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TOPOMYIA JAVAENSIS: A NEW INDONESIAN SPECIES IN THE SUBGENUS *TOPOMYIA* (DIPTERA: CULICIDAE)

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ABSTRACT. A new species, *Topomyia (Topomyia) javaensis,* is described from Java, Indonesia. The adult male and female, male genitalia, larva, and pupa are described in detail, and illustrations of the male genitalia, larva, and pupa are provided.

INTRODUCTION

In September 1991 and December 1993, several larvae of *Topomyia* were collected in leaf axils at an elevation of 1,000 m on Mt. Cibodas in the Bogor Botanical Garden in West Java. These mosquitoes were transported to the Laboratory of Medical Zoology, University of the Ryukyus, Japan, where they were reared. After careful examination and comparison with other species of *Topomyia* (Knight and Stone 1977; Ward 1984, 1992), we confirm the status of this species and here describe it as a new species, *Topomyia (Topomyia) javaensis.* The terminology used follows Harbach and Knight (1980, 1982).

TAXONOMIC TREATMENT

Topomyia (Topomyia) javaensis Miyagi and Toma, new species

Male. Small to medium-sized mosquito. Wing about 2.4 mm. Proboscis about 1.7 mm. Dark brown mosquito with silver markings on head and thorax. *Head*: Vertex and postgena covered with broad, flat, silver scales; a pair of prominent interocular and 4 ocular setae. Clypeus small, brown, bare. Maxillary palpus short, about 0.05 length of proboscis, covered with dark scales. Proboscis slender, covered with dark scales, except for a ring of silver scales on basal 0.1–0.5 and without ventral line of white scales. Antenna about 1.4 mm, as long as proboscis; pedicel black without scales; flagellum black, flagellomeres of fairly even size and whorls with 7–9 setae. *Thorax*: Integument of scutum, scutellum, and pleura dark brown; scutum densely covered with narrow curved brown scales, with a median line consisting of 2 rows of flat silver scales; 4–5 dorsocentral setae, 1–3 anterior promontory setae, and about 10 supraalar setae present; scutellum with broad silver scales and 4 strong marginal setae on central lobe, and with dark scales and 2 long setae on lateral lobes. Antepronotum with silver scales dorsally and a row of several setae on anterior margin. Postpronotum covered with broad flat silver scales; proepisternum with silver scales and 1 seta; subspiracular area, postspiracular area, mesokatepisternum, and mesanepimeron covered with broad silver scales; paratergite bare; several yellow upper mesepimeral setae present. *Halter*: Capitellum and pedicel with dark scales. *Legs*: Coxae and trochanters largely covered with silver scales like those of pleura; 3 or 4 yellowish coxal setae present. Remaining parts of all legs covered with small dark scales except for ventral pale scales extending from femur to tibia of foreleg; terminal part of foretibia and basal part of foretarsus with conspicuous setae. Femora longer than tibiae; tibia about same length as tarsomere 1 on fore- and midlegs, shorter on hind leg. *Abdomen*: Terga I–VIII covered with dark brown scales, without white scales; sterna I–VIII covered with flat golden scales.

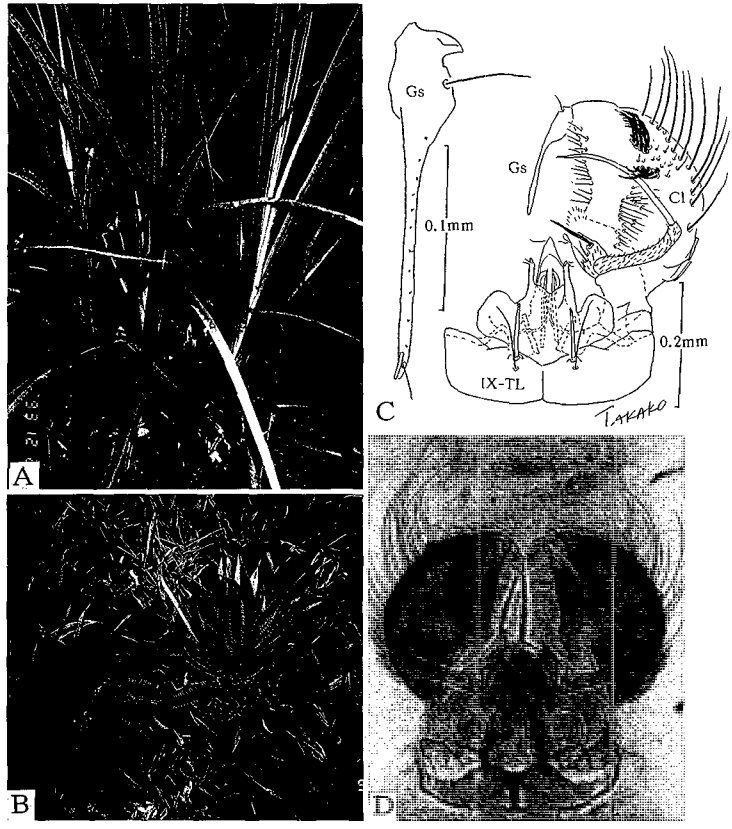

Fig. 1. Habitat and morphology of the adult of *Topomyia* (*Topomyia*) *javaensis*. A,B, Leaf axils of *Eryngium pandanifolium* and of *E. broeliaefolium*; C,D, male genitalia (Gs: Gonostylus; Cl: Claspette; IX-TL: 9th tergal lobe).

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Fig. 2. Pupa of *Topomyia* (*Topomyia*) *javaensis*. A, Cephalothorax of male; B, terminal part of abdomen of female; C, metanotum and abdomen of male.

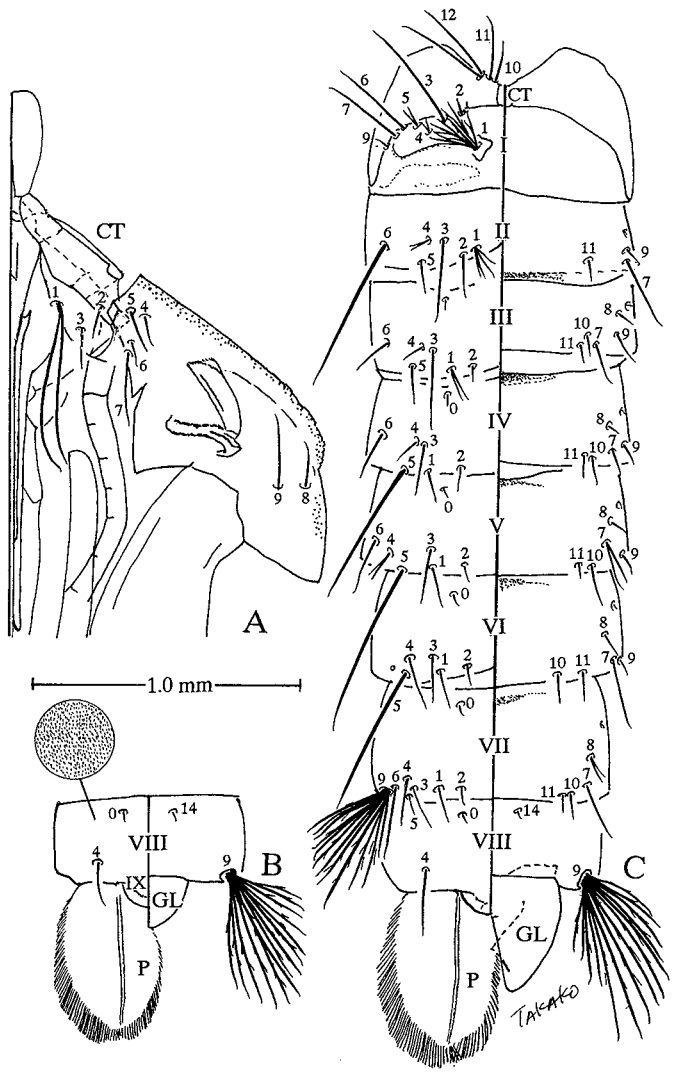
CT
A
1.0 mm
B
C
GL
P
TAKAKO

Table 1. Branching of the seta on pupa of *Topomyia (Topomyia) javaensis.*

Seta no.	Cephalothorax	Abdominal segments							
	CT	I	II	III	IV	V	VI	VII	VIII
0	—	—	1	1	1	1	1	1	1
1	2[1]	M[1,2]	1–9	1–5	1–4	1–3	1–4	1–3	—
2	1–3	1	1	1	1	1	1	1	—
3	1–3	1	1	1–3(1)	1–3	1–3	1–3(1)	1	—
4	1–6	1–3	1–6	1–3	1,2	2–5	1–3	1	1
5	1–4	1–6	1–3	1–3	1[1]	1[1]	1[1]	1	—
6	1,2	1,2(1)	1,2[1](1)	1,2(1)	1–3	1,2(1)	—	1–4	—
7	1	1,2(1)	1,2(1)	1–4	1–3	1–4	1	1,2(1)	—
8	1–5	—	—	1–4	1,2	1	1–3	2–6	—
9	1,2	1–3	1	1,2(1)	1–3(1)	1,2(1)	1–6	12–29[1]	14–23[1]
10	1–4	—	—	1,2	1,2	1,2(1)	1,2	1,2(1)	—
11	1,2(1)	—	1,2(1)	1	1,2	1,2	1,2	1–3	—
12	1–3	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	1

Chaetotaxy count from a total of 10 specimens. Numbers indicate range of branches and those in parentheses show modal number.

[1] Prominent seta.

[2] M = multiple branched.

Genitalia (Fig. 1C,D): Tergum IX broad throughout with a longitudinal midline; lobes not prominent, posterior margin slightly concave; each lobe with a strong submedian flat spine and an elongate pointed seta close to the spine. Gonocoxite short, about 1.6 times width at middle, narrow at apex, with many scales and long setae on outer margin; 2 patches of about 10 conspicuous recurved setae present on inner subapical area and slightly distad of central area. Ventral arm of claspette setaceous, with a long distinct spine and several setae at base; dorsal lobe of claspette a long, curved, rodlike stem with an elongate spine, filamentous at tip. Gonostylus not curved, broader at base, bearing a short curved gonostylar claw and a fine seta at tip. Paraproct with 1 or 2 setae.

Female. Wing about 2.8 mm. Proboscis about 2.0 mm. Antenna about 1.9 mm. Resembles male except ventral pale band on proboscis not prominent.

Pupa (Fig. 2). Abdomen about 2.5–3.2 mm. Trumpet about 0.29–0.36 mm. Paddle about 0.54–0.62 mm. Integument of cephalothorax (CT) and abdomen yellow. Chaetotaxy as in Fig. 2 and Table 1. *Trumpet*: Dark yellow in color, slightly flattened, not laterally expanded; index about 3.5; pinna about 0.2 trumpet length. Seta 1-CT long, conspicuous, double; setae 2–4,8–12-CT inconspicuous, 1–6 branched. *Abdomen*: Seta 1-I dendritic with 5–6 main branches, each divided repeatedly and ending as fine hairlike branches. Seta 3-I and 5-IV-VI long, single; 9-VII 12–29 branched, aciculate; 9-VIII 14–23 branched, aciculate; minute spines on sterna II–VIII. Male genital lobe as illustrated in Fig. 2, extending to 0.73 of paddle, female genital lobe 0.34 of paddle. *Paddle*: Uniformly and lightly pigmented, with midrib and distinct long marginal fringe; length 1.7–2.0 times width.

Larva (Fig. 3). *Head*: Length about 0.70–0.84 mm. Width about 0.82–0.96 mm. Pigmentation yellow, integment smooth. Dorsomentum with median tooth and 9–11 smaller teeth on either side. Maxilla without well-developed maxillary horn. Seta 1-C single, weak, pigmented, curved, pointing backward and downward, 4–7-C single, long; 0,3-C single, weak; 8-C 1–3 branched; 9-C 2–4 branched, weak; 10-C single or double, weak; 11-C long, 3–5 branched; 12-C 3–5 branched; 13-C single; 14-C long, 6–12 branched; 15-C 2–4 branched, weak. *Anten-*

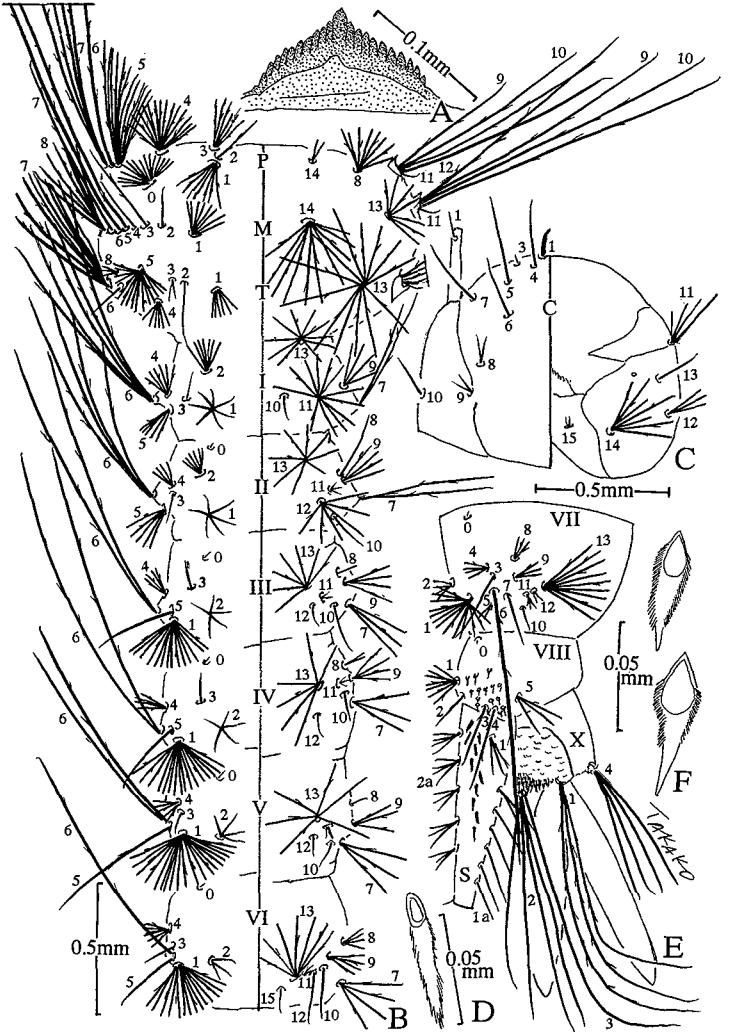

Fig. 3. Larva of *Topomyia* (*Topomyia*) *javaensis*. A, Dorsomentum; B, thorax and abdomen; C, head; D, pecten; E, terminal abdominal segments; F, comb scales.

Table 2. Branching of the setae on the fourth-instar larva of *Topomyia (Topomyia) javaensis.*

Seta	Head	Thorax			Abdominal segments							
no.	C	P	M	T	I	II	III	IV	V	VI	VII	VIII
0	—	15–24	—	—	—	1	1	1	1	1	1	1
1	1	7–14	8–17	6–10	7–11	6–10	14–21	16–23	19–27	14–30	13–24	7–11
2	—	1	1,2	1	7–16	6–11	4–6	3–5	3–5	3–6	4–6	1,2(1)
3	1	5–12	1,2(1)	2–5	1,2	1–3(2)	1	1	3–5	2–4	1	1–3
4	1	14–22	1,2	6–9	6–10	3–7	4–7	4–6	5–7	5–7	4–6	1
5	1	12–20[1]	1[1]	15–24	4–9	4–8	1	1–3	1	1	1–3	2–4
6	1	1[1]	1[1]	1–3	5–7[1]	4–6[1]	2[1]	2,3[1](2)	2[1]	1[1]	1[1]	—
7	1	5–7[1]	1[1]	8–11[1]	2–4[1]	2,3[1](2)	3–7	3–7	3–6	3–6	1,2	—
8	1–3	8–14	6–12[1]	3–6	—	1,2(1)	1–3	2–4	2–4	4–8	3–6	—
9	2–4	1[1]	2–4[1]	5–8[1]	4–9	4–8	4–9	5–9	3–6	4–7	3–6	—
10	1,2	1–3[1](2,3)	1[1]	1[1]	1–4(1)	1,2(1)	1–4(1)	1,2	2–4	1,2(1)	1	—
11	3–5	1,2(1)	1	1	12–16	3–6	3–6	3–6	3–5	3–6	3–6	—
12	3–5	1	1[1]	1	—	6–12	1	1	1	1–3(1)	2–4	—
13	1	—	7–15	13–22	10–15	7–13	7–11	5–10	5–8	7–11	7–11	—
14	6–12	2–4	10–16	—	—	—	—	—	—	—	1	1
15	2–4	—	—	—	—	—	—	—	—	1–4	—	—

Chaetotaxy count from a total of 10 fourth-stage larvae. Numbers indicate range of branches and those in parentheses show modal number. Antenna: 1-A, 1,2(1). Abdomen: 1-X, 3,4[1]; 2-X, 3–5[1]; 3-X, 1[1]; 4-X, 4–8[1]. Siphon: 1-S, 3–6.

[1] Prominent seta.

na: Length about 0.35 head length. Seta 1-A usually single, inserted about 0.81 from base, over tip of antenna. *Thorax*: Seta 6-P long, single, 1.6 length of 7-II; 7-P long, 5–7 branched, 1.6 length of 7-II; 5,6-M long, single, 1.9 length of 7-II; 9-T long, 5–8 branched, 1.7 length of 7-II; 10-T long, single, 1.9 length of 7-II; 12-T single, 0.6 length of 7-II. *Abdomen*: Comb scales in a patch, 23–49 in number, pointed, and with fine fringe. *Siphon*: Long, about 0.7 mm, broad at base and tapering toward apex. Index about 4.3–5.5; 4–19 pecten teeth extending from base to apical half. Seta 1-S 2–4 branched; 1a-S 6–9 in number, each single or double, always on a line; 2a-S 8–13 total, 4–7 (each seta paired or unpaired) on each side, each seta with 1–6 branches.

Type data. The *holotype* male of *Topomyia javaensis* (910906-2), with associated pupal exuvia (188) and male genitalia (G-22) mounted on 2 slides, possesses the following collection data: Mt. Cibodas (1,000 m), Bogor Botanical Garden, West Java, Indonesia, 6 Sept. 1991, collected as a pupa from leaf axil of *Eryngium pandanifolium* Chamand (Fig. 1B). It will be deposited in the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC. The *allotype* female (910906-1), with associated larval and pupal exuviae (187) mounted on slide, with same collection data as the holotype except collected as larva by I. Miyagi from leaf axil of *Eryngium broeliaefolium* Delar (Fig. 1A). Additional specimens designated as *paratypes* with following collection data: Mt. Cibodas, Bogor Botanical Garden, West Java, Indonesia, 21 Dec. 1993, collected by Miyagi and Toma as larvae from leaf axils of same plants as the holotype; 10 males (931221-1-6,-23,-26,-27,-28,-36,-38,-39,-49,-50) and 5 females (931221-1-10,-32,-37,-40,-43), with associated larval and pupal exuviae.

Distribution. So far known only from the type locality, Mt Cibodas, Bogor Botanical Garden, West Java, Indonesia.

Bionomics. *Topomyia javaensis* was found with *Aedes* (*Finlaya*) sp. in leaf axils of *E. pandanifolium* and *E. broeliaefolium*, which were originally introduced from Mexico and Brazil.

Taxonomic discussion. *Topomyia javaensis* belongs to the subgenus *Topomyia* Leicester, as defined by Thurman (1959). This species can be easily distinguished from all other species of the subgenus by the following distinctive characters of the male genitalia: 1. Lobe of IXth tergite is broad throughout, without 2 distinct lobes, with a longitudinal midline suture; a fairly conspicuous flattened spine and a long seta are situated on each side. 2. Gonocoxite is short, about 1.6 times width at middle, narrow at base and apical end; 2 clusters of several long recurved black setae are borne distad of center. 3. Ventral lobe of claspette bears 1 conspicuous spine at base. The larva is characterized by having head seta 14-C long and 6–12 branched, and 23–49 comb scales in a patch, each scale pointed, with fine fringe. About 6–9 siphonal setae 1a-S are situated on a line, each single or double, and 8–13 siphonal setae 2a-S are present. About 4–19 pecten teeth extend from base to apical half of siphon.

Because the larval and pupal stages of most species of the genus *Topomyia* are as yet unknown, it is difficult to discuss the diagnostic features of *To. javaensis*.

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