

Culex (Culiciomyia) azurini, a New Crab Hole Mosquito
Species from the Philippines¹

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ABSTRACT. A new species of the subgenus *Culiciomyia*, genus *Culex* Linnaeus is defined, discussed and compared to related taxa. Descriptions and illustrations are presented for larval, pupal and adult stages of a new species, *Culex (Culiciomyia) azurini*.

During the course of a faunistic survey on mosquitoes in Palawan Is., the Philippines in 1982, the authors found immatures of an interesting *Culex* species occurring in the brackish water of crab holes. As a result of morphological studies, the authors concluded that this species is new to science and belongs to the subgenus *Culiciomyia*. It will be described here as *Culex (Culiciomyia) azurini*. The authors are pleased to name this species in honor of Dr. Jesus C. Azurin, Ministry of Public Health, Republic of the Philippines. The method of presentation, terminology and abbreviation used in the description follows Belkin (1962), Bram (1967) and Sirivanakarn (1976). Chaetotaxy tables for the 4th instar larva and pupa follow Tanaka, Mizusawa and Saugstad (1979).

Culex (Culiciomyia) azurini n. sp.

Male (Figs. 1A-F, I, J, L). Wing 2.1-2.4 mm. Medium sized, with the following diagnostic features. Head. Decumbent scales of vertex and occiput numerous, narrow, linear and entirely pale, occupying an extensive triangular area in center; anterior margin and lateral area of eye with pale broad scales; erect scales numerous and brown. Palpus and proboscis dark scaled, palpus shorter, 0.71-0.73 of proboscis length, without distinctive lanceolate scales; proboscis about 1.3 of forefemur length, with apparent median joint, median ventral tuft of setae absent. Antenna. Not so developed, sparsely plumose, flagellum 0.92-0.97 length of proboscis; inner part of pedicel with 5-9 setae and 1-5 scales. Thorax. Anterior pronotal lobe with integument brown with pale

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broad scales, bearing 5-9 bristles of various sizes; posterior pronotal lobe with integument brown in upper part, with narrow, curved, gray brown scales on dorsal margin, bearing 3-6 bristles of various sizes along upper to posterior margin; scutal integument dark brown, uniformly covered with narrow curved, gray brown scales; acrostichal bristles reduced to 4 dark bristles on anterior promontory; scutellum covered with narrow curved, gray brown scales, bearing 3, 4 long dark brown bristles on each lateral lobe and 5 long dark brown bristles on median lobe, with a few fine bristles on each lobe; pleural integument brown on propleuron, postspiracular area, lower prealar knob, cephalic and middle sternopleuron and upper mesepimeron; pleura otherwise quite pale; sternopleuron and mesepimeron without scales; 5-7 propleural bristles various sizes and 5-8 prealars, nearly 8-13 sternopleurals of various sizes along upper to posterior margin, 4-9 upper mesepimerals, one stout lower mesepimeral. Wing. Cell R_2 1.01-1.21 length of vein R_{2+3} ; 1A ending between Cu and m-cu; halter knob gray brown scaled. Legs. Forecoxa covered with gray scales; mid- and hindcoxae with pale scales; anterior surface of fore- and midfemora entirely dark; anterior surface of hindfemur pale extending from base to near apex and dorsobasal part of it pale; tibiae and tarsi dark scaled. Hind-tarsomere 1 about 0.9 length of tibia. Abdomen. Tergum I with a median spot of pale scales, II-VII dark scaled and with apical bands of pale scales, VIII dark scaled; sterna pale scaled. Terminalia (Figs. 1A-F). Tergal lobe of segment IX with 9-12 strong setae; basimere apparently without scales; subapical lobe with 2 rows of 3-5 strong setae, strongly modified, with elongate stem-like proximal and distal divisions, projecting mesad; stem of distal division with 2 rods on its apex which are blunt apically, proximal division with 2 rods on its apex, the basal rod shorter, and its base with 1 strong seta which set closely to upper row of strong setae of subapical lobe; distimere divided into 2 arms, dorsal arm bears 2 tiny setae and ventral arm bears 1 tiny seta; lateral plate of the phallosome with a very strong and heavily sclerotized basal tooth and weak denticles laterally; proctiger with large crown consisting of close-set row of flat and blunt spicules laterally and 5-7 finer spinelike spicules internally, the latter projecting from both crowns; lateral paraproct well sclerotized, basal sternal process absent; cercal sclerite membranous, with a large patch of spicules in center, 5-6 cercal setae.

FEMALE (Figs. 1G, H, K). Essentially as in the males. Wing: about 2.4 mm. Head. Palpus about 0.21 of proboscis length; proboscis about 1.7 mm. Wing. Cell R_2 about 1.0 vein R_{2+3} length; base of M_{1+2} about at level of that R_2 .

PUPA (Figs. 2A, B). Abdomen: 2.8-3.2 mm. Paddle: 0.74-0.84 mm. Trumpet: 0.49-0.62 mm. Cephalothorax and abdomen yellowish white. Complete chaetotaxy as figured; the following are characteristic. Trumpet. Brownish, strongly darkened basally; slender, distally widened slightly; length of pinna about 0.10-0.19 mm. Cephalothorax. Seta 1-C usually double (1-3); 3-C usually triple (2, 3); 8-C double; 9-C usually double (1, 2). Metanotum. Seta 10-C usually triple (3-5); 11-C usually double (1-3), 12-C usually double (1, 2). Abdomen. Seta 1-II multiple, 7-14 branched; 5-IV-VI usually double (2, 3) strong, more than 2 times as long as 5-I-III; 9-VII usually triple (2-4); 4-VIII single or double; 9-VIII 3-6 branched, pectinate. Paddle. Yellowish white except for midrib which is pigmented brown.

LARVA (Figs. 3A-G). Head: Length 0.81-0.86 mm., width 1.0-1.13 mm. Siphon: 1.15-1.44 mm; index 4.1-4.7. Complete chaetotaxy as figured; the following are characteristic. Head. Seta 1-C filamentous, its length approximately equal to half the distance between the bases of the pair; 4-C single, simple; 5-C usually triple (2-4) pectinate; 6-C usually double (2-3), pectinate; 7-C usually triple (2, 3); 11-C weaker and shorter than 13-C, usually double (2, 3); 13-C 3-5 branched, 14-C single; 15-C usually double (2, 3). Antenna long, about 0.6 of head length; shaft entirely pale except for basal dark ring, without spicules; seta 1-A usually single (1-3), simple, inserted at basal 0.49-0.67 of shaft; 2, 3-A distinctly subapical, short. Mental plate with 10-13 lateral teeth on each side of median tooth. Thorax. Integument glabrous; seta 1-P usually double (2, 3); 2-P double; 3-P single, considerably shorter and slenderer than 1, 2-P; 4-P usually double (1, 2); 5, 6-P single; 7-P usually triple (1-3); 8-P usually double (2, 3); 14-P single; 5-M usually triple (2-4), pectinate; 8-M 8-9 branched, pectinate; 9-M 6-9 branched, pectinate; 7-T 6-11 branched, pectinate; 9-T 4-8 branched; 12-T usually single (1, 2); 13-T usually double (2-4). Abdomen. Seta 1-I single; 5-I 2-5 branched; 6-I double or triple; 7-I single or double; 1-II single or double; 5-II-VI single; 6-II usually triple (2, 3); 1-III, IV single; 6-III, IV double; 13-III, IV usually double (1-3); 1-V usually single (1, 2); 13-V usually single (1, 2); 1-VI single; 6-V, VI usually double (1, 2). Comb scales small, all similar in size, 50-75, individual scales with even fringe of fine spicules. Saddle same color as siphon, incomplete; seta 1-X usually single (1, 2), about 0.97-1.42 of saddle length; 2-X single, pectinate; 3-X single; 4-X 4 pairs, short; 4a-X usually triple (2-4), length 0.13-0.31 mm; 4b-X usually single (1-3); 4c-X usually single (1, 2); 4d-X single, its length shortest among 4-X, 0.04-0.12 mm; anal gills distinctly longer than saddle, length 1.0-1.3 mm, usually 3.4-4.2 times as long as saddle length, dorsal pairs and ventral pairs about same length. Siphon. Pale yellowish brown, slightly sinuate, length 1.15-1.44 mm, index 4.1-4.7; pecten consisting of 4-7 teeth restricted to the basal 0.3; individual pecten tooth with a prominent apical spine, pigmented; siphonal tufts 4 pairs 1-3 branched each, short, inserted beyond last tooth.

HOLOTYPE

Male (821020-1A-216), with larval and pupal skins on slides, found as 4th stage larva in a brackish crab hole at White Beach, Puerto Princesa, Palawan Is., the Philippines on October 20, 1982, by T. Toma and I. Miyagi. Holotype will be deposited in the National Sciences, Tokyo, Japan.

PARATYPES

Four males and 4 females with associated larval and pupal skins on slides and 14 males, 7 females, 15 larvae, 2 larval and pupal skins. Collections were made in crab holes at the same locality as holotype in October 1982, by T. Toma and I. Miyagi. Paratypes (1 male and female with associated larval and pupal skins on slides) will be deposited in the National Science Museum, Tokyo, and 1 male and female with larval and pupal skins on slides which will be presented to the U. S. National Museum, Washington, D. C.

DISTRIBUTION

Palawan Is., the Philippines.

BIOLOGY

The immature stages of *Culex azurini* have been collected in brackish water crab holes, 1.5 m deep under ground. They were usually associated with *Aedes (Geoskusea) baisasi* Knight and Hull, *Ae. (Rhinosukusea) wardi* and sometimes found with *Culex (Culiciomyia) delfinadoae* Sirivanakarn and *Culex (Culiciomyia) spathifurca* (Edwards). The adult habits are not known. Nothing more is known about its biology.

TAXONOMIC DISCUSSION

The characters falling within the range of the subgenus *Culiciomyia* are somewhat variable. A review of all of the currently recognized *Culiciomyia* species revealed species possessing the following adult and larval characters (Bram 1976; Sirivanakarn 1973; Sirivanakarn 1977): 1. the 3rd palpal segment of the male with distinctive lanceolate scales on the ventrolateral surface (except *Cx. delfinadoae*, *Cx. tricuspis* and *Cx. azurini*); 2. the proboscis with a false joint (except *Cx. ramalingami*, *Cx. tricuspis* and *Cx. viridiventer*); 3. acrostichal setae reduced to 4 dark setae on the anterior promontory; and 4. the basimere without scales (except *Cx. tricuspis*). In the larva, 5. seta 1-C usually filamentous; 6. 2-P single (except *Cx. azurini* and *Cx. harrisoni*); 7. the paddle complete (except *Cx. azurini*); 8. 4-X with 4 pairs (or 8 setae) (except *Cx. lampangensis*).

Based on the above characters it seems clear that the new species, *Cx. azurini*, belongs to the subgenus *Culiciomyia*, but also possesses several unique features in the subgenus. In the adult, a ventrolateral row of lanceolate scales on the male palpal segment 3 is absent completely, the length of the male palpus reduced and the antenna is sparsely plumose. In the larva, seta 1-A usually single (1-3), 2-P is double and the paddle incomplete. Such isolated reductions may have evolved due to its specialized existence in crab holes.

The adult of *Cx. azurini* appears to be closely related to *Cx. delfinadoae* and *Cx. tricuspis* in the complete absence of a ventrolateral row of lanceolate scales on the male palpal segment 3 and in the absence of a ventral tuft of setae in the middle of labium. It can be easily distinguished from these species by having the reduced length of the male palpus.

The male terminalia of *Cx. azurini* is similar to *Cx. delfinadoae* and *Cx. tricuspis* but it can be separated from *Cx. delfinadoae* and *Cx. tricuspis* in having the ventral arm without a perpendicular process on the distimere and a subapical lobe with 2 rows of 3-5 strong setae.

The larva of *Cx. azurini* are strikingly different from any other known species of *Culiciomyia* in having seta 1-A usually single (1-3) and simple, 2-P double, paddle incomplete, and short and undeveloped ventral brush.

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EXPLANATION OF FIGURES

Fig. 1. Adult of *Culex (Culiciomyia) azurini* (A-L)

- A. Male terminalia
- B. Distal division
- C. Proximal division
- D. Phallosome
- E. Proctiger
- F. IX-tergum
- G. Palpus of female
- H. Antenna of female
- I. Palpus of male
- J. Antenna of male
- K. Dorsal aspect of female abdomen
- L. Dorsal aspect of male abdomen

Fig. 2. Pupa of *Culex (Culiciomyia) azurini* (A, B)

- A. Cephalothorax (C)
- B. Abdomen

Fig. 3. Larva of *Culex (Culiciomyia) azurini* (A-G)

- A. Thorax and abdomen
- B. Distal part of antenna
- C. Head
- D. Mental plate (MP)
- E. Terminal segments
- F. Pecten teeth (PT)
- G. Comb scale (CS)

Fig. 1

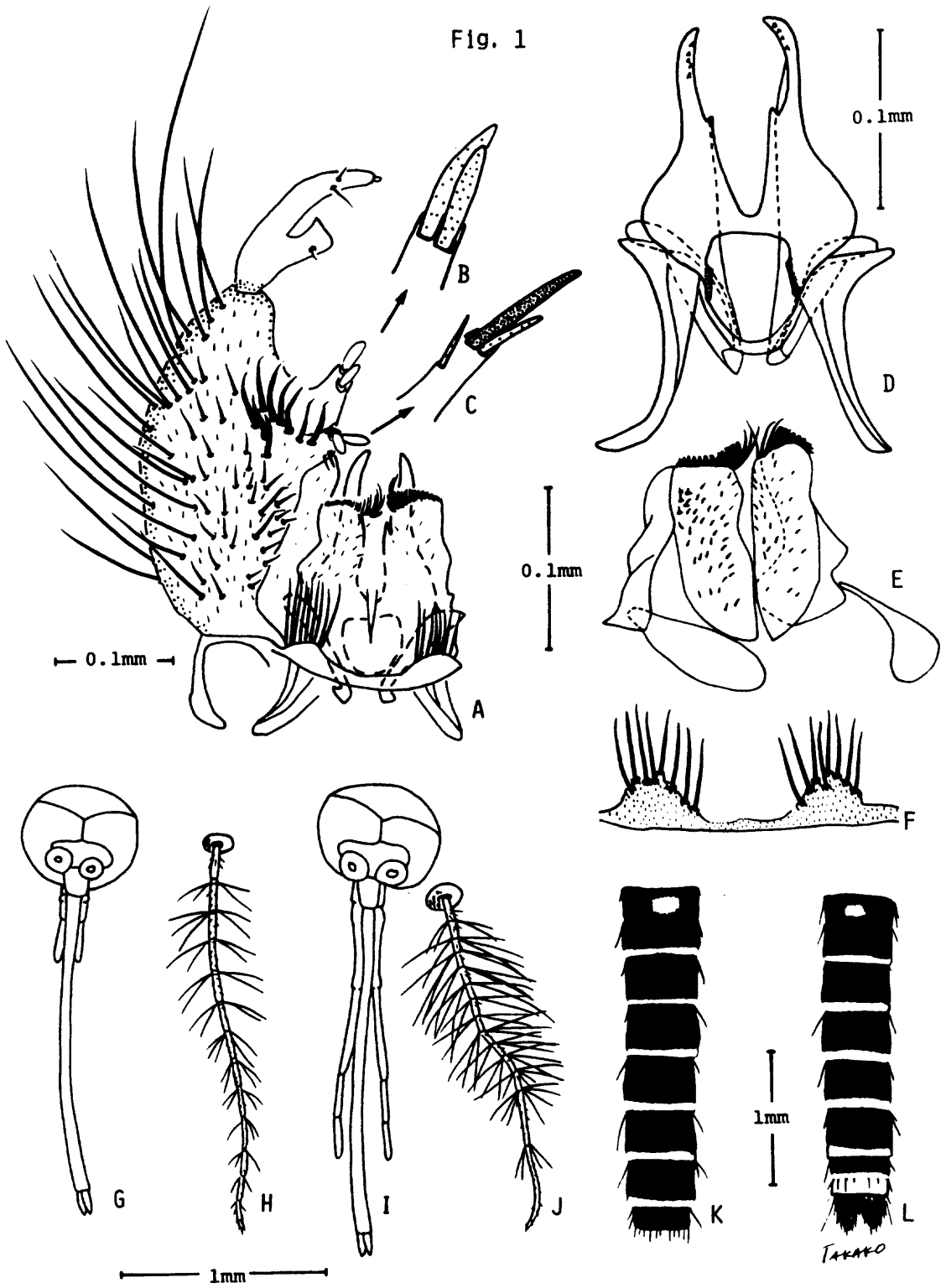
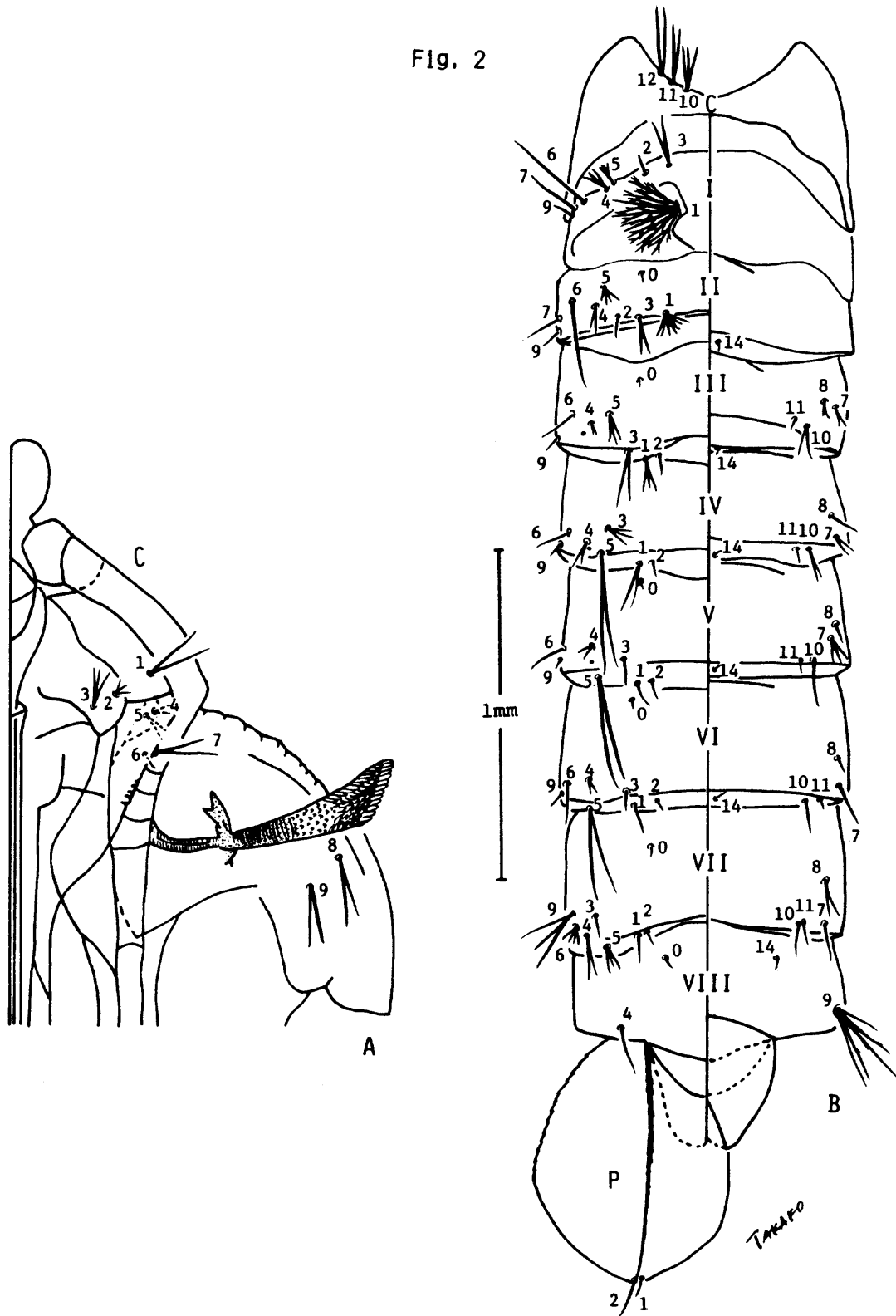


Fig. 2



TAKANO

Fig. 3

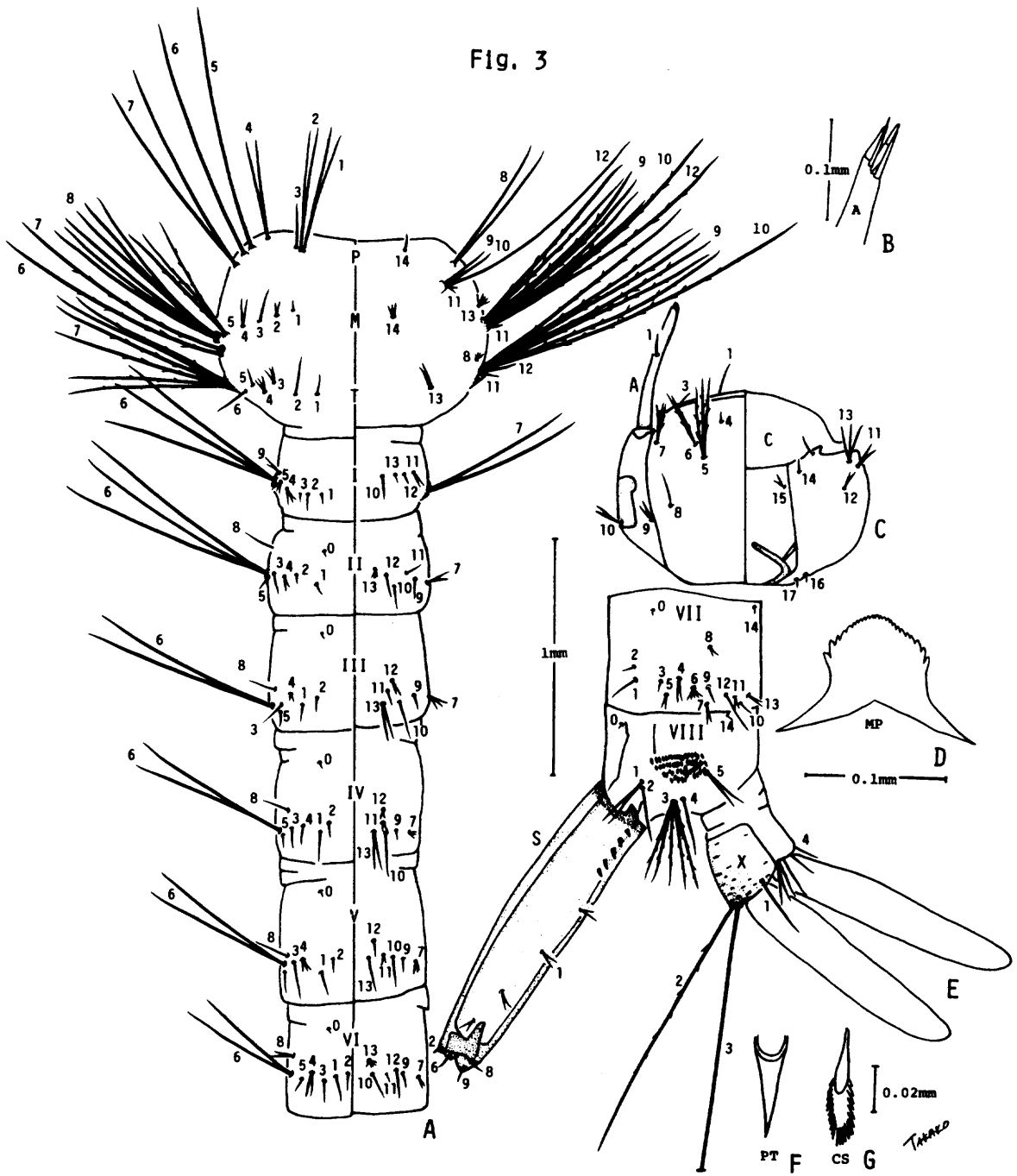


Table 1. Chaetotaxy of the pupa of *Culex (Culicomyia) azurini*

SETA NO.	CEPHALO-THORAX	ABDOMEN							
		I	II	III	IV	V	VI	VII	VIII
0	-	-	1	1	1	1	1	1	1
1	2 (1-3)	7-14	3 (2-5)	2 (2,3)	1 (1,2)	1 (1,2)	1 (1,2)	1 (1,2)	-
2	3 (2-4)	1	1	1	1	1	1	1	1
3	3 (2,3)	2 (2-4)	2 (1,2)	3 (1-4)	1 (1,2)	1 (1-3)	1 (1,2)	1 (1,2)	-
4	2 (1,2)	2 (1,2)	2 (1,2)	2 (1,2)	2 (1-3)	2 (2,3)	2 (1,2)	2 (1,2)	1 (1,2)
5	2 (1,2)	4 (3-5)	3 (3-5)	2 (2,3)	2	2 (2,3)	3 (1-4)	3 (1-4)	-
6	1	1	1	1	1	1	4 (2-5)	4 (2-5)	-
7	2 (1,2)	1 (1,2)	1-4	2,3 (1-3)	3 (1-4)	1	1 (1,2)	1 (1,2)	-
8	2	-	1-3	1	1 (1,2)	1,2	2 (1-3)	2 (1-3)	-
9	2 (1,2)	1	1 (1,2)	1	1	1	3 (2-4)	3 (2-4)	5 (3-6)
10	3 (3-5)	-	2 (1,2)	2 (1,2)	1	1 (1,2)	1 (1,2)	1 (1,2)	-
11	2 (1-3)	-	1 (1,2)	1 (1,2)	1 (1,2)	1 (1,2)	1 (1,3)	1 (1,3)	-
12	2 (1,2)	-	-	-	-	-	-	-	-
14	-	-	1	1	1	1	1	1	1

