a rather long seta on sub-basal part; aedeagus with distal part straight, rod-like and round at apex, basal internal part far longer than apical part and vertically expanded at basal part; accessory pieces of aedeagus two, broad at bases, tapered apically and unequal in shape: one extended straight, not sharply pointed but round at tip and the other longer, sharply pointed and strongly curved ventrad on apical part; ninth tergite subsquare and about 1.7 times as long as coxites; cerci broken off.

Female: - Body length about 1.22 (1.08-1.3) mm. Wings about 1.29 (1.1-1.28) mm. by 0.49 (0.47-0.53) mm. General structure and colouration similar to those of male with usual sexual differences, but wing marking somewhat more distinct.

Head with eyes separated above about as far as 1.5 or 2 facets from each other. Maxillary palpi with four segments in relative lengths of 14 : 15.7 : 15 : 21.3. Antennae (Fig. 41) as in male, with basal four and distal eight segments in proportion of 18 : 14 : 14 : 15 and 16.8 : 16.5 : 16 : 15.8 : 14.3 : 8.3 : 3.8 : 3.5 respectively.

Legs with segments except for basal two in proportion of 73 : 69 : 22 : 12 : 10 : 9 : 12 in fore, 90.5 : 105 : 31 : 14 : 12 : 10.5 : 13 in middle and 98 : 111.3 : 31 : 13.7 : 12.3 : 10.7 : 14 in hind leg. Wings (Fig. 49) with brown marginal clouds somewhat more brownish than in male, costal cells also more brownish, R_1 extending just or slightly beyond end of Cu_1 , other structure closely as in male; relative lengths of R_{2+3} , R_2 and R_3 and M_{1+2} , M_1 and M_2 about 28.3 : 25 : 36 and 24.7 : 48.7 : 43.3 respectively.

Subgenital plate (Fig. 42) subsquare, arising from caudal concavity of sternite with narrow base, longer than wide (18.3 : 16.5) slightly concave on caudal margin, sparsely setigerous on apical part, with inner rod arising from basal one-third of the plate, slender, about half as long as the plate and not beyond caudal margin of the plate; sternite subdivided into lateral semicircular parts by a caudal median concavity; ovipositor rather long and about 3.5 times as long as subgenital plate.

Holotype: - Female; Szechun, near Chaochow, Formosa; Oct. 24, 1951; Captain H. Barnett by light trap. *Allotype*: - Male with holotype. *Paratypes*: - Two females with holotype.

Locality: - Formosa.

The wing marking and the antennal structure of the present species are closely similar to those of *Psychoda pseudalternata* Williams, but the male hypopygium somewhat resembles to that of *Psychoda erminea* Eaton and the female subgenital plate is somewhat similar to that of *Psychoda itoco* Tokunaga et Etsuko. However, in *Psy. erminea* the wings are provided with ten dark spots in three irregular transverse series, differing from the case of this new species and in *Psy. itoco* the antennae are 16-segmented, the wings are not provided with brown clouds and the female sternite which bears subgenital plate is not subdivided into paired lateral lobes, highly differing from the female of the present species.

Psychoda musae del Rosario

del Rosario, F. 1936. Philip. Jour. Sci., 59 (4) : 564-566.

A rather large grayish pale brown species, distributed in Philippines and Formosa. Antennae 14-segmented; last two segments not separated but only constricted; ultimate segment far smaller than penultimate and somewhat elongated. Wings with both forks complete, radial fork far beyond median fork, R_1 ending distinctly beyond end of Cu_1 , R_{2+3} as long as M_{1+2} and subequal in length to R_2 . Subgenital plate of female far longer than width, slightly constricted at middle, basal half round and apical half bi-

lobated.

Female : - Body length about 1.53mm. Wings about 0.6mm. by 1.37mm. Colouration almost uniformly grayish pale brown in dry state and pale brownish yellow in mounted state.

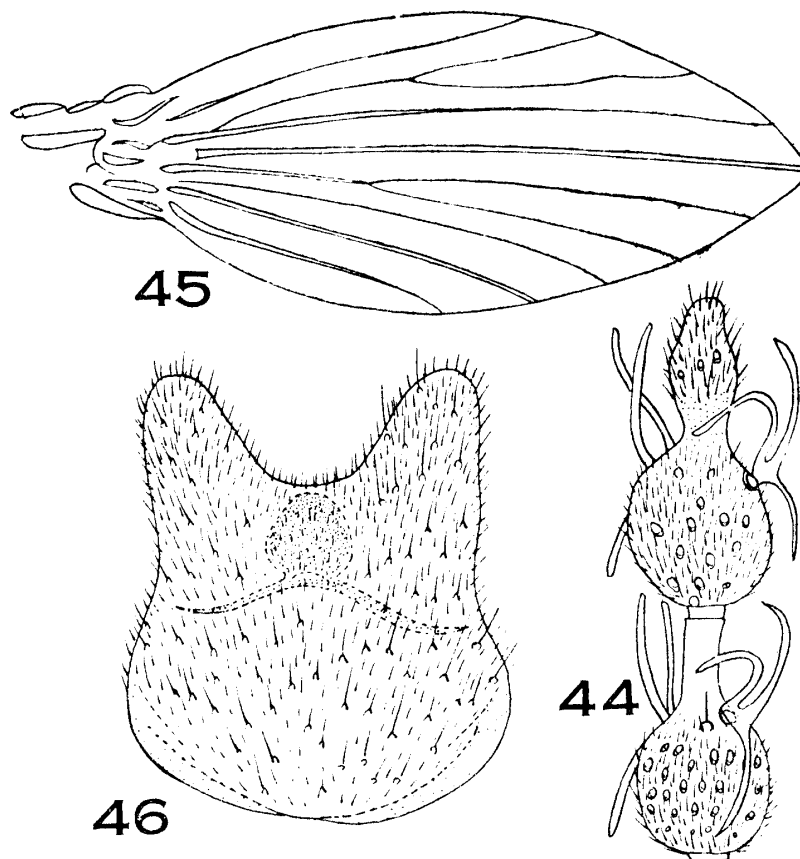
Head with eyes rather broadly separated above as wide as 2.5 facets from each other, without eye-bridge. Maxillary palpi with four segments in proportion of 18 : 20 : 24 : 34. Antennae (Fig. 44) 14-segmented, all ascoids Y-shaped, relative lengths of basal three and apical eight segments as follows : 20 : 15 : 15 and 18 : 18.5 : 18 : 18 : 18 : 17 : 12 : 8 respectively ; thirteenth segments without neck part and with paired Y-shaped ascoids, fourteenth segment not completely segmented from preceding one, small, somewhat elongated and without ascoids ; most flagellar segments with neck parts as long as basal swollen parts.

Fore and middle legs with segments from femora to tarsi in proportion of 105 : 94 : 29 : 17 :

15 : 11 : 16 and 110 : 138 : 41 : 18 : 14 : 12 : 17 respectively, hind legs broken off. Wings (Fig. 45) rather elongated oval, very pale brown. Venation : R_1 ending just before tip of M_4 and R_2 ending above tip of M_3 , radial fork far beyond median fork, relative lengths of R_s , R_{2+3} , R_2 and R_3 about 9 : 30 : 27 : 39, R_3 slightly undulated at apical one-third, relative lengths of M_{1+2} , M_1 and M_2 about 30 : 55 : 47.

Subgenital plate (Fig. 46) longer than wide, entirely setigerous, slightly constricted at middle, basal half, which is sternite proper, round on anterior margin, posterior half bilobated caudad, its median caudal incision rather broad and reaching at middle of posterior half ; inner rod chest-nut-like and arising from middle of subgenital plate. Ovipositor rather long and about twice as long as subgenital plate (59 : 31).

Specimen : - Female ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap.



Psychoda musae del Rosario (Female)

Fig. 44 : Distal segments of antenna. 45 : Wing. 46 : Subgenital plate.

Distribution : - Philippines and Formosa.

This species has been reported only on the specific characters of the male sex, but its antennal structure which is highly specific offers an important common character to both sexes to identify the opposite sex. According to del Rosario, the structure of the male hypopygium as follows : cerci slender, very slightly swollen basally and with a retinaculum at each tip ; styles slender, claw-like, sharply pointed and entirely covered with numerous spine-like hairs ; aedeagus with two accessory pieces which are pointed, slender and strongly curved. Del Rosario although not stated on the ascoids of antennal segments 12-13, these two segments are provided with similar ascoids to preceding flagellar segments.

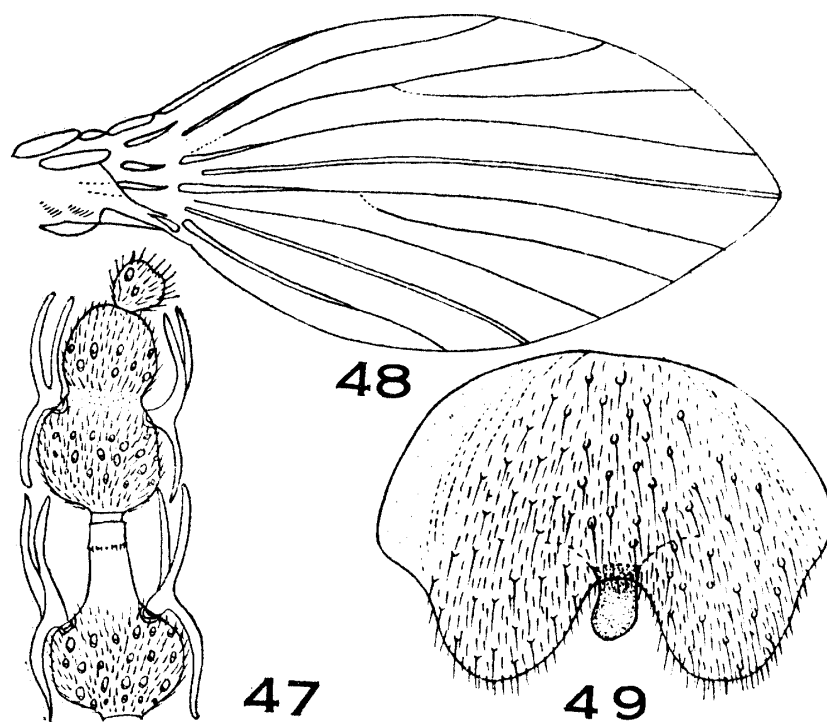
Psychoda pseudobrevicornis sp. nov.

A small pale brownish species. Antennae 14-segmented, twelfth and thirteenth segments fused broadly, ultimate segment very small, round and distinctly separated from penultimate ; ascoids all Y-shaped and present on segments 3-12. Wings rather short and broad, R_1 extend-

ing far beyond tip of Cu_1 , radial fork slightly beyond median fork, both forks not distinct, bases of R_3 and M_2 being somewhat obscure. Female subgenital plate shorter than width, basal half very broad, uniformly continuous with sternite and semicircular, distal half subdivided into broad two caudal lobes by a deep U-shaped median incision, caudal lobes semicircular ; inner rod stout, arising just before median caudal incision and its larger part visible in ventral aspect.

Female : - Body 1.11mm. long. Wings about 0.48 mm. by 1.05 mm. Colouration uniformly pale brownish gray in dry state and pale brown in mounted specimen.

Head with eyes separated above as wide as a facet from each other. Maxillary palpi with four segments in proportion of 17 : 15 : 15 : 21. Antennae (Fig. 47) 14-segmented, with ascoids all Y-shaped and present on segments 3 to 12 ; twelfth segment round, with paired ordinary ascoids and fused with thirteenth ; thirteenth also round, smaller than preceding and without ascoids ; last segment far smaller than preceding, distinctly separated from penultimate and also



Psychoda pseudobrevicornis sp. nov. (Female)

Fig. 47 : Distal segments of antenna. 48 : Wing. 49 : Subgenital plate.

without ascoids ; relative lengths of antennal segments about 16 : 13 : 15 : 16 : 16 : 16 : 16 : 15 : 14 : 14 : 8 : 6 : 3, 5.

Segments from femur to tarsus of fore legs with relative lengths of 67 : 65 : 24 : 12 : 11 : 8 : 11 ; other two pairs broken. Wings (Fig. 48) rather broad and short, about 2.2 times as long as width, with radial and median forks present, but bases of R_3 and M_2 somewhat obscure although not completely atrophied. Venation : R_1 extending distinctly beyond tip of Cu_1 , radial fork slightly beyond median fork, relative lengths of R_{2+3} , R_2 and R_3 about 25 : 22 : 32, those of M_{1+2} , M_1 and M_2 about 23 : 44 : 38.

Subgenital plate (Fig. 49) broadly and uniformly fused with sternite and setigerous almost entirely, far broader than length (45 : 32), basal half semicircular, apical half subdivided into semicircular two lobes by a median deep U-shaped caudal incision ; inner rod stout, round at tip, arising slightly before bottom of caudal incision and its larger part visible between two lobes ; ovipositor about 1.6 times as long as subgenital plate (50 : 32).

Male : - Unknown.

Holotype : - Female ; Szechun, near Chaochow, Formosa ; Oct. 24, 1951 ; Captain H. Barnett by light trap.

Locality : - Formosa.

This species is provided with specific 14-segmented antennae ; the similar structure of the antennal terminal part is usually known in the species with 15-segmented antennae. *Psychoda brevicornis* Tonnoir is very closely allied to the present species, but the wings of this known species are provided with radial and median forks are quite incomplete and the thirteenth antennal segment distinctly separated from the preceding one and fused with the ultimate segment highly differing from the present new species.

Psychoda Jp-No. 4.

Tokunaga, M. 1957. Philip. jour. Sci. (in press).

Specimen : - A female ; Mt. Ari ; Dec. 27,

1934 ; M. Tokunaga at light.

Distribution : - Japan and Formosa.

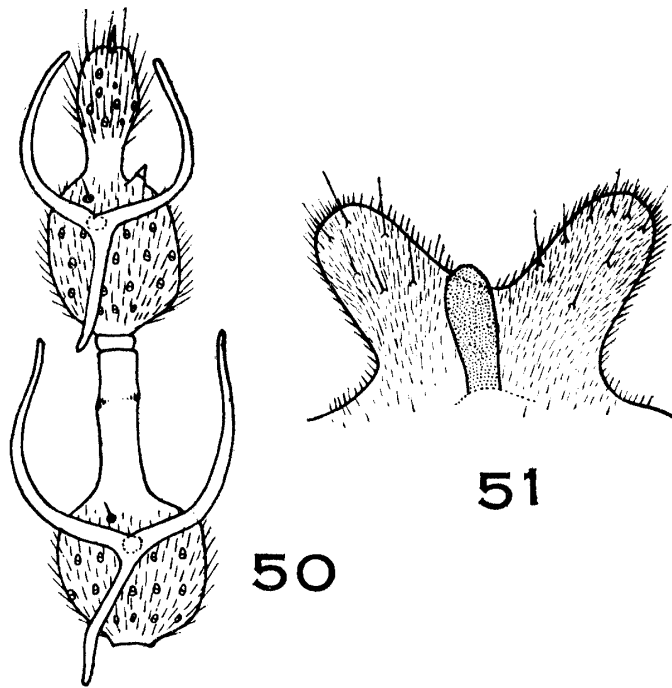
Psychoda Fo-No. 1

A rather large brownish gray Formosan species, very closely allied to *Psychoda severini* Tonnoir, except for the shape of female subgenital plate. Antennae 14-segmented, distal two segments not separated by a suture as in *Psy. severini parthenogenetica* Tonnoir ; penultimate segment with well developed Y-shaped ascoids, a sensory cone and without neck part ; ultimate oval, small and with several verticils. Wings as in *Psy. severini* Tonnoir, with both forks complete. Female subgenital plate wider than long, with basal part very broad, setigerous and semicircular, caudal lobes rather short, round at tips, twice as long as wide, distinctly divergent caudad and caudal incision rather broadly V-shaped ; inner rod stout, arising from part of constriction between basal part and common base of caudal lobes, about thrice as long as wide, ending just beyond caudal margin of subgenital plate.

Female : - Body about 1.79mm. Wings about 1.66mm. by 0.65mm. Colouration brownish gray in dry state.

Head with eyes separated about a little wider than a facet from each other. Maxillary palpi with four segments in relative lengths of 18.3 : 21 : 21.7 : 24.7. Antennae (Fig. 50) 14-segmented, but distal two not completely segmented, with ascoids all Y-shaped and well developed on segments 3 to 13, neck parts on segments 3 to 12, all verticils very finely plumous on distal half ; penultimate segment a little longer than wide, as large as basal node of preceding segment and with a distinct cone ; ultimate far smaller than penultimate, oval and with several verticils ; relative lengths of distal eight segment about 27 : 27 : 26 : 25 : 24 : 22 : 13 : 10.

Legs with segments, except for basal two, in proportion of 104.5 : 111 : 43.5 : 22 : 16.5 : 14 : 20 in fore and 129.5 : 171.5 : 56 : 24.5 : 19.5 : 15.5 : 21 in hind leg. Wings without scales, with R_1 ending above or slightly beyond tip of Cu_1 , radial



Psychoda Fo-No.1 (Female)

Fig. 50 : Distal segment of antenna. 51 : Subgenital plate.

and median forks complete, lengths of R_{2+3} , R_2 and R_3 about 58.7 : 36.7 : 54.3 and those of M_{1+2} , M_1 and M_2 about 32.3 : 99 : 89.3.

Subgenital plate. (Fig. 51) broad, shorter than wide, entirely setigerous, with basal part very broad and semicircular, caudal lobes short, twice as long as wide, round at tips and widely divergent caudad ; inner rod rather short, thrice as long as wide, arising from constricted part between broad basal part and common base of caudal lobes, round or somewhat pointed at tips and extending just beyond caudal margin of subgenital plate ; ovipositor normal and long ; spermathecae without sculpture on surface and closely as in *Psy. severini parthenogenetica*.

Male : - Unknown.

Specimens : - Three females ; Mt. Ari, Formosa ; Dec. 27, 1934 ; M. Tokunaga.

Locality : - Formosa.

This is very closely allied to *Psychoda severini parthenogenetica* Tonnoir except for the structure of female subgenital plate and inner rod.

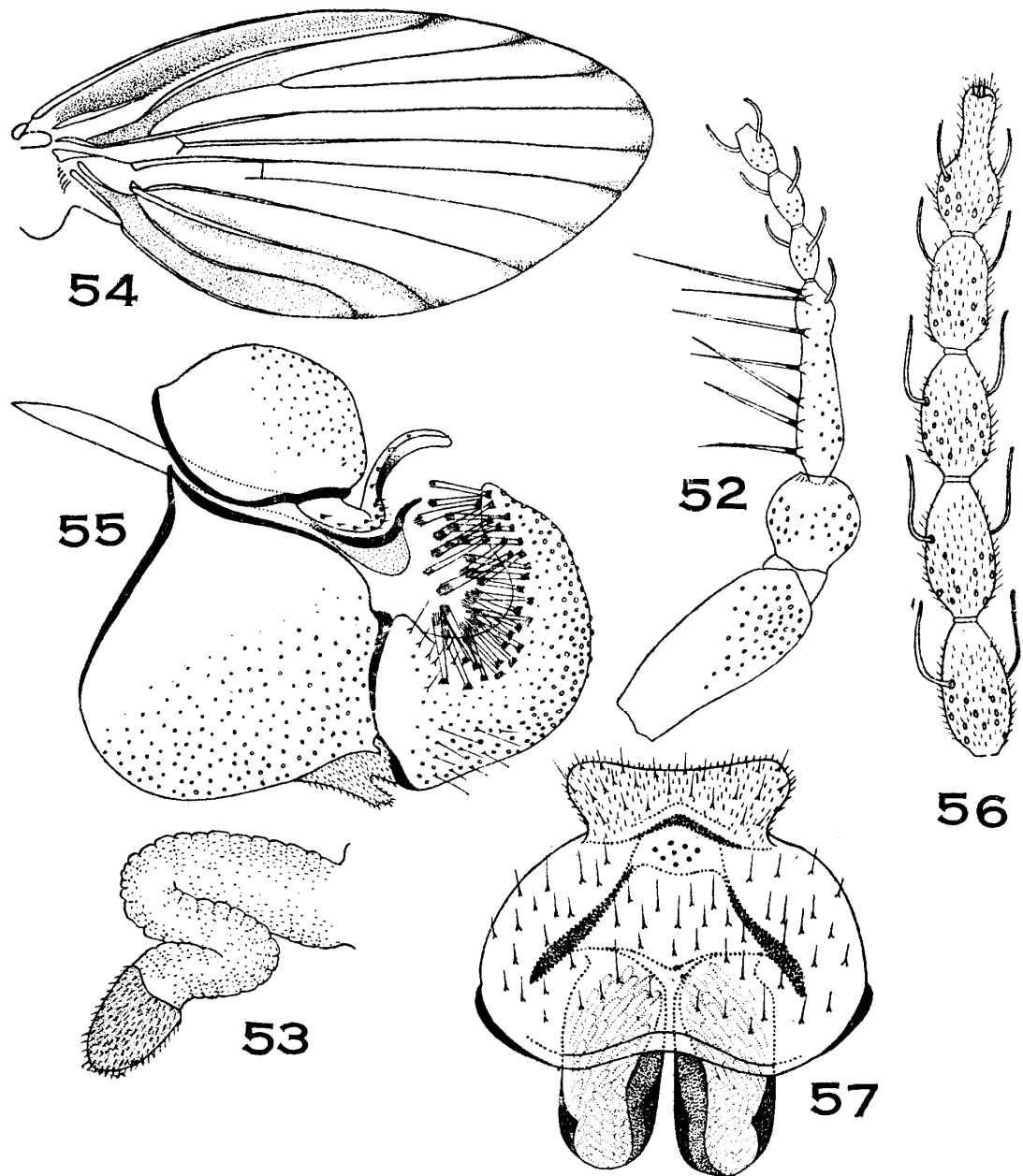
Pericoma formosana sp. nov.

A rather large species ; wings with dark

spots along wing margin at ends of main longitudinal veins, M_2 with backward spur-like prolongation, Cu_1 arising more or less before origin of M_3 . Antennae with scapes long and cylindrical, basal two flagellar segments of male antenna united into a long segment and with six or seven strong spines arranged in a line. Cerci of male hypopygium strongly curved and with many retinacula on entire length of dorsal side ; styles very strongly curved and slender. Subgenital plate of female with caudal part very short and without caudal median incision ; spermathecae large, oval and roughly sculptured on surface.

Male : - Body length 1.8-2mm. Wings about 2.03mm. by 1.03mm. Vestures of body, wings and legs missing.

Head with eyes separated above from each other as wide as three facets, eye bridge inverted T- or Y-shaped, frontal scaly area triangular. Maxillary palpi with four segments in proportion of about 25 : 50 : 51 : 67. Antennae (Fig. 52) with scapes about 2.5 times as long as wide and subcylindrical, pedicels spherical, basal two flagellar segments united forming a long cylindrical



Pericoma formosana sp. nov.

Fig. 52: Basal segments of male antenna. 53: Male allurement organ. 54: Male wing. 55: Lateral aspect of male hypopygium. 56: Distal segments of female antenna. 57: Female subgenital plate with spermathecae.

cal segment which bears about six or seven strong spines arranged in a line, following segments spindle-shaped; relative lengths of basal six segments about 40:15:25+9:9:9 and those of distal eight segments about 9:9:8.5:8.5:8.5:7:6:? (last segment broken off).

Thorax with allurement organs long, cylindrical or cord-like and each with a dark brown oval cap (Fig. 53). Legs with segments, except for basal two, in relative length of 172:204.5:

94:36:27:20.5:27.5 in fore, 188.5:249.5:111:36:27.5:20.5:27.5 in middle and 218.5:289:114.5:41:28.5:21.5:27.5 in hind leg. Wings (Fig. 54) rather broad, with tips round between tips of veins R_4 and R_5 , dark small spots along margin at tips of main ten veins; venation: R_1 ending beyond tip of M_4 , R_{2+3} arising before origin of R_5 and about half as long as R_2 , radial fork distinctly before tip of Cu_1 and beyond median fork, M_{1+2} as long as R_{2+3} , M_2 with base angulat-

ed and basal spur-like prolongation, Cu_1 distinctly undulated and arising just before forking point between M_3 and M_4 , relative lengths of R_{2+3} , R_2 and R_3 about 42 : 83 : 101 and those of M_{1+2} , M_1 and M_2 about 43 : 110 : 102.

Hypopygium (Fig. 55) with ninth tergite very broad and highly convex ventrad and laterad; cerci longer than ninth tergite (89 : 78), strongly curved dorsad, setigerous basally, scaly entirely and each with about thirty or more retinacula on entire length of dorsal side except for only base; coxites oval, strongly swollen dorsad and scaly on apical half; styles arising from pre-apical ventral sides of coxites, rather slender, very strongly curved at about middle, with scattered minute sensory setae but without scales and long setae; aedeagus, apodeme and other accessory piece not ascertained.

Female : - Bodr about 3.12mm. long. Wings about 2.63mm. by 1.43mm. Body far larger and darker than in male, wings provided with dark tufts of hairs at median and radial forks and at ends of ten main veins (other scales and hairs missing) and legs with tips of first tarsal segments and distal four segments brown (colouration of legs not ascertained in alcoholic specimens). General structure similar in male with usual sexual differences.

Head with eyes separated above as wide as three facets from each other; maxillary palpi with four segments in relative length of 24 : 51 : 59 : 74. Antennae 16-segmented, with scapes apically setigerous, about 1.8 times as long as wide; pedicels spherical; flagellar segments (Fig. 56) largely fusiform, about twice as long as wide, ultimate with a large cylindrical apical process which is as long as basal node, all ascoids trichoid; relative lengths of basal five and distal eight about 38 : 20 : 19 : 15 : 14.5 and 14 : 14 : 13.5 : 13.5 : 13 : 12.5 : 11 : 14 respectively.

Legs with segments, except for basal two, in proportion of 187 : 207 : 95 : 36 : 27 : 22 : 32 in fore, 195 : 265 : 115 : 42 : 28 : 23 : 33 in middle and 216 : 311 : 118 : 42 : 28 : 22 : 32 in hind leg. Wings rather broad as in male and with venation similar to that of male, relative lengths of

R_{2+3} , R_2 and R_3 about 45 : 92 : 118, those of M_{1+2} , M_1 and M_2 about 45 : 128 : 106, Cu_1 arising distinctly before forking point between M_3 and M_4 .

Subgenital plate (Fig. 57) setigerous on ventral side, shorter than wide (87 : 100), with basal part about 0.7 as long as wide (66 : 100) and suboval, caudal part very short, about 0.37 as long as basal part (24 : 66), transverse, basally narrowed and apically broadened (45 : 58), with caudal lobes very short and apically round and without median caudal incision; dorsal inner plate rather small and with several minute punctures; spermathecae rather large, oval, about twice as long as wide and with rather rough sculpture on surface; ovipositor about 1.35 times as long as subgenital plate (117 : 87).

Holotype : - Male; Mt. Ari, Formosa; Dec. 27, 1934; M. Tokunaga. *Allotype* : - Female with type. *Paratype* : - A female with types.

Locality : - Formosa

This species is closely allied to *Per. subneglecta* Tonnoir in the wing venation, the antennal structure and the genital characters. The allied species, however, distinctly different from the Formosan species in the following points: the basal two flagellar segments of the male antenna are not fused together and the first flagellar segment bears with only three strong spines, the cercus of the male hypopygium is provided with retinacula on apical half and more slightly curved, the style is not strongly curved, the coxite bears a pointed tip, the subgenital plate of the female is longer than wide and its caudal part is provided with a longer common base of the caudal lobes.

Pericoma Fo No. 1.

A large species; antennae of female with scapes short and subequal to pedicels, flagellar segments fusiform and twice as long as width, ascoids present on eleven basal flagellar segments, ultimate segment with a rather long apical process; wings with dark tufts of hairs on radial and median forks and distal parts of ten main veins, median fork beyond radial fork and before tip of Cu_1 and Cu_1 arising at forking

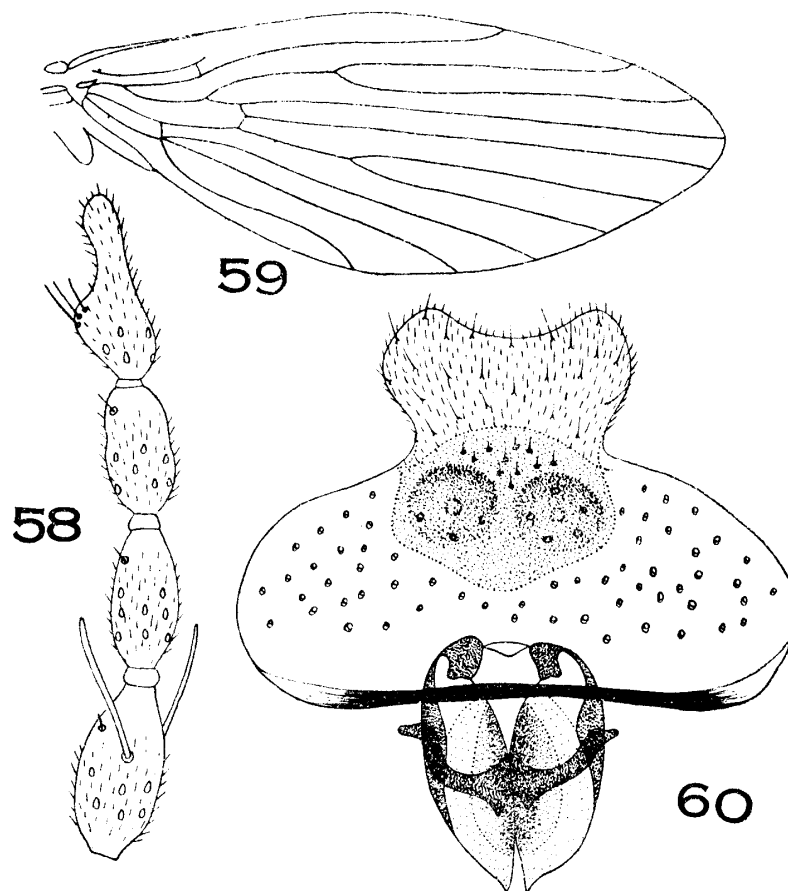
point between M_3 and M_4 ; subgenital plate with two round swellings on inner dorsal plate, spermathecae elongated, fusiform and without sculpture on surface.

Female: -Body length about 2-2.4 mm. long. Wings about 2.78-3.18 mm. by 1.05-1.33 mm. Wings with small brown spots on membrane at ends of ten main veins, membrane almost colourless and hyaline, dark tufts of hairs on radial and median forks and apical parts of main veins, costal fringe paler on basal half and darker on apical half of wing (other marking of hairs not ascertained in alcoholic specimens). Legs with distal four tarsal segments more brownish than other segments, first tarsal segments and tibiae paler.

Head with eyes separated above from each other as wide as three facets, frontal scaly area transverse and subsquare and eye-bridge invert-

ed V-shaped. Maxillary palpi with four segments in proportion of 28 : 46 : 53.5 : 77. Antennae (Fig. 58) 16-segmented, with scapes short, as long as wide or spherical pedicels, flagellar segments fusiform and about as long as or little longer than twice of width, but ultimate segment with a long apical process; relative lengths of basal five and distal eight segments about 22.5 : 20.5 : 16.5 : 16.5 : 16.3 and 17.3 : 17.3 : 16.8 : 16 : 15.5 : 12.8 : 11.5 : 15.8 respectively; ascoids simple and present on basal eleven flagellar segments.

Legs with femora, tibiae and five tarsal segments in relative length of 205 : 216 : 116 : 43 : 32 : 26 : 35 in fore, 223 : 292 : 136.5 : 48.5 : 33.5 : 26.5 : 34 in middle and 235.5 : 333 : 139.5 : 50 : 33 : 26 : 34 in hind leg. Wings (Fig. 59) rather long, with R_1 ending just beyond tip of M_4 , R_{2+3} arising before origin of R_5 and about half as



Pericoma Fo-No. 1 (Female)

Fig. 58 : Distal segmente of antenna. 59 : Wing. 60 : Subgenital plate with spermathecae.

long as R_2 , R_{4+5} longer than 1.5 times of apical width of basal cell (12 : 7), median fork slightly beyond radial fork and distinctly before tip of Cu_1 , R_4 ending just before round tip of wing, Cu_1 arising from forking point between M_3 and M_4 , relative lengths of R_1 , M_4 and Cu_1 about 137 : 132 : 96, those of R_{2+3} , R_2 and R_3 about 52 : 113 : 131.7 and those of M_{1+2} , M_1 and M_2 about 88 : 120.7 : 104.3.

Subgenital plate (Fig. 60) setigerous on ventral side, far shorter than basal width (76.8 : 120), with basal part about 0.37 as long as wide (44.5 : 120), caudal part narrowed basally and broadened apically (38.7 : 51.3), far shorter than basal part (32.3 : 44.5), with caudal lobes widely divergent and round at apices; dorsal inner plate rather broad, with many hyaline punctures on

caudal part and two round swellings which bear single pores at centre; spermathecae fusiform and without special sculpture on surface; ovipositor about 1.44 times as long as subgenital plate (111 : 76.8).

Male : -Not known.

Specimens : -Five females; Mt. Ari, Formosa : Dec. 27, 1934; M. Tokunaga.

Locality : -Formosa.

This species is very closely allied to *Pericoma fuliginosa* Meigen, in which the male is highly characteristic in possession of a pocket-like depression on the wing before middle; at present, however, the male is quite unknown from Formosa and the determination of the species is retained till the male is discovered.

摘 要

徳 永 雅 明 : 台 湾 産 蝶 蠅 科

1953年以来日本産蝶蠅科の研究を行い、55種を記述し、現在略々日本の蝶蠅相 (Psychodid fauna) を明確にする事が出来た。依つて日本蝶蠅相を隣接諸地域のそれ等と比較する目的で、先づ、未だ不明の台湾蝶蠅相の検討に着手し、次の如き結果を得た。

1. 台湾産の *Psychoda* 属 15種及び *Pericoma* 属 2種を明確にし、その種の標徴を記述した (学名未詳

の3種を含む)。

2. 台湾産蝶蠅17種中、8種は特産種で、且つ新種と同定した。

3. 日本との共通種は4種で、1種を除き他は広い分布範囲を示す種類であつた。フィリピンとの共通種は4種で、ミクロネシア群島との共通種は2種であつた。