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Leicester, 1908 (Diptera, Culicidae) from
Malaysia

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Redescription of *Topomyia argenteoventralis* Leicester, 1908 (Diptera, Culicidae) from Malaysia

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Abstract: Detailed redescriptions and illustrations of the adults as well as genitalia, pupa and larva of *Topomyia* (*Suaymyia*) *argenteoventralis* Leicester, 1908 were presented based on the specimens collected in Malaysia. The larva of the species is predacious, having well developed maxilla and breeds in leaf axils of various kinds of taro plants.

Key words: mosquito, Culicidae, *Topomyia argenteoventralis*, Malaysia

In 1908, Leicester described *Topomyia argenteoventralis* on the basis of the males and females from Selangor, Malaysia. Edwards (1922) illustrated the male genitalia of the species based on the specimens of Leicester's collection in the British Museum. Brug (1931) described and illustrated the larva of *To. argenteoventralis* based on the specimens from Sumatra, Indonesia. In 1959, Thurman proposed the subgenus *Suaymyia* (Orthotype: *Topomyia cristata* Thurman, 1959) and placed the species in this subgenus. Several larval collections of the mosquitoes were made in the secondary rain forest from the central mountain range of Gombak, Peninsular Malaysia. The collections included adults, larvae and pupae, and their exuviae of *To. argenteoventralis*. As the original descriptions of the species, especially of the immatures, are inadequate and the illustrations are scanty, these stages are redescribed and illustrated in this paper.

The terminology used for the adults and immature stages follows mainly Harbach and Knight (1980, 1982), Harbach and

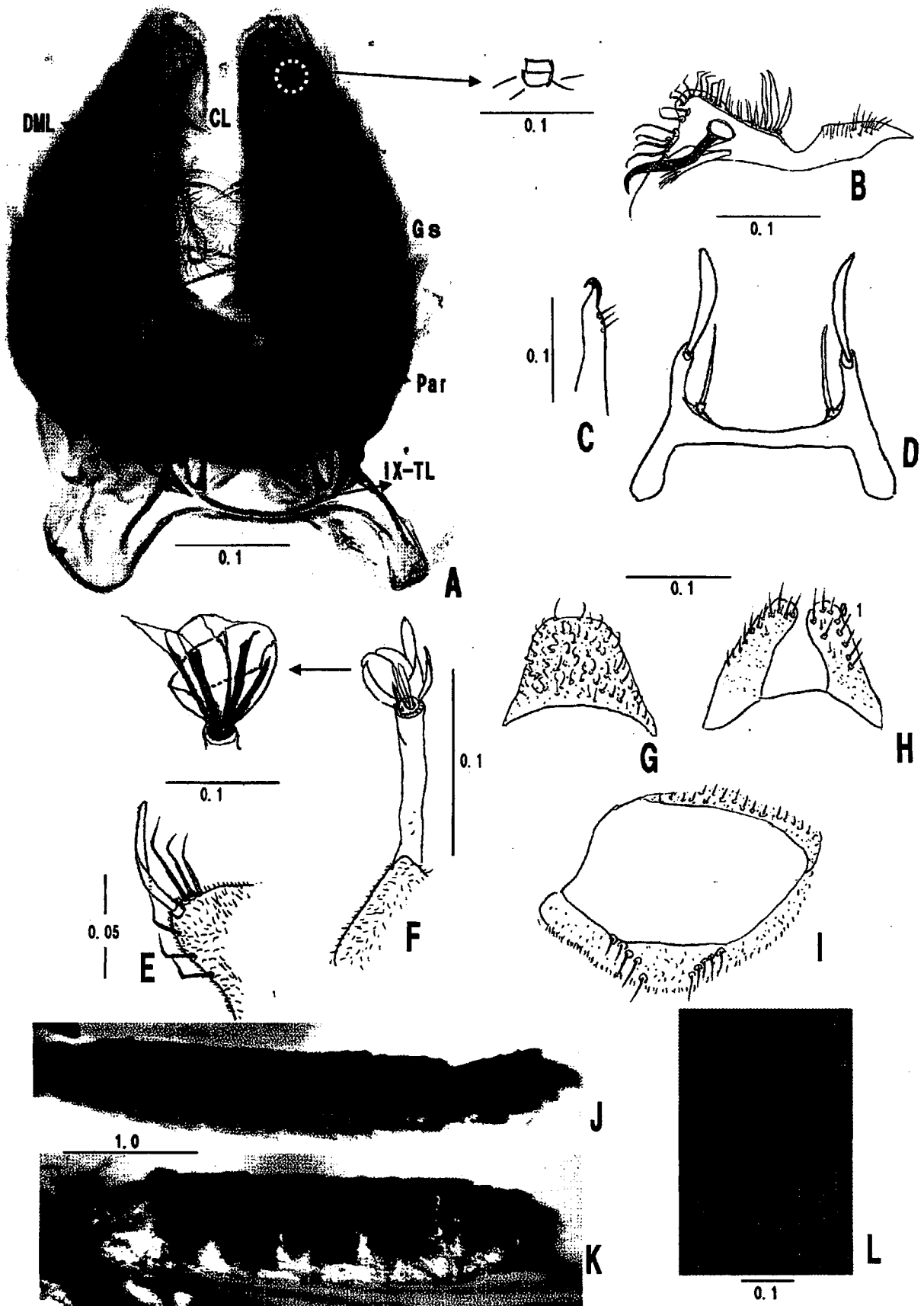
Peyton (1993) and partly Belkin (1962). Some of the specimens examined will be deposited in the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, D.C., and other institutes, after our taxonomic work on the genus *Topomyia* is accomplished.

Topomyia (*Suaymyia*) *argenteoventralis* Leicester

(Figs. 1, 2 and 3; Tables 1, 2)

Topomyia argenteoventralis Leicester, 1908, Stud. Inst. Med. Res. F.M.S., 3: 240. Type specimens: male and female. Type locality: The Gap (Selangor), Malaya. Edwards, 1922, Indian J. Med. Res. 10: 240 (illustration of male genitalia). Brug 1931, Arch Hydrobiol. 2: 13 (illustration of larva).

Topomyia (*Suaymyia*) *argenteoventralis* of Thurman, 1954, Univ. Maryland Arg. Expt. Sta. Bull. A-100, 44–45 (new combination).



Male.

Head: Black in dorsal aspect; vertex closely covered with broad flat dark scales, with somewhat purple reflections; apical part of vertex with a diamond-shaped silver scale patch; a line of yellow scales along ocular suture; erect scales and narrow decumbent scales absent on occiput; a pair of brownish interocular and several black ocular setae present; postgena covered with a small silver scale patch. Clypeus small, dark brown. Maxillary palpus black, short, about 0.11 of proboscis, covered with dark scales. Proboscis slender, 2.41 mm, longer than antenna; slightly swollen at the distal end and covered with dark scales with yellow scale patch ventrobasally. Pedicel brown closely covered with fine grayish scales.

Thorax. Scutum densely covered with velvety black scales and with a median silvery line from anterior promontory to prescutellar area; the line consisting of double rows of overlapping flat silvery scales; 2 anterior and 1 posterior dorsocentral setae, 2 prescutellars, many antealars and supraalars. Thoracic pleura densely covered with silvery reflected spatulate scales on upper and lower postpronotal, anteppronotal, upper proepisternal, postspiracular, subspiracular, prealar, upper and lower mesokatepisternal, upper mesepimeral and metepisternal areas. Conspicuous black setae absent on the pleuron, except about 20 anteppronotals, 1 well developed and 3–4 fine postpronotals, 2–4 lower anteppronotals and 4 upper mesepimerals. Scutellum with flat silvery scales and 1 or 2 well developed setae on median lobe, and 3 or 4 setae on each lateral lobe and with black spatulated scales.

Wing. Length 3.67 mm: Cell R_2 about 3.0 of stem R_{2+3} ; alula with 6–7 fine scales on margin distally; upper calypter without setae. Haltere: Scabellum pale, pedicel and capitellum with dark scales.

Legs. Coxae and trochanters yellow, with silvery-white scales, trochanters with some dark scales dorsally at apex; femora, tibiae and tarsi dark scaled dorsally, femora and tibiae

yellow scaled ventrally. Forefemur 3.0 mm. Forefemora as long as mid- and hindfemora; first tarsal segment of all legs ($Ta-I_1$ – $Ta-III_1$) as long as each tibia ($Ti-I$ – $Ti-III$). All unguis small, equal in size, without a lateral tooth.

Abdomen. Terga dark-scaled without white dorsal patch on all segments, marked lateral bands on all segments (Fig. 1J). All sterna with white spatulate scales.

Genitalia (Fig. 1A–F). Lobes of tergum IX (Fig. 1D) widely separated by narrow bridge, each lobe attenuated apically, terminating in single stout large blade-like seta, the seta longer than the stem of the lobe, and one seta closely spaced on inner basal margin of each lobe. Gonocoxite. Length about 2.8 times breadth at middle. Dorsopreapical part of gonocoxite with a minute round hole (Fig. 1A). Dorsomedian lobe (Fig. 1E) with one long stout flattend spine and with several well developed setae apically curved. Claspette (Fig. 1F) well developed with a peculiar flower-like terminal appendage. Gonostylus (Fig. 1B) complicated with many curved setae dorsoapically and with a large gonostylar claw curved apically. Paramere (Fig. 1C) or paraproct long and slender curved apically.

Female.

Wing about 4.00 mm. Proboscis, 2.50 mm. Forefemur 2.75 mm. Abdomen, 2.6 mm. Resembles male, except abdominal spots: terga (Fig. 1K) covered with dark purple-brown scales, a large patch of white scales on the 2nd segment, large patch of white scales on the 4th to the 6th segments.

Genitalia (Fig. 1G–I). Cercus (Fig. 1H) well developed, divided into two lobes, with several marginal setae and with many fine setae; postgenital lobe (Fig. 1G) round slightly at apical margin and with many hook-like setae scatteringly; upper vaginal lip (Fig. 1I) with short bridge with a row of 5–6 fine setae.

Pupa (Fig. 2, Table 1).

Abdomen (Fig. 2C, D) 4.00–4.75 mm length

Fig. 1. Male (A–F) and female (G–I) genital organs, abdomens (J, K) and pupa (L) of *Topomyia* (*Suaymyia*) *argenteoventralis*.

A, male genitalia (dorsal view) and a small hole on apical gonocoxite (Gc); B, gonostylus (Gs), tergal view; C, paramere (Par) with lateral view; D, tergum IX (IX-TL), ventral view; E, dorsomesal lobe (DML), ventral view; F, claspette (CL) with flower-like terminal appendage; G, postgenital lobe, ventral; H, cercus, ventral view; I, upper vaginal lip, ventral view; J, male abdomen, lateral view; K, female abdomen, lateral view; L, pupal trumpet, lateral view. Scales in mm.

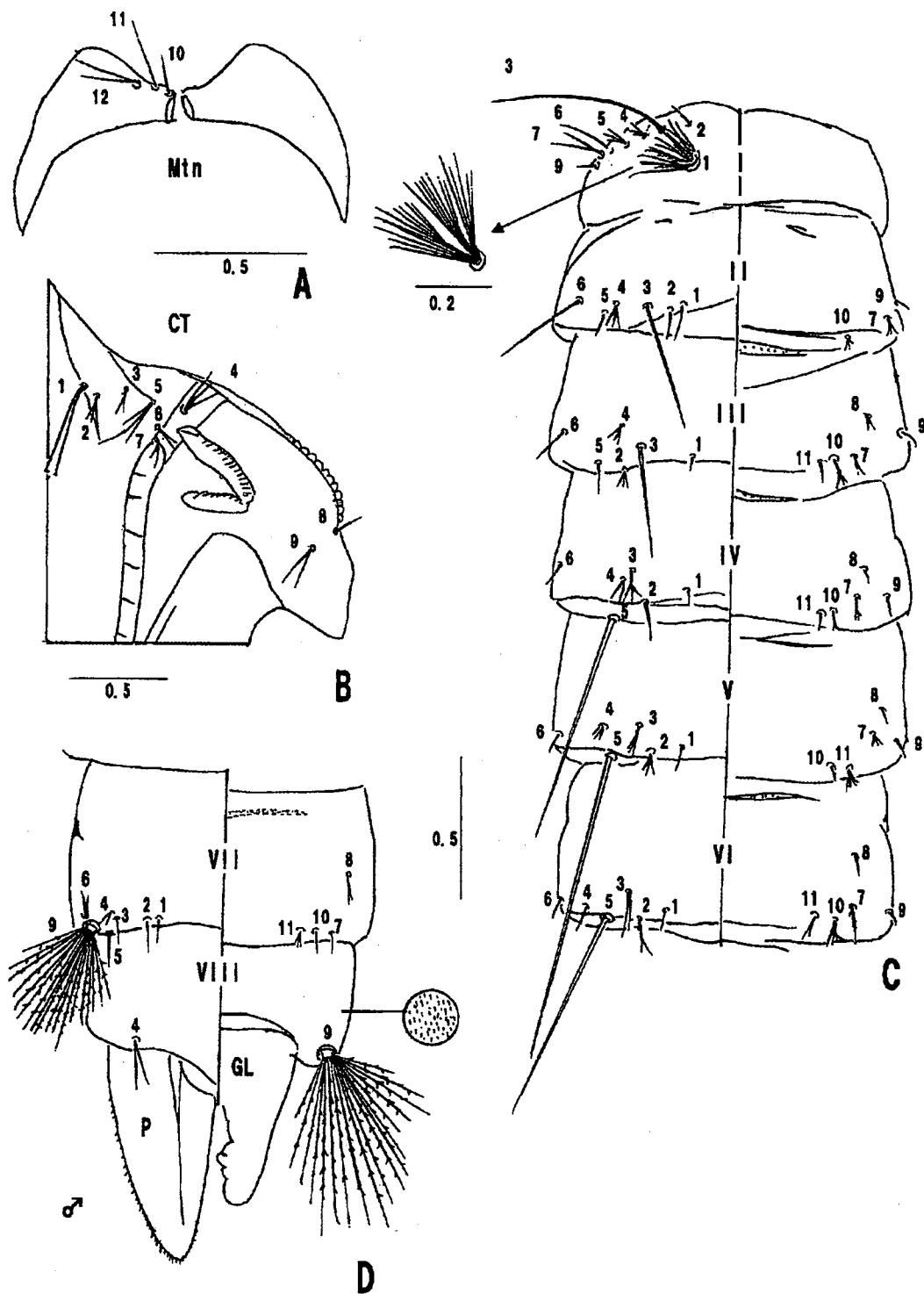


Fig. 2. Pupa of *Topomyia* (*Suaymyia*) *argenteoventralis*.

A, metanotum (Mtn); B, cephalothorax (CT) of male; C, abdomen; D, terminal part of abdomen. Scale in mm.

(from segments 1 to 8). Trumpet 0.40–0.48 mm, index 3.08–4.36. Paddle 0.76–0.83 mm, index 2.57–4.43. Chaetotaxy as figured and given in Table 1. Metanotum and cephalothorax (Fig. 2A, B): Trumpet (Fig. 1L) yellow-brown in

color, with fine sculpturing, not strongly broadened widely towards pinna. Seta 1-CT long, conspicuous, double. Abdominal seta 3-II, III single, well developed. seta 5-IV–VI single, large; seta 9-VII, VIII large, with 18–20

Table 1. Chaetotaxy of the pupa of *Topomyia* (*Suaymyia*) *argenteoventralis*.

Seta no.	Cephalo-thorax	Abdominal segments							
		I	II	III	IV	V	VI	VII	VIII
0	—	—	—	—	—	—	—	—	—
1	2	3, 4*	1	1	1	1	1	1	—
2	1 3	1	1	1-3	1	1-4	1, 2	1	—
3	2-3	1	1	1	1-4	1-4	1, 2	1	—
4	3	2-4	3	1-4	1, 2	1-3	1-4	1, 2	1, 2
5	3	3, 4	1	1	1	1	1	1	—
6	2	1	1	1, 2	1	1	1	1, 2	—
7	3	1-3	1-3	1-3	1-3	1-4	1	1	—
8	1	—	—	1, 2	1	1	1, 2	1, 2	—
9	1, 2	1	1	1	1-3	1-3	1	18 20**	18-20**
10	1	—	1-4	1-3	1	1-3	1-3	1	—
11	1	—	—	1	1	1-4	1, 2	1-3	—
12	2	—	—	—	—	—	—	—	—

* Fanlike seta with 3, 4 aciculate dendritic branches.

** Barbed.

Most of the small setae were single with 2-4 forks apically.

Specimens examined: 2 pupae and pupal exuviae from Gombak, Malaysia.

branches. Paddle long, ending in a point, uniformly and lightly pigmented with a distinct midrib and with minute spicules along apical margin. Male genital lobe extending to about 0.7 of paddle.

Fourth-instar Larva (Fig. 3A-I).

Head (Fig. 3B). Length 0.8-1.1 mm, width 1.0-1.3 mm. Siphon 0.8-1.0 mm. Chaetotaxy in Table 2 and as figured. Mental plate (Fig. 3C) with median tooth and 6-7 small teeth on either side. Mouth parts modified for predation. Mouth brushes stout pectinate. Mandible black, with a large apical tooth and 3 ventral teeth. Maxilla (Fig. 3D) large, about 0.38 mm. Maxillary bundle (MxBn) well developed, shorter than length of maxillary body (MxBo), MxBn/MxBo index 1.80; a tuft of several well developed MxB (Maxillary brush); 2 apical teeth (AT) small process; seta 4 on MxBo well developed, single, situated at basal 0.71 of maxillary body. **Antenna** (Fig. 3A) length about 0.32 of head. Seta 1-A weak, single, arising 0.75 from base, extending over tip of antenna. Seta 1-C stout, simple; setae 6, 11 comparatively well developed single. **Abdomen**. Setae pigmented. Seta 5 stellate with aciculate branches present on segments III-VII. Seta 6-I well developed, 7-8 branched with aciculate. Seta 7-I-VII 3-9 branched with aciculate. Comb scales 5-7 in an irregular row; individual scales (Fig. 3H) usually pointed and with fine fringes

towards base. Siphon (Fig. 3F, G): usually long, variable length, broad at base, tapering, lightly pigmented with fine speckles evenly, index 5.8-9.0. Many small pecten teeth (Fig. 3I), placed irregularly. Ventral setae (1a) of siphon 6-8, unpaired, well developed into strong, simple setae, but apical two small single or bifid. Dorsal seta (2a) 2 pairs, the apical one fine with 2-4 branches, the basal one well developed, fine and curved apically. **Saddle**. Incomplete, with fine spines on posterior margin. 1-X 2 branched with aciculate, 2-X 8-10 branched, 3-X single; 4-X 8-10. Gill elongate, tapering.

Specimens Examined. The following specimens were collected as larval and pupal stages from leaf axils of many kinds of taro plants (*Colocasia* and *Alocasia*) and reared in the laboratory. Ulu Gombak, about 30 km from Kuala Lumpur, Peninsular Malaysia, 2003 and 2004.

1♂ (031004-5) on pin with genitalia G 180 on slide, with L (larval) and P (pupal) exuviae mounted on slide L, P (50). 1♀ (031004-15) with L, P (120). 1♀ (040416-5) with L, P (798). 1♂ (040317-3) with G24, L, P (71). 1♂ (041018-30) with G29, L, P (121). 1♀ (040319-9) with L, P (792). 3 Larvae (031007-6, 040317-5 and 040317-25).

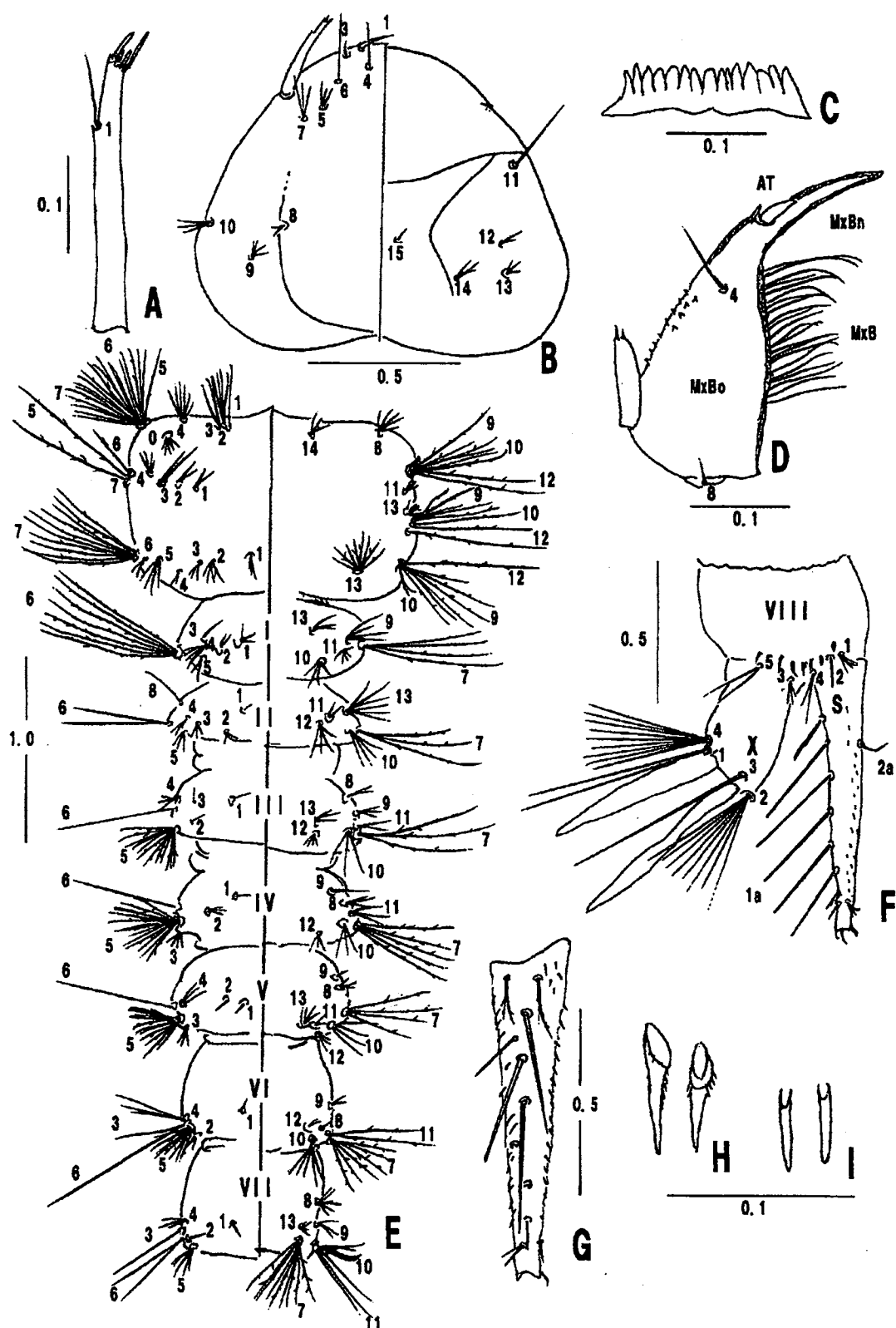


Fig. 3. Larva of *Topomyia* (*Suaymyia*) *argenteoventralis*.

A, antenna; B, head; C, dorsoscutum; D, maxilla; E, thorax and abdominal segments I-VII; F, abdominal segments VIII, X and siphon(S); G, siphon, ventral view; H, comb teeth; I, pecten. Scales in mm.

Table 2. Chaetotaxy of the larva of *Topomyia* (*Suaymyia*) *argenteoventralis*.

Seta no.	Head	Thorax			Abdominal segments							
		P	M	T	I	II	III	IV	V	VI	VII	VIII
0	—	6-12	—	—	—	—	—	—	—	—	—	—
1	1	1-2	1, 2	2-4	3-4	1	1	1	1	1	1	4-7
2	—	3, 4	1, 2	5-7	2, 3	2, 3	1	1-3	1	1-3	1	1
3	1	2-4	2	3-6	1	3	1	3, 4	2-4	1	1	3
4	1	6-11*	3, 4	1-3	4, 5	2, 3	2, 3	—	2, 3	3	3, 4	1, 2
5	1-3	3-5*	1*	3-5*	2, 3	3, 4	10-13**	12-18**	10-15**	10-15**	5-7	2
6	1	8-14*	1*	2, 3*	7, 8*	2	1	1	1	1	1, 2	—
7	2-4	8-14*	1*	10-12*	4, 5*	3*	3*	4, 5*	4*	6*	6-9*	1-X=2
8	1, 2	4, 5	—	—	—	1	1-3	1-3	3, 4	1-3	5-7	2-X-8-10
9	3-5	1, 2*	4, 5*	6-10*	4	—	3, 4	1-3	1	2-4	3, 4	3-X-1
10	2, 3	3, 4*	2*	1, 2	5-7	4	3, 4	3-6	4	5	5, 6	4-X-8-10
11	1	3*	—	—	5-7	2	2	1-3	1, 2	1-3	3, 4	—
12	1-3	1-3*	1*	1*	—	4-6	4, 5	2-4	1-3	2	—	—
13	1-3	—	3, 4	8-11*	3, 4	6-8	3	—	3, 4	—	3-5	—
14	3	3, 4	—	—	—	—	—	—	—	—	—	—
15	1, 2	—	—	—	—	—	—	—	—	—	—	—

*Barbed. **Stellate.

Specimens examined: 2 fourth-stage larvae and larval exuviae from Gombak, Malaysia.

Taxonomic Discussion. Thurman (1959) proposed the subgenus *Suaymyia* and distinguished it from the subgenus *Topomyia* by certain characters of the adult male legs, foretarsomeres and genital organs. In the male genital organs of *Suaymyia* the lobe of tergum IX are widely separated and the dorsal lobe of the claspette is absent. Thurman included *To. argenteoventralis* in the subgenus *Suaymyia*, due to the typical tergum IX even though the species possesses a rod-like dorsal lobe on the claspette. *Topomyia argenteoventralis* appears to be closely related to *To. (Suaymyia) houghtoni* Feng, 1941 and *To. (Suaymyia) tumetarsalis* Chen and Zhang, 1988 in the adult male, larval and pupal stages (Ramalingam, 1983; Chen and Zhang, 1988). In the male genital organs of the latter two species the claspette has setaceous ventral lobe only, without rod-like dorsal lobe, and well developed setae are absent on inner basal margin of IX-T, whereas *To. argenteoventralis* has a rod-like dorsal lobe with apical flared flange (a peculiar flower-like terminal appendage) and one seta on inner basal margin of each lobe of IX-T. The larval stage of *To. ar-*

genteoventralis can be distinguished by the siphon with 6-8 unpaired strong spine-like setae and 5-7 comb scales in a irregular row. In the pupa it is difficult to distinguish *To. argenteoventralis* from the two other species.

Biological Notes. The larvae of *To. argenteoventralis* were collected exclusively from leaf axils of taro plants (*Colocasia/Alocasia*) in mountainous areas. In the present collection from the Gombak forest, the larvae of *To. argenteoventralis*, *Topomyia (Sua.) auriceps* Brug, *To. houghtoni*, *Topomyia (Topomyia) tipuliformis* Leicester, *Topomyia (Top.) gracilis* Leicester, *Topomyia (Top.) pilosa* Brug, and *Malaya genurostris* Leicester were found exclusively in the leaf axils of various kind of taro plants. Larvae of the first 4 species are predacious, and have more or less developed maxillary bundle. Usually the larvae of these species were found solitarily in each leaf axil of the plants.

Distribution. Known from Ulu Gombak, Peninsular Malaysia, Kuching Sarawak, East Malaysia and Sumatra, Indonesia.

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