Studies on the genus *Topomyia*: 3. Redescription of *spathulirostris* and transfer to the subgenus *Suaymyia*[1]

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ABSTRACT. The original description of *Topomyia spathulirostris* by Edwards(1923) included only the adult male and female. A redescription of these stages, as well as the previously undescribed male genitalia, pupa and larva are now made. *Topomyia spathulirostris* is transferred from the subgenus *Topomyia* to the subgenus *Suaymyia* on the basis of characters seen in the male, including the genitalia. This species occurs in rain forests and breeds mainly in bamboo internodes.

INTRODUCTION

Topomyia spathulirostris was described by Edwards (1923) from a male and a female collected by Hacker from the Cameron Highland, Peninsular Malaysia, at 1,062 m and reared from immatures collected in bamboo. As the larval and pupal exuviae were not preserved, they were unavailable for description. The male genitalia were also not described although Edwards referred in the original description to the distinct nature of the male claspers. In 1959, Thurman described the subgenus *Suaymyia* but inadvently placed *spathulirostris* in the subgenus *Topomyia*. Thurman's classification was reflected in the Catalog of the Mosquitoes of the World by Knight and Stone(1977).

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Over 20 collections of this species was made by the Mosquitoes of Malaysia Project during the years 1966-1973 and further collections were made by the first two authors during 1986-87. Examination of the type specimens and the male genitalia at the British Museum by one of us (SR) confirmed that the specimens collected were *spathulirostris*. Many adults, immature stages and associated rearings were obtained and used for the redescription of this species. The male genitalia, pupa and larva are being described for the first time. On the basis of characters seen in the male, including the male genitalia, we now transfer *spathulirostris* to the subgenus *Suaymyia*.

The terminology used for the adult, the pupa, larva and the male genitalia follows Harbach and Knight (1980). The chaetotaxy tables of the fourth instar larva and the pupa follows that of Tanaka et al. (1979).

Topomyia (*Suaymyia*) *spathulirostris* Edwards
(Figs. 1 & 2; Tables 1 & 2)

Topomyia spathulirostris Edwards, 1923, Bull. Entomol. Res. 14:2-3. Type specimens: male and female; type-Locality: Cameron Highland, Malaya; altitude 1,062 m.

Topomyia (*Topomyia*) *spathulirostris* of Thurman (1959); Knight and Stone (1977).

Male. Wing, 2.91 (2.81-2.99) mm. Medium to large in size. Proboscis 2.12 mm, distinctly swollen at the distal end; dark brown mosquito with silver markings on head and thorax.

Head. Vertex, occiput and side of head covered with broad, flat, silver decumbent scales; erect scales absent. Eyes touching each other above antenna; a pair of interocular and several ocular setae present. Clypeus small, yellowish brown, without scales. Maxillary palpus covered with dark scales, small, about 0.10 of proboscis. Proboscis slender, distinctly swollen at the distal end and covered by dark scales except for a patch of silver-white scales at base and ventral line of white scales extending from base to about 4/5 length of proboscis. Pedicel of antenna yellowish brown, without scales; flagellum pilose, approximately 2.03 mm long. **Thorax**. Integument of scutum, scutellum and pleura brown, that of pleura and postnotum slightly lighter. Scutum densely covered with narrow, curved, brown scales; with a median line consisting of double row of rounded flat scales that are silvery at extreme anterior end, rest of line brown-scaled with a metallic lustre. Central lobe of scutellum with patch of flat, silvery scales; integument of side lobes dark, without scales. Humeral, supraalar and prescutellar setae present. Anterior pronotal lobe with con-spicuous patch of silver scales dorsally; row of several setae on anterior side. Posterior pronotum covered with flat, golden scales; 3 setae present on posterior border. Propleuron covered with patch of silver scales with a single

yellow seta. Paratergite with golden scales. Spiracular area, postspiracular area, prealar area, sternopleuron and mesepimeron with dense silver scales; yellowish setae present on upper mesepimeron and lower sterno-pleuron. **Legs**. All coxae and trochanters covered with silver scales; remaining parts of legs covered with small dark scales except for ventral pale scales on all legs extending to the 4th or 5th tarsomeres. Ungues on all legs small, simple and equal in length. **Wing**. Brown-scaled; squame and plume scales covering wing veins; cell R_2 about 3.9 times length of vein R_{2+3}; anal vein ending far beyond fork of Cu ; alula with several fine hairlike scales; upper calypter bare. **Halter.** Covered with dark scales. **Abdomen.** Terga I-VIII covered with dark brown scales; many dorsomarginal setae on terga VII-VIII. Sterna II-VIII entirely covered with flat golden scales. Sternum VIII with many conspicuous setae.

MALE GENITALIA (Fig. 1). As figured. Lobes of tergum IX widely separated by narrow bridge; each lobe attenuated apically, with a terminal curved seta well developed and flattened; 3-4 fine setae present on inner side of lobe. Gonocoxite length about 1.7 times breath, apical 0.5 of outer surface of gonocoxite with many setae extending; inner subapical lobe fingerlike, with a single, large apically rounded spine; a single slender seta on inner side; mesal apical margin of gonocoxite with many fine setae. Gono-stylus nearly as long as gonocoxite, bifurcated basally into slender stalks; outer stalk with a subapical slender seta and inner stalk with 1 or 2 slender apical setae; outer arm longer, 2.3 times length of inner arm. Paraproct elongate, dark apically; 2-3 fine cercal setae. Parameres well developed; phallosome long and prominent.

FEMALE. Wing 3.05 (2.78-3.19) mm. Proboscis, 2.04 mm. Forefemur 2.73 mm. Abdomen, 2.35 mm. Resembles male except that the ventral pale band on the proboscis is not prominent.

PUPA. (Fig. 1, Table 1). Abdomen 3.45-3.8 mm. Trumpet 0.45-0.62 mm. Paddle 0.6-0.7 mm. Integument of cephalothorax and abdomen yellow; trumpet darker; narrow yellow-brown patch on anterior areas of abdominal terga II-VII. Chaetotaxy as figured and given in Table 1. **Cephalothorax**: Trumpet: darker yellow in color, with fine sculpturing; index 2.7-3.7; pinna about 0.12-0.26 of trumpet length. Seta 1-CT long, conspicuous, usually single, very occasionally 2-branched; 8,9 conspicuous, the latter always single; other setae inconspicuous. **Abdomen**: Microtrichia present on abdominal segments II-VIII and paddle. Seta 1-I dendritic, with 3-7 main branches. Seta 3-I long, well developed, usually single (1-3). Well developed and conspicuous setae on segment I are 1 and 3; on segments II and III, setae 1, 3 and 5; on segments IV, V and VI, setae 1 and 5; and on segments VII and VIII, seta 9. Seta 1 4-5 branched on segments II-V; seta 3 generally single on segments II-VI; seta 5 2-3-branched and very long on segments II-VI. Seta 9-VII 13(8-19)-branched; seta 9-VIII 18(15-26)-branched; both seta barbed. Paddle broad, ending in a tapered blunt point; uniformly and lightly pigmented; with a distinct midrib and without marginal fringe. Male genital lobe

extending to about 0.6 of paddle; female genital lobe to 0.4 of paddle.

LARVA (Fig. 2, Table 2). Head length about 0.9 mm. Siphon 1.4-1.6 mm. Anal saddle 0.2 mm. Chaetotaxy in Table 2 and as figured; abdominal setae pigmented. Stellate setae absent. Integument smooth, spicules absent. **Head**. Width about 1.2 length. Pigmentation of head yellow, integument smooth. Mental plate(MP) with median tooth and about 10 smaller teeth on either side. Maxilla large, inner apical angle produced into apical serrate spur; without a well developed maxillary horn. Mouth brushes short and dense. Seta 1-C stout, frayed; 4 usually 3-branched; 5 and 6 single; 7-9 2 branched; 11 and 14 prominent on ventral side. Antenna length about 0.25 of head. Seta 1-A weak, single, arising 0.8 from base, extending over tip of antenna. **Thorax.** Pleural setae long and barbed; pleural tuft 9-12 of prothorax and mesothorax with prominent curved spine. Prothorax with setae 2, 6, 10-12 usually single, others branched and barbed; seta 4 stellate seta; lightly barbed. Mesothorax: setae 3,5, 7 and 12 single, 2, 4, 6, 10, 11 usually single but may be branched; 1, 8, 9, 13, 14 branched, barbed, except for 1 and 14. Metathorax:setae 1-4 inconspicuous; 6, 10 always single; 2, 12 usually single; rest branched; 7, 9, 12, 13 barbed. **Abdomen**: Pleural seta 1 of segments I, III, IV usually double; segment II usually single but may be double; single on segments V, VI, VII. Pleural seta 7 well developed on segments I, II usually 2-branched. Segment I: Setae branched, except 9, 10; setae 1, 11, 13 large, with many branches. Segments I-VII: Setae 1, 5, 13 well developed, with many branches. Comb scales 9(6-11), in a single row; individual scales usually large, pointed and with a fine fringe towards base. Siphon: long, broad at base, tapering, index 13.6-15.5; lightly pigmented. Pecten teeth 4-6 in a row; restricted to basal 0.33 to 0.5; individual scales fairly large, tapering. Ventral setae of siphon 3-5 pairs, individual setae 1-3-branched; dorsal setae 3-6 pairs, usually single but may be branched. Anal segment: Saddle incomplete, with fine spines on posterior margin. Gills elongate, tapering.

SPECIMENS EXAMINED. Total specimens 101: 39 males, 30 females 14 associated larval and pupal exuviae, 14 fourth stage larvae and 4 male genitalia.

TAXONOMIC DISCUSSION. Thurman (1959) created the subgenus *Suaymyia* and distinguished it from the subgenus *Topomyia* by certain characters of the adult male leg, the foretarsomeres and the genitalia. The tarsomeres of the foreleg are straight, not elbowed and tarsomere 2 is longer than tarsomere 3. In the male genitalia of *Suaymyia* the lobes of tergum IX are widely separated and the dorsal lobe of the claspette is absent. Thurman included *spathulirostris* in the subgenus *Topomyia* without any explanation. In the males of *spathulirostris* the fore tarsi are straight and not elbowed and Ta2 is longer than Ta3. In the male genitalia the lobes of tergum IX are widely separated and the dorsal lobe of the claspette is absent. We therefore transfer *spathulirostris* into subgenus *Suaymyia*.

Topomyia spathulirostris appears to be closely related to *Topomyia yanbarensis* Miyagi, 1976 in the adult male, pupal and larval stages. In the male genitalia of both species, the gonostylus is bifurcated. In *yanbarensis* the gonostylus is swollen at the base and the bifurcation does not extend to the very base, whereas in *spathulirostris* there is no swelling and the bifurcation does reach the base. The subapical lobe of the gonocoxite of *yanbarensis* bears two and sometimes three long and blunt spines, whereas *spathulirostris* has only one large, blunt spine. In the pupa of *yanbarensis*, setae 1, 3 and 5 are not well developed on abdominal segment II, whereas they are well developed in *spathulirostris*. Setae 5-III to VI is single in the former and 2-5 branched in the latter. The shape of the saddle in the two species is similar. The larval stages of *spathulirostris* can be distinguished by the following: Head seta 1 stout and frayed; the common tubercle bearing setae 9-12 on the pro- and mesothorax bear a stout curved spine; the siphon is long with an index of 13. 6 to 15.5; and the pecten teeth extend from the base to about 0.33 or 0.5 of the siphon.

BIOLOGY. *Topomyia spathulirostris* occurs in secondary rain forests in Peninsular Malaysia at elevations ranging from 100 to 1,200 m. Over 25 collections were made in association with bamboo. The majority of immature collections were from bamboo internodes (19) and a few from bamboo stumps (3). The immature stages of *Topomyia spathulirostris* have been collected in association with *Topomyia decorabilis*, *Toxorhynchites metalicus*, *Culex brevipalpis* and *Orthopodomyia* species. Nothing is known of the biology of the adults.

DISTRIBUTION. So far known only from Peninsular Malaysia: Selangor State: Ulu Gombak, Ulu Langat, Ulu Klang, The Gap, Kuala Kubu Baru, Genting Simpah. Pahang State: Bukit Kutu, Chegar Perah, Sg. Temau. Kedah State: Sintik- 17th milestone.

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

SETA	CEPHALO-	ABDOMEN							
NUMBER	THORAX	I	II	III	IV	V	VI	VII	VIII
0				1	1	1	1	1	1
1	1(1-2)	Main br. 4(3-7)	5(3-10)	5(4-8)	4(3-6)	4(2-6)	3(2-5)	2(1-3)	
2	1(1-2)	1	1	1	1	1	1	1	
3	1(1-3)	1(1-2)	1(1-2)	1(1-2)	2(1-5)	1(1-2)	1	1	
4	2(1-7)	1(1-8)	4(1-7)	2(1-3)	2(1-2)	4(2-8)	2(1-4)	1(1-2)	1
5	3(1-5)	5(1-9)	2(1-3)	3(2-4)	3(2-5)	3(2-5)	2(1-4)	1(1-2)	
6	3(1-4)	2(1-2)	1(1-3)	1(1-2)	1(1-3)	1(1-2)	1(1-3)	1(1-3)	
7	1(1-2)	2(1-3)	2(1-4)	2(2-5)	2(1-4)	6(1-8)	1(1-2)	1	
8	1(1-2)			3(1-5)	2(1-4)	2(1-4)	3(1-6)	5(3-8)	
9	1	1(1-2)	1	1	1	1	1	13(8-19)	18(15-16)
10	2(1-2)			1(1-2)	1(1-2)	1(1-2)	1(1-2)	2(1-4)	
11	1(1-2)		1	1(1-2)	1(1-2)	2(1-3)	1(1-3)	2(1-4)	
12	1(1-2)								

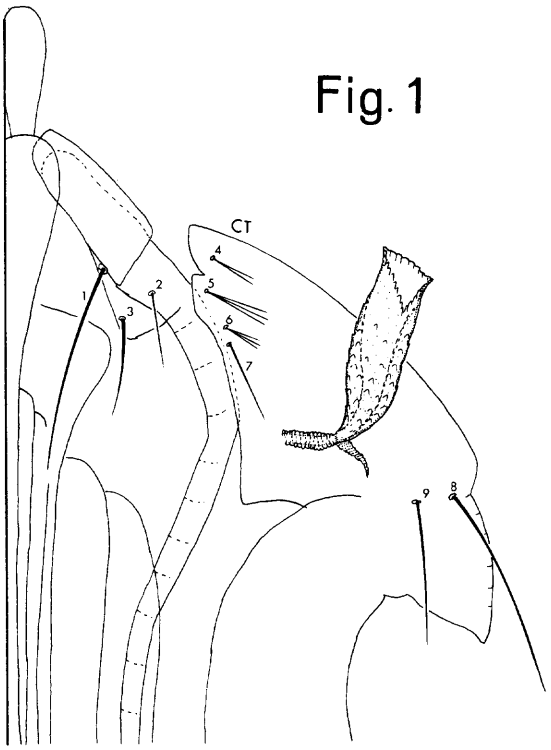
* Chaetotaxy count from a total of 17 specimens. Branching of setae: First number indicates modal number of branches; those in parentheses, the range.

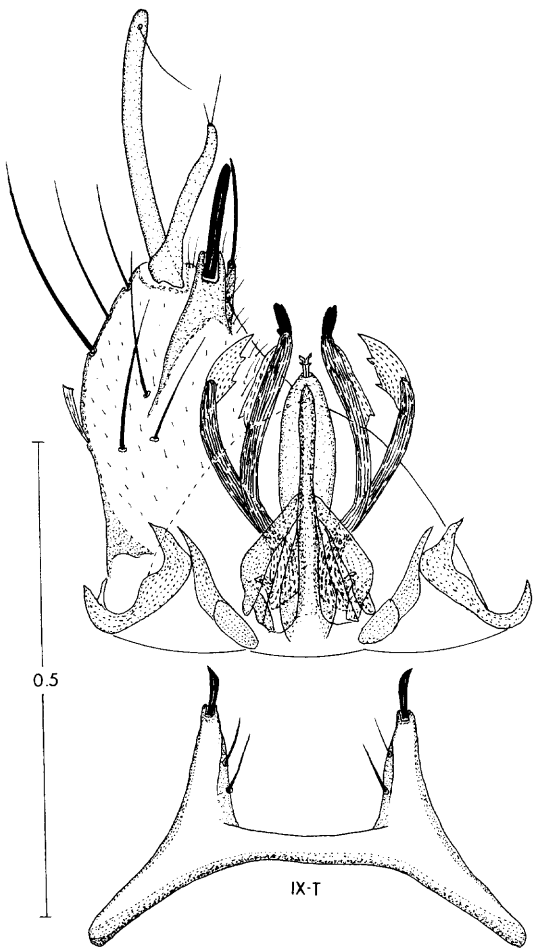
Table 2. Chaetotaxy of the larva of *Topomyia (Suaymyia) spathulirostris*.*

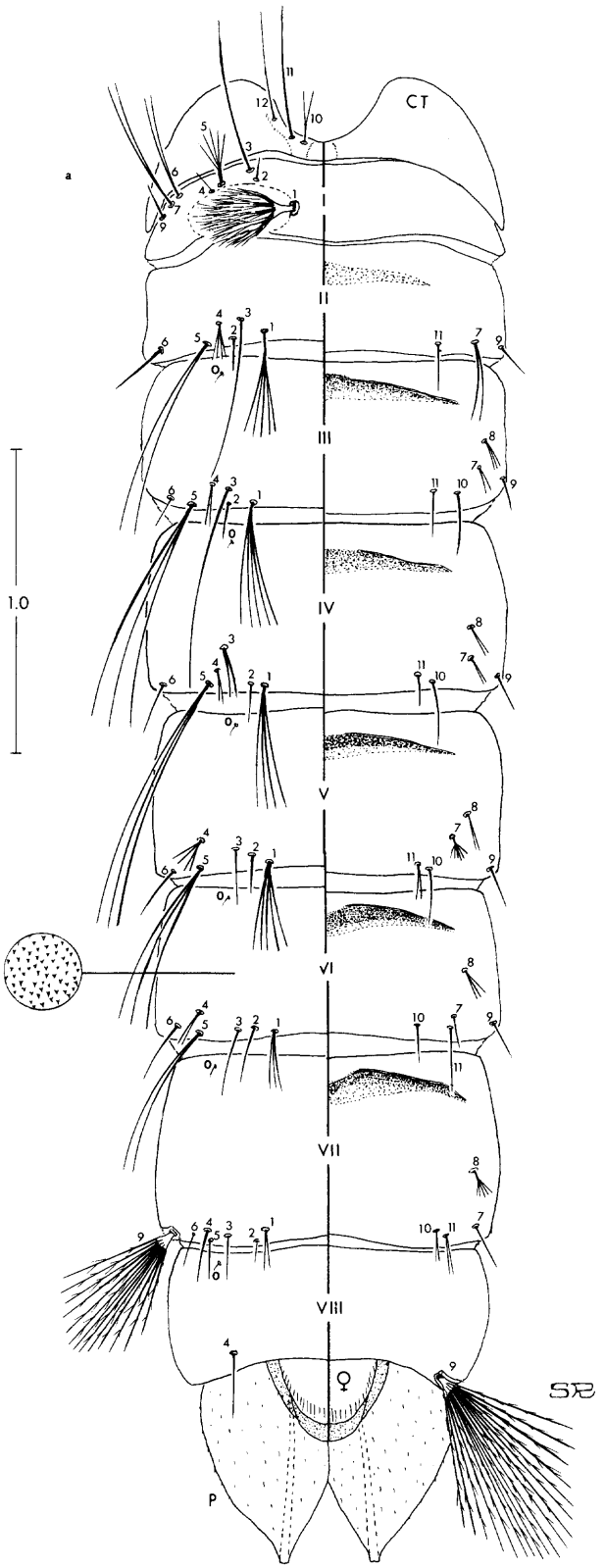
SETA		THORAX			ABDOMEN							
NO:	HEAD	PRO-	MESO-	META-	I	II	III	IV	V	VI	VII	VIII
0	1	12(8-16)										
1		3(3-6)	4(3-6)	4(3-6)	6(3-8)	4(4-6)	3(3-6)	3(2-4)	3(3-4)	3(3-4)	3(2-4)	6(5-7)
2		1(1-2)	1(1-2)	1(1-2)	2(1-4)	1(1-2)	1(1-2)	1	1	1(1-2)	1	1(1-2)
3		3(3-5)	1	4(3-7)	2(1-3)	6(3-10)	2(1-2)	2(1-2)	8(4-12)	1(1-2)	2(1-3)	6(4-8)
4	3(3-4)	10(8-14)	1(1-3)	5(3-6)	6(2-6)	1	1(1-2)	2(1-2)	1	3(1-6)	1(1-2)	1(1-2)
5	1	6(4-9)	1	4(2-7)	3(2-7)	6(3-7)	5(3-7)	4(3-5)	4(2-5)	4(3-5)	3(2-4)	2(1-3)
6	1	1	1(1-2)	1	2(1-2)	1(1-2)	2(1-2)	2(1-2)	1	1	1	
7	3(2-3)	4(2-8)	1	6(4-10)	2(1-3)	2(1-3)	8(5-12)	4(3-6)	6(4-17)	4(4-7)	8(4-12)	
8	2(1-4)	8(5-12)	7(6-9)	8(6-10)		2(1-3)	3(2-6)	2(1-5)	2(1-8)	3(2-8)	10(8-16)	
9	3(2-4)	3(1-6)	3(2-6)	6(2-11)	1(1-2)	1(1-3)	1(1-2)	1(1-2)	1(1-3)	1	1	
10	1	1(1-2)	1(1-2)	1	1	2	3(2-4)	3(2-4)	3(2-6)	6(3-6)	4(3-7)	
11	5(4-7)	1(1-2)	1(1-2)		10(6-16)	3(2-5)	3(2-5)	2(1-5)	2(1-5)	2(2-5)	4(3-5)	
12	2(1-3)	1	1	1(1-2)		4(2-6)	1	1	1	1	1	
13	2(1-3)		8(5-14)	10(7-14)	6(5-10)	6(4-7)	6(5-8)	5(4-8)	5(3-7)	20(15-22)	3(3-5)	
14	8(5-14)	3(1-3)	5(3-8)									
15	2(1-3)											

* Chatetotaxy count from a total of 12 fourth stage larvae and 7 larval exuvie. Branching of setae: First number indicates modal number of branches; those in parentheses, the range.

Fig. 1







Topomyia (Sua) spathulirostris

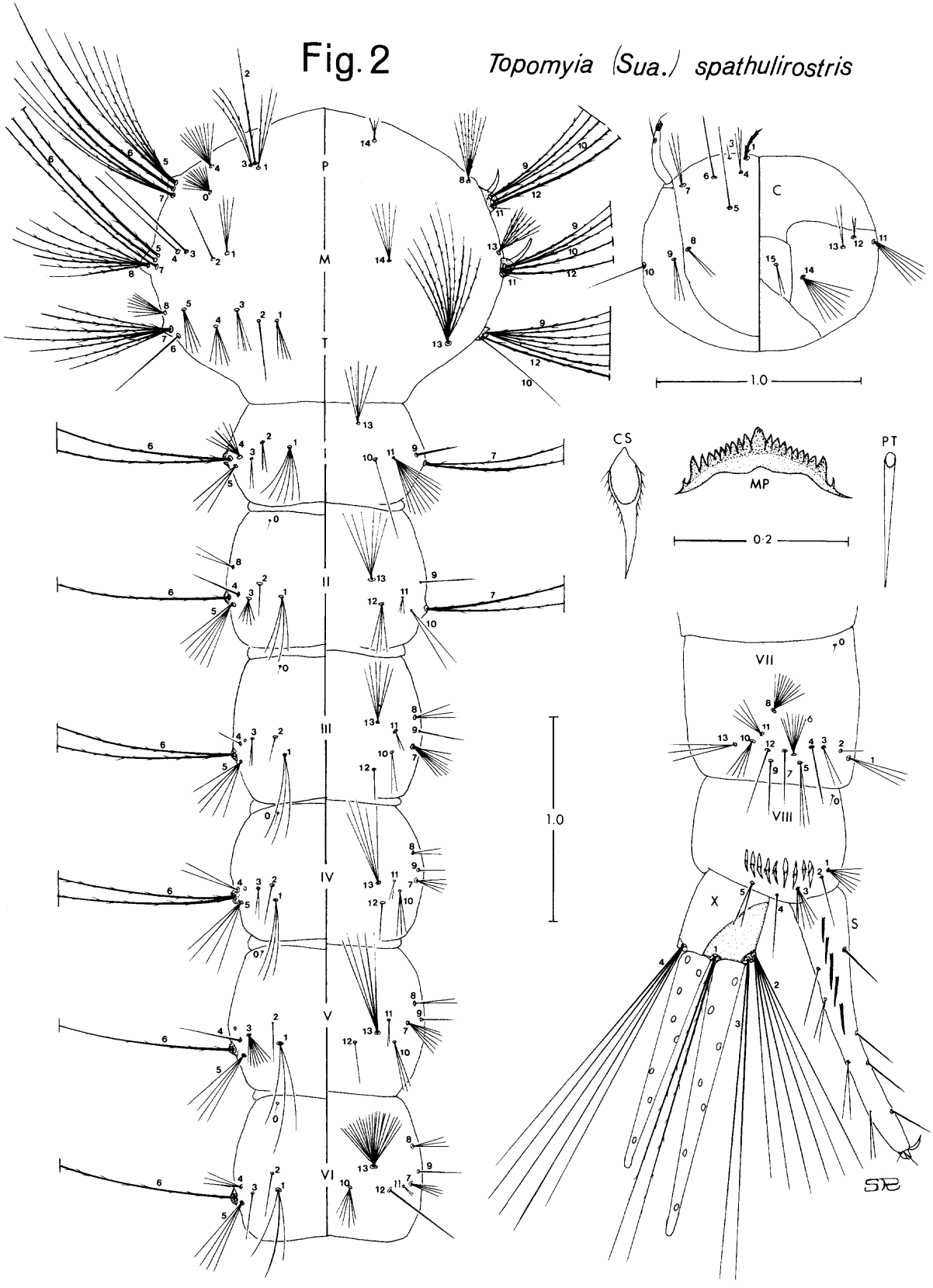


Fig. 2
Topomyia (Sua.) spathulirostris
P
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