

had a total length of 0.25 mm. Right coxa I and III were larger than their counterparts on the opposite side and almost filled the space left by the absence of coxa II.

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MILICHIIDAE AND CHLOROPIDAE (Diptera) FROM THE BATU CAVES, MALAYA

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Abstract: Several species of flies, 2 of them new, are recorded from Batu Caves.

This paper reports on two families of acalyptrate Diptera collected in the Batu Caves, near Kuala Lumpur, Malaya, by H. E. McClure, B. L. Lim and associates, and referred to me for study by Bishop Museum, Honolulu.

In 1929, F. W. Edwards published a short paper on the Diptera of the Batu Caves (*J. Fed. Malay States Mus.* **14**: 376-77) and recorded four species of acalyptrate Diptera from the caves. Two of these, *Chiromyia* (sic) *dubia* Lamb (Chyromyidae) and *Agromyza* (?) sp. (Agromyzidae) are outside the scope of this paper, although the latter, "a very small black species" and "in poor condition," might have been one of the Milichiidae recorded below. The *Phyllomyza* sp. (Milichiidae) of Edwards' list is probably *P. cavernae* Meijere. The record of *Tricimba cavernae* (Meijere) (Chloropidae) is a misidentification. Edwards' specimen is indeed a *Tricimba*, as kindly verified for me by H. Oldroyd of the British Museum (Nat. Hist.), but Meijere's *Oscinella cavernae*, of which I have seen the type in Amsterdam, is not. The Batu species is herein described as new. Edwards may have been

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misled partly by the fact that *cavernae* Meijere was also described from a cave and has a wing pattern almost identical to that of *batucola*, and partly by the suggestion of Frey (1923, Notulae Ent. 3: 111), who recorded *cavernae* as *Oscinella* but with a query that it might belong in *Notonaulax*, now a synonym of *Tricimba*.

Five species of Milichiidae, at least one of them new and described herewith, were found in the large sample submitted for study. The new species *Leptometopa mcclurei*, was easily the most abundant, and *Phyllomyza cavernae* second, but only one or two examples of the other milichiids were found. Specimens of one chloropid, *Tricimba batucola* n. sp., were found in small numbers.

Holotypes, allotypes, and paratypes of the new species are in the Bishop Museum: paratypes in the U. S. National Museum, National Museum of Malaysia and the British Museum (Nat. Hist). The specimens selected for the type series were mounted out of alcohol, and no doubt the colors in life and in pinned specimens would be darker than those stated here.

MILICHIIDAE

Leptometopa mcclurei Sabrosky, n. sp.

Tiny black species with small discal cell.

♂, ♀. Predominantly black, the halter knobs yellow and stalks brown, tarsi yellow except for distal segment or two, wing veins yellow.

Front $1.17\times$ as long as broad and $1.5\times$ as wide as an eye, slightly narrower in ♂, entirely shining, the narrow orbits only weakly distinguished, and no interfrontal stripes; ocellar tubercle inconspicuously brown pollinose; cheeks moderately broad, each $1/5$ eye height and $5/6$ breadth of antennal segment 3, slightly narrower in ♂, shining, upper $1/3$ smooth and polished, lower margin arcuate; frontal lunule prolonged ventrad between antennae, nearly touching the triangular epistoma; face deeply concave; proboscis not elongated, labellum equal in length to lower margin of head; antenna small, segment 3 orbicular, arista microscopically pubescent. Chaetotaxy as usual for the genus, bristles strong: inner and outer verticals, ocellars, postverticals, vibrissae, and on each side 2 laterocline upper orbitals and 2 mesocline lower orbitals; 2 pairs of interfrontal hairs in middle of front and a row of 4 minute hairs along anterior margin of front; 4 strong peristomal bristles on each side.

Thorax subshining, but thinly brown pollinose, only mesopleura and portions of sternopleura polished; mesonotum convex, as broad as long, sparsely beset with hairs; scutellum short and broad, bare of hairs; bristles strong: 1 humeral, 1+1 notopleural, 1 supraalar, 2 postalar, 2 posterior dorsocentral, 1 subapical and 1 apical scutellar, 1 pteropleural, and 1 sternopleural pairs of bristles; presutural bristle weak, hardly differentiated from hairs.

Abdomen subshining, chiefly finely brown pollinose, tergum 5 mostly polished, in ♂ longer than preceding 2 terga combined.

Legs slender, weak; hind tibia of ♂ only slightly broadened, appearing in posterior view to have an elongate oval swelling on distal $1/3$.

Wing venation similar to that of *Desmometopa*, but 1st costal sector short, small crossvein opposite subcostal break; discal cell short and slender, small crossvein opposite midpoint of cell, penultimate sector of vein 4, $0.7\times$ length of ultimate sector of vein 5; veins 3 &

4 subparallel throughout; setae on 1st costal sector not stout and black like those on 2nd sector. Length 1.5 mm.

Holotype ♂ (BISHOP 3623), allotype ♀ (BISHOP), and 100 paratypes (23♂♂, 67♀♀), Batu Caves nr. Kuala Lumpur, Malaya, 1959, H. E. McClure & B. L. Lim (BISHOP, USNM, NAT. MUS. MALAYSIA, BRIT. MUS.).

This small species is referred to *Leptometa* on the basis of the head structure (frontal lunule developed, epistoma broadened and triangular), no interfrontal stripes, pteropleural bristle present, 2 pairs of upper orbital bristles, and ♂ with enlarged hind tibia (though not broadened as in other species of genus). The slight development of the hind tibia and the unusually short discal cell separate it from other species of the genus.

***Phyllomyza cavernae* Meijere**

Phyllomyza cavernae Meij., 1914, Tijds. Ent. **57**: 253, pl. 7, fig. 28.

This species was originally described from a cave in Java. The black palpi, black-brown halter knobs, and 2nd and 3rd veins converging toward apex of wing are the distinctive features. Most of the known Oriental species have the palpi or halteres, or both, yellow. *P. nudipalpis* Malloch (Taiwan) and *P. tenebrosa* Brunetti (Assam) have palpi and halteres both black; but the former has elongated ♂ palpi, 1.5× the length of the head, and the latter has partly orange-yellow 3rd antennal segment and broad cheeks, 1/4–1/3 the height of an eye.

It is interesting to note that one of the other Oriental species, *P. tenebrosa* Brunetti (1924, Rec. Indian Mus. **26**: 104) was also described from a specimen collected in a cave—in Siju Cave, Garo Hills, Assam, 135–150 m from the entrance. As with most of the Miliichiidae, little is known of the biology of *Phyllomyza*. Several European species of the genus are known to be myrmecophiles.

***Milichia* sp.**

Only one specimen of this genus, collected 5.V.1959, was found in the sample examined. It is a ♀ and cannot be identified further at this time.

***Desmometopa* spp.**

Two ♀♀ that represent 2 different species were collected in the Batu Caves 5.V.1959. One is close to the widespread *D. sordida* (Fallén).

CHLOROPIDAE

***Tricimba batucola* Sabrosky, n. sp.**

Tricimba cavernae (Meijere): Edwards, 1929, J. Fed. Malay States Mus. **14**: 376. Misidentification.

Species with angular scutellum and 4 spine-like scutellar bristles; discal cell of wing short, and hind crossvein strongly oblique.

♂, ♀. Head dull, heavily gray pollinose; back of head, frontal triangle, and orbits black, remainder of front chiefly brown, yellowing toward anterior margin; face, cheeks,

palpi, and proboscis yellow; antenna yellow, segment 3 infuscated dorsally; arista dark brown, basal segments yellow. Thorax black except for brown to brownish red scutellum, humerus below, and propleuron, all heavily gray pollinose except polished black postscutellum. Abdomen brown, pollinose. Legs, including fore coxa, chiefly yellow, all femora centrally and median band on hind tibia brown, tarsi probably brownish distally. Wing clear, costa yellow but remaining veins brown, appearing spotted because of dark brown to black distal $1/3$ (thickened) of vein 1, curved apical portion of vein 2, and fore crossvein; halteres whitish yellow, partially lightly browned in some specimens. All bristles and hairs yellow.

Front nearly square, wider than an eye; ocellar tubercle swollen; frontal triangle small, narrow, no wider than ocellar tubercle at base, narrowly acuminate anterior to median ocellus, ending midway of front; cheek narrow, $1/2$ breadth of antennal segment 3 and $0.18\times$ height of an eye; antennal segment 3 orbicular; arista slender, short pubescent, basal segment elongated; cephalic bristles short, stout and spine-like: outer verticals, erect and convergent ocellars and postverticals, and 3 pairs of orbitals, a few lower orbitals and vibrissae somewhat weaker and inconspicuous.

Mesonotum with deeply incised lines of strong punctures, a median row, 2 rows in each dorsocentral position, and a partial supraalar row on each side; mesonotal hairs thick, relatively sparse, a single row of intermediate acrosticals between median row and each dorsocentral position; thoracic bristles stout, spine-like, the $1+1$ notopleural, posterior dorsocentral, 1 subapical and the apical scutellar pairs outstanding, the humerals and postalars as short as hairs, inconspicuous. Scutellum angular, with approximated, convergent apical scutellars and well separated, slightly divergent subapicals, all bristles arising from lower margin of the high, convex scutellum.

Legs slender, hind tibia with posterodorsal oval "sensory area," $0.4 \times$ length of tibia.

Wing with proportions of 2nd, 3rd, and 4th costal sectors as $35 : 35 : 17$; marginal cell narrow, vein 2 paralleling costa, then curving forward at apex; veins 3 & 4 diverging on distal $1/4$; first basal cell broadened in middle; discal cell short, the penultimate sector of third vein $2/3$ as long as that of vein 4, the latter sector only slightly shorter than ultimate sector of vein 5; fore crossvein beyond middle of discal cell, opposite 0.6 of its length; hind crossvein strongly oblique, upper angle of discal cell acute; anal area of wing strongly developed. Length 1.5–2.0 mm.

Holotype ♂ (BISHOP 3624), allotype ♀ (BISHOP), and 130 paratypes (52 ♂♂, 78 ♀♀; BISHOP, USNM, NAT. MUS. MALAYSIA, BRIT. MUS). Batu Caves nr. Kuala Lumpur. Malaya, 1959 and 1960, H. E. McClure & B. L. Lim). The holotype, allotype, and 39 paratypes were collected in Cavern C, 14.VII.1959.

This species is related to the Palaearctic *T. lineela* (Fallén). In the form of the scutellum and scutellar bristles it is reminiscent of the Nearctic *T. spinigera* Malloch. It is easily distinguished from the other known Oriental species of *Tricimba*, *fascipes* Becker and *marina* Becker from Taiwan and *annulipes* Duda from Sumatra, by the short 2nd costal sector and oblique hind crossvein.