

DESCRIPTION OF *TOPOMYIA IRIANENSIS* N. SP. AND NEW RECORDS OF *TO. PAPUENSIS* FROM MALUKU AND IRIAN JAYA, INDONESIA (DIPTERA: CULICIDAE)

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ABSTRACT. The adults, male genitalia, pupa, and larva of *Topomyia* (*Topomyia*) *irianensis* n. sp. from Irian Jaya, Indonesia, are described and illustrated. The new species is compared to closely related species, *Topomyia dejesusi* Baisas and Feliciano, 1953, and *Topomyia argyropalpis* Leicester, 1908. *Topomyia* (*Suaymyia*) *papuensis* Marks was recorded for the first time from Maluku and Irian Jaya. This is the first record of the genus *Topomyia* from Maluku and Irian Jaya, Indonesia.

INTRODUCTION

Only one species, *Topomyia* (*Suaymyia*) *papuensis* Marks, has been described from Papua New Guinea (Marks 1960) but no species of the genus has been known to occur in Irian Jaya and Maluku, Indonesia. While examining specimens collected by Japanese and Indonesian mosquito research teams in Maluku and Irian Jaya in 1993, we found two species belonging to the genus *Topomyia*, one of which belongs to the subgenus *Topomyia* and is distinct from all of the described species of the subgenus (Thurman 1959, Knight and Stone 1977, Knight 1978, Ward 1992). Further studies revealed that this species is closely related to *Topomyia* (*Topomyia*) *dejesusi* Baisas and Feliciano, originally described from Mindanao, Philippines, differing only slightly but consistently in the male genitalia. The other species is identified as *Topomyia* (*Suaymyia*) *papuensis*, which is a new record for Irian Jaya and Maluku, Indonesia. A key to adult males is provided for identification of the newly described species and closely related species. The terminology used follows Harbach and Knight (1980, 1982). In immature descriptions the range of setal branching number is followed by the mode in parentheses.

TAXONOMIC TREATMENT

Topomyia (*Topomyia*) *irianensis* Miyagi and Toma, new species

Male. Medium in size. Wing about 2.5 mm. Proboscis about 2.0 mm. Black mosquito with silver markings on head, thorax, pleura, and lateral margins of abdominal terga. **Head:** Vertex, side of head, and postgena covered with broad, flat, silver decument scales; erect scales absent. Ocular and interocular setae strong; clypeus small, elongate, dark brown with grayish pollen. Maxillary palpus about 1.5 as long as clypeus, silvery-scaled except

basal half dark. Proboscis dark, swollen toward apex, about as long as forefemur; a pale golden line underneath, originating from base where the line is fairly broad, gradually tapering toward the apex; pedicel of antenna dark, with grayish pollen. Antenna about 0.7 length of proboscis. **Thorax:** Integument of scutum, scutellum, and pleura dark; scutum densely covered with narrow, curved dark brown scales; one dorsocentral, several anterior promontary and scutal fossal setae present; usually silvery line of broad scales at middle running from anterior border to level of wing root. Central and lateral lobes of scutellum black, with very few silvery scales. Anteprepronotum dark, covered with dense patch of broad silvery scales and about 10 dark setae on anterior side. Postpronotum covered with flat golden scales. Proepisternum covered with patch of silver scales; 1-3 prespiracular setae present. Paratergite without scales; postspiracular, upper and lower mesokatepisternal, and prealar areas with dense patch of silver scales; anterior mesepimeral scales and upper mesepimeral setae present. **Legs:** Coxae and trochanters covered with silver scales; 1-3 coxal setae present. Remaining parts of legs dark except undersides of mid- and hindfemora and -tibiae with white scaling, on continued hindleg to tarsomeres 1-4. **Wing:** Dorsal and ventral veins dark-brown-scaled. Cell R_2 about 2.3 times length of vein R_{2+3} . Anal vein ending at or a little beyond base of mediocubital cross vein. Alula with several fine piliform scales; upper calypter bare. **Halter:** Capitellum and pedicel with dark scales. **Abdomen:** Terga dark with lateral silvery white scale patches; without silvery white dorsal bands or patches; line of demarcation between dorsal dark and lateral silvery white scaling of terga II-VII. Terga and sterna VIII and IX dark, without pale scales. Sterna I-VII with golden scales. **Genitalia** (Figs. 1A-C): Tergum IX with fairly straight posterior border having on each side a row of 4, 5 fine setae which are bent and pointing outwardly, outermost longer than the others. Gonocoxite elongate, broadest in basal 0.4, length about 3.0 length of greatest width; lateral and sternal surface of the distal half covered with

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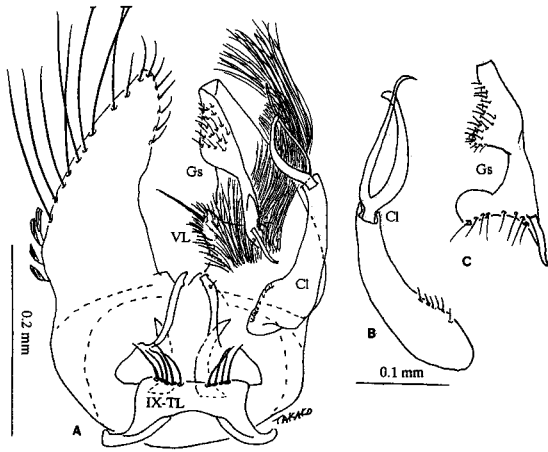


Fig. 1. *Topomyia (Topomyia) irianensis*. A-C. Male genitalia (VL: ventromesal lobe; Gs: gonostylus; Cl: claspette; IX-TL: 9th tergite lobe).

many long setae and scales; ventromesal lobe indistinct, with a cluster of long, bent setae, and usually one, but sometimes additional short, stout seta borne on inner apical corner. Gonostylus shorter than gonocoxite, broad at basal half, with many tiny setae on outer margin; middle narrow and bilobed apically; the external lobe with several fine setae on interior margin, the other lobe with a few fine setae and a gonostylar claw that is dark brown, broad in middle, and hooked at tip. Claspette composed of a broad rod-like bent stem with a terminal appendage which is bifurcate; upper fork longer, and pointed, the other shorter and bent at its tip, somewhat expanded and apically rounded.

Female. Wing about 2.6 mm. Proboscis about 2.5 mm. Forefemur about 2.5 mm. Essentially as in male, differing in the following respects: **Head:** Antenna and proboscis about 0.74 mm and 1.0 length of forefemur; ventral pale scales on proboscis not prominent. **Thorax:** Central and lateral lobes of scutellum covered with silvery scales. **Abdomen:** Terga I-VI each dark scaled with lateral basal triangular patch of silvery white scales extending narrowly toward dorsum on IV-VI but never forming complete band; some specimens from Halmahera and Ambon with a small patch of white dorsal scales on terga III-VI. Terga VII-VIII without pale scales. Sterna golden scaled, except dark on sternum VIII.

Pupa (Fig. 2). Abdomen about 3.1-3.9 mm. Trumpet about 0.31-0.39 mm. Paddle about 0.52-0.64 mm. Integument of cephalothorax (CT) and

abdomen yellow. Chaetotaxy as in Fig. 2 and Table 1. **Trumpet:** Dark yellow, slightly flattened, not laterally expanded; index about 3.1-3.8; pinna about 0.05-0.09 of trumpet length. Seta 1-CT long, conspicuous, double; 2-4-, 6-, 8-CT inconspicuous, 1-4 branched. **Abdomen:** Microtrichia present on abdominal segments II-VIII. Seta 1-I dendritic with 5-6 main branches, each divided repeatedly. Setae 3-II, -III, 5-IV, -V, -VI long, single; 9-VII 12-20 branched, barbed; 9-VIII barbed, 15-22 branched. Male genital lobe as illustrated in Fig. 2, extending to 0.83-0.93 of paddle, female genital lobe 0.35-0.45 of paddle. **Paddle:** Uniformly and lightly pigmented, with midrib; length 2.4-3.7 times width.

Larva (Fig. 3). **Head:** Length about 0.72-0.88 mm. Width about 1.01-1.28 mm, pigmentation yellow, integument smooth. Dorsosentum with median tooth and 9-11 teeth on either side. Maxilla without well-developed maxillary horn. Seta 1-C trace; 4-, 6-, 11-C single; 5-C usually single; 7-C 3-10 branched; 8-C 3-7 branched; 9-C 2-7 branched, weak; 10-C 1-5 branched; 12-C 4-10 branched; 13-C 3-11 branched; 14-C long, 2-6 branched; 15-C 1-3 branched. **Antenna:** Length 0.22-0.31 of head length. Seta 1-A usually single, inserted 0.76-0.85 from base. **Thorax:** Setae 6-, 7-P and 5-, 6-, 8-M long and barbed. 6-P 4-12 branched, 7-P 3-7 branched, 5-M usually single, 6-M 2 or 3 branched, 8-M single; 13-T 13-19 branched. **Abdomen:** Setae 6-I-VI and 7-I, -II long and barbed, 6-I 7-11 branched, 7-I 3-8 branched, 6-II 9-11 branched, 7-II 4 or 5 branched, 6-III 2-4 branched, 6-IV 3 or 4 branched, 6-V 3-5 branched, 6-VI 2 or 3 branched. Comb scales in a patch, 20-34 in number, individual scales pointed and with fine fringe. **Siphon:** Length about 0.51-0.64 mm, lightly pigmented, broad at base and tapering toward apex. Index about 3.2-3.9; 14-20 pecten teeth extending from basal 0.07-0.13 to apical 0.77-0.89; 2 pairs of ventrolateral tufts, each tuft with 4-9 branches; 2-3 pairs of dorsolateral tufts, each tuft with 7-12 branches. **Saddle:** Indistinct. Seta 1-X long, about 1.3 times of 3-X and barbed.

Systematics. *Topomyia (Topomyia) irianensis* is most closely related to *Topomyia (Top.) dejesusi* Baisas and Feliciano, 1953, from Mindanao, Philippines, and *Topomyia (Top.) argyropalpis* Leicester, 1908, from Malaya (Edwards, 1992). The very remarkable morphological congruence of the male genitalia in these species is undoubtedly a clear indication of common ancestry. Males of these three species can be separated by the following key:

- 1. Gonocoxite with small defined basal mesal lobe with fine setae. Claspette with a terminal appendage of upper fork longer than the lower one, both of them apically bent and pointed *argyropalpis*
- Gonocoxite with ill-defined basal mesal lobe, with a conspicuous cluster of long bent setae. Claspette with a terminal appendage, upper fork longer, bent, pointed and the lower one shorter and straight, its tip expanded and rounded 2

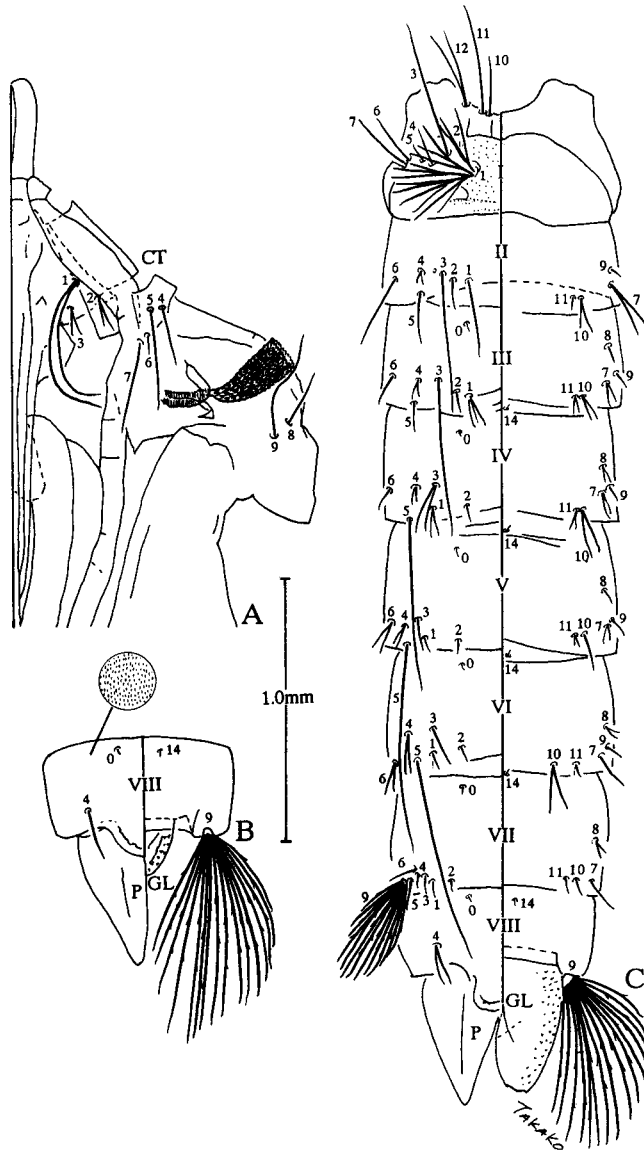


Fig. 2. Pupa of *Topomyia (Topomyia) irianensis*. A. Cephalothorax of male. B. Terminal part of abdomen of female. C. Metanotum and abdomen of male.

- 2. A conspicuous spine located on gonocoxite subapically; ventromesal lobe of gonocoxite with a cluster of long bent setae, without inner apical seta *dejesusi*
- Conspicuous spine absent on gonocoxite subapically; ventromesal lobe of gonocoxite with a cluster of long bent setae and usually one short, stout seta bore on inner apical corner *irianensis* sp. nov.

During the morphological comparison of the specimens of *Topomyia irianensis* collected from different islands, we found slight variation in male genital forms and lateral silvery white scales in abdominal terga of the adult. In the specimens collected at Halmahera (Kao district), North Maluku, spines on the ventromesal lobe of gonocoxite were completely absent or very weak and tergal abdom-

inal white scales were inconspicuous, forming small patches, while specimens from Arso and Koya Timur, Irian Jaya, had 1 well-developed spine and 1 or 2 weak spines clearly present on inner apical corner of the lobe; lateral silvery white scale patches are conspicuous, sometimes forming white bands. On the other hand, in the limited specimens from Ambon and Ceram, South Maluku, the spine

Table 1. Chaetotaxy of the pupa of *Topomyia (Topomyia) irianensis*.

Seta no.	Cephalothorax (CT)	Abdominal segments								
		I	II	III	IV	V	VI	VII	VIII	
0	—	—	1	1	1	1	1	1	1	1
1	2 ¹	m ¹	1, 2	2-6	1-4	1-3	1-4	1-3	—	—
2	2, 3	1	1	1	1	1	1	1	—	—
3	2, 3 (2)	1, 2 ¹	1 ¹	1 ¹	2-4	1-3	1-3	1, 2	—	—
4	1, 2	1	2-4	1-3	2, 3	2-5	1-3	1, 2 (1)	1-3	—
5	1-5	2-5	1	1, 2 (1)	1 ¹	1 ¹	1 ¹	1-3	—	—
6	1-4 (1, 2)	1-6	1-3	1-4	1-3	2-4	1-5	1, 2	—	—
7	1-4	1-3	1-3	1-4	1-3	2-4	1-3	1-3 (1)	—	—
8	1, 2 (1)	—	—	1-3 (1)	1-4	1-3	2-6	2-5	—	—
9	1-4	1, 2 (1)	1	1	1	1	1	12-20 ¹	15-22 ¹	—
10	1, 2 (1)	—	1, 2 ²	1-3	1-3	1-3	1-3	1-3	—	—
11	1	—	—	1-3	1-3	1-3	1-3	2-4	—	—
12	1-3	—	—	—	—	—	—	—	—	—
14	—	—	—	—	1	1	1	1	1	1

Chaetotaxy count from a total of 10 specimens collected from Irian Jaya. Numbers indicate range of branches and those in parentheses show model number. 1 = prominent seta, m = multiple branches, 3 = sometimes present.

was very weak. No other morphological differences were found between specimens examined from different islands. Either specimens collected at each island represent two distinct species, or the reduction in development of the spine reflects intraspecific variation.

Bionomics. Adult specimens of the type series were reared from larvae collected from leaf axils of taro plants and *Donax* in association with *Corsethrella* sp.

Distribution. *Topomyia irianensis* is recorded from Irian Jaya (Koya Timur and Arso), Biak, Ambon, Seram (Mt. Manusela), Halmahera (Popon, Kai, Wasile Wateto, Pediwang).

Type data. The holotype male 930810-1 (478) with associated pupal and larval exuviae mounted on a slide with collection data: leaf axils of *Donax*

sp., Arso, Irian Jaya, 10 August 1993, col. I. Miyagi. It will be deposited in the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC.

Additional specimens designated as paratypes with collection data as follows, unless otherwise stated collected by I. Miyagi and T. Toma: Irian Jaya, one male (930807-3) with slides of associated larval and pupal exuviae (468) and male genitalia (G-29), one male (930807-3) with slide of pupal exuviae (355). One male (930806-9) with slides of associated pupal exuvia (352) and male genitalia (G-26), Koya Timur, Irian Jaya. One male (930807-4) with pupal exuvia (354), Koya Timur, Irian Jaya. One male (930810-1) with pupal exuvia (357), Arso, Irian Jaya. Three females (930810-1) with slides of associated larval and pupal exuviae

Table 2. Chaetotaxy of the 4th-instar larva of *Topomyia (Topomyia) irianensis*.

Seta no.	Head	Thorax			Abdominal segments								
		P	M	T	I	II	III	IV	V	VI	VII	VIII	
0	—	4-10	—	—	—	—	—	—	—	—	—	—	—
1	1	2,3	1-3	1-3	4-7	3-7	4-10	16-22	21-23	21-30	10-21	5-8	2
2	—	1-3	1,2	2-6	1	1	1,2	1-3	1-3	2-4	2-4	2-4	2
3	1	5-8	1	4-7	1-3	1-3	1-3	1-3	1,2	2,3	5-8	2-5	—
4	1	8-11	4-8	1-3	3-7	3-6	2,3	1-3	3-8	2-4	1,2	1-3	—
5	1,2(1)	10-18 ¹	1,2 ¹	1	2	1-3	1-3	2-5	2-4	2-4	1-3	1,2	—
6	1	4-12 ¹	2,3 ¹	3-7	7-11 ¹	8-11 ¹	2-4 ¹	3,4 ¹	3-5 ¹	2,3 ¹	1,2	—	—
7	3-10	3-7 ¹	1,2 ¹	6-10 ¹	3-8 ¹	4-7 ¹	3-5	3,4	3-5	2-5	5-9	—	—
8	3-7	4,5 ¹	1 ¹	3,4	—	1,2	1,2	1,2	1-3	3-6	5-10	—	—
9	2-7	4-6	2-4 ¹	7-12 ¹	2-4	2	1,2	1,2	1-3	1,2	3-5	—	—
10	1-5	3-6	2-4	1 ¹	5-7	2-6	3,4	2-4	2,3	4-6	2,3	—	—
11	1	1,2	1	1	2-4	4,5	3-5	3,4	3,4	2-4	3-5	—	—
12	4-10	4-6	1,2	2,3	—	4-8	2,3	1-3	1-3	1,2	4-7	—	—
13	3-11	—	4-6	13-19	2	2,3	1-4	2-4	3-5	4-6	4,5	—	—
14	2-6	1,2	3-9	—	—	—	—	—	—	—	—	—	—
15	1-3	—	—	—	—	—	—	—	—	—	—	—	—

Chaetotaxy in head count from a total of 7 4th-instar larval skins and 3 4th-instar larvae and chaetotaxy in other setae count from 3 4th-instar larvae from Irian Jaya. Numbers indicate range of branches and those in parentheses show modal number. Antenna, 1-A, single. Abdomen, 1-X, 3-5; 2-X, 2 or 3; 3-X, 2; 4-X, 4-7. 1 = prominent seta.

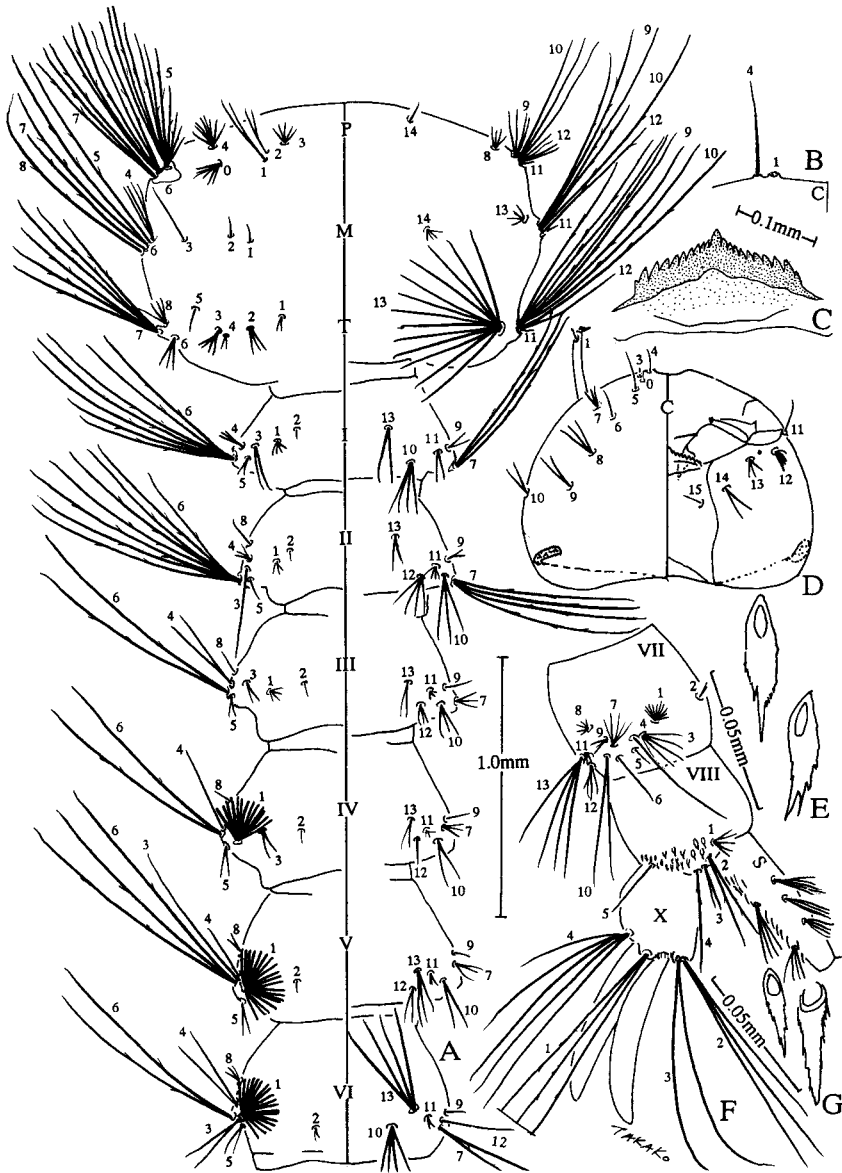


Fig. 3. Larva of *Topomyia (Topomyia) irianensis*. A. Thorax and abdominal segments I–VI. B. Head setae 1 and 4. C. Dorsomentum. D. Head. E. Comb scales. F. Abdominal segments VII and VIII. G. Pecten.

(452, 370, 486), one female (930811-1) with larval and pupal exuviae (484), Arso, Irian Jaya. One male (930811-1) with slides of associated pupal exuvia (371) and male genitalia (G-32), Biak, col. K. Kamimura.

Specimens examined. Halmahera: Two males (930707-6, -19-5) with slides of associated male genitalia (G-4, G-19), Wateto, Kao. One male (930713-10), with slide of associated male genitalia (G-14), Pediwang. One female (930718-3) with slide of associated larval and pupal exuviae (337) and one female (930718-4), Popon. One male (930716-13)

with slide of associated pupal exuvia (244), Wasile, taro leaf axils. One female (930710-27) with slide of associated larval and pupal exuviae (181), Kai. One female (930629-2) with slide of associated pupal exuviae (10), Popon. Ambon: Two males (930727-4, -27-3), with slides of associated larval and pupal exuviae (350, 304) and genitalia (G-24, G-23), col. K. Kamimura. Seram: 1 male (930726-19) with slides of associated larval and pupal exuviae (338) and genitalia (G-25), Mt. Manusela, col. K. Kamimura. Two females (930726-17, -14), Mt. Manusela and Tehoru, col. K. Kamimura.

Topomyia (Suaymyia) papuensis Marks

Topomyia papuensis was originally described from Papua New Guinea. It was newly collected in Halmahera, Ambon, Ceram, and Irian Jaya. The immatures of this species were commonly found in leaf axils of taro, wild banana, and pandanus. This is apparently the Papua New Guinean species, and there is no record of this species from the Oriental region.

Topomyia papuensis is recognized as being atypical in male genitalia and a key to the subgenus is given in Thurman (1959). As mentioned by Lee et al. (1988), the key cannot be applied satisfactorily to this species, but it should be placed in the subgenus *Suaymyia*.

Topomyia (Topomyia) Marks sp. no. 144 from Sepik District, Papua New Guinea was listed as an unnamed species recognized in literature or collection (Lee et al. 1988). *Topomyia irianensis* should be compared with the description of *Topomyia Marks* sp. no. 144 from Papua New Guinea.

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