THE PSYCHODIDAE OF BATU CAVES, MALAYA

(Diptera)$^1$

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ABSTRACT

Twenty-two species of psychodid flies were taken in Batu Caves, near Kuala Lumpur, Malaya during an ecological study in 1959-60 by the U. S. Army Medical Research Unit. The species belong to six genera in three subfamilies as follows: Trichomyiinae—Sycorax, 1 n. sp.; Trichomyia, 2 n. spp.; Phlebotominae—Phlebotomus, 4 spp.; Psychodinae—Telmatoscopus, 3 spp. (2 new); Brunettia, 1 sp.; Psychoda, 11 spp. (3 new). The most abundant species were Telmatoscopus albipunctatus (Williston), Psychoda malayica, n. sp., and P. lutea, n. sp. This is the first record of Sycorax in the Oriental Region.

Batu Caves, located in a great limestone bluff northeast of Kuala Lumpur, Malaya, has attracted a number of naturalists interested in biospeleology and several studies have been made of the fauna. The latest and most intensive is that of the U. S. Army Medical Research Unit, Kuala Lumpur, under the direction of H. E. McClure. Over a two year period extensive collections were made in the caves. The invertebrate specimens were sorted at Bishop Museum and loaned to various specialists for their identifications. A series of papers is planned to describe the new species and make the names available for the final report.

This paper treats the psychodid flies taken in Batu Caves. Descriptions and illustrations are given of the new species and keys provided. Primary types are deposited in Bishop Museum (BISHOP); paratypes will be sent to the U. S. National Museum, Washington, D. C. (USNM); the California Academy of Sciences, San Francisco, (CAS); and the British Museum (Natural History), London (BMNH).

A detailed analysis of the Batu Caves fauna will be published at a later date by Dr. McClure. For this paper it is sufficient to point out that many of the psychodids taken in the caves are represented by only a few specimens and are probably there merely by accident ("accidental trogloxenes"). Three species, Telmatoscopus albipunctatus, Psychoda malayica and P. lutea, were extremely abundant during certain seasons, larvae of at least the first were found, and all three undoubtedly passed their complete life cycle in the cave. T. albipunctatus is a widely distributed trogicopolitan species and breeds under a wide variety of conditions; the other two probably will be found to occur elsewhere than Batu

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Caves. The three species, then, may be classified as "troglophiles," those which complete their life cycles in the cave but may also be found outside.

**KEY TO PSYCHODIDAE GENERA IN BATU CAVES**

1. Eyes hemispherical, not extended towards midline above antennae..........................2
   Eyes with definite bridges, extensions 2 to 5 facets wide above antennae............... 4
2. Wing with 1 vein between radial and medial forks; palpus 3- or 4-segmented; proboscis not fitted for bloodsucking............................................................... 3
   Wing with 2 veins between radial and medial forks; palpus 5-segmented; proboscis long, slender and ♀ fitted for bloodsucking; yellowish, narrow-winged, long-legged species ......................................................... Phlebotomus
3. Scape very small, much smaller than pedicel; antennal segment 3 one and one-half times length of 4; Cu very short, not attaining wing margin, ending far before level of medial fork ........................................ Sycorax
   Scape as large as or larger than pedicel; antennal segment 3 subequal to 4; Cu long, attaining margin ending near or beyond level of medial fork......... Trichomyia
4. Vertex (anterior surface of head above eyes) on midline much longer than width of eye bridge; palpal segment 2 about 2× length of 1; labellum bulbous apically; terminal antennal segments not reduced....... Psychoda
   Vertex shorter than width of eye bridge; palpal segment 2 subequal to 1; labellum flattened apically; antennal segments beyond 13 reduced and much smaller than preceding flagellar segments................................. Telmatoscopus
5. Palpal segment 2 about 2× length of 1, palpus about as long as head height; ascoids forked or many on each segment (figs. 4c, 5a); tenacula of ♀ surstyle without bell-shaped tips........................................ Telmatoscopus
   Palpal segment 2 more than 3× length of 1, palpus longer than head height; a pair of simple, long, unbranched ascoids on each flagellar segment; tenacula of ♀ surstyle with bell-shaped tips........................................ Brunettia

Subfamily TRICHOMYIINAE

Genus *Sycorax* Curtis, 1839

The finding of this genus in Malaya is the first record in the Oriental Region. *Sycorax* is widespread, but with few species. There are now known 1 Ethiopian species, 6 Palaearctic, 4 Australasian (all from New Zealand), 3 Neotropical and 1 fossil from Baltic amber. The distribution and morphological characteristics indicate *Sycorax* is an archaic genus.

Although the antennae of *Sycorax* are usually described as 15-segmented, the Malayan species is 16-segmented. The terminal is very small, but nevertheless distinct when seen under high magnification. Perhaps, a similar condition exists in other species of the genus.

The head and mouth parts seem similar to that of *Phlebotomus*. The scales on the 2nd palpal segment appear homologous to the "Newstead scales" of *Phlebotomus* and have been so designated in this paper. The cibarium and pharynx are described, since they are
different from those in *Trichomyia* and the Psychodinae and, as in *Phlebotomus*, may prove to have interspecific variation. The spermatheca are fragile sac-like structures much like that of *Phlebotomus*. They probably are best examined in a temporary phenol mount after the whole specimen is cleared in lacto-phenol and before being treated with KOH, but this wasn’t done with the specimens studied due to lack of experience with the group.

**Sycorax malayensis** Quate, n. sp.  
Fig. 1.

**Male**: Body integument brown. Proboscis extending to palpal segment 3; palpus 4-segmented, segment 1 cylindrical, without remaining subglobal, 2 with circular patch of Newstead scales (fig. 1) on anteriodmedian margin, ratio of segments = 14 : 11 : 10 : 9. Cibarium with dome-like apex; pharynx slender. Antenna 16-segmented; flagellar segment 1 about 1-1/3 length of 2; terminal segment very small but distinct; ascoids simple, rod-like, those on segments 7-14 very small, about 1/3 size of those on 3-6.

Wing short and broad; base of M₃ and junction with M₄+5 weak or obliterated. Genitalia as figured.

Antenna 0.7 mm; wing length 1.1 mm; wing width 0.5 mm.

**Female**: Similar to ♀, but larger; sternite 2 as figured; pair of spermathecae membranous, globular and simple without visible setae or other adornment; sternite 7 narrowed in center to thin band, wider on sides; external genitalia as figured.

Antenna 0.9 mm; wing length 1.4 mm; wing width 0.6 mm.


**Genus Trichomyia** Curtis, 1839

**Key to Batu Caves species of Trichomyia**

Radial fork distad of center of wing and Cu apex; flagellar segment 1 clearly longer than pedicel; ♀ ovipositor ( cercus) elongate, nearly 3× as long as wide; spermathecal duct very short, shorter than stem of furca; palpus 3-segmented ...... *malaya*

Radial fork basad of center of wing and Cu apex; flagellar segment 1 and pedicel subequal in length; ♀ ovipositor circular, about as long as wide; spermathecal duct long, about 2× length of stem of furca; palpus 4-segmented ............... *batu*

**Trichomyia malaya** Quate, n. sp.  
Fig. 2.

**Male**: Integument pale brown. Head with single row of large sockets along upper eye margin; palpus 3-segmented, thick patch of Newstead scales in circular pit at apicolateral margin of palpal segment 1, ratio of segments = 24 : 14 : 14; cibarium with margins weak, concave at base of posterior arms, pharynx slender with number of longitudinal ridges. Antenna 15-segmented; flagellar segments elongate pyriform, eccentric, segment 1 twice as long as pedicel, terminal with thick apiculus; ascoids simple.

Wing membrane very light brown; radial and medial forks beyond Cu apex, radial beyond center, medial about at center. Hairs on abdominal sternites on posterior 2/3 of
Fig. 1. *Sycorax malayensis*. a, antenna base, ♂; b, antenna tip, ♂; c, palpus, ♂; d, cibarium and pharynx, ♂; e, head, ♂; f, wing, ♀; g, wing, ♂; h, apex of abdomen, ventral view, ♀; i, sternite 2, ♀; j, sternites 7 and 8, ♀; k, ♂ genitalia, lateral view; l, ♂ genitalia, dorsal view.
each segment and gradually become denser on hind margin, without a single definite row on margin. Genitalia as figured; parameres thickly combed, aedeagus furcate with pair of strong subapical spurs and terminating in arrowhead-like apex; surstyle triangular with upturned lateral margins.

Antenna (1.0–1.2 mm, holotype 1.2; wing length 1.0–1.2 mm, holotype 1.2; wing width 0.4–0.5 mm, holotype 0.5.

- **Female**: Similar to ♂; flagellar segments smaller and not eccentric; ratio of palpal segments = 20 : 14 : 14, segment 1 smaller; wing longer and more slender; genitalia as figured, subgenital plate acutely pointed; spermathecal duct very short; cercus elongate,
paddle-shaped.

Antenna 1.0–1.1 mm, allotype 1.0; wing length 1.2–1.4 mm, allotype 1.3; wing width 0.4–0.5 mm, allotype 0.5.


**Trichomyia batu** Quate, n. sp. Fig. 3.

**Male**: Unknown.

**Female**: Integument brown. Head with patch of large hair sockets between upper part of antennal bases and along upper eye margin; palpus 4-segmented, basal segment incompletely divided; patch of Newstead scales on center of median margin of segment 2, segment 4 long and slender, ratio of segments = 10 : 10 : 14 : 30; cibarium with margins strong,
straight and a little divergent, posterior arms short, pharynx slender. Antenna 15-segmented; flagellar segments pyriform, segment 1 subequal to length of pedicel and more nearly cylindrical than others, terminal with small, round apiculis; ascoids simple.

Wing membrane very light brown; radial and medial forks well before center of wing and Cu apex, radial fork distad of medial. Abdominal sternites sparsely covered with spatulate, striate hairs and a definite row of close-set, stiff hairs on hind margin. Genitalia as figured; subgenital plate truncate, weakly trilobed; spermathecal duct very long, strongly and finely annulate; cercus nearly circular in profile.

Antenna 0.8–1.0 mm, holotype 0.8; wing length 1.1–1.4 mm, holotype 1.1; wing width 0.4–0.6 mm, holotype 0.4.


Genus Phlebotomus (Rondani), 1840

KEY TO BATU CAVES SPECIES OF PHLEBOTOMUS

1. Palpal segment 5 longest segment; antennal segment 3 at most but little longer than proboscis .......................................................... 2

Palpal segment 3 longest, inflated basally; antennal segment 3 three or more times length of proboscis; wing rather broad; cibarium only with vertical teeth in pair of triangular patches, pharynx unarmed; ♂ dististyle very long with 3 major spines and row of stiff hairs at side of basal spine.................. asperulus

2. Abdominal hairs erect, hair sockets as large on tergites 2–6 as on 1; palpal formula 1–4–2–3–5 (segments arranged in order of increasing size); pharynx armed with cluster of spines apically, ♂ dististyle with 4 or 5 spines, 2 apical and 2 or 3 at or basad of center; spermatheca strongly annulate....................... 3

Abdominal hairs on tergites 2–6 recumbent, sockets on those segments smaller than on tergite 1; palpal formula 1–2–3–4–5; pharynx and cibarium unarmed; ♂ dististyle with 4 major spines, all clearly distad of center; spermatheca long and tubular, not annulate and not differentiated from duct .................. anodontis

3. Male with 5 spines on dististyle, 3 of which are median, nondeciduous hairs on inner face of basistyle in sparse patch; ♂ with antennal segment 3 extending only to distal 2/3 of proboscis, cibarium with number of scattered teeth, 4–6 of which little larger than others, ascoids do not extend beyond tip of segment bearing them ................................................................. argentipes

Male with 4 spines on dististyle, 2 of which are median, nondeciduous hairs on inner face of basistyle in dense patch; ♂ with antennal segment 3 nearly or exceeding tip of proboscis, cibarium with number of scattered teeth, 2 or 3 of which much larger than others, ascoids extend beyond tip of segments bearing them................................................................. stantoni

Phlebotomus (Idiophlebotomus) asperulus Quate and Fairchild, 1961, Pac. Ins. 3: 208.

DISTRIBUTION: Malaya.

MALAYA. Batu Caves, VIII, IX, XII–1959; 6 ♂♂, 4 ♀♀.
   DISTRIBUTION: Borneo to India.

   DISTRIBUTION: Malaya to India, Hainan, South China.
   MALAYA. Batu Caves, XII–1959; 1 ♂.

Phlebotomus (Sergentomyia) anodontis Quate and Fairchild, 1961, Pac. Ins. 3: 220.
   DISTRIBUTION: Malaya.

Genus Telmatoscopus Eaton, 1904

**KEY TO BATU CAVES SPECIES OF TELMATOSCOPUS**

1. Radial and medial forks distinctly before Cu apex; eye bridge with 4 rows of facets; large species, wing length 2 mm or more ................................. 2
   Radial fork on same level as Cu apex and medial little distad; eye bridge with 3 rows of facets; small, slender winged species, wing length 1.4 mm .............. kulas
2. Eyes contiguous; palpal segment 1 about 1/2 length of 2; radial and medial forks on same level; wing apex rounded; ♂ genitalia with very long appendages, dististyle with slender appendage at base ........................................ mcclurei
   Eyes separated; palpal segment 1 one-third length of 2; radial fork distad of medial; wing apex acute; appendages of ♂ genitalia not unusually long, dististyle without appendage, aedeagus racquet-shaped .................. albipunctatus

**Telmatoscopus kulas** Quate, n. sp. Fig. 4.

*Male*: Unknown.

*Female*: Body integument brown. Eyes contiguous, eye bridge with 3 rows of facets; frons with hairs nearly divided into 2 patches; cibarium with margins moderately strong, concave apically, pharynx very slender; palpus with segments 2 and 3 a little inflated, ratio of segments = 4 : 6 : 6 : 11. Antenna 16-segmented, segment 14 with very short internode, 15 spherical without internode, 16 with stout apiculus; ascoids slender, V-shaped.


Antenna 0.6 mm; wing length 1.4 mm; wing width 0.5 mm.

Holotype ♀ (BISHOP 3154), Batu Caves, 3–IX–1959, H. E. McClure.

Of hundreds of psychodids collected in the caves, there was only the single female of this species. Perhaps its usual environment is the forest near the caves.
Telmatoscopus mcclurei Quate, n. sp.

**Male**: Body integument brown; frons and palpus with slender, spatulate hairs. Eyes contiguous, eye bridge with 4 rows of facets; vertex prolonged and indented at apex; frons with quadrate patch of hairs without posterior extension; cibarium very long, with strong, nearly straight margins, pharynx slender, nearly parallel-sided; ratio of palpal segments = 6 : 11 : 12 : 16. Antenna 16-segmented; flagellar segment 1 with cylindrical node and small internode, following nodes cubical in outline with short nodes in basal segments and lengthening distally, terminal segment elongate with slender, eccentric apiculis; ascoids small, rod-like, 30–50 on each segment arranged in 2 rings.


Antenna 1.2–1.3 mm, holotype 1.3; wing length 2.0–2.1 mm, holotype 2.0; wing width 0.9–1.0 mm, holotype 1.0.

**Female**: Similar to ♂; flagellar segments smaller, ascoids 2- or 3-branched pair on each segment; genitalia as figured, subgenital plate strongly bulging ventrally on disc (not shown in illustration); cercus short and acute.

Antenna 1.1–1.2 mm, allotype 1.1; wing length 1.9–2.1 mm, allotype 1.9; wing width 0.8–0.9 mm, allotype 0.8.

Fig. 5. *Telmatoscopus mcclurei*. a, antennal segments 3-6, ♂; b, antenna tip, ♂; c, cibarium and pharynx, ♂; d, head, ♂; e, ♂ genitalia, dorsal view; f, ♂ surstyle; g, lobe of tergite 9 (between surstyli), ♂; h, ♀ cercus; i, ♀ genitalia, left external view, right internal; j, wing, ♂.
A feature of this species is the contiguous eyes in both sexes. One female, however, has the eyes separated by about one facet and the eyes are joined by a strong suture. Otherwise, it is the same as other specimens of *mcclurei*.

This species is named after Dr. H. E. McClure in recognition of his intensive study of Batu Caves and the contribution made to the cave ecology.


**DISTRIBUTION:** Tropicopolitan.

**MALAYSIA.** Batu Caves, VII to IX, XI, XII–1959, I to VI–1960; 260 spec. incl. larvae and pupae.

**Genus Brunettia** Annandale, 1910

**Brunettia** sp.

Two ♀ ♂ of *Brunettia* were taken in the Caves in V–1960. They probably belong to an undescribed species of the *biformis* group, but without ♀ ♂ little is to be gained from naming them.

**Genus Psychoda** Latreille, 1796

**KEY TO BATU CAVES SPECIES OF PSYCHODA**

1. Wing forks incomplete (fig. 6c) .................................................................................. 2
   Wing forks complete (fig. 7c) ..................................................................................... 5

2 (1). Antenna 16-segmented ......................................................................................... 3

3 (2). Male genitalia with lateral shaft of aedeagus straight or lacking; ♀ subgenital plate quadrate with small apical lobes ....................................................................... 4
   Lateral shaft of ♂ aedeagus twice curved, S-shaped; ♀ subgenital plate elongate with sides divergent posteriorly ................................................................. *makati*

4 (3). Male dististyle with large, sac-like lobe attached to base; digit of ♀ subgenital plate arises from level of base of lobes .................................................... *malleola*
   Male dististyle without sac-like lobe; digit of subgenital plate arises near center clearly cephalad of level of base of apical lobes ........................................... *lutea*

5 (1). Wing veins with brown spots at tips; antenna 15-segmented, terminal 2 segments reduced, terminal smallest, button-like ................................................. 6
   Wing veins without brown spots at tips; terminal antennal segment not button-like ....................................................................................................................... 8

6 (5). Radial fork little distad of medial, nearly on same level; ♀ subgenital plate not V-shaped ................................................................................................. 7
   Radial fork distad of medial by 2–3× width of cell $R_3$; subgenital plate consisting only of V-shaped piece ............................................................... *alternata*

7 (6). Female subgenital plate with deep apical concavity, deeper than 1/2 length of plate; ♂ dististyle short, clavate with sharp, spur-like apex and bearing
about 15 strong setae on distal 1/2 of inner face .................. acanthostyla
Subgenital plate rectangular with V-shaped apical notch, notch less than 1/2
length of plate; $\delta$ unknown........................................... vagabunda

8 (5). Eye bridge with 4 rows of facets; eyes separated by 1.5 facets at most; anten-
na 16- or apparently 14-segmented.............................. 9
Eye bridge with 2 or 3 rows of facets; eyes separated by 2 facets or more;
antenna 15-segmented, terminal 2 segments equal and separated; ascoids of
both sexes 4-branched; wing length 1.2–1.9 mm.................. malayica

9 (8). Antenna 16-segmented with terminal 3, reduced segments subequal in size ...... 10
Antenna apparently 14-segmented (actually 15-segmented but segment 14 very
small and fused to 13); $\delta$ antennal ascoids 4-branched, $\varphi$ ascoids 3-branch-
ed; small species, wing length 1.0–1.5 mm ......................... savaiiensis

10 (9). Wing veins R₁, R₅, and M₄ much thicker than others; palpal segments unequal,
ratio = 8 : 11 : 13 : 15; $\delta$ aedeagus ending as 2 straight rods; $\varphi$ subgenital
plate with sides subparallel or convergent posteriorly ................ aponesos
Vein R₅ little thicker than others, but R₁ and M₄ as others; ratio of palpal
segments = 8 : 8 : 8 : 10; $\delta$ aedeagus ending in strongly recurved, beak-like
point; $\varphi$ subgenital plate with sides of apical part divergent posteriorly and
basal piece widely expanded flap-like .................................. harrisi

Psychoda pellucida Quate, n. sp.  Fig. 6 a–e.

Male: Body integument brown. Eyes separated by about 1/2 facet at narrowest point,
interocular suture absent; bridge with 4 rows of facets; frons thickly covered with hairs
and dense band extending posteriorly between eyes; palpus with first 3 segments equal,
ratio of segments = 6 : 6 : 6 : 8; labellum with 2 setae. Antenna 15-segmented; terminal
2 reduced, subequal, well separated, 14 partly fused to 13; ascoids Y-shaped, not dimorphic.

Wing broad, forks incomplete; vein tips without spots. Ratio of fore leg = 20 : 18 :
8 : 12, mid leg = 22 : 22 : 8 : 12, hind leg = 22 : 24 : 8 : 12. Genitalia as figured; dististyle
rather broad and suddenly tapering to apex, aedeagus simple without lateral shaft, para-
mere a conspicuous, bilobed shelf under aedeagus, surstyle of usual elongate Psychoda shape
with single tenaculum.

Antenna 0.7 mm; wing length 1.0 mm; wing width 0.4 mm.

Female: Unknown (see discussion below).

Holotype $\delta$ (Bishop 3156), Batu Caves, 1–IX–1959, H. E. McClure. Paratypes (USNM,
BMNH): 3 $\delta$$\delta$, same locality, IX–1959 and II–1960.

There are three females associated by date and location with the above males. They
have similar size, antennal structure and wing venation as the males, but differ in the less
dense vestiture on the frons, wider eye separation and dimorphic antennal ascoids. That
may be sexual variance, but on the other hand might indicate the females are not con-
specific with the males. Further specimens are needed from different localities to confirm
the association of sexes for this species.

The females are the same as described by Tokunaga (1957, Sci. Rpt. Saikyo Univ.
Agric. 9: 64) from Taiwan and designated as the female of P. alabangensis del Rosario,
a species described from the Philippines on the male sex only. There is some question if
Tokunaga’s identification is correct. The above association would indicate this female is not that of *alabangensis* and, furthermore, the male genitalia of *alabangensis* illustrated by Tokunaga (loc. cit.) differs markedly from that described by del Rosario (1936, Phil. Jour. Sci. 59: 566). Only additional specimens can settle the question and clarify the identity of *alabangensis*.


**DISTRIBUTION**: Polynesia, Australia, Borneo, Philippines, Taiwan, Malaya.

**MALAYA**. Batu Caves, 1-IX-1959; 2 ♂♂, 5 ♀♀.

**DISTRIBUTION:** Japan, Borneo, Malaya.

**MALAYA.** Batu Caves, 12–IV–1960; 2 ♀ ♂

**Psychoda lutea** Quate, n. sp.  

*Male:* Body integument pale brown. Eyes separated by 1 facet, interocular suture absent; bridge with 4 rows of facets, rounded on median margin; frons with wide, thick band of hairs extending posteriorly on midline and joining hairs on vertex; palpus extending to node of antennal segment 6, ratio of segments = 20 : 18 : 18 : 26; labellum with 2 setae and 4 teeth. Antenna 16-segmented, segments 13, 14, 15 partly fused, 16 separate; ascods Y-shaped.

Wing with forks incomplete; vein tips with outspots. Ratio of fore leg = 20 : 20 : 8 : 12, mid leg = 24 : 26 : 8 : 14, hind leg = 26 : 26 : 8 : 15. Genitalia as figured, basistyle inflated laterally, dististyle tapering to sharp, slightly hooked apex, surstyle of usual elongate Psychoda shape with single spatulate tenaculum.

Antenna 0.8–1.0 mm, holotype 0.9; wing length 0.9–1.2 mm, holotype 1.2; wing width 0.4–0.5 mm, holotype 0.5.

*Female:* Similar to ♂; genitalia as figured, subgenital plate with small apical lobes, genital digit arising near center of plate well before base of lobes.

Antenna 0.7–1.0 mm, allotype 0.8; wing length 1.1–1.5 mm, allotype 1.2; wing width 0.4–0.6 mm, allotype 0.5.


In antennal characters, wing venation and appearance of the female genitalia, *lutea* resembles *malleola* Tokunaga. The male of *lutea*, however, lacks the sac-like appendage of the dististyle which is such a distinctive feature of *malleola*. Details of the female genitalia of the two species also differ; in *lutea* the genital digit arises near the center of the plate clearly cephalad of the base of the apical lobes and there isn’t the reticulated shelf from the spermatheca to the plate, while in *malleola* the genital digit originates on the level of the base of the apical lobes and there is a reticulation from the spermatheca to the center of the plate; also, the apical lobes of *lutea* are larger than those of *malleola* in relation to the rest of the plate.

**Psychoda alternata** Say, 1824; Quate, 1959, Ins. Micronesia, Bishop Mus. 12 (4): 469.

**DISTRIBUTION:** Cosmopolitan.

**MALAYA.** Batu Caves, II–1960; 3 ♀ ♂


**DISTRIBUTION:** Borneo, Malaya, Ceylon.

**MALAYA.** Batu Caves, 3–IX–1959; 1 ♀.

DISTRIBUTION: Micronesia, Taiwan, Borneo, Malaya.


Psychoda malayica Quate, n. sp. Fig. 7.

Male: Body integument pale brown. Eyes separated by 2 facets, interocular suture present but weakened in center; bridge with 3 rows of facets but narrowing to 2 rows on median edge; frons with thick, quadrate patch of hairs anteriorly and narrow band extending posteriorly on midline to suture; palpus with segment 3 smallest, ratio of segment = 24 : 20 : 18 : 28; labellum with 4 teeth and 2 setae, few specimens with 3 setae on one side. Antenna 15-segmented, terminal 2 reduced, of equal size, well separated, 13 and 14 with apicolateral spinose tubercles; ascoids 4-branched.

Wing with forks complete, but M₃ weakened at base; vein tips without spots. Ratio of fore leg = 30 : 30 : 10 : 18, mid leg = 30 : 40 : 10 : 20, hind leg = 35 : 40 : 10 : 20. Geni-

Fig. 7. Psychoda malayica. a, antenna tip, ♂; b, head, ♂; c, wing, ♂; d, ♀ genitalia, left external view, right internal; e, ♂ surstyle; f, ♀ genitalia, dorsal view.
talia as figured, basistyle rather inflated laterally, dististyle evenly tapering to acute apex, lateral shaft slender and extending to tip of main shaft; surstyle of moderate length.

Antenna 1.0–1.3 mm, holotype 1.1; wing length 1.2–1.5 mm, holotype 1.2; wing width 0.5–0.6 mm, holotype 0.5.

Female: Similar to ♂; eyes separated by little more than 2 facets; genitalia as figured, subgenital plate weakly bilobed, genital digit with single apical spine.

Antenna 0.9–1.2 mm, allotype 1.1; wing length 1.4–1.9 mm, allotype 1.8; wing width 0.5–0.7 mm, allotype 0.7.


DISTRIBUTION: Tropicopolitan, except Ethiopian Region.


DISTRIBUTION: Micronesia, Borneo, Malaya.


DISTRIBUTION: Australia, New Zealand, Hawaii, Ryukyus, Borneo, Malaya.


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RECENT LITERATURE ON PACIFIC INSECTS

GENERAL


