

A New Species of *Topomyia* from Peninsular Malaysia
(Diptera: Culicidae)*

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ABSTRACT. A new species *Topomyia (Topomyia) vijayae* is described from Peninsular Malaysia. The adult female and male, pupa and larva are described in detail and illustrations of the male genitalia, pupa and larva are provided. *Topomyia vijayae* is a rain forest species and breeds mostly in the axils of wild-ginger inflorescence.

INTRODUCTION

The genus *Topomyia*, of the tribe Sabethini, is known mainly from the Oriental Region and occurs almost entirely in Peninsular Malaysia, Indonesia, Philippines and Thailand with only a single species described from China and another from Papua New Guinea. Of a total of 30 species known in this genus 12 have been reported to occur in Peninsular Malaysia (Stone, Knight and Starcke, 1959; Macdonald, 1957). A new species of *Topomyia* is now recognized from several collections made from the axils of ginger inflorescence in rain forests. The collections form part of an extensive study on the mosquito fauna of Malaysia, carried out by the author.

The terminology used for the females, males and male genitalia follows Knight (1970), Knight and Laffoon (1970a, 1970b, 1971), and for the chaetotaxy of the pupa and larva, that of Belkin (1962). In the description of immature stages, the following system is used to enumerate seta branching: If only one numeral is given in parenthesis following the seta number, it represents the only number of branches encountered in the sample; if two sets of figures are given, the first represents the mean number of branches and the second, the range encountered in the sample.

Topomyia (Topomyia) vijayae n. sp.
(Figs. 1, 2)

FEMALE.—Wing, 2.72 mm. Proboscis, 1.78 mm. Fore-femur, 1.82 mm. Abdomen: About 2.0 mm. Small to medium in size; dark brown with silver markings on head and thorax.

Head: Vertex, occiput and side of head covered with broad, flat, dark brown, decumbent scales, which have a metallic green sheen at certain angles. A large triangular patch of flat silvery scales, present on the vertex, just above the eyes; similar silvery patch on side of head below eye. Erect scales

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absent. Eyes touching each other above antenna. Interocular and ocular setae present. Clypeus slightly elongated, dark and bare of scales. Maxillary palps covered over with dark scales, small, about 0.12 of proboscis. Proboscis slender and slightly distended at the distal end; covered by dark scales except for a pale band of scales on the ventral side, from the base to about 2/3 the length of the proboscis. Pedicel of antenna dark, with few dark, hair-like scales on inner side. Flagella pilose, approximately 1.28 mm. long.

Thorax: Integument of scutum, scutellum and pleurae darkish brown. Scutum covered over densely with narrow, curved, brown scales; with a median line, consisting of two rows of flat silvery scales, reaching to the end of the scutum and extending on to the scutellum. Dorsocentral, humeral, scutal, supra-alar and prescutellar setae present. Central lobe of scutellum covered with a large patch of flat, silvery scales; side lobes with flat dark scales. Mesopostnotum bare, integument brown. Anteprenotal lobe with conspicuous patch of silver scales dorsally; row of setae on anterior side. Postpronotum covered with flat, dark brown scales on upper 3/4, with a few silvery scales on lower 1/4; single setae present on posterior border. Three to five distinct prespiracular setae present. Postspiracular setae absent. Propleuron with a patch of silver scales. Paratergite bare. A large patch of rounded silvery scales covering the post- and sub-spiracular areas, most of the sternopleuron and the mesepimeron. Metepisternum bare. Batches of setae present on propleuron, pre-alar and upper mesepimeron.

Leg: Coxae and trochanter of all three legs brown with silvery scales. Rest of legs covered with dark scales. The venter of the fore-femur has a pale patch at the base. Under the mid leg the white band extends from the base of the femur to the distal end of the tibia. In the hind leg the ventral white band extends all the way from the base of the femur to the IV tarsal segment. Claws on all legs simple and equal.

Wing: Brown scaled. Squame scales densely covering wing veins; plume scales narrow. Cell R_2 about 2.7 times the length of its stem. Anal vein ending about level of fork of Cu. Alula with several hair-like scales. Upper calypter bare.

Haltere: Pedicel and capitellum covered with dark scales.

Abdomen: The terga of segments I to VIII are densely covered with dark brown scales; the lateral aspect of each terga has a strip of golden scales. Sternites II to VIII entirely covered with flat, pale-golden scales.

MALE.-Wing, 2.56 mm. Proboscis, 1.6 mm. Palpi, 0.19 mm. Fore-femur, 1.80 mm. Resembles the female in most aspects, except that the ventral pale band on the proboscis is more prominent and the ventral pale band on all three legs extends to the IV or V tarsal segments. The second tarsal segment on the fore-leg is slightly shorter than the third tarsal segment and the last three tarsal segments of the fore-leg are elbowed backwards. Head: Maxillary palps and antenna about the same length as in the female; antenna pilose.

MALE GENITALIA (Fig. 1).- As figured. Tergum of IX segment broad throughout with the two lobes situated close together; each lobe bearing a flat, broad spine rounded at the apex; one or two fine hairs present on the lateral aspect of the spine. Sternite of IX segment broad and covered with scales; lateral

aspects with sclerotized bands. Gonocoxite narrow at base and broader at distal end; ventral aspect covered with scales and with only a few setae; dorsal aspect with a prominent ball-like lobe at the distal end, densely covered with short setae; also on the dorsal aspect, slightly above the center is a sloped ridge or lobe bearing a row of fine setae; a bunch of stout curved setae arise from the upper corner of this ridge, and curve along the distal margin of the gonocoxite. The dorsal lobe of the claspette is composed of a broader rod-like stem and a narrower elongated spine; the ventral lobe bears three to five prominent, curved spines. Gonostylus broad at basal 1/3, narrow and curving at apical 2/3; tip with small, slightly curved spine; a patch of tiny setae present on outer margin. Paraproct fairly long and pointed. Phallosome long and slender.

PUPA (Fig. 1).—Abdomen, 2.6 mm. Trumpet, 0.27 mm. Paddle, 0.45 mm. Integument of cephalothorax and abdomen very pale yellow, with darker yellow trumpets and narrow yellow-brown patch on anterior areas of abdominal tergites III to VI. Chaetotaxy as figured; smaller hairs pale, the more conspicuous hairs dark brown and marked with an asterisk (*).

Cephalothorax: Trumpet: Darker yellow in color, slightly bulged in basal half and with fine sculpturing. Index 2.8 to 3.9; pinna about 0.14 to 0.18 of trumpet length. Seta 1 long, conspicuous, and 2 branched from base, other setae inconspicuous, 2(2,1-2), 3(2,1-2), 4(2,1-3), 5(2,1-3), 6(1), 7(1), 8(1,1-2), 9(1), 10(1,1-3), 11(1), 12(2,1-3). Abdomen: Microtrichia present on abdominal segments II to VIII. Segment I: Float hair with five to 11 main branches, each further branching and ending as fine hairs. Seta 2(1), 3(1), 4(3,2-4), 5(2,1-3), 6(1), 7(1), 9(1,1-2). Segment II: 1(1,1-3), 2(1), 3(1,1-2), 4(2,1-4), 5(2,1-2), 6(1), 7(1,1-2), 9(1,1-2), 11(1). Segment III: 1(2,1-3), 2(1), 3(2,1-3), 4(2,1-3), 5(2,1-3), 6(1), 7(1,1-2), 8(2,1-2), 9(1), 10(1,1-2), 11(1). Segment IV: 1(3,2-5), 2(1), 3(2,1-3), 4(2,1-3), 5*(1), 6(1,1-2), 7(1,1-3), 8(2,1-2), 9(1), 10(1,1-2), 11(1,1-2). Segment V: 1(2,1-3), 2(1), 3(2,1-3), 4(2,1-3), 5*(1), 6(1), 7(2,1-3), 8(2,1-3), 9(1), 10(1,1-3), 11(1). Segment VI: 1(2,2-3), 2(1), 3(1,1-2), 4(2,2-3), 5*(1), 6(1), 7(1,1-2), 8(2,1-3), 9(1), 10(1,1-2), 11(1,1-2). Segment VII: 1(1,1-2), 2(1), 3(1,1-2), 4(1,1-2), 5(1,1-2), 6(1,1-2), 7(1), 8(2,1-3), 9*(13, 9-16) barbed, 10(1,1-2), 11(1). Segment VIII: 4(1), 9*(12,10-16) barbed. Paddle: Uniformly and lightly pigmented, with a distinct midrib; lengths about 1.84 times breadth; margin with long and distinct fringe; seta 1 indistinguishable from fringe. Male genital lobe as illustrated, extending to about 0.8 of paddle, female genital lobe to 0.42 of paddle.

LARVA (Fig. 2).—Head, 0.68 mm. Siphon, 0.58 mm. Chaetotaxy as figured, setae lightly to moderately pigmented. Stellate setae present, but spicules absent. Integument smooth. Prominent setae marked with an asterisk (*).

Head: Width about 1.15 of length. Ocular bulge and collar inconspicuous. Pigmentation of head pale yellow. Integument smooth. Mental plate with a strong median tooth and with about ten smaller and even teeth on either side. Maxilla without a well-developed horn. Mouth brushes are short, dense and with the inner setae serrated. Seta 1 (1, stout, slightly pigmented, curved and pointing backwards and downwards), 4(1), 5(1), 6(1), 7(1). Setae

4, 6 and 7 are nearly in a straight line, seta 5 is situated well behind setae 4 and 6 and is almost directly behind 6, 8(2,2-3), 9(3,2-4), 10(2,1-3), 11(3,3-4), 12(2,1-3), 13(1), 14(2,1-2), 15(2,1-2).

Antennae: Length about 0.29 of head. Shaft slightly swollen at lower third, then continuing about the same width. Integument pale and smooth. All setae single. Seta 1 extending over tip of antenna, its base about 0.85 from base of antenna.

Thorax: All long and prominent setae with barbs. Prothorax: Seta 0 (12,9-17, stellate), 1(6,4-8), 2(1), 3(5,3-7), 4(14, 12-16*, stellate), 5* (14,13-17), 6*(1), 7*(8,6-10), setae 5,6 and 7 rise from a common tubercle, 8(8,6-10, stellate), 9*(3,2-4), 10*(1), 11(1,1-2) 12*(1), 14(5,4-6). Mesothorax: 1(3,3-4, inconspicuous and well separated from seta 2), 2(2,1-2), 3(1), 4(2), setae 1, 2, 3 and 4 in straight line, 5*(1), 6*(1), 7*(1), 8*(6, 4-7), hairs 5, 6, 7 and 8 each on a separate tubercle, 9*(2), 10*(1,1-2), 11 (1), 12*(1), setae 9 to 12 on common tubercle, 13(7,5-9, stellate), 14(6,5-8). Metathorax: Seta 1(2,1-2), 2(2,2-3), 3(4,3-7), 4(3,2-4), 5(8,6-11), 6(2,2-3), 7*(9,8-10), 8(4,3-6), 9*(5,4-6), 10*(1), 12(1), 13*(10,7-14).

Abdomen: Segment I: Seta 1(3,2-4), 2(4,2-7), 3(2,1-3), 4(5,3-7), 5(4, 3-6), 6*(5,4-6), 7*(2), 9(4,3-5), 10(2,2-3), 11(8,6-10, stellate), 13(7,5-8, stellate). Segment II: Seta 1(2,2-3), 2(3,2-4), 3(4,3-5), 4(2,1-3), 5(5,3-6), 6*(4,3-5), 7*(2), 8(1,1-2), 9(3,3-4), 10(1,1-2), 11(2), 12(4,2-5), 13(4, 3-4). Segment III: Seta 1(21,17-27, stellate), 2(1, 1-3), 3(1,1-2), 4(1,1-2), 5*(4,3-6), 6*(2), 7(4,3-5), 8(2,2-3), 9(4,3-5), 10(3,2-5), 11(2,1-3), 12 (1), 13(3,2-4). Segment IV: Seta 1(24, 17-32, stellate), 2(1,1-3), 3(1,1-2), 4(2), 5*(4,3-4), 6*(2), 7(3,2-4), 8(2,2-3), 9(4,3-5), 10(3,2-5), 11(2,1-4), 12(1), 13(3,2-4). Segment V: Seta 1 (24,20-31, stellate), 2(2,2-3), 3(1), 4(2,2-3), 5*(4,2-5), 6*(2), 7(4,3-5), 8(2,2-3), 9(4,3-5), 10(4,3-6), 11(2,2-3), 12(1), 13(3,2-3). Segment VI: Seta 1(21,18-32, stellate), 2(2,1-3), 3 (2,1-2), 4(3,2-4), 5*(4,2-5), 6*(1), 7(3,2-4), 8(5,4-6), 9(4,2-5), 10(2), 11 (2), 12(3), 13(3,3-4). Segment VII: Seta 1(11,4-17, stellate), 2(3,2-3), 3*(1), 4(1), 5(2), 6(4), 7(2), 8(7,4-9), 9(4,1-6), 10(4,2-5), 11(3,2-5), 12(1), 13(4,3-5). Segment VIII: 1(6,4-8), 2(1,1-2), 3(2,1-2), 4(1), 5* (2,2-3). Comb scales 12(9-13), in one or sometimes two irregular rows; individual scales large, pointed and with a small fringe at base. Siphon: Long and comparatively narrow; index 5.3 (5 to 5-6); lightly pigmented; pecten teeth 1 to 2, when more than one tooth present they are wide apart, the first tooth being near the base of the siphon and the second between 1/3 to 1/2 way on the siphon; seta 1(3,3-4), ventral tufts about six in number, each 2 branched; dorsal tufts usually four pairs, each tuft with 3-4 branches. Anal segment: Saddle: Incomplete, only dorsal plate present; lightly pigmented, with small spines along distal margin length 0.16 mm. (0.15 to 0.17 mm.). Gills fairly long and bluntly pointed, length 0.95 mm. (0.81 to 1.12 mm.), averaging 5.9 times the length of the saddle. Seta 1*(1,1-2, arising from saddle), 2*(2,1-3), 3*(1), 4a(2,1-4), ventral fan consisting of a single tuft.

TYPE DATA.-Holotype male (3561.100), with slides of associated pupal skin and genitalia, Ulu Langat Forest Reserve, Selangor, Peninsular Malaysia,

elevation 300 feet above sea level, from ginger inflorescence, in secondary rain forest, 11 August 1970, S. W. James, K. Ramakrishna and Sulaiman bin Omar (USNM). Allotype female (3561.11), with slide of associated larval and pupal skins, same data as holotype (USNM). Paratypes: 10 female, eight male, six slides associated larval and pupal skins, three slides associated pupal skins, three slides male genitalia and nine slides whole larvae, all from the same collection (3561) as holotype: Three female (one with associated larval and pupal skins 3561.19, one with associated pupal skin 3561.101); three male (one with associated larval and pupal skins 3561.12), one slide male genitalia (3561.12), and three slides whole larvae (USNM). Three female (one with associated larval and pupal skins 3561.13), two male (one with associated pupal skin 3561.105), one slide male genitalia (3561.105), and three slides whole larvae (BM). Four female (three with associated larval and pupal skins, 3561.17, 3561.18, 3561.19), three male (one with associated larval and pupal skins 3561.10 and one with associated pupal skin 3561.106), one slide male genitalia (3561.106), and three slides whole larvae (Ramalingam).

This species is dedicated to my wife, Vijaya.

SPECIMENS EXAMINED.—Total 1010 specimens: 262 males, 395 females, 194 skins, 113 whole larvae on slides and 25 male genitalia slide preparations.

TAXONOMIC DISCUSSION.—*Topomyia vijayae* is included in the subgenus *Topomyia* of Thurman (1959) because of the following characters of the adult male: 1. The claspette consists of a setaceous ventral lobe and an arm-like dorsal lobe, bearing a long spine. 2. The lobes of the IX tergite are close together. 3. The 2nd tarsal segment of the fore-leg slightly shorter than the third and the last three tarsi of the fore-leg elbowed backwards.

The presence of a single distinct seta on the posterior margin of post-pronotum; 3 to 4 small prespiracular bristles; and the median line of silver scales extending to the posterior margin of the scutum, relates this species closely with *rubithoracis*, *nigra*, *gracilis*, *trifida* and *tenuis*. However, the following very distinctive structures present on the venter of the gonocoxite easily distinguishes *T. vijayae* from all the above species: 1. A distinct apical rounded lobe with numerous setae. 2. The mesal lobe or ridge with row of fine hair and with a bundle of large curved setae at the apex.

As the immature stages of most species of *Topomyia* are as yet unknown, it is not feasible at this stage to point out the distinctive characters of these stages in *vijayae*.

BIOLOGY.—*Topomyia vijayae* was collected at elevations ranging from sea level to 3200 feet. The predominant breeding habitat of this species is the axils in ginger inflorescence (*Zingiber spectabile*), as 36 of 38 collections of immature stages were obtained from this habitat. The fluid contained in the axils of the inflorescence is transparent, but dense and slimy, with a pungent odour. The wild ginger is common in secondary, lowland dipterocarp forests. It blooms once a year, from July to October, and it is during this period that breeding of *T. vijayae* occurs. One collection each of this species was obtained from leaf axils of banana and *Alocasia*. These habitats may be rare breeding sites, especially during the non-blooming season of

Zingiber or they may be contaminants as single specimens of *vijsayae* were recovered from each of these collections. Two collections of adults were obtained resting on ginger shoots and on other vegetation. Little else is known of the adult biology. As with all other *Topomyia*, it is doubtful if this species will take a blood meal.

DISTRIBUTION.—Peninsular Malaysia: Selangor State: Ulu Langat and Ulu Gombak; Perak State: Kuala Kangsar, Choir Forest Reserve, and Cameron Highlands; Negri Sembilan State: Rantau and Kg. Beting; Pahang State: Karak. So far known only from Peninsular Malaysia.

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Topomyia (Topomyia) vijayae

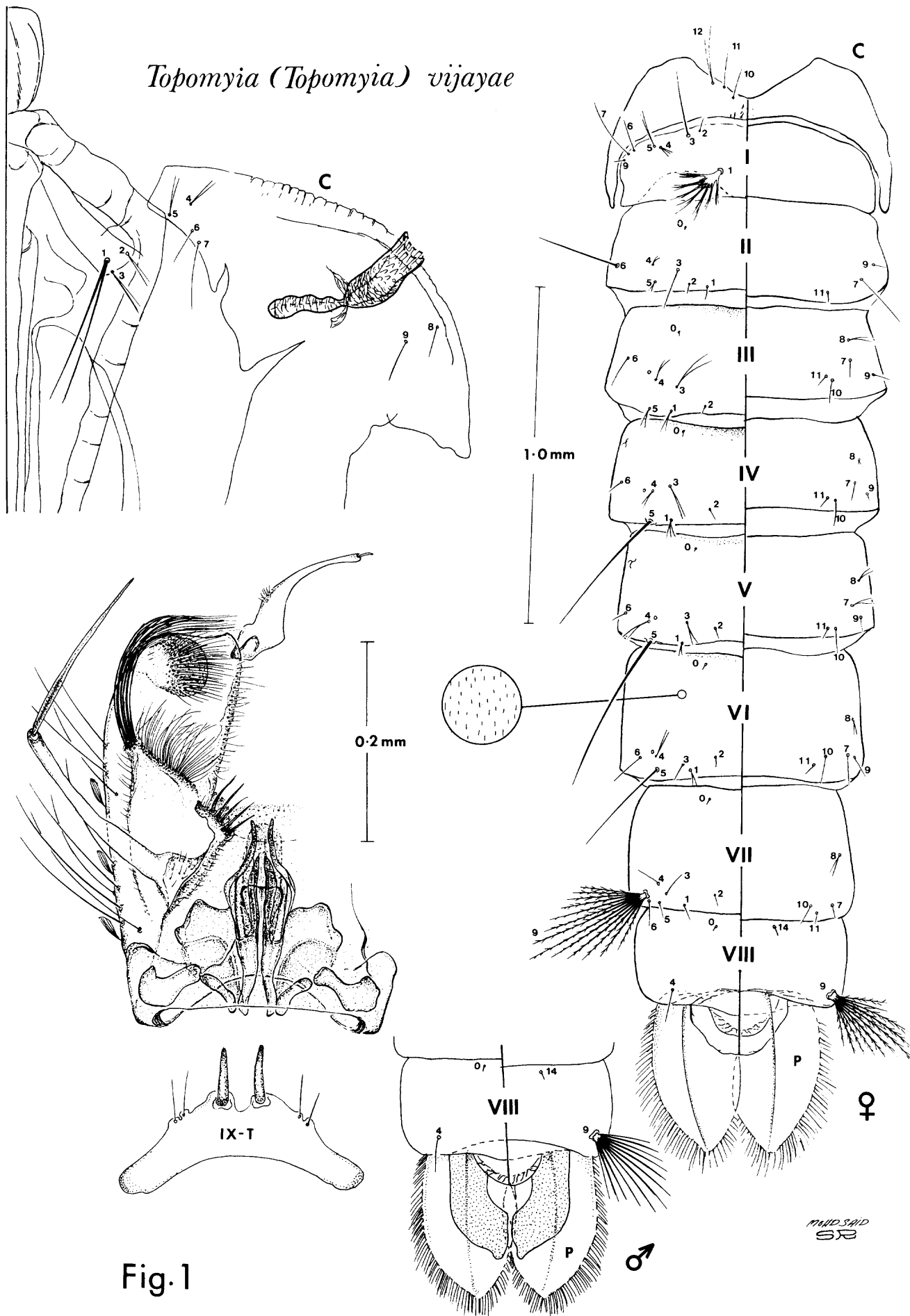


Fig. 1

Topomyia (Topomyia) vijayae

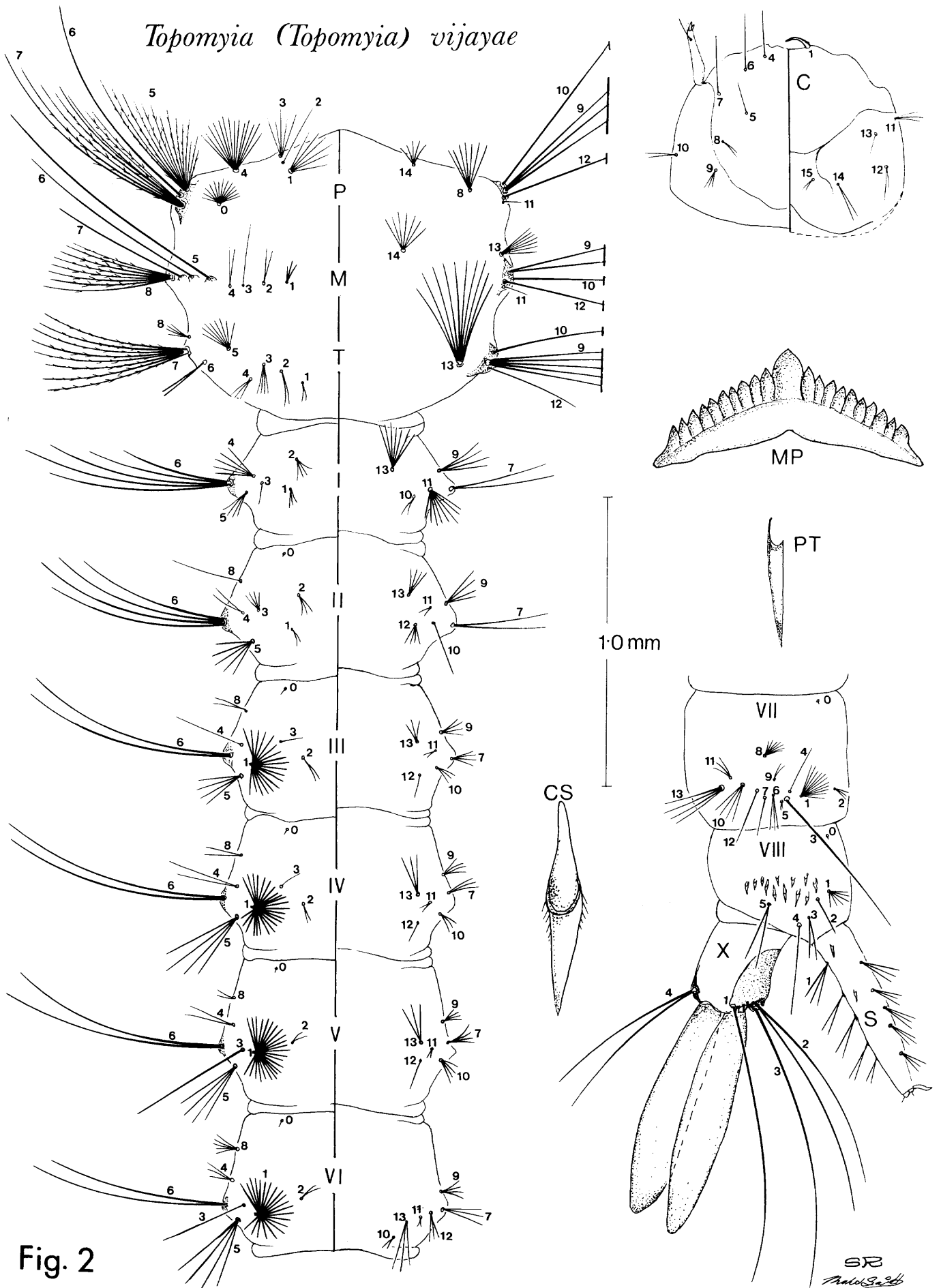


Fig. 2