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THE SUBGENUS *CHRISTOPHERSIOMYIA*
OF THE GENUS *AEDES*
(DIPTERA: CULICIDAE).

By

Jay Abercrombie

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(DIPTERA: CULICIDAE)¹.

by

Jay Abercrombie²

ABSTRACT

The subgenus *Christophersiomyia* Barraud of *Aedes* Meigen is revised. Descriptions, illustrations and keys are presented for the adults, pupae and larvae of the 5 included species: *annulirostris*, *chionodes*, *gombakensis*, *ibis* and *thomsoni*. *Aedes brayi* Knight is synonymized with *ibis* Barraud. Information is presented on the distribution and bionomics of each species.

INTRODUCTION

Christophersiomyia Barraud (1923a) was erected as a new genus for the inclusion of 2 species (*thomsoni* Theobald and *annulirostris* Theobald) previously included in *Stegomyia* Theobald. Barraud (1931) subsequently reduced *Christophersiomyia* to a subgenus of *Aedes* and included a third species, *ibis* Barraud. Three additional species (*brayi* Knight (1947), *gombakensis* Mattingly (1959) and *chionodes* Belkin (1962)) were later added.

The subgenus occurs throughout tropical Asia, from Pakistan east to the Philippines, and into the southwestern South Pacific islands.

Five species are recognized: *annulirostris*, *chionodes*, *gombakensis*, *ibis* and *thomsoni*. *Aedes brayi* is considered as a synonym of *ibis*.

The larvae and pupae of *chionodes* and *ibis* are described and illustrated for the first time. In addition, descriptions and illustrations of the female, male, larva and pupa of all 5 species are given and keys are presented for their separation. No eggs were available for study.

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This revision is based mainly on specimens in the United States National Museum (USNM). Other specimens were borrowed from the British Museum (Natural History) (BMNH), the Bernice P. Bishop Museum (BPBM) and the Field Museum of Natural History (FMNH).

Morphological terms for the adult, pupa and larva follow Belkin (1962), as slightly modified by later workers, particularly Huang (1972).

The lists of synonyms which begin each species discussion provide information on that species as given in the literature. The abbreviations (A = adult, ♂ = male, ♀ = female, P = pupa and L = larva) indicate the stage dealt with in the article. An asterisk (*) denotes that all or some portion of that stage is illustrated. Abbreviations used in the distribution sections are the same as above with the addition of: p = pupal exuvium and l = larval exuvium. Abbreviations used for the references follow the BIOSIS List of Serials, BioSciences Information Service of Biological Abstracts, Philadelphia, 1974.

Distribution records have the country in capital letters, the province or administrative division (where known) in italics, followed by the specific locality. A few place names could not be located in gazetteers; these are placed in quotes. The known distribution of the subgenus as a whole is not increased significantly by new information presented in this revision. However, individual species are shown to have much more extensive geographic ranges than previously reported.

GENUS *Aedes* MEIGEN

SUBGENUS *CHRISTOPHERSIOMYIA* BARRAUD

Type-species: *Stegomyia thomsoni* Theobald 1905a: 18 (by original designation, Barraud 1923a: 787).

Stegomyia of Theobald 1905a: 18 (in part, *S. thomsoni* only), nec *Stegomyia* Theobald 1901.

Stegomyia of Theobald 1905b: 239 (in part, *S. annulirostris* only), nec *Stegomyia* Theobald 1901.

Christophersiomyia Barraud 1923a: 786.

Aedes (*Christophersiomyia*) Barraud, of Barraud 1931: 610; Knight 1947: 73; Knight and Hull 1952: 162; Stone et al. 1959: 177; Belkin 1962: 433.

Aedes (*Christophersiomyia*) Barraud, of Edwards 1932: 159; Barraud 1934: 212; Mattingly 1959: 51.

FEMALE. Ornate, small. *Head.* Decumbent scales all broad and flat; erect scales restricted to occiput; clypeus bare; proboscis slender, about length of forefemur, with a postmedian complete or incomplete white scaled ring; palpus dark scaled, short, about 0.25-0.35 of proboscis length, 4 segmented, segment 4 short; antenna longer than proboscis. *Thorax.* Scutellum with broad, flat scales; pleuron with white scales, *apn* predominantly with long, narrow curved scales, some broadened; paratergite apparently with scales; *pra* with scales; acrostichal and dorsocentral bristles lacking; 1 or 2 upper *stp* bristles; 1-4 lower *mep* bristles. *Wing.* Scales all dark except for a small white patch at base ventrally. *Legs.* Ornate, usually with distinctive rings or spots; both claws of all legs with small subbasal tooth. *Abdomen.* Laterotergite completely white scaled; most tergites with basal median triangular patches and subapical lateral triangular patches of white scales.

MALE. Essentially as in female. *Antenna.* Flagellar whorls with numerous long bristles extending dorsally and ventrally; flagellomeres 12 and 13 elongate. *Legs.* Claws slightly longer than in female. *Genitalia.* Tergite IX shallowly to moderately emarginate in the middle of caudal border, forming pair of short, lateral, tergal lobes bearing a group of short setae; basimere simple, without lobes other than short claspette, mesal membrane present, scales restricted to lateral and ventral surfaces; claspette small, thin basally, much stouter apically, bearing numerous simple bristles; distimere simple, with 1 or 2 simple subapical setae; spiniform process simple, rather long; aedeagus simple, without denticles or spicules (except *gombakensis*), swollen distally in dorsal aspect; proctiger lightly sclerotized except for paraproct which ends in a single heavy spine; cercal setae lacking.

PUPA. *Cephalothorax.* Setae 1, 2-C single to 7 branched; 3, 4, 7-C single to 6 branched; 5, 9-C single to 5 branched; 6-C single or double; 8-C single to 8 branched. *Metanotum.* Seta 10-C triple to 15 branched; 11-C single; 12-C single to 8 branched. *Respiratory trumpet.* Moderately pigmented; a few short setae on inner surface of meatus; index 2.83-5.50. *Abdomen.* Setae 0-II, VIII single; 0-III-VII single or double; 1-I 10-18 branched; 1-II 6-34 branched; 1-III double to 23 branched; 1-IV single to 12 branched; 1-V single to 10 branched; 1-VI single to 7 branched; 1-VII single to 4 branched; 2-I, III, IV, VI, VII single; 2-II, V single or double; 3-I, II single; 3-III, VII single to triple; 3-IV single to 7 branched; 3-V single to 4 branched; 3-VI single or double; 4-I double to 15 branched; 4-II double to 11 branched; 4-III double to 6 branched; 4-IV, VII single to triple; 4-V triple to 8 branched; 4-VI single to 6 branched; 4-VIII single or double; 5-I single to 4 branched; 5-II single to 10 branched; 5-III double to 10 branched; 5-IV single to 7 branched; 5-V single to 5 branched; 5-VI single to triple; 5-VII single or double; 6-I, II single; 6-III-VI single or double; 6-VI single to 6 branched; 7-I single to 6 branched; 7-II, III single to 4 branched; 7-IV single to 5 branched; 7-V double to 7 branched; 7-VI single or double; 7-VII single; 8-III single to 8 branched; 8-IV single to 5 branched; 8-V double to 5 branched; 8-VI double to 6 branched; 8-VII single to 6 branched; 9-I-VI single; 9-VII single to 5 branched; 9-VIII single to 7 branched; 10-III single to 4 branched; 10-IV single to 5 branched; 10-V, VII single or double; 10-VI single; 11-III, VII single or double; 11-IV-VI single; 14-II-VIII single. *Paddle.* Ovoid; midrib lightly to moderately pigmented, never reaching apex; 1-P moderately long, single (rarely triple); index 1.19-1.94.

LARVA. *Head.* Moderately pigmented; setae 0, 1, 3-C single; 4-C triple to 13 branched; 5-C triple to 10 branched; 6-C, 6-MP [basal maxillary hair (*bmk*)] single to triple; 7-C triple to 12 branched; 8, 15-C double to 5 branched; 9, 13-C triple to 9 branched; 10-C single to 5 branched; 11-C with 4-11 branches; 12-C double to 12 branched; 14-C single or double; 1-C short, stout, on ventral surface; 4-C short, well caudad of anterior margin of head, mesad and slightly cephalad of 6-C; 5-C long, only slightly caudad of 6-C; 6-C long to very long, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, well caudad of anterior margin of head, well laterad and slightly cephalad of 6-V; mental plate heavily pigmented with 19-27 anteriorly-directed teeth; mouth brush with simple setae. *Antenna.* Short, moderately pigmented, with scattered spicules on shaft; 1-A long, double to 5 branched, attached 0.40-0.58 from base; 2-6-A single, attached apically; 5-A short, peg-like. *Thorax.* Seta 0-P with 6-22 branches; 1-P double to 6 branched; 2-P single or double; 3, 8-P double or triple; 4, 7, 14-P double to 4 branched; 5, 6, 10, 12-P single; 9-P single to triple; 11-P double to 7 branched;

1, 6-M double to 5 branched; 2-M single to 4 branched; 3, 5, 7, 10, 12-M single; 4-M double or triple; 6-M double to 5 branched; 8-M triple to 8 branched; 9-M triple to 5 branched; 11-M single to 5 branched; 13-M with 5-30 branches; 14-M with 4-32 branches; 1-T with 4-9 branches; 2, 5, 6-T single or double; 3-T with 5-10 branches; 4-T double to 6 branched; 7-T with 4-9 branches; 8-T with 4-14 branches; 9-T triple to 5 branched; 10, 12-T single; 11-T double to 5 branched; 13-T triple to 6 branched. *Abdomen.* 0-II-VIII single; 1-I with 4-20 branches; 1-II with 5-9 branches; 1-III-V single to 4 branched; 1-VI double to 4 branched; 1-VII single to triple; 1-VIII single to 5 branched, 2-I-III, VIII single or double; 2-IV-VII single; 3-I, II double or triple; 3-III double; 3-IV, VI single or double; 3-V single; 3-VII double to 8 branched; 3-VIII with 4-7 branches; 4-I with 4-17 branches; 4-II with 5-10 branches; 4-III double to 6 branched; 4-IV double to 4 branched; 4-V with 4-7 branches; 4-VI double or triple; 4-VII, VIII single; 5-I double to 7 branched; 5-II double to 11 branched; 5-III, VII double to 9 branched; 5-IV single to 8 branched; 5-V, VI single to 7 branched; 5-VIII double to 4 branched; 6-I double to 4 branched; 6-II double or triple; 6-III single to triple; 6-IV, V double; 6-VI single or double; 6-VII with 6-15 branches; 7-I, VII single or double; 7-II double to 8 branched; 7-III, V triple to 9 branched; 7-IV with 4-9 branches; 7-VI double to 6 branched; 8-II single to triple; 8-III, V single or double; 8-IV single; 8-VI double to 10 branched; 8-VII with 4-16 branches; 9-I, II single or double; 9-III-VI single; 9-VII single to 6 branched; 10-I-V, VII single or double; 10-VI single; 11-I, III-VII single to triple; 11-II single; 12-II triple to 6 branched; 12-III, IV double or triple; 12-V single or double; 12-VI, VII single; 13-I single or double; 13-II with 5-24 branches; 13-III single to 5 branched; 13-IV, V single to 4 branched; 13-VI with 4-26 branches; 13-VII single to 6 branched; 14-III, V single; 14-IV, VI, VII single; VIII with comb composed of 9-18 scales in one row; 1-X moderately long, slender, single to triple, attached near posterior margin of saddle; 2-X long, stout, single or double; 3-X long to very long, stout, single; 4-X composed of 4 pairs of setae on grid: 4a single to triple, 4b, d single to 5 branched, 4c single to 4 branched; 4a, b moderately long; 4c, d rather short; no precratal setae; saddle moderately pigmented, with a few inconspicuous spicules on posterior margin, acus absent; 4 anal papillae. *Siphon.* Pigmented, acus absent, index 1.72-3.90; pecten on basal 0.47 of siphon, composed of 4-14 evenly spaced teeth, each tooth with a slender attenuated filament with 1 or 2 small denticles on ventral margin; 1-S moderately long, double to 7 branched, attached on basal 0.53 of siphon, distad to apical pecten tooth; 2-S short, single, on apical margin of siphon; 6, 9-S short, single; 7-S short, single or double; 8-S short, single to triple.

EGG. Not known.

DISCUSSION. *Christophersiomyia* is a very homogenous subgenus. The 5 known species are closely related, with only *thomsoni* being distinctly different in all stages. The adults, particularly the male, of *gombakensis* are also rather distinct, although they closely resemble those of *chionodes*. The immature stages of *gombakensis* are very similar to those of *annulirostris* and *ibis*.

Another indication of the homogeneity of *Christophersiomyia* is its markedly isolated position within *Aedes*. Mattingly (1959) pointed out that the male terminalia are more like those of other genera, especially *Ficalbia* Theobald, than than those of most *Aedes*. Within *Aedes*, *Christophersiomyia* appears to have its closest affinities with the subgenus *Bothaella* Reinert. Theobald (1905a, 1905b), who examined only females of *thomsoni* and *annulirostris*, placed these species in *Stegomyia*. Barraud (1931), who described *ibis* from a single

female, questionably placed this species in *Christophersiomyia*, stating that it may properly belong in *Finlaya* Theobald.

Reinert (1973) outlined the following characters of adults of *Bothaella* which differ from *Christophersiomyia*: prosternum bare, propleuron with 2 or 3 dark setae, postpronotum and paratergite bare, scutum with dark scales and distimere club-like apically. In contrast, *Christophersiomyia* possesses prosternum with white scales, propleuron with 6-14 light-colored setae, postpronotum and apparently paratergite with white scales, scutum with white scales and distimere simple.

The pupae of *Bothaella* and *Christophersiomyia* are readily separated by seta 1-P on the paddle. In *Bothaella*, this seta is short, multiple branched and barbed. In *Christophersiomyia*, seta 1-P is longer, single (rarely triple in *gombakensis*) and simple.

The fourth-stage larvae of the 2 subgenera are separated by the following combination of characters. *Bothaella* possesses: seta 5-C single, 4-C moderately long, near anterior margin of head, 5-C well caudad of 6-C and 13-P well developed. *Christophersiomyia* possesses: seta 5-C triple to 10 branched, 4-C short, well caudad of anterior margin of head, 5-C only slightly caudad of 6-C and 13-P lacking.

Adults of *Christophersiomyia* are separated from those of *Stegomyia* by having a proboscis with complete or incomplete ring and a simple aedeagus, without lateral sclerotized plates.

Pupae of *Christophersiomyia* differ from those of most *Stegomyia* by lacking a fringe on the paddle. Pupae of most *Stegomyia* have the fringe well developed.

The placement of head setae 4-6-C is the best character for distinguishing mature larvae of *Stegomyia* and *Christophersiomyia*. In the former, they are far forward; in the latter, they are well caudad of the anterior margin of the head.

Adults of *Christophersiomyia* are separated from those of *Finlaya* by having a short palpus (in the male), proboscis with complete or incomplete postmedian ring, erect scales on head restricted to occiput, hindleg claws toothed and cercal setae lacking in the male genitalia.

More study of *Finlaya* is needed before diagnostic characters of the pupa can be compared with those of *Christophersiomyia*.

Mature larvae of the 2 subgenera are separated by the following combination of characters. *Finlaya* has: setae 5, 6-C moderately short, 12-I developed and comb scales on VIII arranged in a subtriangular patch. *Christophersiomyia* has: setae 5, 6-C well developed, 12-I lacking and comb scales arranged in a single row.

DISTRIBUTION. *Christophersiomyia* is known from Pakistan, India, Sri Lanka, Nepal, Bangladesh, Thailand, China (Hainan Island), Cambodia, Vietnam, Malaysia (Selangor and Sabah), Philippines (Luzon), Papua New Guinea (Papua) and the Solomon Islands (Bougainville). Species of this subgenus occur in the Oriental, Indomalayan, Papuan and South Pacific faunal areas as defined by Belkin (1962).

BIONOMICS. *Christophersiomyia* is apparently rarely collected since it is poorly represented in museum collections. Field workers have collected specimens, usually only a few in number, in relatively scattered locations. Adults are apparently thamnophilous.

The immature stages are found in similar habitats as those of *Stegomyia*, as listed by Huang (1972). Indeed, Peters and Dewar (1956) collected specimens of both subgenera from the same tree hole. Eggs of *Christophersiomyia*

are similar to those of *Stegomyia* in that they undergo diapause and are resistant to desiccation (Howlett 1913; Peters and Dewar 1956).

Larvae and pupae have been collected in tree holes (*gombakensis* and *thomsoni*); tree holes, stump holes, water butts and woodpecker holes (*annulirostris*); tree holes, woodpecker holes and stream rock pools (*ibis*); and coconut shells and spathes (*chionodes*).

MEDICAL IMPORTANCE. Although several of the species have been collected feeding on man, none has been implicated as a vector of human pathogens.

KEYS TO THE SPECIES OF *Aedes* (*CHRISTOPHERSIOMYIA*)

ADULTS

1. Hindtibia with a white band at basal 0.3; metameron with white scales. *thomsoni* (p. 21)
Hindtibia without a white band; metameron bare. 2
- 2(1). Anterior surface of forefemur with a white spot or mark at apical 0.3. *ibis* (p. 17)
Anterior surface of forefemur completely dark scaled or with scattered white scales basally. 3
- 3(2). White band of proboscis entire; all lobes of scutellum white scaled. *annulirostris* (p. 7)
White band of proboscis interrupted dorsally; scutellum with midlobe white or pale scaled and lateral lobe dark scaled. 4
- 4(3). Females. 5
Males. 6
- 5(4). Abdominal tergites II and III with white basal median triangular patches, and with quite large similar markings on posterior tergites. *chionodes* (p. 11)
Abdominal tergites II and III dark scaled, and with only minute white basal median triangular patches on posterior tergites. *gombakensis* (p. 14)
- 6(4). Aedeagus without denticles. *chionodes* (p. 11)
Aedeagus with 3 denticles on each side. *gombakensis* (p. 14)

PUPAE

1. Seta 12-C single; seta 5-II single; seta 6-V double. *chionodes* (p. 11)
Seta 12-C with 2 to 8 branches; seta 5-II with 2 to 10 branches; seta 6-V single. 2
- 2(1). Seta 1-III with 11 to 23 branches; seta 1-VII double to 4 branched. *thomsoni* (p. 21)
Seta 1-III with 2 to 7 branches; seta 1-VII single. 3

- 3(2). Paddle with spicules on apical 0.50-0.55 of both outer and inner margins. *ibis* (p. 17)
 Paddle with spicules limited to apical 0.33 of inner margin and covering practically entire outer margin. 4
- 4(3). Seta 1-P 0.45-0.53 (mean = 0.49) length of paddle; seta 1-P single. *annulirostris* (p. 7)
 Seta 1-P 0.27-0.40 (mean = 0.33) length of paddle; seta 1-P single or triple. *gombakensis* (p. 14)

FOURTH STAGE LARVAE

1. Seta 6-C single; seta 10-VII double. *thomsoni* (p. 21)
 Seta 6-C double or triple; seta 10-VII single. 2
- 2(1). Seta 13-VII single. *chionodes* (p. 11)
 Seta 13-VII double to 4 branched. 3
- 3(2). Mesal mouth brush hairs comb-like. *annulirostris* (p. 7)
 Mesal mouth brush hairs simple. 4
- 4(3). Comb scales 6-11; seta 3-VII with 4 to 8 branches, 11-VII double or triple; seta 1-A attached 0.48-0.53 from base of antenna. *gombakensis* (p. 14)
 Comb scales 14 or 15; seta 3-VII triple, 11-VII single; seta 1-A attached 0.40-0.44 from base of antenna. *ibis* (p. 17)

SPECIES TREATMENT

AEDES (CHRISTOPHERSIOMYIA) ANNULIROSTRIS (THEOBALD)

(Figs. 1, 2, 3, 4)

- Stegomyia annulirostris* Theobald 1905b: 239 (♀); Theobald 1907: 173 (♀, key); Brunetti 1907: 329 (distribution); Theobald 1910: 154 (key); Green 1911: 234 (distribution); Brunetti 1912: 444 (distribution); Brunetti 1920: 129 (distribution); Senior-White 1923: 62 (distribution).
- Aëdes (Stegomyia) annulirostris* of Edwards 1917: 210 (♂).
- Aedes (Stegomyia) annulirostris* of Edwards 1922: 256 (key).
- Christophersiomyia annulirostris* of Barraud 1923a: 788 (♂*, ♀*, distribution, key); Senior-White 1927: 62 (distribution).
- Aedes (Christophersiomyia) annulirostris* of Barraud 1931: 611 (taxonomy); Edwards 1932: 159 (taxonomy); Knight 1947: 75 (key); Horsfall 1955: 410 (distribution); Rao and Rajagopalan 1957: 11 (biology); Stone et al. 1959: 177 (distribution); Belkin 1962: 433 (taxonomy); Joshi et al. 1965: 139 (distribution); Stone and Delfinado 1973: 292 (distribution).
- Aëdes (Christophersiomyia) annulirostris* of Barraud 1934: 215 (♂*, ♀*, L); Carter 1950: 92 (references); Peters and Dewar 1956: 39 (L*, P*); Mattingly 1959: 54 (key).

FEMALE (Figs. 1, 2). Wing: 1.9-2.8 mm. Proboscis: 1.0-1.6 mm. Forefemur: 1.2-1.7 mm. Abdomen: 1.8 mm. Head. Decumbent scales

white except for diffuse patch of dingy scales dorsolaterally and laterally at about level of *apn*; erect scales pale beige; labium with complete postmedian ring of white scales, sharply defined, length of ring about 0.22-0.26 of labium length; palpus dark scaled; torus with prominent patch of broad white scales on median surface. *Thorax*. Integument brown; densely covered with white scales throughout except pale beige in color in prescutellar space and in small area posterad of scutal angle; mesonotal scales predominantly long and narrow; midlobe of scutellum with white scales, lateral lobe with 3 or 4 white scales; paratergite almost completely covered with white scales, narrow anteriorly, broader posteriorly; pleural scaling entirely white, scales all broad except for some on *apn* and on upper *ppn*, *apn* with broad flat scales anteriorly, narrow curved scales in the middle, broader curved scales posteriorly and longer broader curved scales ventrally; *ppn* almost completely covered with white scales, narrow above, broad below and intermediate in the middle; *ppl* with a large patch of white scales; *acx* and *pcx* with a few white scales; *psp* with a few scales caudad of bristles; *ssp* with a large scale patch continuous with patch on upper *slp*; a small scale patch below *pra* bristles; *slp* with a large upper patch of scales continuous with that of *ssp* and a large separate lower patch; *mep* with a scale patch below upper bristles, usually extending ventrad to lower *mep* bristles; prescutellar and supra-alar bristles well developed; usually 2 lower *mep* bristles, equal in character; 2 strong upper *slp* bristles, posterior row with 5 or 6 moderately strong bristles, several small hairs between the 2 scale patches in front of posterior row of bristles. *Legs*. All coxae with white scales, except forecoxa which has dark scales medially; trochanters with white scales; forefemur predominantly dark scaled but with a conspicuous white marking on posterior surface restricted to basal 0.5, a few scattered white scales posteriorly near distal end; midfemur dark scaled except for conspicuous apical white ring; hindfemur with white scales anteriorly except for basal dark ring, dark scales posteriorly on apical 0.5, continued dorsally as a dark spot; foretibia predominantly dark scaled except for dingy, white scales on apical 0.75 posteriorly; midtibia entirely dark scaled; hindtibia dark scaled except for white streak on basal 0.4 ventrally; tarsi dark scaled except for the following white markings, (1) small basal rings on segments 1-3 of foretarsus, (2) midtarsus pale scaled with narrow basal rings on segments 1-3, except sometimes incomplete dorsally on segment 3, (3) distinct, broader basal rings on segments 1-4 of hindtarsus. *Wing*. Scales all dark except for small, inconspicuous basal white patch on costa; remigial bristles lacking; plical area without scales at base ventrally. *Halter*. Knob predominantly with dark scales at base, a few whitish scales below in front, distal part with pale scales. *Abdomen*. Tergite I dark scaled, sometimes with 2 or 3 white scales basally on median, laterotergite densely covered with white scales; tergites II-V largely dark scaled, with basal median triangular patches narrowed distad and subapical lateral triangular patches of white scales, patches narrowed basad; tergites VI, VII with similar triangular patches of white scales, remainder of tergum covered with dingy, light beige scales except for small white patches laterally; sternites II-VI largely white scaled and with progressively broader apical bands of dark scales; sternite VII largely pale scaled.

MALE (Figs. 2, 3). Essentially as in female but smaller; head with white scales only; thorax with pale beige scales restricted to prescutellar space; terminalia as figured and as described for the subgenus; aedeagus without denticles.

PUPA (Fig. 3). Chaetotaxy as recorded in Table 1. *Respiratory trumpet*.

Moderately pigmented; a few setae on inner surface of meatus; index 3.0-5.5, mean = 3.94. *Cephalothorax*. Seta 12-C double to 4 branched. *Abdomen*. Seta 1-II with 6-18 branches; 1-III double to 5 branched; 1-IV double or triple; 1-VII single; 5-I with 1-4 branches; 5-II double to 5 branched; 5-IV, V single or double; 6-V single. *Paddle*. Ovoid, with minute spicules on apical 0.85-0.90 of outer and 0.20-0.25 of inner margins; midrib moderately pigmented, not reaching apex; 1-P moderately long, single; index 1.56-1.73, mean = 1.64.

LARVA (Fig. 4). *Head*. Seta 0-C single; 1-C long, thin, single; 3-C minute, single; 4-C short, dendritic, with 7-13 branches, well caudad of anterior margin of head, mesad and slightly cephalad of 6-C; 5-C long, with 4-10 branches, caudad of 6-C; 6-C long, double or triple, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, with 5-12 branches, well caudad of anterior margin of head, well mesad of base of antenna, laterad and slightly cephalad of 6-C; 8-C triple or 4 branched; 9-C triple to 7 branched; 10, 15-C double to 5 branched; 11-C with 7-10 branches; 12-C with 4-8 branches; 13-C with 5-9 branches; 14-C single or double; 6-MP single to triple; mental plate with 20-24 teeth; ventromentum with long, pectinate setae; mouth brush with comb-like setae mesally. *Antenna*. Short, moderately pigmented; 1-A long, triple to 5 branched, attached 0.48-0.53 from base; 2-A single, longer than 3-6-A; 3-6-A single, short; 5-A blunt, peglike. *Abdomen*. Setae 0-VII, VIII single; 1-VII single; 1-VIII double or triple; 2-VII, VIII single; 3-VII triple to 6 branched; 3-VIII with 5-7 branches; 4-VII, VIII single; 5-VII with 4-8 branches; 5-VIII double or triple; 6-VII with 9-14 branches; 7-VII single or double; 8-VII with 8 to 12 branches; 9-VII single to 5 branched; 10-VII single; 11-VII single or double; 12-VII single; 13-VII double to 4 branched; 14-VIII single; 1-X moderately long, slender, single to triple; 2-X long, double; 3-X very long, single; 4-X composed of 4 pairs of setae on grid; 4a double or triple; 4b, c double to 4 branched; 4d triple to 5 branched; 4c, d shorter than 4a, b; VIII with comb composed of 10-18 scales in one row; 4 anal papillae, long and slender; dorsal margin of saddle 0.25-0.30 total length of anal papillae. *Siphon*. Pigmented, acus absent, index 1.72-3.18 (mean = 2.13); pecten on basal 0.36-0.43 of siphon, composed of 6-12 evenly spaced teeth, each tooth with a slender attenuated filament with 2 or 3 small denticles on ventral margin and one on the dorsal margin; 1-S moderately long, with 5-7 branches, attached at about 0.5 of siphon, distad to posteriormost pecten tooth; 2, 6, 7, 9-S single; 8-S double.

DISCUSSION. The adult of *annulirostris* is distinguished from other members of the subgenus by the following combination of characters: hindtibia wholly dark scaled except for a small white streak ventrally, anterior surface of forefemur with only a few pale scales basally, metameron without scales, white band of proboscis entire and all 3 lobes of scutellum with white scales.

The pupa of *annulirostris* is very similar to that of *gombakensis*. *Aedes annulirostris* has seta 1-P always single and rather long, about 0.5 the length of the entire paddle while *Aedes gombakensis* has seta 1-P single or triple and short, only about 0.33 the length of the paddle. *Aedes annulirostris* is also very similar to *ibis* and can be distinguished only by careful examination of the spicule pattern on the paddle. Spicules cover practically the entire outer paddle margin of *annulirostris* but only about the apical 0.33 of the inner margin. The paddle of *ibis* has spicules on the apical 0.50-0.55 of both the outer and inner margins. *Aedes annulirostris* is separable from other members of the subgenus by having setae 12-C double to 4 branched, 1-III and 5-II double to 5 branched, and 1-VII and 6-V single.

The description of the larva of *annulirostris* is based on 7 poorly preserved

exuviae and one whole slide-mounted larva, also in poor shape. The thoracic and abdominal segments are particularly difficult to interpret. Only the characters on the head and terminal abdominal segments, particularly segment X and the siphon, were sufficiently distinguishable for inclusion in the description and in the key.

The larva, as the pupa, of *annulirostris* shows close affinities with *gombakensis* and *ibis*. *Aedes annulirostris* is best distinguished by having comb-like mesal hairs on the mouth brush; both *gombakensis* and *ibis* have simple hairs throughout the mouth brush. *Aedes annulirostris* has seta 1-A attached 0.48-0.53 from the base of the antenna, as does *gombakensis*, but *ibis* has seta 1-A closer to the head, at about 0.40-0.44.

TYPE-DATA. The holotype female of *annulirostris* is in the BMNH. Type-locality: Peradeniya, [Central], CEYLON [SRI LANKA], I-1902. I have not seen the type.

DISTRIBUTION. 56 specimens examined: 10♀, 14♂, 9♂ terminalia, 1 L, 7 L, 15 p.

INDIA. Mysore. Belgaum (4-8-1921, P. J. Barraud), 2♂, 2♀; Karwar, N. Kasiara (II-1931, P. J. B.), 1♀, 1 L, 1 p: "Najargah" (VIII-1921, P. J. Barraud), 1♀.

NEPAL. Hetaura, 27° 26' N, 85° 02' E (I-V-1955, W. Peters), 4♂, 2♂ terminalia, 1 L, 2 L, 4 p.

SRI LANKA. Kandy. Udawattehele (22-VI-1975, Peyton and Huang), 3♂, 3♂ terminalia.

THAILAND. Chiang Mai. Chiang Mai (25-V-1952, D. C. and E. B. Thurman), 1♂, 1♂ terminalia; Doi Suthep, Chom Cheng Peak (13-XI-1952, D. C. and E. B. Thurman), 1♂ terminalia, (13-II-1953, Manop Ratanapradit), 1♂; Doi Suthep, Ban Chang (10-VII-1970, Chailou and Anun), 1♂, 1 L, 1 p; "Changpuak Chang Kien" (5-9-1962, U. S. Army - SMRL), 1♂. Kanchanaburi. Huai Mai Nam Noi (24-V-1965, Peyton and Somboon), 1 p, (28-V-1965, Sumeth), 1♀, 1 L, 1 p. Lampang. Ban Rai Na Dieo (16-V-1968, Harrison and team), 3♂, 2♂ terminalia, 3♀, 2 L, 7 p.

BIONOMICS. *Aedes annulirostris* breeds in tree holes and water butts (Barraud 1934). Immature stages in Thailand were collected in a small stump hole in secondary deciduous forest in partial shade at 800 m by Chailou and Anun, in a small tree hole about 3.8 cm in diameter and about 7.5 cm deep in a primary bamboo grove in partial shade at 2.3 m by Sumeth and in a woodpecker hole in a log laying on the ground in a cultivated field in partial shade at 520 m by Harrison and his team. Larvae and pupa of *ibis* also were collected in the same woodpecker hole.

Adult specimens from the BMNH collected by Barraud in 1921 in Belgaum, India, bear the notation "barrel." Barraud's notes on other specimens from Karwar, India, indicate that he reared the adults from tree hole material.

Peters and Dewar (1956) collected eggs of *annulirostris* in dried residue in holes in mango trees in Nepal at 610 m. They wrote (p. 38), "These eggs had survived at least seven months since the last rainy season and hatched within a day or two of the addition of water." Eggs of *annulirostris* were found in the same holes with those of *Aedes (Stegomyia) w-albus* (Theobald) and *A. (S.) albopictus* (Skuse).

Joshi et al. (1965), obtained a female of *annulirostris* outdoors in the jungle in Kosi, Sunsari, Dharan, Nepal in June 1961.

MEDICAL IMPORTANCE. Green (1911) reported that *annulirostris* was "scarce and of no importance" in Sri Lanka. In an extensive study of the Culicidae of Poona District, India, Rao and Rajagopalan (1957) found *annuli-*

rostris "in fair numbers" at each of their 3 collecting localities. They collected adults in all months except February, March and April. They observed that adults rest in the bushes of the forest and readily bite man, both during the day and after sunset. A total of 86 females were collected biting outdoors. None were ever found indoors, but a few were taken in outdoor shelters. Nothing is known of the disease vector status of this species.

Aedes (CHRISTOPHERSIOMYIA) CHIONODES BELKIN

(Figs. 5, 6, 7, 8)

Aedes (Christophersiomyia) chionodes Belkin 1962: 434 (♂*, ♀); Stone 1963: 128 (distribution); Steffan 1966: 210 (distribution); Huang 1968: 176 (A*, biology, distribution).

Aedes (Christophersiomyia) chinodes of Steffan 1966: 187 (error).

FEMALE (Fig. 5). Essentially as described by Belkin (1962). Wing: 2.8-3.1 mm. Proboscis: 1.8-2.1 mm. Forefemur: 1.8-2.0 mm. Abdomen: 2.7-2.8 mm. *Head*. Decumbent scales all white except for diffuse patches of darker scales laterally at about level of *apn*; erect scales beige, labium with an incomplete postmedian ring of snowy white scales, divided longitudinally by a narrow streak of dark scales dorsally, length of ring about 0.15-0.18 of labium length; palpus dark scaled; torus with patch of white scales on median surface; flagellar segment 1 with rather large patch of dark scales. *Thorax*. Integument brown; densely covered with white scales throughout except pale beige in color in prescutellar space; mesonotal scales predominantly long and narrow; midlobe of scutellum with white scales, lateral lobe predominantly with white scales but with a few dingy scales laterally; paratergite almost completely covered with broad white scales; pleural scaling entirely white, scales all broad except some on *apn* and on upper *ppn*; *apn* with broad flat scales anteriorly, narrow curved scales in the middle, broader curved scales posteriorly, and longer broader curved scales ventrally; *ppn* almost completely covered with white scales, narrow above, broad below, and intermediate in the middle; *ppl* with a large patch of white scales; *acx* and *pcx* with a few white scales; *psp* with a few scales caudad of bristles; *ssp* with a large scale patch often joined with patch on *stp*; a large scale patch below *pva* bristles; *stp* with a large upper patch of scales more-or-less continuous with those of *ssp* and *mep* and a large separate lower patch; *mep* with a very large scale patch from upper to lower bristles, extending to anterior margin throughout and prolonged ventrad behind lower *mep* bristles; prescutellar and supra-alar bristles well developed; 2-4 lower *mep* bristles, usually 1 quite strong; usually only 1 small upper *stp* bristle, posterior row also weak except for 2 heavy lower bristles, several small hairs between the 2 scale patches in front of posterior row of bristles. *Legs*. All coxae with snow-white scales, except forecoxa which has dark scales medially; trochanters with snow-white scales; forefemur predominantly dark scaled except for a conspicuous white marking on posterior surface starting in basal 0.1, broadening and extending to dorsal and ventral margins to about 0.5 and then continuing as a narrow posteroventral streak to about 0.9; midfemur similar but with the posterior white marking less extensive and with a conspicuous subapical dorsal white spot; hindfemur predominantly with white scales, anterior surface with a narrow apical dark ring and a dorsal dark streak from about 0.6 to 0.7, this dark streak continuing as a dark band on posterior surface to the ventral margin; foretibia pre-

dominantly dark scaled with a few scattered pale scales on posterior and ventral surfaces; midtibia dark scaled; hindtibia mostly dark scaled with a few pale scales apically on anterior surface; tarsi dark scaled except for the following white markings, (1) a small basal dorsal spot on segment 1 of foretarsus, (2) a narrow basal ring on segment 1 and a narrower incomplete basal ring or basal dorsal patch on segment 2 of midtarsus, and (3) distinct, somewhat broader basal rings on segments 1-3 and a few dingy scales at base of segment 4 of hindtarsus. *Wing*. Scales all dark except for small, inconspicuous basal white patch on costa; 1 or 2 inconspicuous remigial bristles; plical area without scales at base ventrally. *Halter*. Knob predominantly with dark scales at base, a few whitish scales below in front, distal part with pale scales. *Abdomen*. Tergite I dark scaled; laterotergite densely covered with snow-white scales; tergites II-VI largely dark scaled, with subapical lateral triangular patches of white scales, patches narrowed basad, reaching base of segment on II-IV, progressively smaller and more distant from base on V and VI; tergite VII with a narrow lateral border of white scales; tergites II-VII with basal median white markings separate from lateral patches, usually only a few scales on II, progressively longer on III-VI, and occupying more than half the length of tergite VII; sternites II-VI largely white scaled and with progressively broader apical bands of dark scales; sternite VII largely dark scaled and with a few pale scales on distal margin in the middle.

MALE (Figs. 5, 6, 7). Essentially as in female but smaller; head and thorax with white scales only; labium with an incomplete postmedian ring of snowy white scales, divided longitudinally by a narrow streak of dark scales dorsally, length of ring about 0.15-0.18 of labium length; palpus dark scaled; torus with patch of white scales on median surface; foretibia with pale white inconspicuous streak on ventral surface; genitalia as figured and as described for the subgenus; aedeagus without denticles.

PUPA (Fig. 7). *Respiratory trumpet*. Length: 0.46 mm; greatest width: 0.11 mm; index 4.18. Moderately pigmented; a few short setae on inner surface of meatus. *Cephalothorax*. Setae 1-3, 5, 6, 8, 9, 12-C single; 4-C double or triple; 7-C single or double; 10, 11-C missing; 12-C long and slender. *Abdomen*. Seta 0-II-VIII single; 1-I with 17 or 18 branches, 1-II-VI missing, 1-VII single; 2-I missing, 2-II-V, VII single; 3-I, III, IV missing, 3-II, VII single, 3-V double; 4-I, II, V triple, 4-III double or 4 branched, 4-IV double, 4-VI single or double, 4-VII, VIII single; 5-I triple, 5-II, III, VII single, 5-VI missing; 6-I-III single, 6-IV missing, 6-V double, 6-VI single or double; 7-I, II, VI, VII single, 7-IV double, 7-III, V triple or 4 branched; 8-II missing, 8-III double or triple, 8-IV, V, VII double, 8-VI triple; 9-I, III-VI single, 9-II, VII, VIII missing; 10-III, VI missing, 10-IV double, 10-V, VII single; 11-III-VII single; 14-III-VIII single; 1-VII very small and short; 5-I very small and short; 5-II moderately long and slender; 6-V moderately long and slender. *Paddle*. Length: 0.61 mm; greatest width: 0.51 mm, index 1.19; ovoid, with minute spicules on apical 0.35 of outer and apical 0.20 of inner margin; midrib moderately pigmented, not reaching apex; 1-P short, single.

LARVA (Fig. 8). Record of the branching of the setae follows. *Head*. Seta 0-C single; 1-C short, stout, single, on ventral surface; 3, 14-C single; 4-C short, dendritic, with 8 or 9 branches, well caudad of anterior margin of head, mesad and slightly cephalad of 6-C; 5-C long, triple to 5 branched, only slightly caudad of 6-C; 6-C long, double, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, with 5 or 6 branches, well caudad of anterior margin of head, well laterad and slightly cephalad of 6-C; 8, 15-C triple; 9-C with 4 to 6 branches; 10-C single to triple; 11-C with

6 or 7 branches; 12-C double to 5 branched; 13-C triple to 7 branched; mental plate with 24 or 25 teeth; mouth brush with simple setae. *Antenna*. Short, moderately pigmented; seta 1-A long, double to 4 branched, attached 0.45 from base; 2-A single, much longer than 3-6-A; 3-6-A single, short; 5-A blunt, peglike. *Thorax*. Seta 0-P dendritic, with 14 to 17 branches; 1-P double to 4 branched; 2, 9-P single or double; 3, 11, 14-P double or triple; 4, 7-P triple; 5, 6, 10, 12-P single; 8-P double; 1-M with 4 or 5 branches; 2-M single or double; 3, 5, 7, 10, 12-M single; 4-M double; 6-M double to 4 branched; 8-M triple to 6 branched; 9, 14-M with 4 branches; 11-M single to triple; 13-M dendritic, with 8 to 11 branches; 1, 3-T dendritic, with 6 to 10 branches; 2, 5, 6, 10, 12-T single; 4-T double to 4 branched; 7-T with 4-6 branches; 8-T with 4 or 5 branches; 9, 13-T triple or 4 branched; 11-T double or triple. *Abdomen*. Seta 0-II-VIII single; 1-I dendritic, with 9-15 branches; 1-II with 5 or 6 branches; 1-III-V, VII single; 1-VI double or triple; 1-VIII single or double; 2-I, II, IV-VIII single; 2-III single or double; 3-I-III double; 3-IV single or double; 3-V, VI single; 3-VII double to 4 branched; 3-VIII with 4-6 branches; 4-I dendritic, with 7 or 8 branches; 4-II dendritic, with 5 to 8 branches; 4-III triple to 5 branched; 4-IV, VI double or triple; 4-V with 4 or 5 branches; 4-VII, VIII single; 5-I double to 5 branched; 5-II triple to 6 branched; 5-III double to 4 branched; 5-IV-VI single; 5-VII with 4 or 5 branches; 5-VIII double; 6-I, IV, V double; 6-II double or triple; 6-III, VI single; 6-VII dendritic, with 6 to 10 branches; 7-I, VII double; 7-II, VI double or triple; 7-III with 4-6 branches; 7-IV with 5-8 branches; 7-V with 4 or 5 branches; 8-II single or double; 8-III-V single; 8-VI with 5 branches; 8-VII with 8 branches; 9-I, VII single or double; 9-II double; 9-III-VI single; 10-I-VII single; 11-I single or double; 11-II-VII single; 12-II triple or 4 branched; 12-III, IV double or triple; 12-V, VII single; 12-VI missing; 13-I, III-V, VII single; 13-II dendritic, with 6-15 branches; 13-VI dendritic, with 16-18 branches; 14-II-VI missing; 14-VII, VIII single; 1-X moderately long, slender, single; 2-X long, single or double; 3-X long, single; 4-X composed of 4 pairs of setae on grid; 4a-c single or double; 4d single to triple; 4c, d shorter than 4a, b; VIII with comb composed of 9-12 scales in one row; 4 anal papillae, long and slender; dorsal margin of saddle 0.40-0.43 total length of anal papillae. *Siphon*. Pigmented, acus absent, index 2.13-2.27 (mean = 2.20); pecten on basal 0.38 of siphon, composed of 6-10 evenly spaced teeth, each tooth with a slender attenuated filament with a small denticle on ventral margin; 1-S moderately long, triple or 4 branched, attached on basal 0.44 of siphon; distad to posteriormost pecten tooth; 2, 6, 8, 9-S single; 7-S single or double.

TYPE-DATA. The holotype male of *chionodes* with terminalia slide (590601-2) is in the School of Public Health and Tropical Medicine, University of Sydney, Sydney, Australia. Type-locality: Torokina, Bougainville, Solomon Islands [PAPUA NEW GUINEA], IV-1945, F. N. Ratcliffe. Allotype: ♀, with same data as holotype. Paratypes: one ♀, with same data as holotype; one ♀, with same data as holotype, except collected V-1945. I have seen none of the type-series.

DISTRIBUTION. 14 specimens examined: 3♀, 4♂, 4♂ terminalia, 2 L, 1 p.

INDONESIA. *Ambon Island*. Waai (1-VI-1966, A. M. R. Wegner), 3♀.

PAPUA NEW GUINEA. *Papua*. 35 miles east of Port Moresby, Rigo Road (29-XII-1965, S. Sirivanakarn), 1♂, 1♂ terminalia; Southeast Central District, Rigo Road (29-XII-1965, S. Sirivanakarn and H. Lake), 3♂, 3♂ terminalia, 2 L, 1 p.

DISCUSSION. *Aedes chionodes* is the only species in *Christophersiomyia*

known to occur outside of the Oriental-Indomalayan faunal areas. It occurs in both the South Pacific and Papuan faunal areas as defined by Belkin (1962). Belkin theorized that a dispersal of Papuan forms colonized the Solomons; the discovery of *chionodes* on New Guinea and on Ambon Island as well as in the Solomons tends to support his hypothesis. However, he thought that *chionodes* itself was an example of an insular preservation of a form of a relict group since it was unknown to him from the neighboring Papuan and Australian faunal areas.

The adult of *chionodes* is very similar to that of *gombakensis*. Females of the 2 species can be most reliably separated by characters on the abdomen. *Aedes gombakensis* has abdominal tergites II and III dark scaled and has only minute white basal median triangular patches on the other tergites. *Aedes chionodes* has tergites II-VII with white basal median triangular patches, quite large progressively on tergites III-VII. Males of the 2 species are separated rather easily by the presence of denticles on the aedeagus of *gombakensis*; the aedeagus of *chionodes* lacks denticles. *Aedes chionodes* can be distinguished from the other members of the subgenus by the following combination of characters; lateral lobe of scutellum with a few dingy or dark scales, anterior surface of forefemur predominantly dark scaled, and hindtibia almost completely dark scaled, lacking white rings.

This description of the pupa of *chionodes* is based on a single mounted exuvium from New Guinea. The specimen is in rather poor shape, with many setae missing. Nevertheless, the pupa is easily distinguishable from others in the subgenus by the following combination of characters: seta 12-C single, seta 5-II single and seta 6-V double; *annulirostris* has seta 12-C double to 4 branched, 5-II double to 5 branched and 6-V single; *gombakensis* has seta 12-C triple to 5 branched, 5-II double to 4 branched and 6-V single; *ibis* has seta 12-C double to 7 branched, 5-II double to 6 branched and 6-V single; and *thomsoni* has seta 12-C 4-8 branched, 5-II 6-10 branched and 6-V single.

This description of the larva of *chionodes* is based on 2 specimens from New Guinea. They clearly belong to *Christophersiomyia*, and can be separated from other members of the subgenus by the following distinctive setae: 5-C triple to 5 branched; 6-C double; 11-P double or triple; 13-M dendritic, with 8-11 branches; 14-M with 4 branches; 5-II triple to 6 branched; 7-II double or triple; 1, 6, 10, 11, 13-III, 1, 5, 13-IV, 1, 5, 11, 13-V, 10, 11, 13-VII, 8-S single; 5-III double to 4 branched; 7-V with 4 or 5 branches; 8-VI double to 5 branched; 3-VII double to 4 branched; 1-VIII single or double; 1-S triple or 4 branched.

BIONOMICS. Belkin (1962) theorized that *chionodes* breeds in tree holes or possibly rock holes. Huang (1968) reported it from coconut shells in New Guinea. The immature stages also have been collected in coconut spathes in New Guinea.

MEDICAL IMPORTANCE. Females of *chionodes* were taken biting in a forest in Indonesia by Wegner. Nothing is known of its disease vector status.

Aedes (CHRISTOPHERSIOMYIA) GOMBAKENSIS MATTINGLY
(Figs. 9, 10, 11, 12)

Aedes (Christophersiomyia) sp. Macdonald 1957: 19 (biology).

Aedes (Christophersiomyia) gombakensis Mattingly 1959: 56 (♂*, ♀*, L*, P*).

Aedes (Christophersiomyia) gombakensis of Stone 1961: 41 (distribution);

Belkin 1962: 433 (taxonomy); Stone and Delfinado 1973: 292 (distribution).

FEMALE (Figs. 9, 10). Wing: 2.7-3.0 mm. Proboscis: 1.7-1.9 mm. Forefemur: 1.6-1.7 mm. Abdomen: 2.4 mm. *Head*. Decumbent scales all white except for a large patch of dark scales dorsolaterally and laterally on each side at about level of *apn*, sometimes reaching hind margin of eye but usually interrupted by scattered white scales along this margin; erect scales light brown; labium with an incomplete postmedian ring of white scales, sharply defined ventrally and laterally but divided by a narrow line of dark scales dorsally, length of ring about 0.11-0.18 of labium length, and a very small apical patch of light-brown scales; palpus dark scaled; torus with median patch of broad white scales; flagellum 1 with a few white scales basally. *Thorax*. Integument brown; fossa with pale scales laterally, interrupted medially by a broad prolongation of dark scales from mesonotum, sometimes reaching anterior margin of thorax; mesonotal scales long and narrow; midlobe of scutellum with broad white scales except broad brown scales posteriorly and laterally, lateral lobe with broad brown scales; paratergite apparently with a few curved, narrow white scales but all specimens wholly or partially denuded in this area; pleural scaling white, scales all broad except for some on *apn* and on upper *ppn*; *apn* with broad flat scales on anterior surface, narrow curved scales in the middle and broader curved scales posteriorly; *ppn* with thin vestiture of white scales, narrow above and broad below; *ppl* with large patch of white scales extending to *pst*; *acx* and *pcx* with 2 or 3 white scales each; *psp* apparently with a few scales; *ssp* with a large scale patch continuous with patch on upper *stp*; a large scale patch below *pva* bristles; *stp* with a large upper patch of scales continuous with that of *ssp* and a large separate lower patch; *mep* with a large scale patch extending from upper to lower bristles and prolonged only slightly ventrad behind lower *mep* bristle; prescutellar and supra-alar bristles well developed; 1 lower *mep* bristle; 1 or 2 upper *stp* bristles, posterior row with 3 or 4 weak or moderately strong bristles, several hairs between the 2 scale patches in front of posterior row of bristles. *Legs*. Coxae with white scales; trochanters with white scales; forefemur predominantly dark scaled but with a conspicuous white marking on posterior surface restricted to basal 0.5, broad, and extending to dorsal and ventral margins, sub-apical pale patch; midfemur very dark scaled except for subapical dorsal white spot in most specimens; hindfemur largely white anteriorly except for basal dark ring, posteriorly with dark area on apical 0.5; all tibiae dark scaled except for small apical white spot ventrally on hindtibia; all tarsi dark scaled except for the following white markings, (1) foretarsus with small pale markings basally on ventral surface of segments 1 and 2, (2) midtarsus with basal white rings on segments 1 and 2 and an often incomplete basal pale ring on segment 3, (3) hindtarsus with basal white rings on segments 1-3 and an often incomplete basal pale ring on segment 4. *Wing*. Scales all dark except for a few pale scales at base of costa; remigial bristles lacking; plical area without scales at base ventrally. *Halter*. Knob with dark scales dorsally, pale beige scales ventrally. *Abdomen*. Tergites I-III dark scaled; laterotergite with pale and white scales; tergites IV-VI with only a few white scales medially; tergites II-VI with subapical lateral triangular patches of white scales, patches narrowed only slightly basad; tergite VII with lateral border of white scales; sternites II-VI largely white scaled, with progressively broader apical bands.

MALE (Figs. 10, 11). Essentially as in female, differing in the following respects: head with white decumbent scales throughout; scutum more extensively dark scaled; hindfemur with dark anterodorsal stripe; abdominal tergites II and IV-VII with basal median pale or white triangular patches, pro-

gressively larger on posterior tergites; tergite III variable, with or without basal median triangular patch; genitalia as figured and as described for the subgenus, but aedeagus unique in possessing 3 teeth on each side.

PUPA (Fig. 11). Chaetotaxy as recorded in Table 2. *Respiratory trumpet*. Moderately pigmented; a few short setae on inner surface of meatus; index 3.50-4.64, mean = 3.93. *Cephalothorax*. Seta 12-C triple to 5 branched. *Abdomen*. Seta 1-II with 13-21 branches; 1-III triple to 7 branched; 1-IV triple to 5 branched; 1-VII single; 5-I, IV single to triple; 5-II double to 4 branched; 5-V single; 6-V single. *Paddle*. Ovoid, with minute spicules on outer margin and apical 0.25-0.33 of inner margin; midrib moderately pigmented, almost reaching apex; 1-P short, single to triple; index 1.69-1.83, mean = 1.73.

LARVA (Fig. 12). Chaetotaxy as recorded in Table 5. *Head*. Seta 4-C short, dendritic, with 9-11 branches, well caudad of anterior margin of head; 5-C long with 4-7 branches, only slightly caudad of 6-C; 6-C long, double or triple, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, with 4-7 branches; mental plate with 20-25 teeth; mouth brush with simple setae. *Antenna*. Short, moderately pigmented; seta 1-A long, triple, attached 0.48-0.53 from base. *Thorax*. Seta 11-P triple to 7 branched; 13-M dendritic, with 15-22 branches; 14-M dendritic, with 14-32 branches. *Abdomen*. Seta 5-II double to 4 branched; 7-II moderately long, with 4-8 branches; 1, 10-III single; 5-III double to 4 branched; 6, 13-III double or triple; 11-III double; 1-IV double; 5, 13-IV double or triple; 1, 5-V single or double; 7-V with 6-8 branches; 11-V double; 13-V single to triple; 5-VI double or triple; 8-VI double to 5 branched; 3-VII with 4-8 branches; 10, 14-VII single; 11, 13-VII double or triple; 1-VIII double; 1-X moderately long, slender, single; 2-X long, single or double; 3-X long, single; 4-X composed of 4 pairs of setae on grid; 4a, b single to triple; 4c single to 4 branched; 4d double to 5 branched; 4c, d slightly shorter than 4a, b; VIII with comb composed of 6-11 scales in one row; anal papillae long and slender; dorsal margin of saddle 0.43-0.50 total length of anal papillae. *Siphon*. Pigmented, acus absent, index 2.10-2.40 (mean = 2.23); pecten on basal 0.35-0.40 of siphon, composed of 4-14 evenly spaced teeth, each tooth with a slender attenuated filament with 1 or 2 (usually 2) small denticles on ventral margin; 1-S moderately long, double to 5 branched, attached on basal 0.48-0.55 of siphon, distad to posteriormost pecten tooth; 2, 6, 7, 9-S single; 8-S single to triple.

DISCUSSION. The adult of *gombakensis* is very similar to that of *chionodes*. The 2 species can be separated by characters discussed under the latter species. *Aedes gombakensis* is the only species of *Christophersiomys* which possesses denticles on the aedeagus, of which there are 3 teeth on each lateral surface. The teeth are small and simple, quite unlike the sclerotized lateral toothed plates in the subgenera *Stegomyia* and *Bothaella*. This, combined with other morphological characters in the adult and immature stages, indicate clearly that *gombakensis* is properly placed in *Christophersiomys*.

The pupa of *gombakensis* is very similar to that of *annulirostris*. The latter species has seta 1-P single, about 0.5 the length of the paddle; *gombakensis* has seta 1-P single or triple, and only about 0.33 the length of the paddle. The pupa of *gombakensis* is distinguished from other members of the subgenus by the following combination of characters: paddle with minute spicules covering practically the entire outer margin but restricted to the apical 0.33 of the inner margin, abdominal setae 1-III triple to 7 branched, 1-VII and 6-V single.

The larva of *gombakensis* also is very similar to that of *annulirostris*. It

is likely that good characters exist on the thorax and abdomen of *annulirostris*, as on other larvae of the subgenus, that would aid in species determination. Until more specimens are available for study, the most reliable means of distinguishing between the 2 species are the mesal hairs of the mouth brush. Those of *gombakensis* are simple while those of *annulirostris* are comb-like.

Aedes gombakensis is also very similar to *ibis*. They are best separated by the characters given in the key. *Aedes gombakensis* is separated from other members of the subgenus by the key characters and by the diagnostic setae described above.

Mattingly (1959) speculated that his paratype female may represent a different species since the associated larval skin has head seta B (seta 6-C here) short, strongly plumose and triple. Other larvae of *gombakensis* have seta 6-C long, barbed and double. The additional adult specimens examined are in such poor shape (all females have missing abdomens) that an answer to Mattingly's speculation must still await additional material.

Aedes gombakensis is the only species in *Christophersiomyia* restricted to the Indomalayan region of Belkin (1962). *Aedes ibis* is found in both the Indo-malayan and Oriental regions.

TYPE-DATA. The holotype male (993/15) of *gombakensis* is in the BMNH. Type-locality: 16th mile, Ulu Gombak, Selangor, [MALAYSIA], II-1956, J. A. Reid. Allotype: ♀ (993/8), with same data as holotype. Paratypes: ♀ (993/16), 2♂ (993/12, 993/13), with same data as holotype. All with associated larval and pupal exuviae. I have seen the allotype with associated exuviae and the 3 paratypes, all with associated larval and pupal exuviae.

DISTRIBUTION. 31 specimens examined: 5♂, 3♂ terminalia, 5♀, 9 l, 9 p.

MALAYSIA. *Selangor.* 16th mile, Ulu Gombak (II-1956, J. A. Reid), 3♂, 1♂ terminalia, 2♀, 5 l, 5 p; 15th mile, Ulu Gombak (25-X-1956, J. A. Reid), 2♂, 2♂ terminalia, 3♀, 4 l, 5 p.

BIONOMICS AND MEDICAL IMPORTANCE. Macdonald (1957) collected females biting man in Malaysia and reported that this species breeds in tree holes. Nothing is known of its disease vector status.

Aedes (*CHRISTOPHERSIOMYIA*) *IBIS* BARRAUD (Figs. 4, 13, 14, 15)

Aedes (*Christophersiomyia*?) *ibis* Barraud 1931: 610 (♀).

Aedes (*Christophersiomyia*) *ibis* of Barraud 1934: 215 (taxonomy); Mattingly 1959: 54 (key).

Aedes (*Christophersiomyia*) *brayi* Knight 1947: 73 (♂*, ♀) NEW SYNONYMY; of Knight and Hull 1951: 219 (key); Knight and Hull 1952: 162 (taxonomy); Horsfall 1955: 410 (distribution); Stone et al. 1959: 177 (distribution); Belkin 1962: 433 (taxonomy); Basio 1971: 13 (list); Stone and Delfinado 1973: 292 (distribution).

Aedes (*Christophersiomyia*) *ibis* of Knight 1947: 75 (key); Horsfall 1955: 410 (distribution); Stone et al. 1959: 177 (distribution); Belkin 1962: 433 (taxonomy); Stone and Delfinado 1973: 292 (distribution).

Aedes (*Christophersiomyia*) *brayi* of Mattingly 1959: 55 (♂*, taxonomy).

FEMALE (Figs. 13, 14). Wing: 2.1-2.8 mm. Proboscis: 1.2-1.6 mm. Forefemur: 1.3-1.8 mm. Abdomen: 1.7-2.4 mm. *Head.* Decumbent scales all white except for large patch of dark scales dorsolaterally and later-

ally on each side at about level of *apn*, not reaching hind margin of eye; erect scales light brown; labium with a postmedian ring of white scales, sharply defined ventrally and laterally but sometimes interrupted dorsally by a line of dark scales, length of ring about 0.10-0.18 of labium length, a hairstreak of white scales ventrally near apex, a small apical patch of light colored scales; palpus dark scaled; torus with median patch of broad white scales; flagellum 1 with a few white scales mediobasally. *Thorax*. Integument brown; fossa with white scales; mesonotal scales long and narrow; midlobe and lateral lobe of scutellum with broad pale brown scales; paratergite with curved, narrow white scales; pleural scaling white, scales all broad except for some on *apn* and on upper *ppn*; *apn* with broad flat scales on anterior surface, narrow curved scales in the middle, and broader curved scales posteriorly; *ppn* with white scales narrow above and broad below, continuous with patch on *ssp* below; *ppl* with large patch of white scales extending to *pst*; *acx* and *pcx* with dense vestiture of white scales; *psp* with a few scales; *ssp* with a large scale patch continuous with patches on lower *ppn* and upper *stp*; a large scale patch below *pva* bristles; *stp* with a large upper patch of scales continuous with that of *ssp* and a large separate lower patch; *mep* with a large scale patch extending from upper to lower bristles and prolonged very slightly ventrad behind lower *mep* bristles; prescutellar and supra-alar bristles strongly developed; usually 1 lower *mep* bristle; 1 or 2 upper *stp* bristles, posterior row with 4-6 strong bristles. *Legs*. All coxae with white scales, except forecoxa which has middle with dark scales; trochanters with white scales; anterior surface of forefemur with intergrading light beige and dark scales except for prominent white scaled marking ventrally on apical 0.3, posterior surface dark scaled at base, remainder white scaled except for a broad dark scaled band beginning at about 0.5, and a few diffuse dark scales distally; midfemur dark scaled throughout except for apical white ring, continued basally on ventral surface as hairstreak; hindfemur white scaled throughout except for dark scaled marking posteriorly on apical 0.45 often continued as light beige scales on anterior surface, and with basal dark scales dorsally; foretibia and midtibia dark scaled except for a few white scales ventrally on foretibia; hindtibia dark scaled except for pale beige scales on basal 0.5 ventrally and posteriorly; tarsi dark scaled except for the following white markings, (1) small basal ring on segment 1 of foretarsus, (2) narrow basal rings on segments 1-3 of midtarsus, often inconspicuous on segment 3, (3) conspicuous, broader basal rings on segments 1-4 of hindtarsus. *Wing*. Scales all dark except for small, inconspicuous basal white patch on costa; remigial bristles lacking; plical area without scales at base ventrally. *Halter*. Knob predominantly dark scaled, except for a few whitish scales below in front. *Abdomen*. Tergite I dark scaled, laterotergite densely covered with white scales; tergites II and III largely dark scaled, with only a few white scales basally on median and subapical lateral triangular patches of white scales, patches narrowed basad; tergites IV and V largely dark scaled, with basal median triangular patches narrowed distad and lateral triangular patches of white scales similar to tergites II and III; tergites VI and VII with similar median and lateral triangular patches of white scales, remainder of tergum covered with dingy light beige scales; sternites II-VI largely white scaled and with progressively broader apical bands of dark scales; sternite VII largely pale scaled.

MALE (Figs. 14, 15). As in female but head lacking dorsolateral dark patch; thorax with white scales only; abdominal segments V-VII with less extensive white basal median triangular patches; genitalia as figured and as described for the subgenus; aedeagus without denticles.

PUPA (Fig. 15). Chaetotaxy as recorded in Table 3. *Respiratory trumpet*. Moderately pigmented; a few short setae on inner surface of meatus; index 2.83-4.12, mean = 3.36. *Cephalothorax*. Seta 12-C double to 7 branched. *Abdomen*. Seta 1-II with 8 to 15 branches; 1-III double to 6 branched; 1-IV single to 4 branched; 1-VII single; 5-I single to triple; 5-II double to 6 branched; 5-IV single or double; 5-V single; 6-V single. *Paddle*. Ovoid, with minute spicules on apical 0.55-0.60 of outer and inner margins; midrib moderately pigmented, almost reaching apex; 1-P moderately long, single; index 1.45-1.94, mean = 1.68.

LARVA (Fig. 4). *Head*. Seta 0-C single; seta 1-C stout, single; 3-C, 6-MP single; 4-C short, dendritic, with 5-12 branches, well caudad of anterior margin of head, mesad and slightly cephalad of 6-C; 5-C long, with 7-9 branches, caudad of 6-C; 6-C long, double or triple, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, with 6-12 branches, well caudad of anterior margin of head, mesad and slightly caudad of base of antenna, laterad and slightly cephalad of 6-C; 8-C double to 4 branched; 9-C triple to 5 branched; 10-C triple; 11-C with 6-11 branches; 12-C with 6 or 7 branches; 13-C with 5 to 7 branches; 14-C single or double; 15-C double or triple; mental plate with 22-26 teeth; mouth brush with simple setae. *Antenna*. Short, moderately pigmented; seta 1-A long, triple or 4 branched, attached 0.40-0.44 from base; 2-A single, slightly longer than 3-6-A; 3-6-A single, short; 5-A blunt, peglike. *Abdomen*. Setae 0-III, VIII single; 1-VII single; 1-VIII single or double; 2-VII, VIII single; 3-VII triple or 4 branched; 3-VIII with 5 to 7 branches; 4-VII, VIII single; 5-VII double or triple; 5-VIII double; 6-VII with 7 to 9 branches; 7, 13-VII double; 8-VII with 5 to 14 branches; 9-12-VII single; 13-VII double; 14-VII, VIII single; 1-X moderately long, slender, single; 2-X long, double; 3-X very long, single; 4-X composed of 4 pairs of setae on grid; 4a double; 4b double or triple; 4c double to 4 branched; 4d triple to 5 branched; 4c, d shorter than 4a, b; VIII with comb composed of 14 or 15 scales in one row; anal papillae missing. *Siphon*. Pigmented, acus absent, index 1.96-2.12 (mean = 2.04); pecten on basal 0.28-0.34 of siphon, composed of 7 to 10 evenly spaced teeth, each tooth with a slender attenuated filament with 1 or 2 small denticles on ventral margin and 1 on the dorsal margin; 1-S moderately long, with 4 branches, attached at about 0.5 of siphon, distad to posteriormost pecten tooth; 2, 6, 7, 9-S single; 8-S single or double.

DISCUSSION. *Aedes ibis* is closely related to *gombakensis* and *annulirostris*. It can be separated from these species, as well as from *chionodes*, by the prominent white spot on the anterior surface of the forefemur at about 0.3 from the apical end. The other species have the forefemur dark near the apex.

The immature stages are more difficult to separate. The pupa of *ibis* has the paddle with spicules scattered subequally on the apical 0.50-0.55 of both the outer and inner margins. *Aedes annulirostris* and *gombakensis* have spicules covering practically the entire outer margin but restricted to the apical 0.33 of the inner margin.

The larva of *ibis* is described from only 3 exuviae from Thailand. All are in rather poor shape, with the chaetotaxy of the thorax and most abdominal segments uncertain. The larva is quite close to that of *gombakensis* but can be most easily separated by the comb scales; *ibis* has 14 or 15 while *gombakensis* has 6-11.

Aedes ibis was described by Barraud (1931) from a single unique female from Darjeeling, India, in the foothills of the Himalayas. Knight (1947) subsequently described *brayi* from the Philippines. Until now, the 2 species were thought to be allopatric and completely distinct. With the accumulation of

additional specimens from Thailand and the Indochina peninsula, it is seen that the 2 species are connected by intermediate, intergrading populations. Hence it is necessary to place *brayi* into synonymy with *ibis*. It is possible that *ibis* may be a polytypic species. The 2 type-localities from India and the Philippines are the western and eastern extremes, respectively, of its known range. Until more specimens, particularly of immature stages, are collected in the Philippines and show otherwise, *ibis* and *brayi* should be considered conspecific. *Aedes ibis* is the only species of *Christophersiomyia* known to occur in both the Oriental and Indomalayan faunal areas.

TYPE-DATA. The holotype female (2556) of *ibis* is in the BMNH. Type-locality: Sukna, North Bengal, [Darjeeling, INDIA], VIII-1928, Sobha Ram, "caught in jungle." Barraud (1934) reported the elevation as 500 feet [= 152 m]. The holotype male of *brayi* (F280(b)-x), with terminalia slide is in the USNM. Type-locality: San Jose, Luzon, Nueva Ecija, [PHILIPPINES], 15-IX-1945, D. Bray. Paratype: ♀ (F280 (b)), with same data as holotype. I have seen Barraud's holotype and Knight's holotype and paratype.

DISTRIBUTION. 97 specimens examined: 32♂, 10♂ terminalia, 28♀, 31, 24p.

CAMBODIA. *Kompong Speu*. Kirirom (19-XII-1969, J. M. Klein), 1♀. "Pichnil, Stungchral" (22-V-1969, J. M. Klein), 1♀.

CHINA. *Kwangtung*. Hainan Island (1934, C. Ho), 1♂.

INDIA. *Darjeeling*. Sukna, North Bengal (VIII-1928, Sobha Ram), 1♀.

MALAYSIA. *Sabah*. Tenom (Dept. Parasit., U. Malaya), 1♂, 1♂ terminalia.

PHILIPPINES. *Nueva Ecija*. Luzon, San Jose (15-IX-1945, D. Bray), 1♂, 1♂ terminalia, 1♀. *Cagayan*. Luzon, Alcala (23-VII-1945), 5♂, 4♂ terminalia, 3♀.

THAILAND. *Chiang Mai*. Doi Suthep, Chom Chen Pk. (13-II-1953, Manop Ratanapradith), 1♂; Doi Suthep, "Dr. Buker's Cabin" (4-III-1953, Thurman), 1♀. *Khon Kaen*. Tham Pho Ti Yan (1962, U. S. Army-SMRL), 1♀; Pa Dong Larn (1962, U. S. Army-SMRL), 2♀. *Lampang*. Ban Rai Na Dieo (V-1968, Harrison and team), 19♂, 4♂ terminalia, 13♀, 31, 24 p. *Kanchanaburi*. Hua Mae Nam Niu (V-1965, Peyton and Somboon), 1♂, 1♀. *Nakhon Si Thammarat*. Ban Thuan Lek (VI-1966, U. S. Army-SMRL), 1♂.

VIETNAM. *Thua Thien*. Phu Bai (15-IX-1966, A. Garcia), 1♀. *Binh Dinh*. Qui Nhon (1966, Institut Pasteur), 1♀. *Pleiku*. Plei Djereng (XII-1966, R. H. Hochman), 1♂, 1♀. *Binh Duong*. Lai Khe (IV-1966, 20th Preventive Medicine Unit), 1♂.

BIONOMICS. Knight (1947) reported that this species was reared from a stream rock pool. Mattingly (1952) pointed out that such habitats, if shaded, often contained tree hole breeding species.

Field data of specimens collected in Thailand and Vietnam indicate that *ibis* breeds in tree holes. It was collected in a tree hole in a bamboo grove in heavy shade at an elevation of 107 m by Peyton and Somboon. A male from Ban Thuan Lek, Nakhon Si Thammarat, Thailand, was bred from tree hole material collected in a primary rain forest in mountainous terrain at 76 m. Harrison and his team collected *ibis* and *annulirostris* from a hole in a log on the ground at an elevation of 520 m.

Data on the labels with pinned adults from Cambodia read "repos sous bois" and "cascade, forêt." Adults also have been taken at light traps in Chiang Mai, Thailand, and Thua Thien, Vietnam. Nothing is known of its disease vector status.

AEDES (CHRISTOPHERSIOMYIA) THOMSONI (THEOBALD)

(Figs. 16, 17, 18, 19)

- Stegomyia thomsoni* Theobald 1905a: 18 (♀); Theobald 1907: 174 (♀, key); Brunetti 1907: 335 (distribution); Howlett 1909: 574 (distribution); Theobald 1910: 155 (key); Christophers 1911: 48 (distribution); Brunetti 1912: 450 (distribution); Howlett 1913: 75 (biology); Brunetti 1920: 129 (distribution); Senior-White 1923: 71 (distribution).
- Stegomyia Thomsoni* of Howlett 1909: 574 (error).
- Aedes (Stegomyia) thomsoni* of Edwards 1917: 210 (♂*).
- Aedes (Stegomyia) thomsoni* of Edwards 1922: 256 (key).
- Christophersiomyia thomsoni* of Barraud 1923a: 787 (♂*, ♀*, distribution, key); Barraud 1923b: 503 (L*); Senior-White 1927: 68 (L).
- Aedes (Christophersiomyia) thomsoni* of Edwards 1932: 159 (taxonomy); Knight 1947: 75 (key); Knight and Hull 1952: 162 (larva); Horsfall 1955: 410 (distribution); Rao and Rajagopalan 1957: 11 (biology); Ansari 1959: 25 (distribution, key); Stone et al. 1959: 177 (distribution); Belkin 1962: 433 (taxonomy); Baker and Aslamkhan 1969: 46 (karyotype*); Aslamkhan and Salman 1969: 192 (biology); Reuben 1971: 120 (biology); Aslamkhan 1971: 152 (distribution); Aslamkhan and Wolfe 1972: 31 (disease relationships); Stone and Delfinado 1973: 292 (distribution).
- Aedes (Christophersiomyia) thomsoni* of Barraud 1934: 213 (♂*, ♀*, L*); Carter 1950: 110 (distribution); Peters and Dewar 1956: 40 (P*); Mattingly 1959: 53 (key).

FEMALE (Figs. 16, 17). Wing: 2.3-3.5 mm. Proboscis: 1.5-2.0 mm. Forefemur: 1.5-2.1 mm. Abdomen: 2.1-2.9 mm. *Head*. Decumbent scales white except for patch of brown scales dorsolaterally at about level of upper part of *apn* and a smaller patch of brown scales below it at about level of lower part of *apn*; erect scales pale beige; labium with complete postmedian ring of white scales, sharply defined, length of ring about 0.10-0.14 of labium length; palpus dark scaled; torus with patch of broad white scales on median surface. *Thorax*. Dark brown, covered with white scales throughout except brown in color in prescutellar space and in small area posterad of scutal angle; mesonotal scales long and narrow; midlobe and lateral lobe of scutellum with dense vestiture of broad white scales; paratergite almost completely covered with white scales, narrow anteriorly, broader posteriorly; pleural scaling entirely white, scales all broad except for some on *apn* and on upper *ppn*; *apn* with broad, flat scales on anterior face and narrow, curved scales in the middle, posteriorly and ventrally; *ppn* almost completely covered with white scales, narrow above, broad below; *ppl* with a dense patch of white scales; *acx* and *pcx* with a dense vestiture of white scales; *psp* densely covered with white scales; *ssp* with a large scale patch continuous with patch on upper *stp*; a large scale patch below *pva* bristles, continuous with patch on *mep* and sometimes upper *stp*; *stp* with a large upper patch of scales continuous with that of *ssp* and *mep* and sometimes *pva* and a large separate lower patch; *mep* with a large scale patch extending from upper to lower bristles and prolonged ventrad behind lower *mep* bristles; metameron with white scales; prescutellar and supra-alar bristles well developed; 2 or 3 lower *mep* bristles, at least 1 strong; usually 2 moderately strong upper *stp* bristles, posterior row with 5-8 weak or moderately strong bristles, several prominent hairs between the 2 scale patches in front of posterior row of bristles. *Legs*. Coxae with white scales, except fore- and midcoxae with a few dark scales; trochanters with white scales; forefemur

predominantly dark scaled but with a conspicuous white marking on posterior surface restricted to basal 0.5, broad, and often extending to dorsal and ventral margins, a few scattered white scales posteriorly near distal end; midfemur dark scaled except for diffuse white spot on ventral margin about 0.3 from base, spreading to posterior and anterior surfaces, and conspicuous apical white ring; hindfemur predominantly white scaled except for basal dark ring and a variable dark scale marking near apex that usually covers 0.1 of anterior surface and about 0.3 of posterior surface, sometimes extending to dorsal and ventral margins and interrupting line of white scales to apex; all tibiae predominately dark scaled except for a small unique ring, usually complete, of white scales at 0.3, most prominent and always complete on hindtibia and least prominent on foretibia; foretibia with pale scales ventrally on apical 0.70-0.75; all tarsi dark scaled on dorsal surface but usually white or dingy white on ventral surface and with the following prominent white markings, visible dorsally, (1) basal rings on segments 1-3 of foretarsus, (2) basal rings on segments 1-3 and sometimes incomplete basal ring on segment 4 of midtarsus, (3) prominent, broad basal rings on segments 1-5 of hindtarsus, this tarsus otherwise completely dark scaled dorsally and ventrally. *Wing*. Scales all dark except for small, inconspicuous basal white patch on costa; remigial bristles lacking; plical area without scales at base ventrally. *Halter*. Knob with very dark scales at base, distal part with dingy beige scales. *Abdomen*. Tergite I dark scaled; laterotergite densely covered with white scales; tergites II-V largely dark scaled (lighter on tergite V) with basal subtriangular white patches and subapical lateral triangular patches of white scales, patches narrowed basad; tergites VI, VII with basal median triangular patches narrowed distad, surrounded by light beige scales and with lateral patches of white scales on both segments; sternites II, III largely white scaled; sternites IV, V with narrow basal bands of white scales, remainder dark scaled; sternite VI usually with only 1-3 basal white scales, remainder dark scaled; sternite VII with few basal white scales, remainder of scales light beige in color.

MALE (Figs. 17, 18). Essentially as in female but smaller; genitalia as figured and as described for the subgenus; aedeagus without denticles.

PUPA (Fig. 18). Chaetotaxy as recorded in Table 4. *Respiratory trumpet*. Moderately pigmented; a number of scattered, short setae on inner surface of meatus; index 3.70-4.75, mean = 4.01. *Cephalothorax*. Seta 12-C with 4-8 branches. *Abdomen*. Seta 1-II with 24-34 branches; 1-III with 11-23 branches; 1-VII double to 4 branched; 5-I with 1-4 branches; 5-II with 6-10 branches; 5-IV with 4-7 branches; 5-V triple to 5 branched; 6-V single. *Paddle*. Ovoid, with minute spicules on apical 0.75-0.80 of outer and 0.3-0.4 of inner margins; midrib moderately pigmented, not reaching apex; 1-P moderately long, single; index 1.46-1.70, mean = 1.56.

LARVA (Fig. 19). Chaetotaxy as recorded in Table 6. *Head*. Seta 4-C short, dendritic, with 6-10 branches, well caudad of anterior margin of head; 5-C long, triple to 5 branched, only slightly caudad of 6-C which is very long, single, well caudad of anterior margin of head, well mesad and slightly caudad of 7-C; 7-C long, with 6-8 branches; mental plate with 19-24 teeth; mouth brush with simple setae. *Antenna*. Short, moderately pigmented; 1-A long, double, attached 0.5-0.6 from base. *Thorax*. Seta 11-P with 5-7 branches; 13-M dendritic, with 12-30 branches; 14-M dendritic, with 20-30 branches. *Abdomen*. Seta 5-II with 7-11 branches; 7-II moderately long, with 4-7 branches; 1-III double to 4 branched; 5-III with 6-9 branches; 6, 10, 11-III double; 1-IV triple to 4 branched; 5-IV with 5-8 branches; 13-IV with 4 branches; 1-V triple or 4 branched; 5-V with 4-7 branches; 7-V with 6-9 branches; 11-V

single to triple; 13-V with 4 branches; 5-VI with 7 branches; 8-VI with 9 or 10 branches; 3-VII double to 4 branched; 10, 14-VII double; 11-VII single to triple; 13-VII with 4-6 branches; 1-VIII triple to 5 branched; 1-X moderately long, slender, double; 2-X long, double; 3-X very long, single; 4-X composed of 4 pairs of setae on grid; 4a double or triple; 4b, c triple or 4 branched; 4d with 4 or 5 branches; 4c, d slightly shorter than 4a, b; VIII with comb composed of 12-17 scales in one row; 4 anal papillae, relatively short. *Siphon*. Pigmented, acus absent, index 2.48-3.90 (mean = 2.86); pecten on basal 0.44-0.51 of siphon, composed of 10-14 evenly spaced teeth, each tooth with a slender attenuated filament with 1 or 2 small denticles on ventral margin; 1-S moderately long, with 4-6 branches, attached on basal 0.50-0.57 of siphon, distad to posteriormost pecten tooth; 2, 6, 7, 9-S single; 8-S double or triple.

DISCUSSION. *Aedes thomsoni* is easily identifiable in all stages from other members of the subgenus. The adult is ornate, with strikingly banded legs. The pupa is characterized by long, multibranched setae, particularly setae 1-III-VII and 5-IV-VI and by the very long, single setae 6-I-VI. In addition, the larva has many long, multibranched setae but is distinguished most easily with seta 6-C single, very long and seta 10-VII double.

It was the first species of *Christophersiomyia* to be described, probably due to the obvious scale patterns on the adult and its relative abundance on the Indian subcontinent. Barraud (1923a) established *thomsoni* as the type-species of *Christophersiomyia*.

TYPE-DATA. The holotype female of *thomsoni* is in the BMNH. Type-locality: North West Provinces, INDIA [now Peshawar Division, PAKISTAN]. I have not seen the type.

DISTRIBUTION. 142 specimens examined: 17♂, 8♂ terminalia, 41♀, 22 L, 28 l, 26 p.

INDIA. [Bihar]. Pusa (26, 27-V-1909, 3, 4-V-1912, H. N. S.), 1♂, 1♂ terminalia, 4♀; (25-III-1913, Md. S.), 1♀. Pusa, Tried-al-Karnal (III-1931, P. J. Barraud), 18 L. [Madras]. Madras (III-1916, Patton and Barraud), 1♀. [East Punjab]. West Himalayas near Kasauli (VIII-1923, P. J. Barraud), 3♂, 2♀. Koli near Kalka, West Himalayan Foothills (VIII-1923, P. J. Barraud), 1 l. Patiala City (II-1931, P. J. B.), 2♂, 5♀, 3 l, 3 p. [Maharashtra]. Bombay (1921, P. J. Barraud), 1 L, 1 l. Bombay Harbour, Elephanta Island (6-VIII-1921, P. J. Barraud), 1 l, 1 p. Bombay Harbour, Trombay (16-VII-1921, P. J. Barraud), 1 l, 1 p. "Debra boon" (Major Thomson), 1♀.

PAKISTAN. [Peshawar]. Kohat (VII-1916, Sinton and Barraud), 1♂. [West Punjab]. Lahore (IX-1923, J. A. Sinton and P. J. Barraud), 2♂, 3♀, 1 l; (IV-1963, ICMRT), 4 l, 4 p; (IX-1963), 2♂, 2♀. Lahore District (1962, D. J. Gould), 17♀.

THAILAND. Chiang Mai. Hoad, Huay Mae Lon (8-X-1963, Neely, Oonruan and Sahem), 6♂, 6♂ terminalia, 5♀, 3 L, 16 l, 16 p. Nakhon Si Thammarat. Ban Thuan Lek (VI-1966), 1 p. Phrae. Ban Phai Thon (XI-1961), 1♂ terminalia.

In addition to the above, Carter (1950) reported *thomsoni* from Ceylon (Sri Lanka). Aslamkhan (1971) and Aslamkhan and Wolfe (1972) reported it from East Pakistan (Bangladesh).

BIONOMICS. Howlett (1913) found that *thomsoni* and *scutellaris* (Walker) [= *Aedes (Stegomyia)* sp.] (which he noted were the 2 most common species at Pusa, India) survive cold and dry weather as dry eggs and not as adults. Peters and Dewar (1956) made the same observations on *annulirostris* in Nepal.

Edwards (1917), Barraud (1923b), and Ansari (1959) reported that the larvae are found in tree holes. Barraud (1934) and Ansari (1959) called

thomsoni a common monsoon species. Aslamkhan and Salman (1969) also found this species "fairly common during the monsoon from Peshawar to Lahore" in Pakistan, but collected only small numbers. Rao and Rajagopalan (1957) found *thomsoni* in Poona District, India, in October resting in outdoor shelters and in bushes. Baker and Aslamkhan (1969) studied *thomsoni* karyotypically and discovered that its diploid chromosome number is 6.

MEDICAL IMPORTANCE. Aslamkhan and Salman (1969) reported that 45 specimens of *thomsoni* (0.13% of the total mosquitoes collected) were found biting man in the early afternoon during a 7 month survey in Pakistan. All of the *thomsoni* were collected during the day, and none were found on cattle. However, they found that a magoon trap baited with a calf and placed overnight in a forest yielded 26 *thomsoni* (0.30% of the total mosquitoes collected) during a 5 month period.

In Bangladesh, Aslamkhan and Wolfe (1972) found *thomsoni* among the mosquitoes in 2 villages in a non-urban focus of nocturnally periodic bancroftian filariasis. Five *thomsoni* were collected while biting man and dissected, but all were found negative for filarial larvae. No *thomsoni* were found resting in houses, nor were any taken biting cattle.

Reuben (1971) processed mosquitoes for isolation of Japanese encephalitis virus in Madras, India. Although *thomsoni* was collected, no virus isolations were obtained from this species.

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LITERATURE CITED

- ANSARI, M. A. R.
1959. A report on the culicine mosquitoes in the collection of the Department of Entomology and Parasitology (I. H. P. M.), Lahore. Pak. J. Hlth. 8: 25-36.
- ASLAMKHAN, M.
1971. The mosquitoes of Pakistan. I. A checklist. Mosq. Syst. Newslett. 3: 147-59.
- ASLAMKHAN, M. and C. SALMAN.
1969. The bionomics of the mosquitoes of the Changa Manga National Forest, West Pakistan. Pak. J. Zool. 1: 183-205.
- ASLAMKHAN, M. and M. S. WOLFE.
1972. Bancroftian filariasis in two villages in Dinajpur District, East Pakistan. II. Entomological investigations. Am. J. Trop. Med. Hyg. 21: 30-7.
- BAKER, R. H. and M. ASLAMKHAN.
1969. Karyotypes of some Asian mosquitoes of the subfamily Culicinae (Diptera: Culicidae). J. Med. Entomol. 6: 44-52.
- BARRAUD, P. J.
1923a. A revision of the culicine mosquitoes of India. Part I. Indian J. Med. Res. 10: 772-88, pl. XLIII-LIX.
1923b. A revision of the culicine mosquitoes of India. Part VII. The larvae of some species of *Stegomyia* (Theo.). The larvae of some species of *Finlaya* (Theo.). The larva of *Christophersiomyia thomsoni* (Theo.). The larva of *Mimomyia chamberlaini* (Ludl.). The larva of *Aedomyia catasticta* (Knab.). Indian J. Med. Res. 11: 495-505, pl. XXXIV-XL.
1931. Descriptions of eight new species of Indian culicine mosquitoes. Indian J. Med. Res. 19: 609-16, pl. XXXVI.
1934. The fauna of British India, including Ceylon and Burma. Vol. V. Diptera. Family Culicidae. Tribes Megarhinini and Culicini. Taylor and Francis, London. 463 + xxviii p., 8 pl., 1 map.
- BASIO, R. G.
1971. The mosquito fauna of the Philippines (Diptera Culicidae). Nat. Mus. Philipp. Monogr. 4: 1-198.
- BELKIN, J. M.
1962. The mosquitoes of the South Pacific (Diptera, Culicidae). Univ. Calif. Press, Berkeley and Los Angeles, 2 vols. 608 p., 412 fig.
- BRUNETTI, E.
1907. Annotated catalogue of Oriental Culicidae. Rec. Indian Mus. 1: 297-377.

1912. Annotated catalogue of Oriental Culicidae--Supplement. Rec. Indian Mus. 4: 403-517.
1920. Catalogue of Oriental and South Asiatic Nemocera. Rec. Indian Mus. 17: 1-300.
- CARTER, H. F.
1950. Ceylon mosquitoes: Lists of species and names of mosquitoes recorded from Ceylon. Ceylon J. Sci. Sect. B. Zool. 24: 85-115.
- CHRISTOPHERS, S. R.
1911. Aids to the identification of Culicidae other than *Anopheles*, with special reference to Indian species. Paludism 3: 40-54, pl. II.
- EDWARDS, F. W.
1917. Notes on Culicidae, with descriptions of new species. Bull. Entomol. Res. 7: 201-29.
1922. A synopsis of adult Oriental culicine (including megarhinine and sabethine) mosquitoes. Part I. Indian J. Med. Res. 10: 249-93, pl. V-VII.
1932. Diptera. Fam. Culicidae. In P. Wytman, ed. Genera Insectorum. Desmet-Verteneuil, Brussels. Fasc. 194, 258 p., 5 pl.
- GREEN, E.
1911. *Stegomyia* (tiger-mosquitoes) in Ceylon. Trop. Agric. Mag. Ceylon Agric. Soc. 36: 234-5.
- HORSFALL, W. R.
1955. Mosquitoes. Their bionomics and relation to disease. Ronald Press Co., New York. 723 + viii p.
- HOWLETT, F. M.
1909. Diptera. (Flies.). P. 545-657, pl. LVIII-LXIX. In H. Maxwell-Lefroy. Indian insect life. A manual of the insects of the plains (Tropical India). Thacker, Spink and Co., Calcutta. 786 + ixii p., 84 pl.
1913. Report of the Imperial Pathological Entomologist. Rept. Agric. Res. Inst. Coll., Pusa, 1911-12: 74-7.
- HUANG, Y.-M.
1968. A new subgenus of *Aedes* (Diptera, Culicidae) with illustrated key to the subgenera of the Papuan subregion (Diptera: Culicidae). J. Med. Entomol. 5: 169-88.
1972. Contributions to the mosquito fauna of Southeast Asia. XIV. The subgenus *Stegomyia* of *Aedes* in Southeast Asia. I - The *scutellaris* group of species. Contrib. Am. Entomol. Inst. (Ann Arbor) 9(1): 1-109.
- JOSHI, G., S. PRADHAN and R. F. DARSIE, JR.
1965. Culicine, sabethine and toxorhynchitine mosquitoes of Nepal including new country records (Diptera: Culicidae). Proc. Entomol. Soc. Wash. 67: 137-46.

KNIGHT, K. L.

1947. A new species of *Aedes (Christophersiomyia)* from the Philippines (Diptera: Culicidae). Proc. Biol. Soc. Wash. 60: 73-6.

KNIGHT, K. L. and W. B. HULL.

1951. The *Aedes* mosquitoes of the Philippine Islands I. Keys to species. Subgenera *Mucidus*, *Ochlerotatus*, and *Finlaya* (Diptera, Culicidae). Pac. Sci. 5: 211-51.
1952. The *Aedes* mosquitoes of the Philippine Islands II. Subgenera *Skusea*, *Christophersiomyia*, *Geoskusea*, *Rhinoskusea*, and *Stegomyia* (Diptera, Culicidae). Pac. Sci. 6: 157-89.

MACDONALD, W. W.

1957. Malaysian parasites--XVI. An interim review of the non-anopheline mosquitoes of Malaya. Stud. Inst. Med. Res. Malaya 28: 1-34.

MATTINGLY, P. F.

1952. The subgenus *Stegomyia* (Diptera: Culicidae) in the Ethiopian region I. A preliminary study of the distribution of species occurring in the West African sub-region with notes on taxonomy and bio-nomics. Bull. Br. Mus. (Nat. Hist.) Entomol. 2: 235-304.
1959. The culicine mosquitoes of the Indomalayan area. Part IV. Genus *Aedes* Meigen, subgenera *Skusea* Theobald, *Diceromyia* Theobald, *Geoskusea* Edwards and *Christophersiomyia* Barraud. Br. Mus. (Nat. Hist.), London. 61 p.

PETERS, W. and S. C. DEWAR.

1956. A preliminary record of the megarhine and culicine mosquitoes of Nepal with notes on their taxonomy (Diptera: Culicidae). Ind. J. Malariol. 10: 37-51.

RAO, T. R. and P. K. RAJAGOPALAN.

1957. Observations on mosquitoes of Poona District, India, with special reference to their distribution, seasonal prevalence and the biology of adults. Indian J. Malariol. 11: 1-54.

REINERT, J. F.

1973. Contributions to the mosquito fauna of Southeast Asia. - XIX. *Bothaella*, a new subgenus of *Aedes* Meigen. Contrib. Am. Entomol. Inst. (Ann Arbor) 10(3): 1-51.

REUBEN, R.

1971. Studies on the mosquitoes of North Arcot District, Madras State, India. Part 1. Seasonal densities. J. Med. Entomol. 8: 119-26.

SENIOR-WHITE, R.

1923. Catalogue of Indian insects. Part 2 - Culicidae. Superintendent Government Printing, India. Calcutta. 124 + ii p.
1927. Notes on Ceylon mosquitoes, II. The larvae of the commoner non-anopheline mosquitoes. Spolia Zeylon. 14: 61-76, pl. VI-XI.

STEFFAN, W. A.

1966. A checklist and review of the mosquitoes of the Papuan subregion (Diptera: Culicidae). *J. Med. Entomol.* 3: 179-237.

STONE, A.

1961. A synoptic catalog of the mosquitoes of the world, Supplement I (Diptera: Culicidae). *Proc. Entomol. Soc. Wash.* 63: 29-52.
1963. A synoptic catalog of the mosquitoes of the world, Supplement II (Diptera: Culicidae). *Proc. Entomol. Soc. Wash.* 65: 117-40.

STONE, A. and M. D. DELFINADO.

1973. Family Culicidae. P. 266-343. *In* M. D. Delfinado and D. E. Hardy, eds. A catalog of the Diptera of the Oriental region. Volume I. Suborder Nematocera. Univ. Press, Hawaii, Honolulu. 618 p.

STONE, A., K. L. KNIGHT and H. STARCKE.

1959. A synoptic catalog of the mosquitoes of the world (Diptera, Culicidae). *Entomol. Soc. Amer. Thomas Say Found.* 6: 1-358.

THEOBALD, F. V.

1901. A monograph of the Culicidae or mosquitoes. Vol. I. *Br. Mus. (Nat. Hist.)*, London. 424 + xviii p.
1905a. Diptera. Fam. Culicidae. *In* P. Wytsman, ed. *Genera Insectorum*. Desmet-Verteneuil, Brussels. Fasc. 26, 50 p., 2 pl.
1905b. Some new mosquitoes from Ceylon. *J. Bombay Nat. Hist. Soc.* 16: 237-50, pl. A and B.
1907. A monograph of the Culicidae or mosquitoes. Vol. IV. *Br. Mus. (Nat. Hist.)*, London. 639 + xix p., 16 pl.
1910. A monograph of the Culicidae or mosquitoes. Vol. V. *Br. Mus. (Nat. Hist.)*, London. 646 + xv p., 6 pl.

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Fig.1

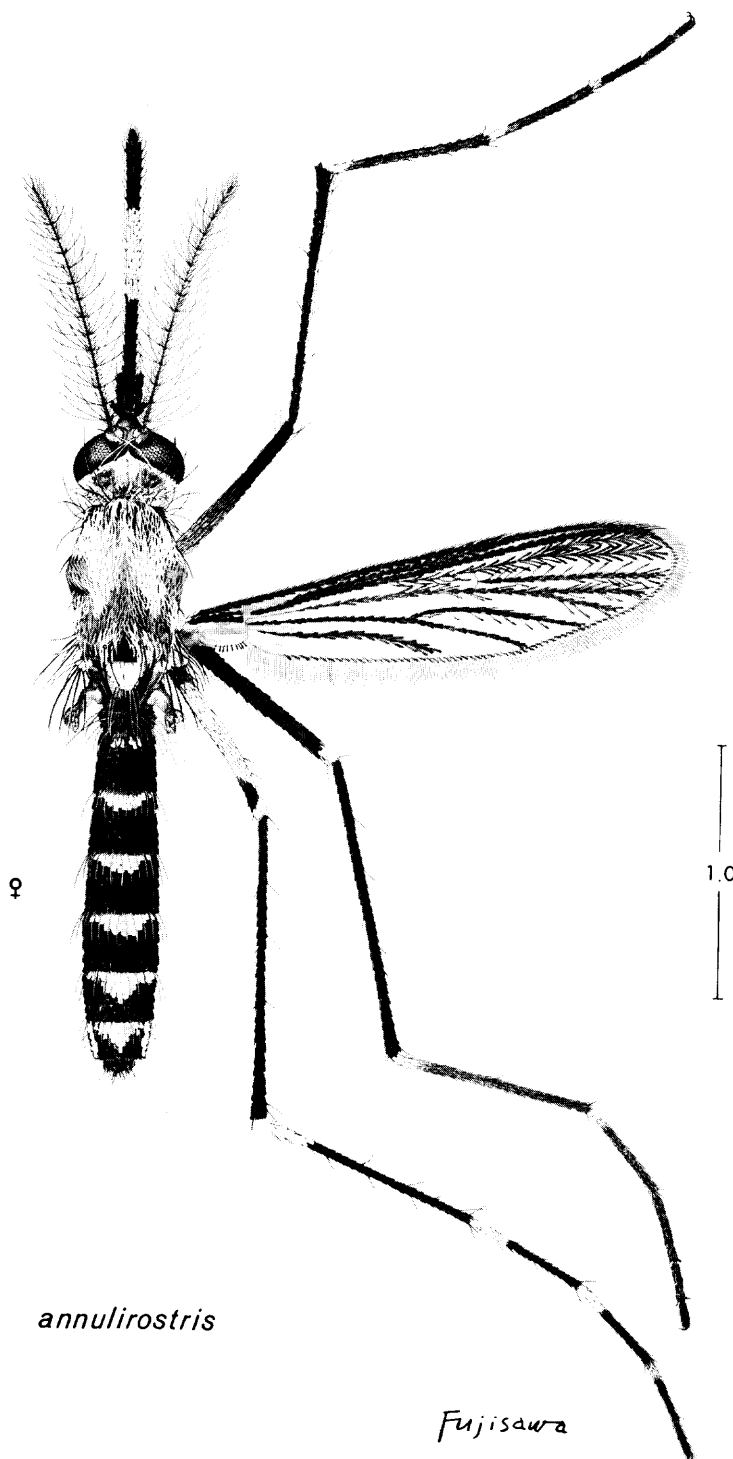
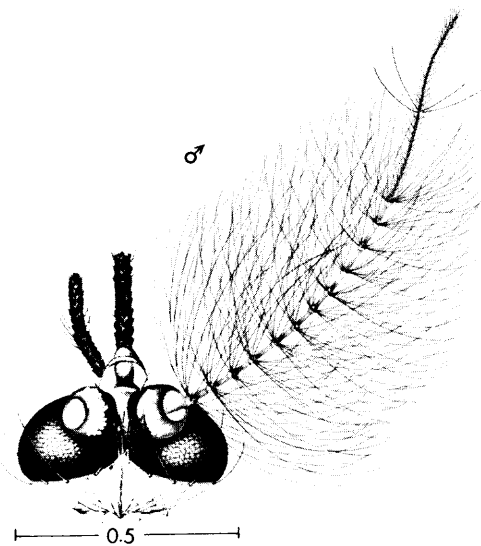
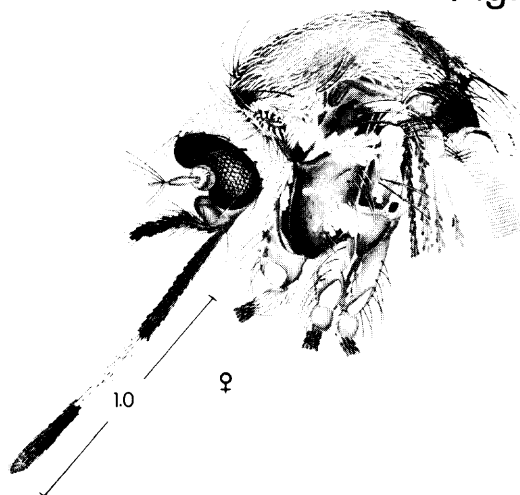
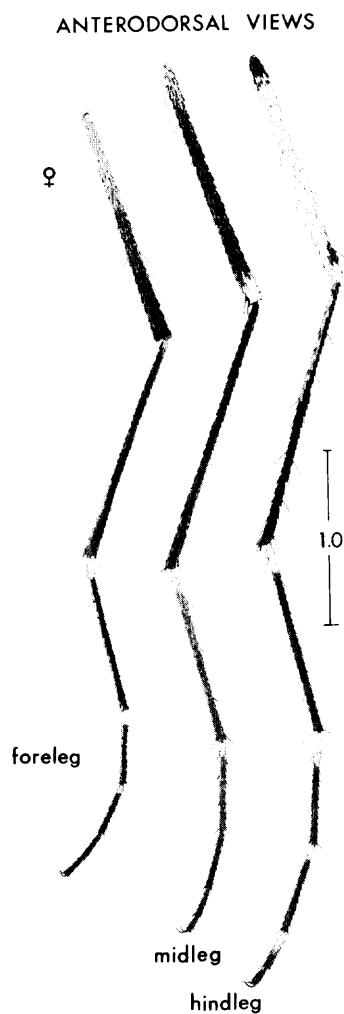
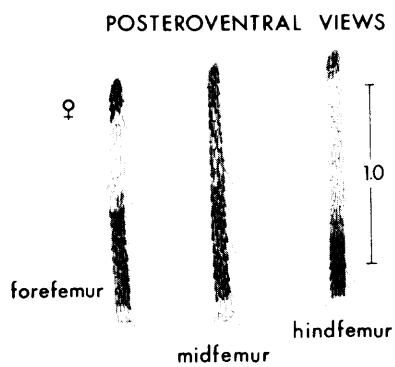


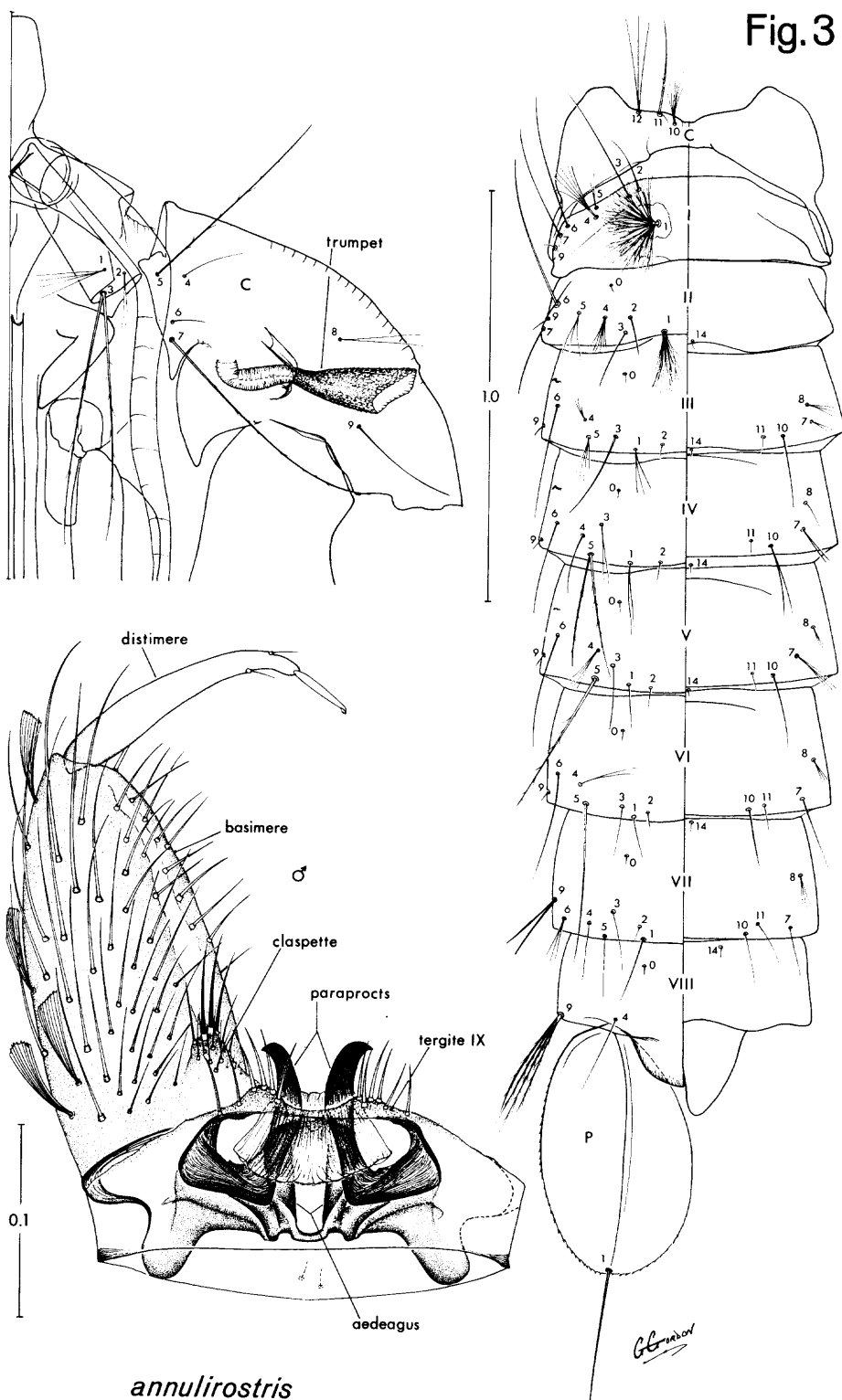
Fig.2



annulirostris

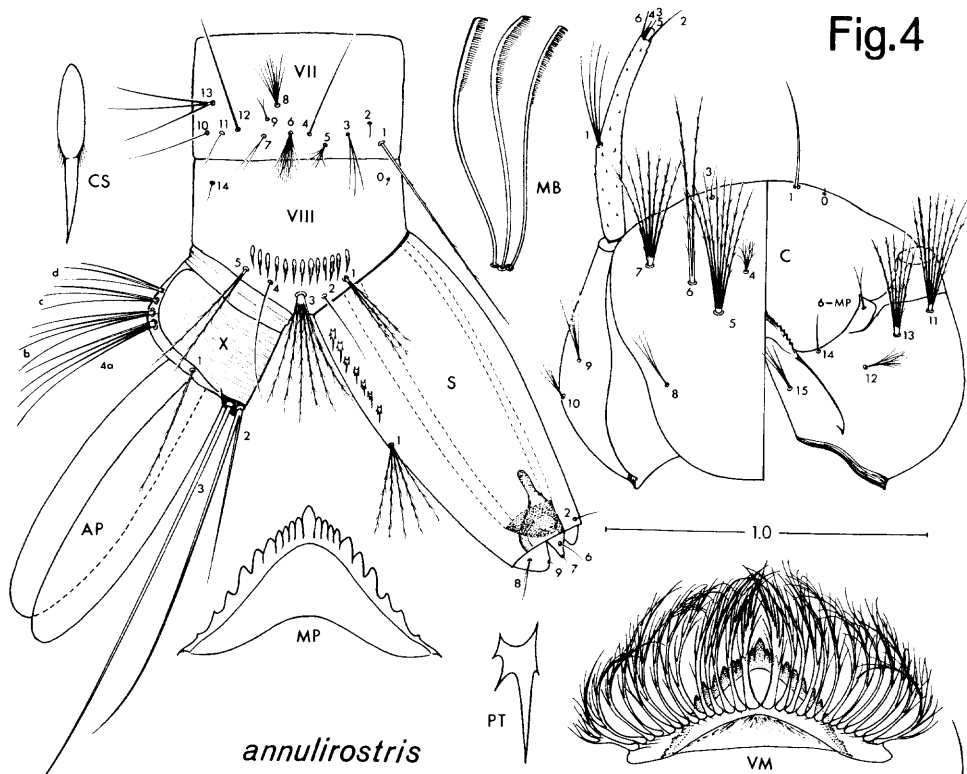
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Fig.3

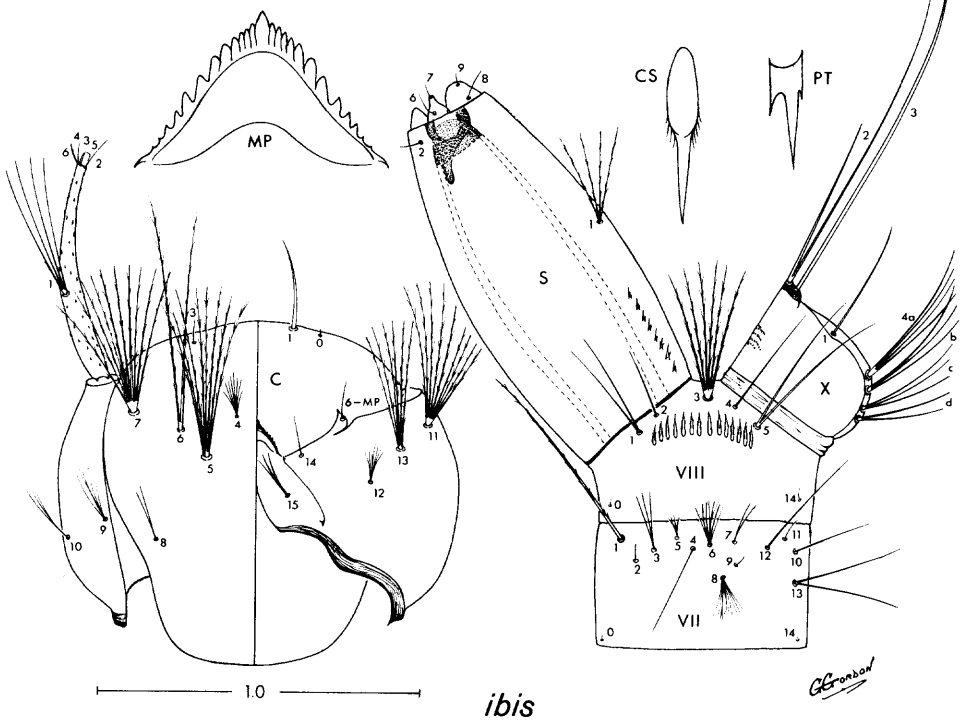


annulirostris

Fig.4



annulirostris



ibis

Granhol

Fig.5

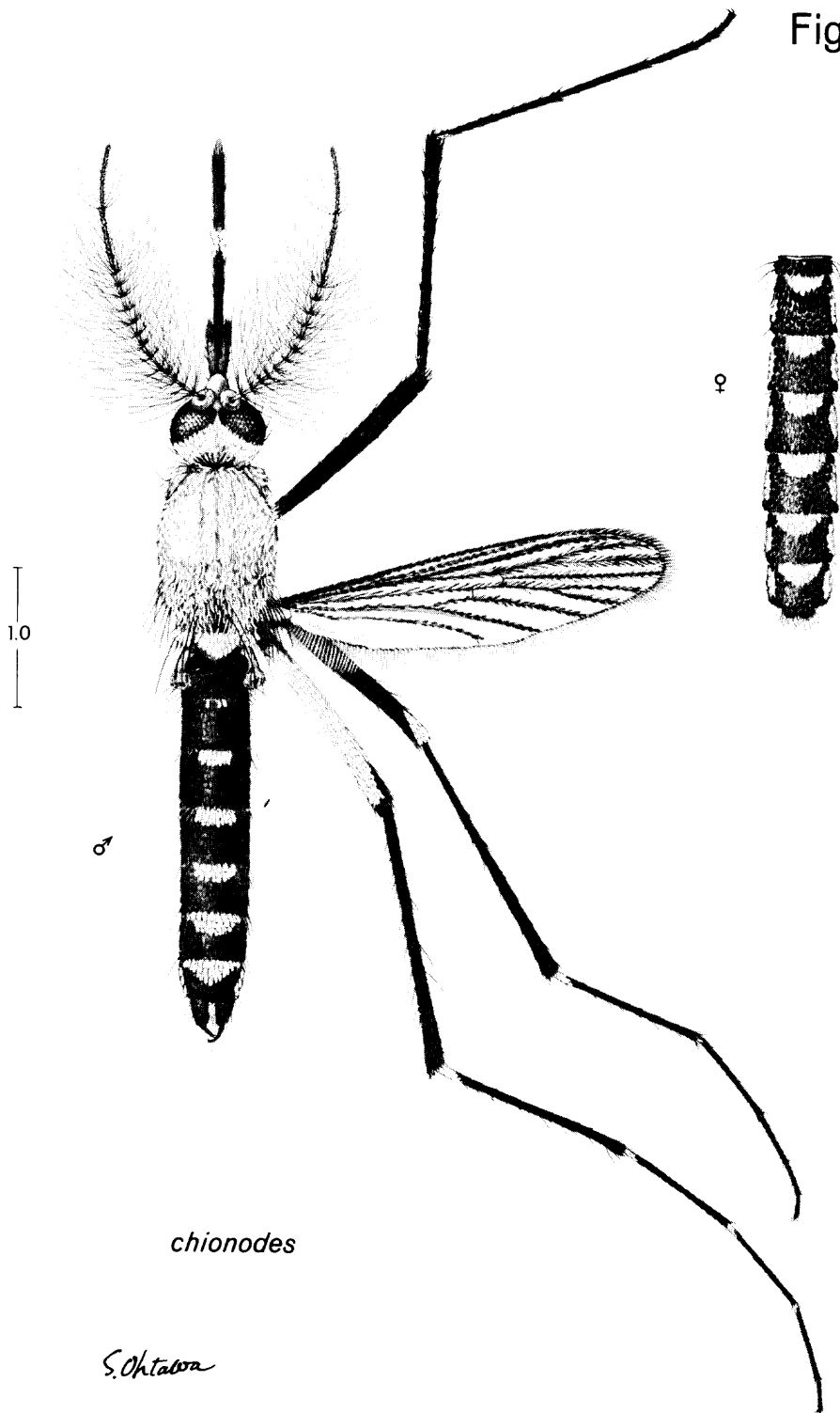


Fig.6

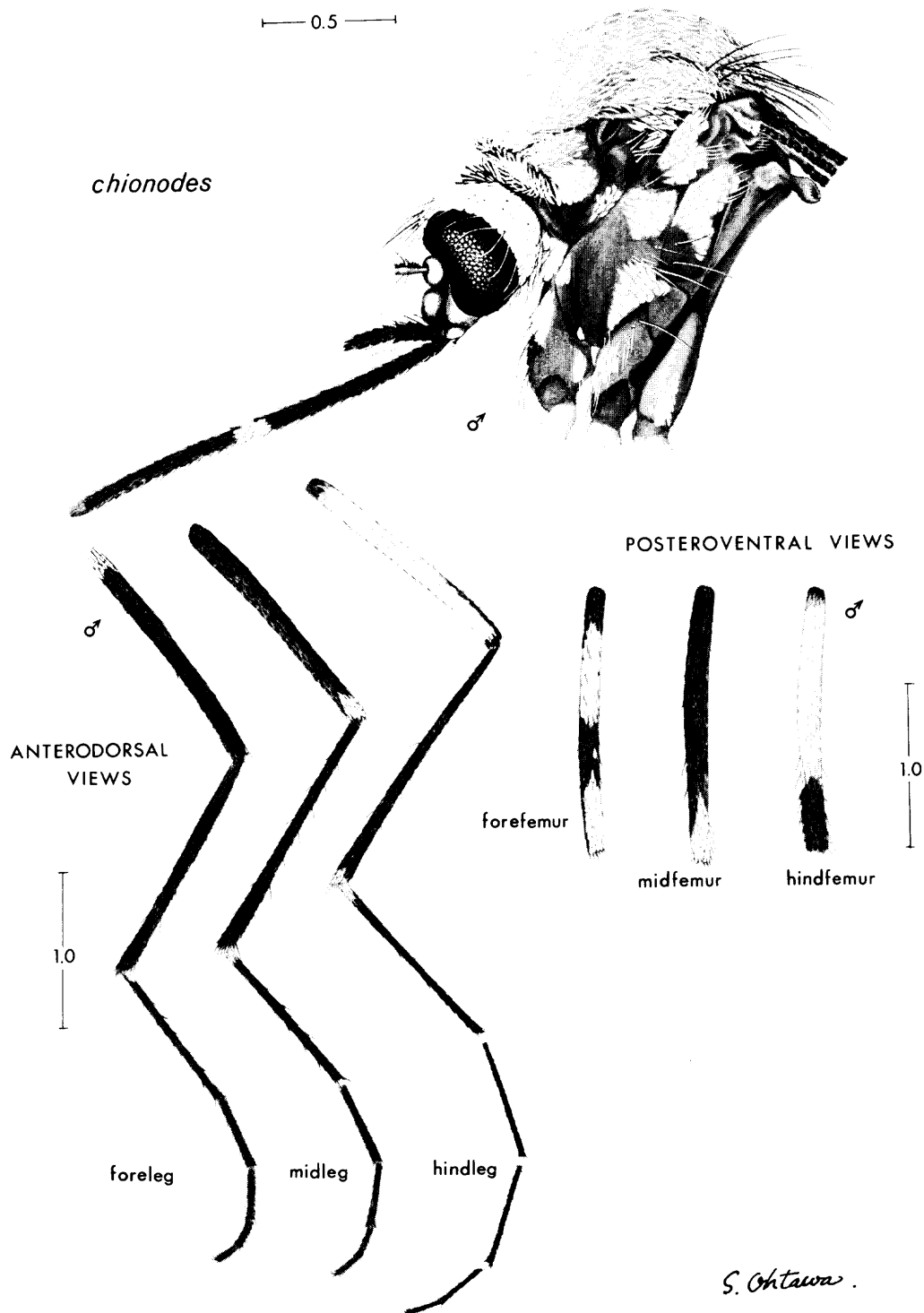
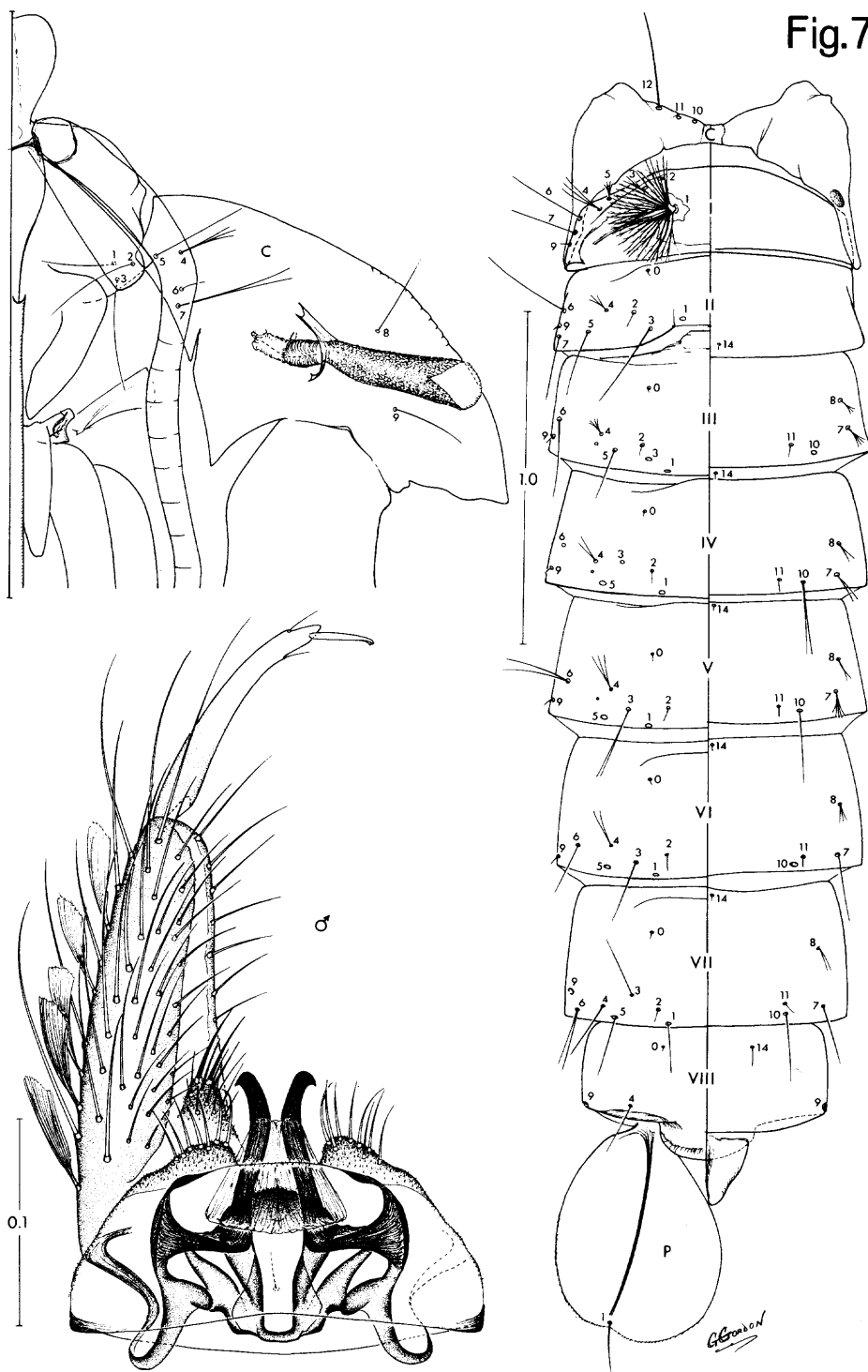


Fig.7



chionodes

Fig. 8

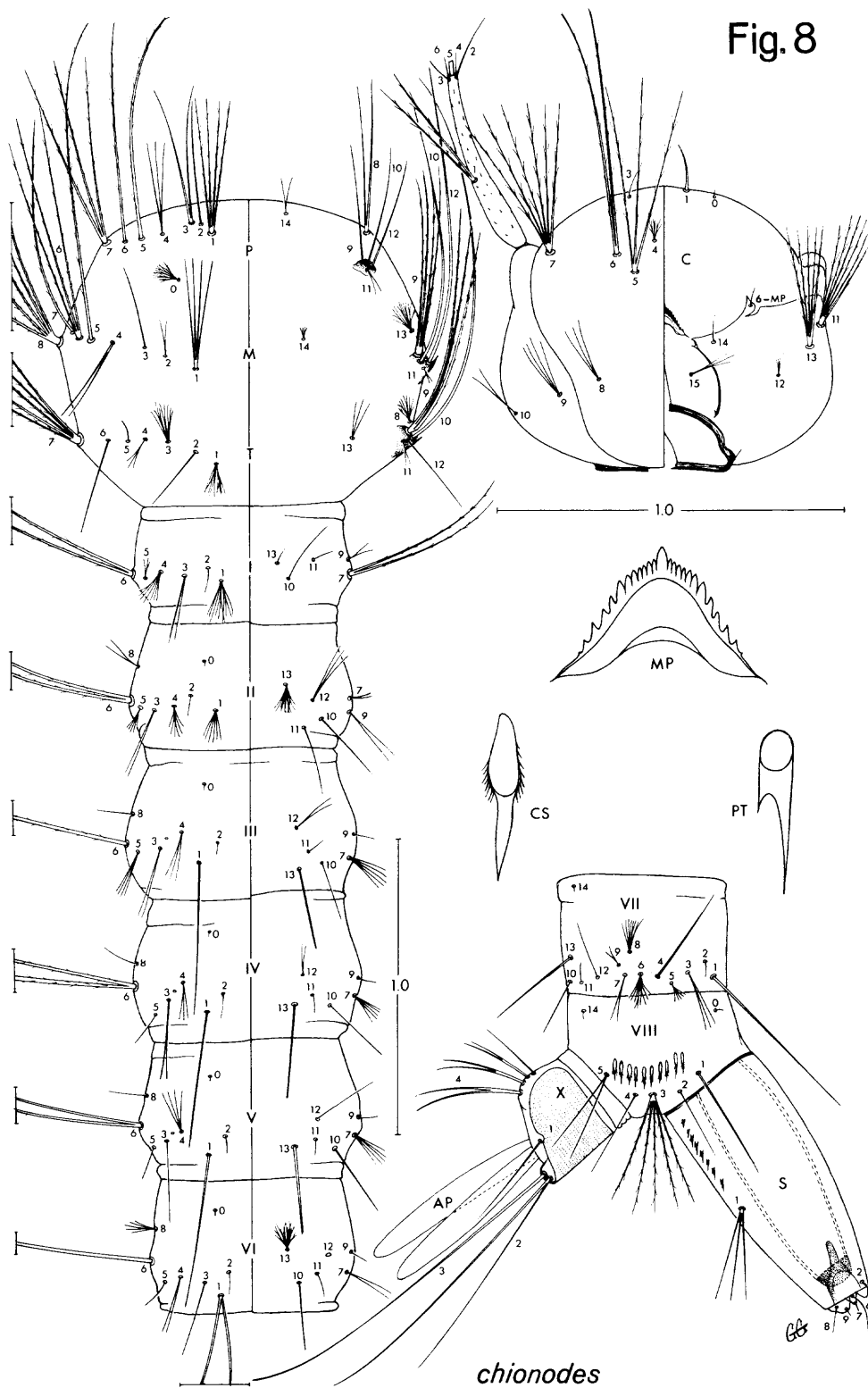


Fig. 9

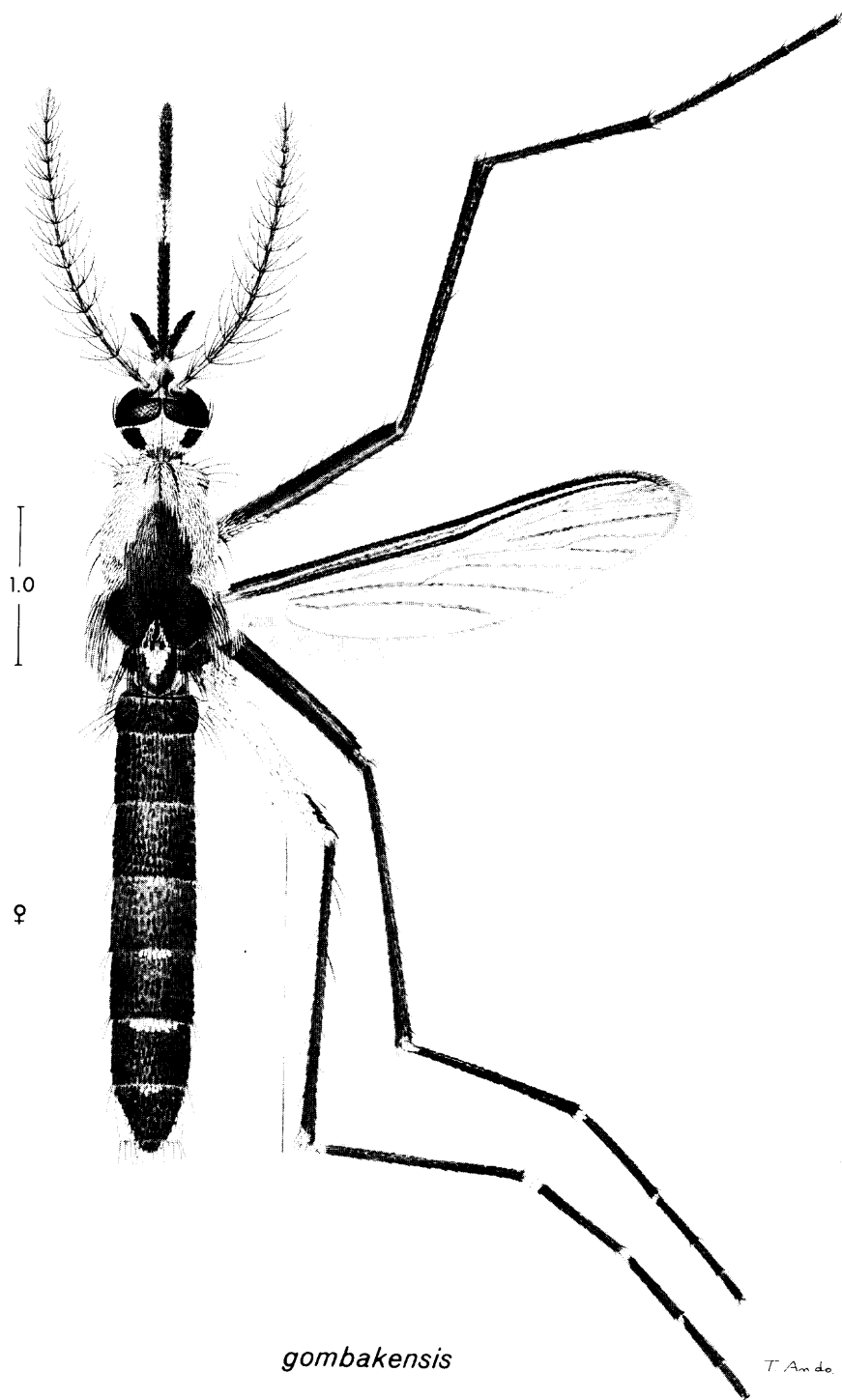


Fig.10

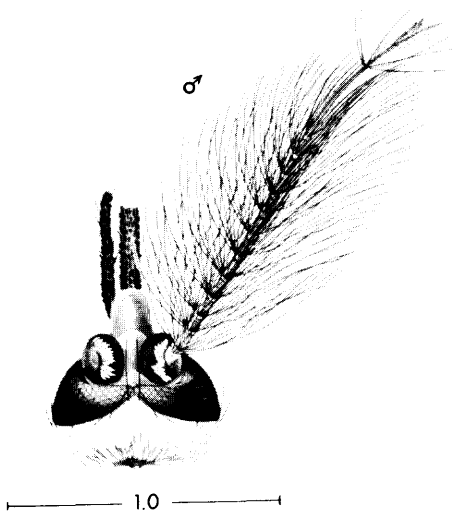
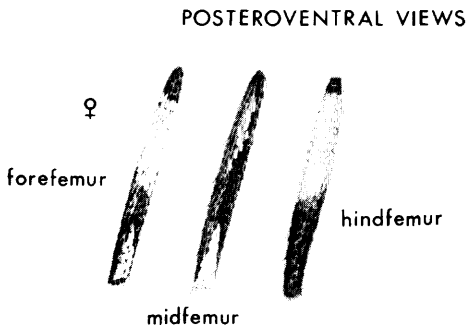
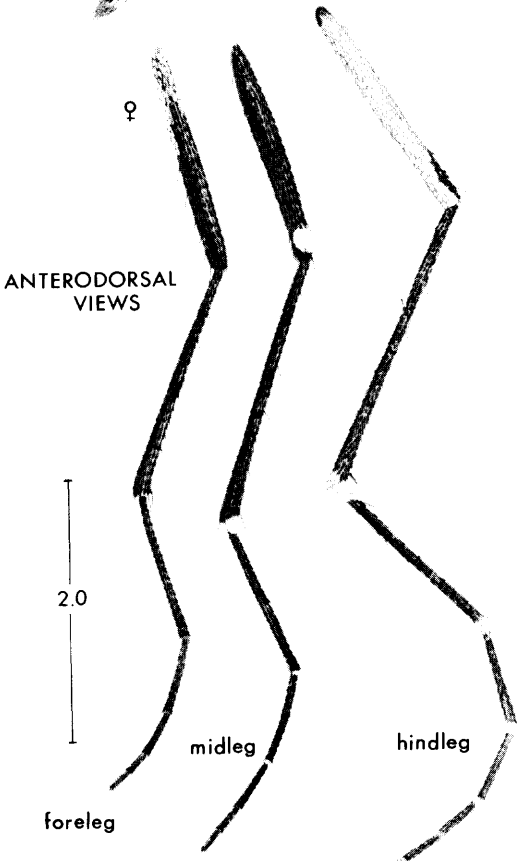
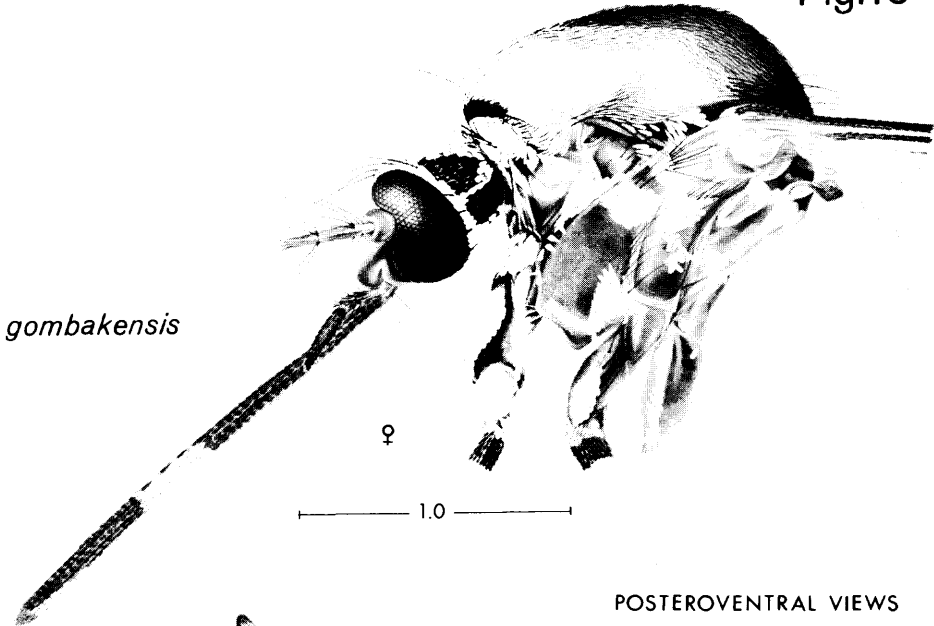
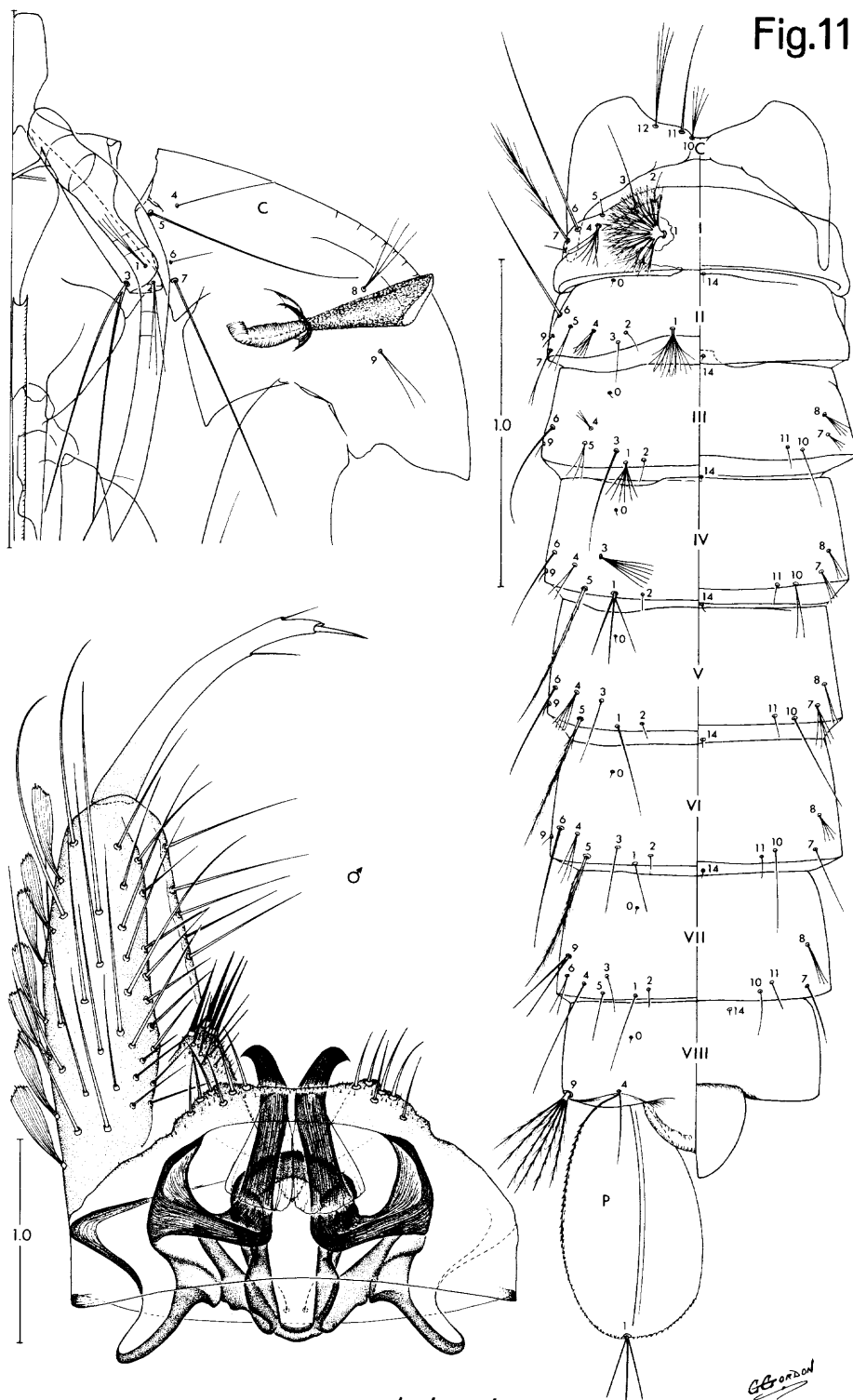


Fig.11



gombakensis

Fig.12

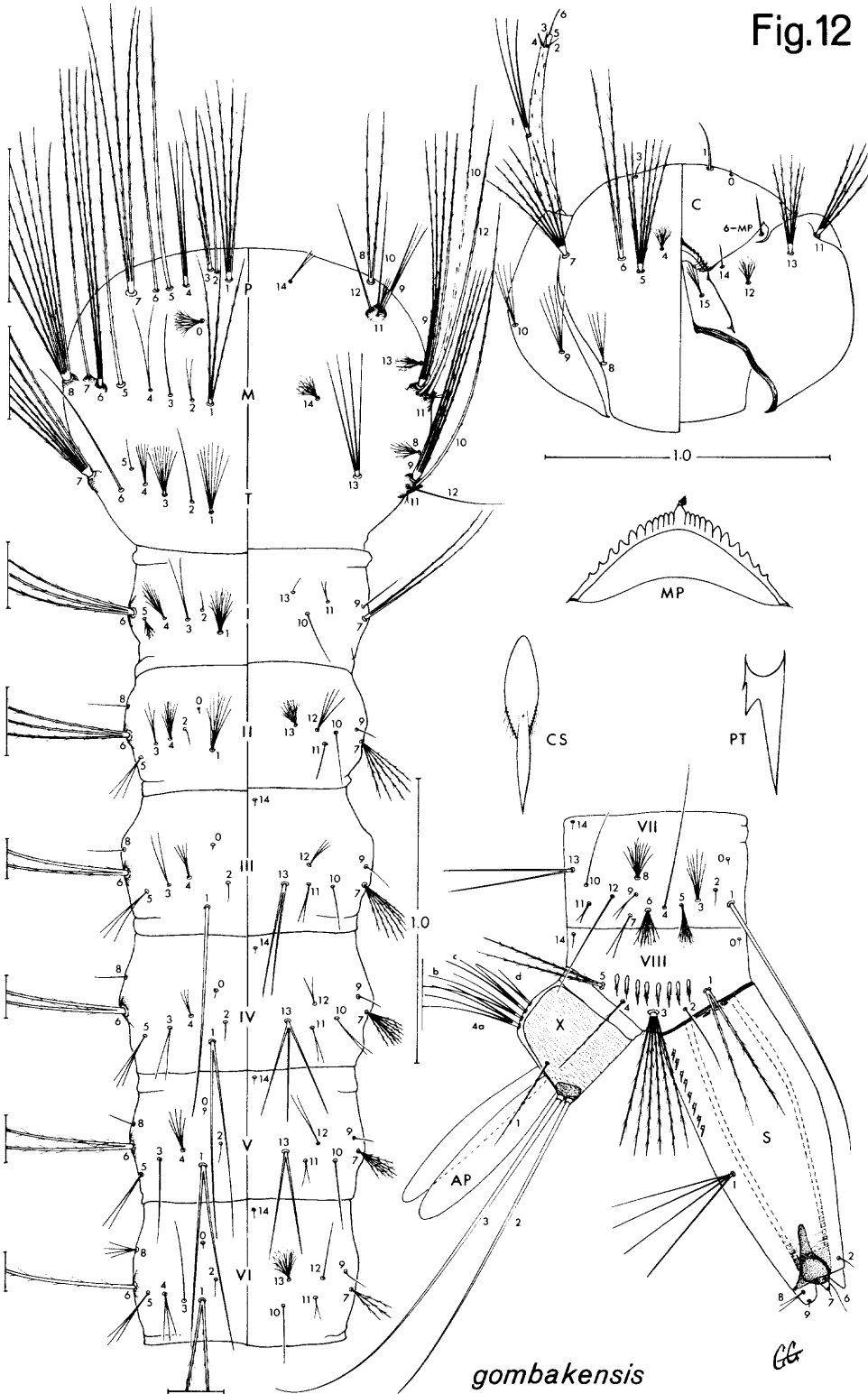


Fig.13

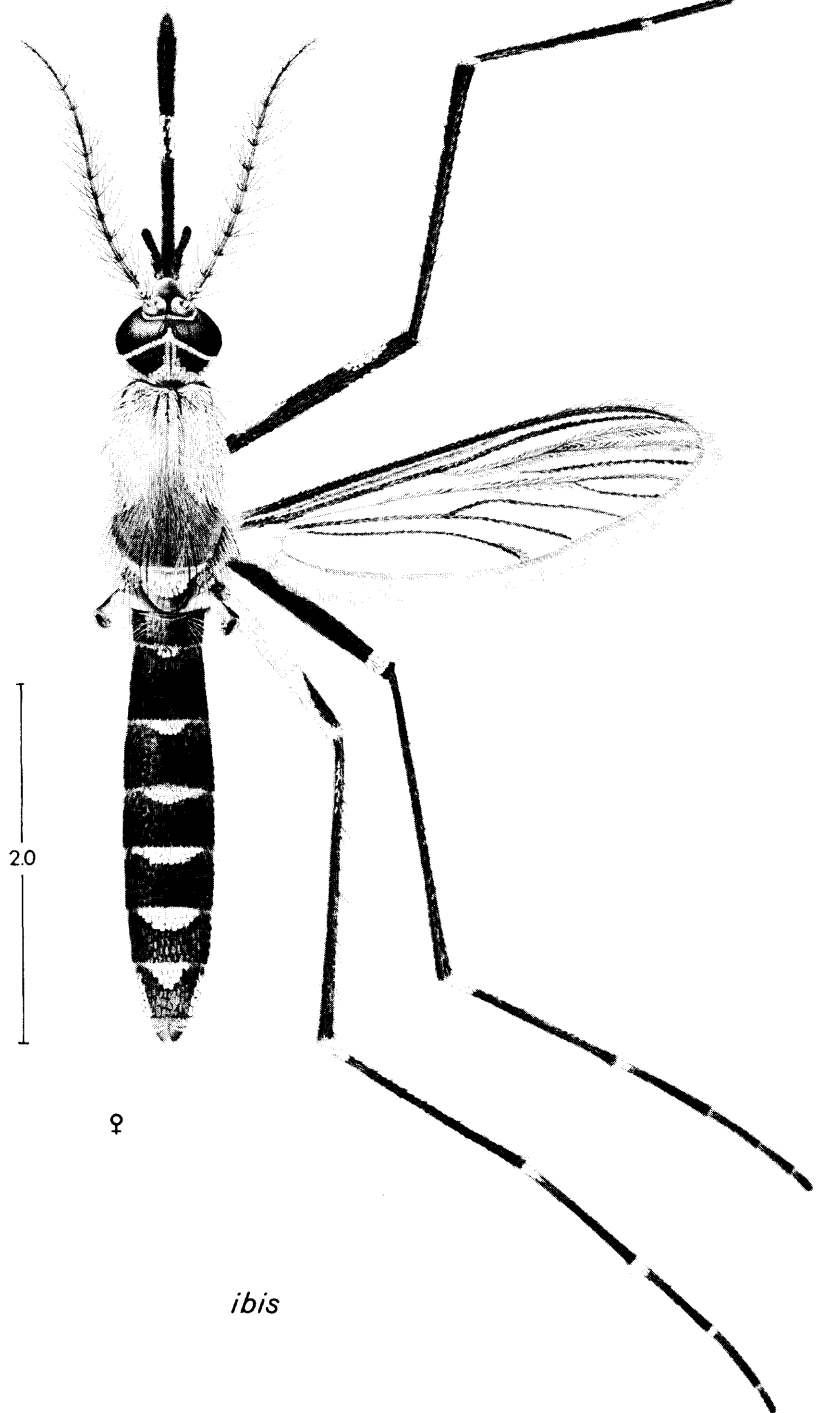


Fig.14

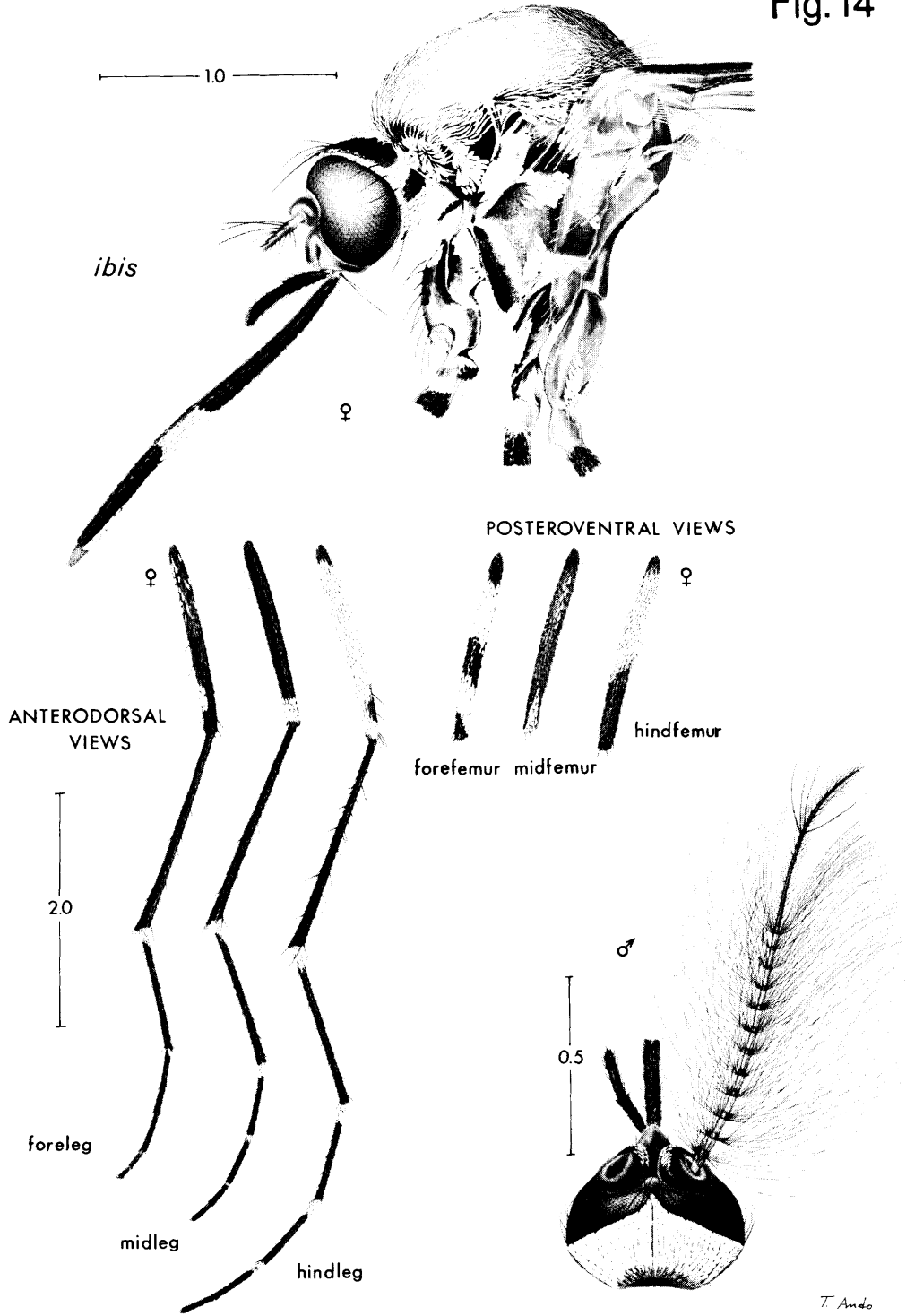


Fig.15

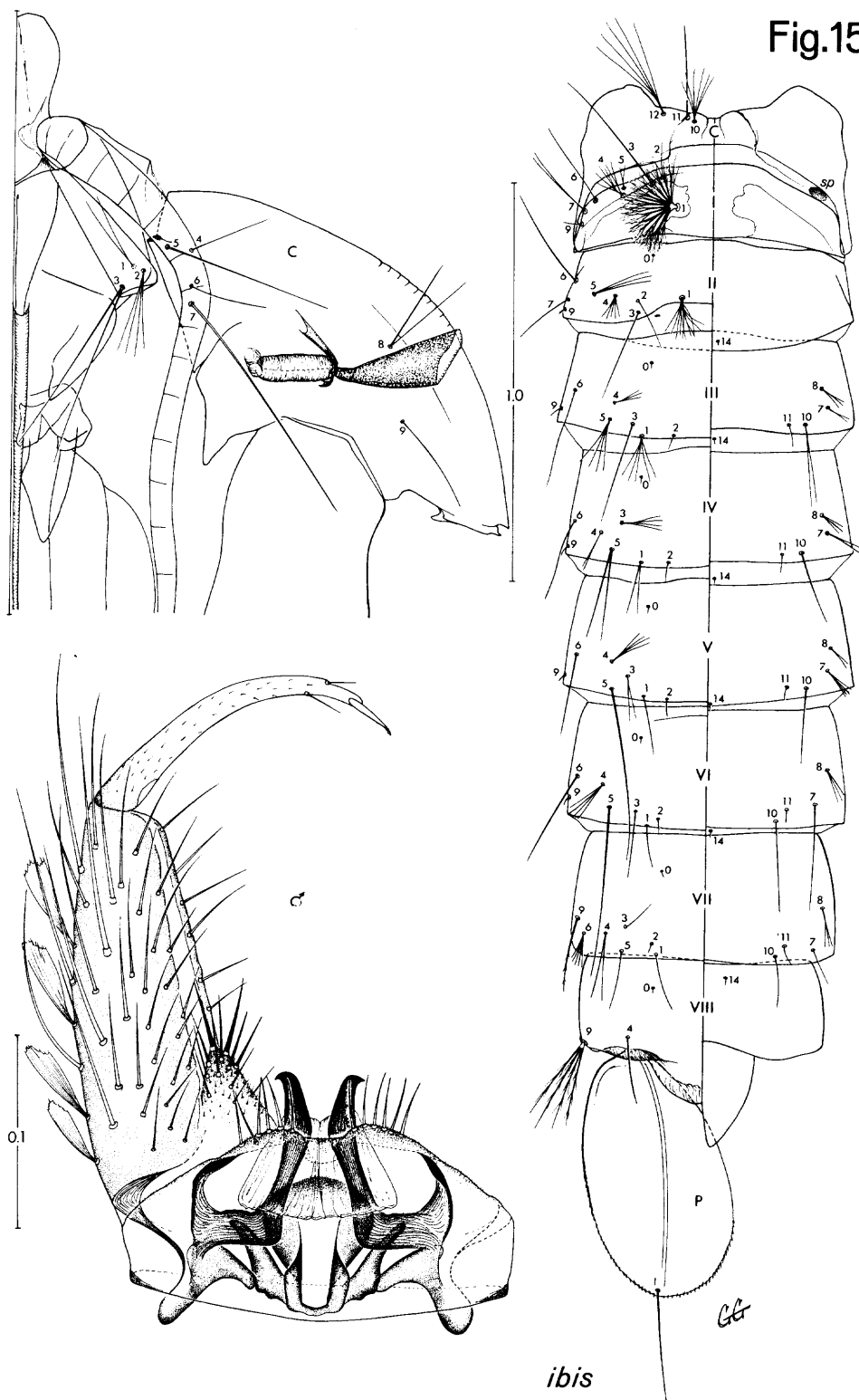
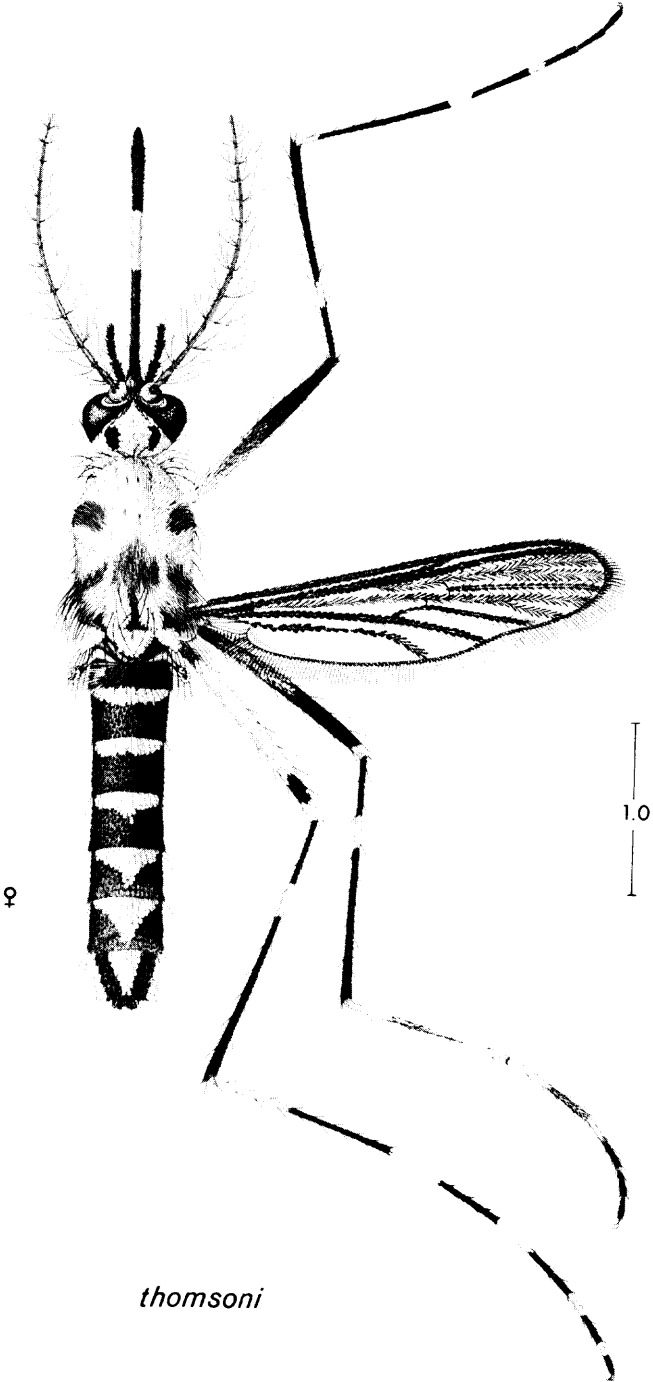


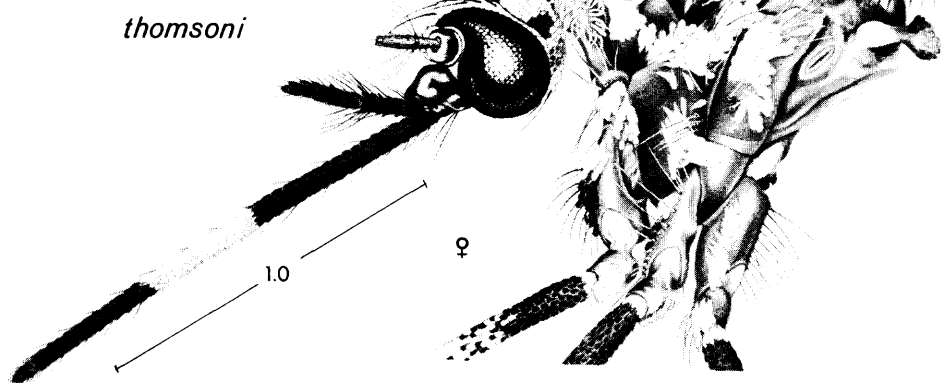
Fig.16



thomsoni

Kei Daishoji

Fig. 17



ANTERODORSAL VIEWS

POSTEROVENTRAL VIEWS

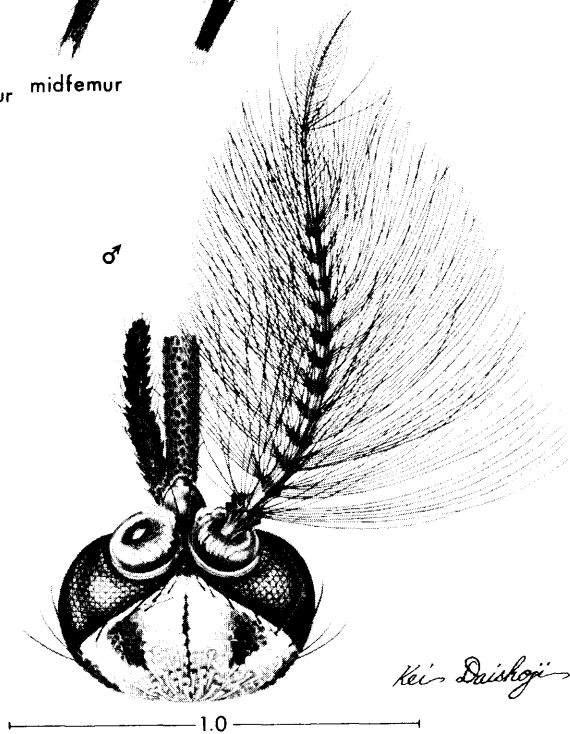
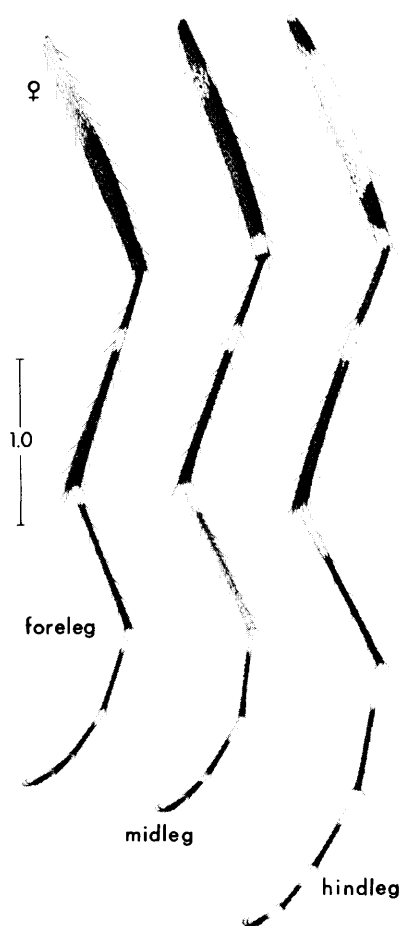


Fig.18

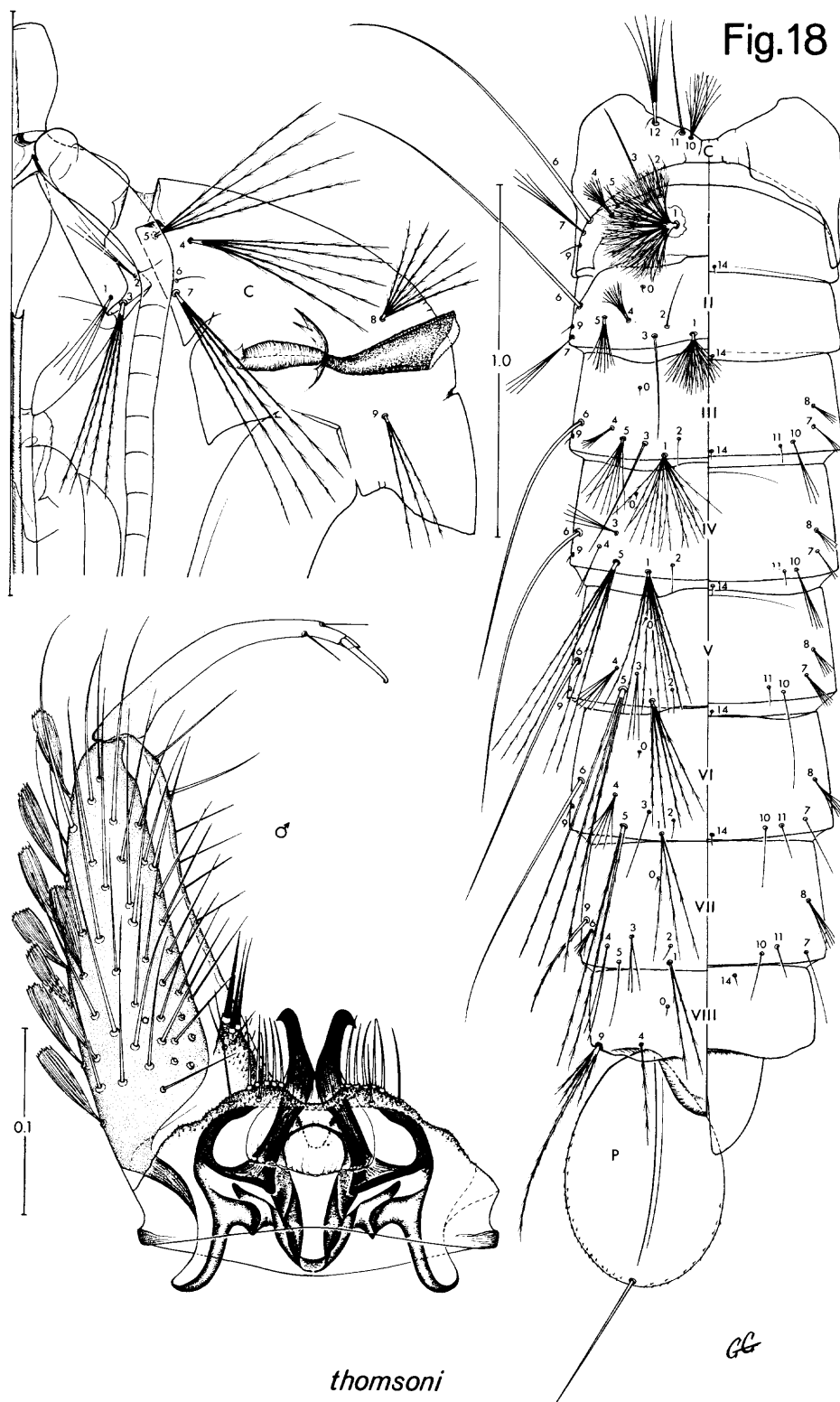
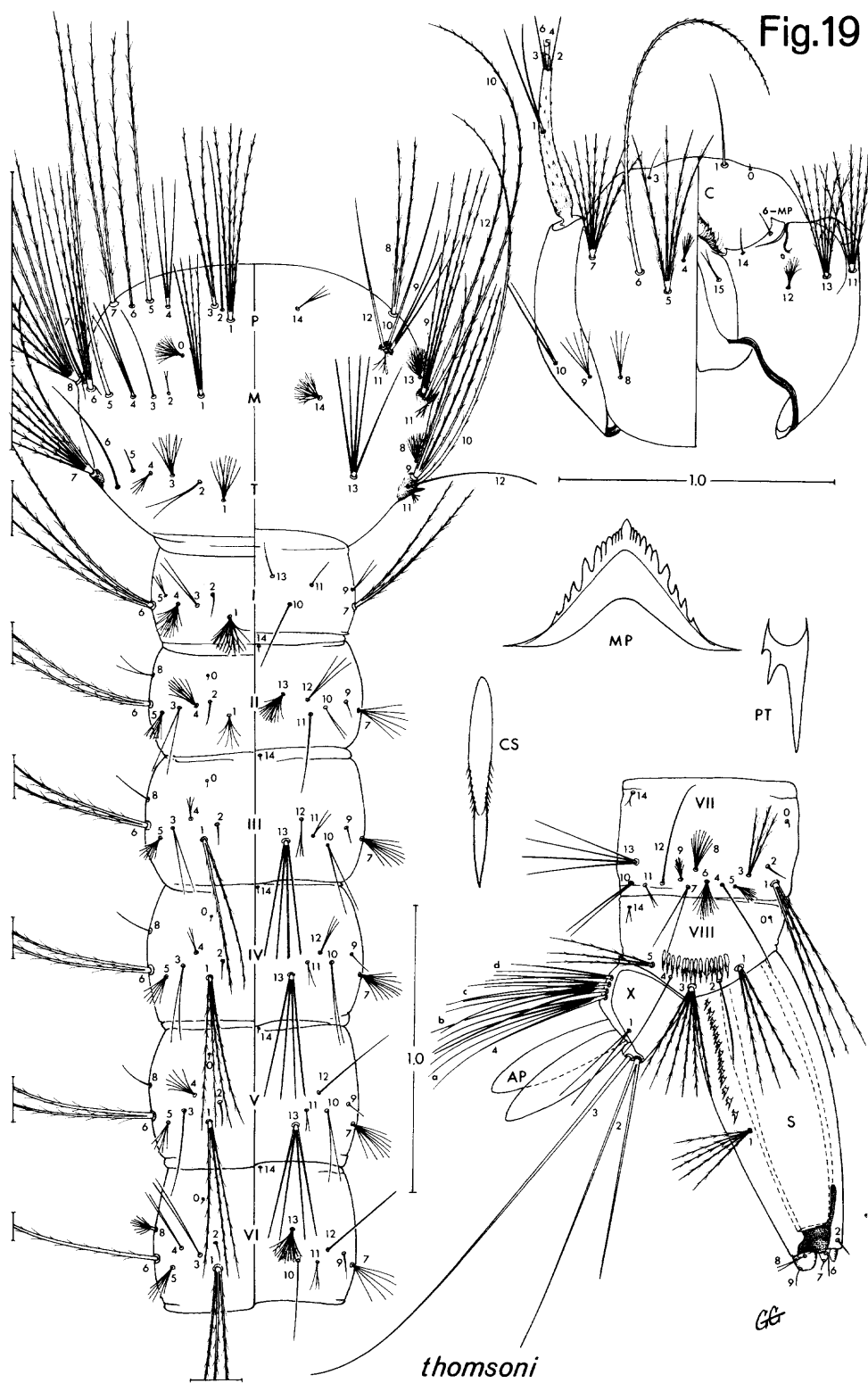


Fig.19



APPENDICES

TABLE 1. Record of the branching of the setae on the pupae of *Aedes (Christophersiomyia) annulirostris* (10 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Cephalothorax(C)				Abdomen II			
1	1-6	3	3.5	0	1	1	1.0
2	2-3	2	2.5	1	6-18	15	12.3
3	1-3	2	2.0	2	1	1	1.0
4	1-3	1	1.3	3	1	1	1.0
5	1	1	1.0	4	4-6	6	5.4
6	1-2	1	1.0	5	2-5	3	3
7	1	1	1.0	6	1	1	1.0
8	1-4	2	1.8	7	1-3	1	1.5
9	1-2	1	1.3	9	1	1	1.0
Metanotum(C)				14	1	1	1.0
10	3-9	4	4.7	Abdomen III			
11	1	1	1.0	0	1	1	1.0
12	2-4	3	3.2	1	2-5	3	3.1
Abdomen I				2	1	1	1.0
1	12-17	14	13.8	3	1	1	1.0
2	1	1	1.0	4	2-5	3	3
3	1	1	1.0	5	2-5	3	3.7
4	4-8	7	6.2	6	1	1	1.0
5	1-4	2	2.1	7	1-4	3	2.4
6	1	1	1.0	8	1-7	2	3.4
7	1-2	1	1.3	9	1	1	1.0
9	1	1	1.0	10	1-3	1	1.3

TABLE 1 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen III (Cont.)				Abdomen V (Cont.)			
11	1	1	1.0	6	1	1	1.0
14	1	1	1.0	7	2-5	4	3.9
Abdomen IV				8	2-5	3	3.2
0	1	1	1.0	9	1	1	1.0
1	2-3	2	2.3	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	1-5	3	3.2	14	1	1	1.0
4	1-2	1	1.3	Abdomen VI			
5	1-2	2	1.8	0	1	1	1.0
6	1	1	1.0	1	1-2	1	1.0
7	1-3	2	1.6	2	1	1	1.0
8	1-4	3	2.6	3	1	1	1.0
9	1	1	1.0	4	2-4	2	3.0
10	1-3	1	1.6	5	1-2	1	1.1
11	1	1	1.0	6	1	1	1.0
14	1	1	1.0	7	1	1	1.0
Abdomen V				8	3-5	4	3.9
0	1	1	1.0	9	1	1	1.0
1	1-3	1	1.3	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	1-2	1	1.2	Abdomen VII			
4	3-6	4	4.5	0	1	1	1.0
5	1-2	1	1.1	1	1	1	1.0

TABLE 1 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen VII (Cont.)				Abdomen VII (Cont.)			
2	1	1	1.0	10	1	1	1.0
3	1-3	1	1.4	11	1	1	1.0
4	1	1	1.0	Abdomen VIII			
5	1	1	1.0	0	1	1	1.0
6	1-6	3	3.5	4	1	1	1.0
7	1	1	1.0	9	3-7	4	4.1
8	2-6	3	3.3	14	1	1	1.0
9	1-4	2	2.0	Paddle(P)			
				1	1	1	1.0

TABLE 2. Record of the branching of the setae of the pupae of *Aedes (Christophersiomyia) gombakensis* (5 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Cephalothorax(C)				Abdomen II			
1	2-4	3	2.9	0	1	1	1.0
2	3	3	3.0	1	13-21	17	16.5
3	2-3	2	2.3	2	1-2	1	1.1
4	1	1	1.0	3	1	1	1.0
5	1	1	1.0	4	5-8	7	6.5
6	1-2	1	1.1	5	2-4	3	2.9
7	1	1	1.0	6	1	1	1.0
8	2-4	3	2.8	7	1-2	2	1.7
9	1-3	2	2.1	9	1	1	1.0
Metanotum(C)				14	1	1	1.0
10	3-7	5	5.0	Abdomen III			
11	1	1	1.0	0	1	1	1.0
12	3-5	5	4.4	1	3-7	4	5.4
Abdomen I				2	1	1	1.0
1	10-16	14	10.9	3	1-3	1	1.4
2	1	1	1.0	4	3-6	3	3.7
3	1	1	1.0	5	2-6	5	4.2
4	5-8	6	6.3	6	1	1	1.0
5	1-3	1	1.4	7	1-3	3	2.4
6	1	1	1.0	8	4-8	4	4.7
7	2	2	2.0	9	1	1	1.0
9	1	1	1.0	10	1-2	1	1.2

TABLE 2 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen III (Cont.)				Abdomen V (Cont.)			
11	1-2	1	1.3	6	1	1	1.0
14	1	1	1.0	7	5-7	5	5.7
Abdomen IV				8	2-5	5	4.0
0	1	1	1.0	9	1	1	1.0
1	3-5	4	3.9	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	3-6	6	5.0	14	1	1	1.0
4	2-3	3	2.6	Abdomen VI			
5	1-3	2	2.0	0	1	1	1.0
6	1	1	1.0	1	1-3	2	1.8
7	3-5	4	3.7	2	1	1	1.0
8	3-5	3	3.9	3	1	1	1.0
9	1	1	1.0	4	3-5	3	3.5
10	1-2	2	1.8	5	1-2	1	1.2
11	1	1	1.0	6	1	1	1.0
14	1	1	1.0	7	1	1	1.0
Abdomen V				8	4-6	4	4.6
0	1	1	1.0	9	1	1	1.0
1	1-6	2	2.2	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	1-4	1	1.8	14	1	1	1.0
4	3-7	4	5.2	Abdomen VII			
5	1	1	1.0	0	1	1	1.0

TABLE 2 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen VII (Cont.)				Abdomen VII (Cont.)			
1	1	1	1.0	10	1	1	1.0
2	1	1	1.0	11	1-2	1	1.1
3	1-2	1	1.2	14	1	1	1.0
4	1-3	3	1.8	Abdomen VIII			
5	1-2	1	1.1	0	1	1	1.0
6	2-4	3	2.8	4	1	1	1.0
7	1	1	1.0	9	5-7	6	6.0
8	3-6	4	4.6	14	1	1	1.0
9	2-5	5	3.5	Paddle(P)			
				1	1-3	1	1.4

TABLE 3. Record of the branching of the setae of the pupae of *Aedes (Christophersiomyia) ibis* (10 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Cephalothorax(C)				Abdomen II			
1	2-3	2	2.2	0	1	1	1.0
2	3-7	3	3.4	1	8-15	8	10.2
3	1-3	2	1.8	2	1	1	1.0
4	1-3	1	1.6	3	1	1	1.0
5	1-2	1	1.1	4	2-6	4	4.3
6	1-2	1	1.0	5	2-6	4	3.5
7	1	1	1.0	6	1	1	1.0
8	1-3	2	1.8	7	1-2	1	1.3
9	1-4	2	1.7	9	1	1	1.0
Metanotum(C)				Abdomen III			
10	4-10	4	5.3	0	1	1	1.0
11	1	1	1.0	1	2-6	3	3.8
12	2-7	3	4.0	2	1	1	1.0
Abdomen I				3	1	1	1.0
1	11-16	14	13.2	4	2-5	3	3.0
2	1	1	1.0	5	2-4	3	3.0
3	1	1	1.0	6	1-2	1	1.1
4	2-9	5	5.1	7	1-3	2	2.3
5	1-3	2	2.1	8	2-4	3	3.0
6	1	1	1.0	9	1	1	1.0
7	1-3	2	1.8	10	1-2	2	1.6
9	1	1	1.0	11	1	1	1.0

TABLE 3 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen III (Cont.)				Abdomen V (Cont.)			
14	1	1	1.0	7	2-6	5	4.3
Abdomen IV				8	2-4	2	2.8
0	1	1	1.0	9	1	1	1.0
1	1-4	2	2.0	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	2-5	4	3.6	14	1	1	1.0
4	1-3	2	1.8	Abdomen VI			
5	1-2	2	1.6	0	1	1	1.0
6	1-2	1	1.0	1	1-2	1	1.0
7	1-3	2	1.9	2	1	1	1.0
8	1-4	3	2.9	3	1-2	1	1.2
9	1	1	1.0	4	1-4	4	3.4
10	1-2	1	1.4	5	1	1	1.0
11	1	1	1.0	6	1	1	1.0
14	1	1	1.0	7	1	1	1.0
Abdomen V				8	2-5	3	3.2
0	1	1	1.0	9	1	1	1.0
1	1-2	1	1.0	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	1-3	2	1.7	14	1	1	1.0
4	3-5	3	3.8	Abdomen VII			
5	1	1	1.0	0	1	1	1.0
6	1	1	1.0	1	1	1	1.0

TABLE 3 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen VII (Cont.)				Abdomen VII (Cont.)			
2	1	1	1.0	11	1	1	1.0
3	1-2	2	1.6	14	1	1	1.0
4	1-2	1	1.0	Abdomen VIII			
5	1-2	1	1.2	0	1	1	1.0
6	1-5	3	3.6	4	1	1	1.0
7	1	1	1.0	9	3-5	4	4.4
8	1-3	2	2.2	14	1	1	1.0
9	1-3	2	1.6	Paddle(P)			
10	1	1	1.0	1	1	1	1.0

TABLE 4. Record of the branching of the setae of the pupae of *Aedes (Christophersiomyia) thomsoni* (10 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Cephalothorax(C)				Abdomen II			
1	2-7	4	4.2	0	1	1	1.0
2	1-3	2	2.3	1	24-34	30	29.2
3	3-6	5	4.5	2	1	1	1.0
4	3-6	5	4.4	3	1	1	1.0
5	1-5	4	3.5	4	4-11	8	7.6
6	1	1	1.0	5	6-10	10	8.8
7	2-6	4	3.8	6	1	1	1.0
8	3-8	6	5.7	7	2-4	3	3.3
9	2-5	3	3.6	9	1	1	1.0
Metanotum(C)				14	1	1	1.0
10	7-15	12	11.4	Abdomen III			
11	1	1	1.0	0	1-2	1	1.2
12	4-8	6	6.0	1	11-23	15	16.2
Abdomen I				2	1	1	1.0
1	11-15	12	12.0	3	1	1	1.0
2	1	1	1.0	4	2-6	5	4.6
3	1	1	1.0	5	5-10	7	7.8
4	7-15	8	9.4	6	1-2	1	1.0
5	1-4	3	2.3	7	1-5	3	3.3
6	1	1	1.0	8	3-6	5	5.0
7	2-6	4	3.8	9	1	1	1.0
9	1	1	1.0	10	2-4	3	3.3

TABLE 4 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen III (Cont.)				Abdomen V (Cont.)			
11	1	1	1.0	6	1	1	1.0
14	1	1	1.0	7	5-7	6	6.0
Abdomen IV				8	2-5	4	3.8
0	1-2	1	1.2	9	1	1	1.0
1	6-12	8	8.9	10	1-2	1	1.0
2	1	1	1.0	11	1	1	1.0
3	3-7	5	4.8	14	1	1	1.0
4	1-2	1	1.2	Abdomen VI			
5	4-7	5	5.3	0	1-2	1	1.1
6	1	1	1.0	1	2-7	3	3.8
7	1-2	1	1.4	2	1	1	1.0
8	2-4	4	3.2	3	1-2	1	1.0
9	1	1	1.0	4	3-6	4	4.4
10	2-5	4	3.8	5	2-3	2	2.3
11	1	1	1.0	6	1-2	1	1.1
14	1	1	1.0	7	1-2	1	1.1
Abdomen V				8	3-6	5	4.8
0	1-2	1	1.2	9	1	1	1.0
1	5-10	5	6.5	10	1	1	1.0
2	1	1	1.0	11	1	1	1.0
3	1-3	3	2.5	14	1	1	1.0
4	4-8	6	5.8	Abdomen VII			
5	3-5	3	3.8	0	1-2	1	1.1

TABLE 4 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen VII (Cont.)				Abdomen VII (Cont.)			
1	2-4	3	2.6	11	1	1	1.0
2	1	1	1.0	14	1	1	1.0
3	1-3	2	2.2	Abdomen VIII			
4	1-2	1	1.2	0	1	1	1.0
5	1-2	2	1.6	4	1-2	1	1.1
6	3-6	5	4.7	9	1-3	1	2.0
7	1	1	1.0	14	1	1	1.0
8	3-6	4	4.6	Paddle(P)			
9	1-2	1	1.1	1	1	1	1.0
10	1-2	1	1.2				

TABLE 5. Record of the branching of the setae of the larvae of *Aedes (Christophersiomyia) gombakensis* (5 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Antenna				Head (C) (Cont.)			
1	3	3	3.0	6-MP	1-3	1	1.4
2	1	1	1.0	Prothorax(P)			
3	1	1	1.0	0	12-22	18	16.6
4	1	1	1.0	1	4-6	4	4.6
5	1	1	1.0	2	1	1	1.0
6	1	1	1.0	3	2	2	2.0
Head (C)				4	2-3	2	2.5
0	1	1	1.0	5	1	1	1.0
1	1	1	1.0	6	1	1	1.0
3	1	1	1.0	7	3-4	3	3.2
4	9-12	10	10.4	8	2-3	2	2.1
5	4-7	6	5.6	9	2-3	3	2.6
6	2-3	2	2.2	10	1	1	1.0
7	4-7	6	6.0	11	3-7	5	4.9
8	3-5	4	3.9	12	1	1	1.0
9	4-6	5	5.1	14	2-4	3	3.0
10	3-5	4	3.9	Mesothorax(M)			
11	5-7	6	5.8	1	2-4	3	3.1
12	8-11	10	9.8	2	2-4	2	2.5
13	5-6	5	5.3	3	1	1	1.0
14	1-2	1	1.2	4	2	2	2.0
15	3-5	5	4.4	5	1	1	1.0

TABLE 5 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Mesothorax(M) (Cont.)				Abdomen I			
6	2-4	3	3.1	1	10-20	11	14.0
7	1	1	1.0	2	1-2	1	1.2
8	5-8	6	6.2	3	2-3	2	2.3
9	3-5	4	4.1	4	7-12	11	10.2
10	1	1	1.0	5	4-7	4	4.7
11	2-3	2	2.2	6	2-4	4	3.2
12	1	1	1.0	7	1-2	2	1.9
13	15-22	18	18.0	9	1-2	1	1.3
14	14-32	20	20.6	10	1-2	1	1.2
Metathorax(T)				11	1-3	2	1.7
1	7-9	7	7.5	13	1-2	1	1.2
2	1	1	1.0	Abdomen II			
3	8-10	8	9.0	0	1	1	1.0
4	2-5	3	3.9	1	5-9	8	7.2
5	1	1	1.0	2	1	1	1.0
6	1-2	1	1.1	3	2-3	2	2.3
7	6-9	8	7.1	4	5-10	8	7.7
8	8-11	8	9.0	5	2-4	3	3.0
9	3-5	4	4.1	6	2-3	2	2.5
10	1	1	1.0	7	4-8	5	5.2
11	2	2	2.0	8	1-2	1	1.3
12	1	1	1.0	9	1-2	1	1.2
13	3-6	4	4.6	10	1	1	1.0

TABLE 5 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen II (Cont.)				Abdomen IV (Cont.)			
11	1	1	1.0	3	2	2	2.0
12	3-6	4	4.3	4	2-4	3	3.0
13	12-21	16	16.2	5	2-3	3	2.7
Abdomen III				6	2	2	2.0
0	1	1	1.0	7	7-8	8	7.8
1	1	1	1.0	8	1	1	1.0
2	1	1	1.0	9	1	1	1.0
3	2	2	2.0	10	1-2	2	1.5
4	3-6	5	4.7	11	2	2	2.0
5	2-4	2	2.5	12	2-3	2	2.5
6	2-3	2	2.2	13	2-3	2	2.5
7	5-7	7	6.2	14	1	1	1.0
8	1	1	1.0	Abdomen V			
9	1	1	1.0	0	1	1	1.0
10	1	1	1.0	1	1-2	2	1.8
11	2-3	2	2.2	2	1	1	1.0
12	3	3	3.0	3	1	1	1.0
13	2-3	2	2.3	4	4-7	5	5.2
14	1	1	1.0	5	1-2	1	1.3
Abdomen IV				6	2	2	2.0
0	1	1	1.0	7	6-8	7	6.8
1	2	2	2.0	8	1-2	1	1.2
2	1	1	1.0	9	1	1	1.0

TABLE 5 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen V (Cont.)				Abdomen VII (Cont.)			
10	1	1	1.0	1	1-2	1	1.1
11	2	2	2.0	2	1	1	1.0
12	1-2	2	1.5	3	4-8	4	5.3
13	1-3	2	2.2	4	1	1	1.0
14	1	1	1.0	5	5-8	8	7.0
Abdomen VI				6	7-13	10	10.7
0	1	1	1.0	7	2	2	2.0
1	2	2	2.0	8	8-16	11	11.7
2	1	1	1.0	9	1-4	2	2.3
3	1	1	1.0	10	1	1	1.0
4	2-3	2	2.5	11	2-3	2	2.5
5	2-3	2	2.5	12	1	1	1.0
6	1-2	1	1.2	13	2-3	2	2.2
7	2-3	3	2.8	14	1	1	1.0
8	2-5	3	3.3	Abdomen VIII			
9	1	1	1.0	0	1	1	1.0
10	1	1	1.0	1	2	2	2.0
11	1-2	2	1.8	2	1	1	1.0
12	1	1	1.0	3	4-6	6	5.5
13	13-26	18	17.3	4	1	1	1.0
14	1-2	2	1.5	5	2	2	2.0
Abdomen VII				14	1-2	1	1.3
0	1	1	1.0				

TABLE 5 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen X				Siphon(S) (Cont.)			
1	1	1	1.0	2	1	1	1.0
2	1-2	1	1.2	6	1	1	1.0
3	1	1	1.0	7	1	1	1.0
4	4	4	4.0	8	1-3	2	1.9
Siphon(S)				9	1	1	1.0
1	2-5	4	3.5				

TABLE 6. Record of the branching of the setae of the larvae of *Aedes (Christophersiomyia) thomsoni* (10 specimens).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Antenna				Head(C) (Cont.)			
1	2	2	2.0	6-MP	1	1	1.0
2	1	1	1.0	Prothorax(P)			
3	1	1	1.0	0	15-20	20	17.8
4	1	1	1.0	1	3-4	4	3.9
5	1	1	1.0	2	1	1	1.0
6	1	1	1.0	3	2	2	2.0
Head(C)				4	3-4	3	3.1
0	1	1	1.0	5	1	1	1.0
1	1	1	1.0	6	1	1	1.0
3	1	1	1.0	7	2-3	2	2.1
4	6-10	8	7.9	8	2	2	2.0
5	3-5	4	4.4	9	3	3	3.0
6	1	1	1.0	10	1	1	1.0
7	6-8	7	7.2	11	5-7	5	5.4
8	3-5	4	3.9	12	1	1	1.0
9	3-9	5	5.8	14	2-3	3	2.8
10	2-3	2	2.1	Mesothorax(M)			
11	4-7	5	5.5	1	4-5	4	4.2
12	6-12	8	9.1	2	1-2	1	1.4
13	4-6	5	4.9	3	1	1	1.0
14	1	1	1.0	4	2-3	3	2.8
15	2-3	2	2.1	5	1	1	1.0

TABLE 6 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Mesothorax(M) (Cont.)				Abdomen I			
6	3-5	3	3.5	1	12-15	13	13.1
7	1	1	1.0	2	1	1	1.0
8	6-7	6	6.5	3	2-3	2	2.2
9	3-5	4	3.8	4	11-17	13	13.5
10	1	1	1.0	5	3-4	3	3.2
11	4-5	4	4.5	6	3	3	3.0
12	1	1	1.0	7	2	2	2.0
13	12-30	12	18.9	9	1-2	2	1.5
14	20-30	25	24.0	10	1	1	1.0
Metathorax(T)				11	1	1	1.0
1	6-8	8	7.6	13	1	1	1.0
2	1-2	2	1.9	Abdomen II			
3	6-10	7	8.0	0	1	1	1.0
4	4-6	5	5.0	1	5-7	5	5.5
5	1	1	1.0	2	1-2	1	1.1
6	1	1	1.0	3	2	2	2.0
7	7-9	7	7.2	4	8-10	9	8.9
8	8-14	10	10.9	5	7-11	7	8.1
9	3-4	4	3.8	6	2	2	2.0
10	1	1	1.0	7	4-7	6	5.9
11	3-5	4	4.2	8	2-3	3	2.6
12	1	1	1.0	9	1	1	1.0
13	4-5	5	4.9	10	1-2	2	1.9

TABLE 6 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen II (Cont.)				Abdomen IV (Cont.)			
11	1	1	1.0	2	1	1	1.0
12	3-4	3	3.4	3	2	2	2.0
13	15-24	19	18.2	4	2-3	3	2.6
14	1	1	1.0	5	5-8	8	6.6
Abdomen III				6	2	2	2.0
0	1	1	1.0	7	7-9	8	7.8
1	2-4	2	2.2	8	1	1	1.0
2	1	1	1.0	9	1	1	1.0
3	2	2	2.0	10	1-2	2	1.9
4	2-4	3	2.8	11	1-3	2	2.1
5	6-9	8	7.5	12	2-3	2	2.5
6	2	2	2.0	13	4	4	4.0
7	7-9	8	8.0	14	1-2	1	1.3
8	1-2	1	1.1	Abdomen V			
9	1	1	1.0	0	1	1	1.0
10	2	2	2.0	1	3-4	3	3.4
11	2	2	2.0	2	1	1	1.0
12	2-3	3	2.9	3	1	1	1.0
13	3-5	4	3.8	4	5-6	6	5.7
14	1	1	1.0	5	4-7	5	5.5
Abdomen IV				6	2	2	2.0
0	1	1	1.0	7	6-9	8	7.7
1	3-4	4	3.9	8	1	1	1.0

TABLE 6 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen V (Cont.)				Abdomen VII			
9	1	1	1.0	0	1	1	1.0
10	1-2	2	1.5	1	2-3	3	2.8
11	1-3	2	1.8	2	1	1	1.0
12	1	1	1.0	3	2-4	3	3.1
13	4	4	4.0	4	1	1	1.0
14	1	1	1.0	5	6-9	8	7.5
Abdomen VI				6	10-15	12	11.9
0	1	1	1.0	7	2	2	2.0
1	2-4	3	3.0	8	8-12	10	10.0
2	1	1	1.0	9	3-6	4	4.9
3	1-2	2	1.7	10	2	2	2.0
4	2	2	2.0	11	1-3	2	1.6
5	5-7	6	6.0	12	1	1	1.0
6	1	1	1.0	13	4-6	4	4.5
7	3-6	4	4.5	14	2	2	2.0
8	9-10	9	9.2	Abdomen VIII			
9	1	1	1.0	0	1	1	1.0
10	1	1	1.0	1	3-5	3	3.5
11	1-3	3	2.5	2	1-2	1	1.1
12	1	1	1.0	3	5-7	6	6.1
13	20-26	20	22.5	4	1	1	1.0
14	1	1	1.0	5	3-4	3	3.2

TABLE 6 (Continued).

Seta	Range	Mode	Mean	Seta	Range	Mode	Mean
Abdomen VIII (Cont.)				Siphon(S)			
14	2	2	2.0	1	4-6	5	4.8
Abdomen X				2	1	1	1.0
1	2	2	2.0	6	1	1	1.0
2	2	2	2.0	7	1	1	1.0
3	1	1	1.0	8	2-3	2	2.2
4	4	4	4.0	9	1	1	1.0

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