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THE SUBGENUS *STEGOMYIA* OF *AEDES* IN THE ORIENTAL REGION WITH KEYS TO THE SPECIES (DIPTERA: CULICIDAE).

by

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MEDICAL ENTOMOLOGY STUDIES - XI.

THE SUBGENUS *STEGOMYIA* OF *AEDES* IN THE ORIENTAL REGION WITH KEYS TO THE SPECIES (DIPTERA: CULICIDAE).[1]

by

Yiau-Min Huang[2]

ABSTRACT

The subgenus *Stegomyia* Theobald of the genus *Aedes* Meigen and the 5 species groups recognized in the Oriental region are characterized. The taxonomy, medical importance, immature habitats and distribution of the species of the region are discussed and summarized. Keys and illustrations are provided for the identification of adults (males and females), male terminalia, pupae and 4th stage larvae of the 5 species groups and 37 species and subspecies known to occur in this region. In addition, the detailed description of the male, female, pupa and larva of *Aedes aegypti* (Linnaeus) and a redescription of the male terminalia of *Aedes platylepidus* Knight and Hull are given.

INTRODUCTION

The subgenus *Stegomyia* Theobald is medically very important since it includes vectors of human filariasis and a number of virus diseases. It is one of the most dominant subgenera of the genus *Aedes* Meigen in the Oriental region, as indicated by the number of species groups and species. At present, 37 species and subspecies of this subgenus are recognized in this region.

The subgenus *Stegomyia* has not been properly defined since Edwards' (1932) classification and this has resulted in the incorrect assignment of some species to it and exclusion of others. As there is no comprehensive review of the subgenus of this area, this paper is intended to clarify some of these taxonomic problems and also provide a guide for the identification of the species occurring in the Oriental region.

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The subgeneric characters of *Stegomyia* and its affinities to other aedine subgenera and the classification of the species groups are discussed. The 5 species groups of this subgenus, known as the *aegypti, albolineatus, edwardsi, scutellaris* and *w-albus* groups, occurring in the Oriental region are also characterized. These 5 species groups with their constituent subgroups and 37 species and subspecies recognized here are outlined in Table 1. The role of members of the subgenus in the transmission of pathogens is presented in Table 2. Keys and illustrations for the identification of adults (males and females), male terminalia, pupae and 4th stage larvae of the 5 species groups and 37 species and subspecies of this region are provided. However, the full illustrations of those species which were published previously by Huang (1972, 1977a, 1978a, 1978b) will not be included. Data on the present status, geographical distribution and immature habitats of the species are summarized in Appendices I, II, and III.

Aedes aegypti (Linnaeus) is the type-species of the subgenus *Stegomyia*. It is one of the most variable of all species of mosquitoes with respect to its coloration (scale pattern). Mattingly (1957) recognized 3 forms of *aegypti:* (1) *aegypti* sensu strictu, the type form, (2) *aegypti* subspecies *formosus* (Walker), (3) *aegypti* variety *queenslandensis* (Theobald) and gave a provisional diagnosis for each. Both the "type form" and "variety *queenslandensis*" occur in the Oriental region. It is interesting to note that these 2 forms appear to exist sympatrically throughout this region, but "variety *queenslandensis*" occurs at a very low frequency. For this reason, I believe that these "forms" of *aegypti* in the Oriental region are not discrete entities, and therefore consider that "variety *queenslandensis*" is an infraspecific variation. The detailed description of the male, female, pupa and larva of this species is given in Appendix IV. Another form of *aegypti,* "subspecies *formosus*", is known only from Africa and will not be discussed here.

Aedes platylepidus Knight and Hull, which was assigned by Reinert (1970) to the subgenus *Diceromyia* Theobald, is included here in the *albolineatus* group. This decision was reached after a careful study of the male terminalia of this species which agree well with the members of the *albolineatus* group, as demonstrated in this paper. The male terminalia of *platylepidus* are very similar to that of other members of the *albolineatus* group. Its closest allies within this group are *bambusicola* Knight and Rozeboom, *hoogstraali* Knight and Rozeboom and *impatibilis* (Walker), (see Figs. 12C, 16C, 19C). It should be noted that the description and the illustration of the male terminalia given by Reinert (1970: 13 and Fig. 10) are in error, particularly with regards to the basal mesal lobe (claspette) and is corrected in Appendix V (Fig. 24). Unfortunately, the larva and pupa of this species are unknown. The transfer of *platylepidus* from *Diceromyia* to *Stegomyia* may well receive further confirmation when the immature stages are known.

Aedes meronephada (Dyar and Shannon), was placed by Edwards (1929) in the subgenus *Stegomyia* and was assigned by Edwards (1932) to Group B (*w-albus* group), on the basis of the tarsal markings and the thoracic ornamentation. Huang (1978b) removed *Aedes meronephada* from Group B (*w-albus* group) and placed it in the subgenus *Diceromyia*. This conclusion was reached after a critical study and consideration of all known stages. Thus, *Aedes meronephada* is omitted from the key since it is not a *Stegomyia*.

Hairiness in *Stegomyia* larvae was first reported by Rosen and Rozeboom (1954) in members of the *scutellaris* group in the South Pacific. In Singapore, Colless (1956) observed that larvae of *Ae. albopictus* (Skuse) (also a member of the *scutellaris* group) collected from tree holes, frequently had many of the

body setae longer, stouter and more branched than usual. The hairiness factor was shown to be associated with the presence of debris in the tree holes utilized as larval habitats.

This study was based primarily on specimens accumulated by the Southeast Asia Mosquito Project (SEAMP) and its successor, the Medical Entomology Project (MEP), Department of Entomology, Smithsonian Institution. Additional material was borrowed from the following institutions: Bernice P. Bishop Museum; United States National Museum; Field Museum of Natural History, Chicago; University of Utah; Cornell University; Johns Hopkins School of Hygiene and Public Health; California Academy of Sciences; Academy of Natural Sciences, Philadelphia; Medical Zoology Laboratory, Institute for Infectious Disease, University of Tokyo; British Museum (Natural History) and the Instituut voor Tropische Hygiene, Amsterdam.

All the type-specimens of the included species which are in the British Museum (Natural History), the United States National Museum and the Medical Zoology Laboratory, Institute for Infectious Diseases, University of Tokyo, have been studied.

It has been necessary to rely upon available literature both for information regarding those species recorded from the Oriental region and for information regarding medical significance.

The nomenclature chosen for the chaetotaxy of the larva and pupa and the terminology for the structural parts of the adult used in this paper largely follows that of Belkin (1962) and Huang (1972, 1977a).

Abbreviations cited for the references to the literature conform to the BIOSIS List of Serials, Biosciences Information Service of Biological Abstracts, Philadelphia, 1974.

The information on the immature habitats is entirely based on data accompanying specimens which I have examined.

The term "Oriental region" as used here encompasses both the Oriental and Indomalayan areas of Belkin (1962). It comprises the following area: the Ryukyu islands (Amami, Okinawa, Miyako, Ishigaki, Iriomote), Taiwan, the Pescadores, Hainan, China (south of the Yangtze Kiang), the Philippines, Vietnam, Indonesia (the eastern boundary is essentially that of Lee 1944), Laos, Cambodia, Thailand, Malaysia, the Andaman islands, the Nicobar islands, Burma and Assam, Bangladesh, Bhutan, Nepal, India (south of the Himalayas), Sri Lanka, southeastern part of Pakistan, the Laccadive islands, the Maldive islands and the Chagos islands. This area falls approximately within 11 degrees south to 30 degrees north latitude and 65 to 130 degrees east longitude (Map 1).

SUBGENUS *STEGOMYIA* THEOBALD

Stegomyia Theobald 1901a (June 1), in Howard 1901: 235; Theobald 1901b (July 15): 235; Theobald 1901c (Sept.): 4, App. ii; Theobald 1901d (Nov. 23): 283. Type-species: *Culex aegypti* Linnaeus 1762 (see Mattingly, Stone and Knight 1962).

Scutomyia Theobald 1904: 77. Type-species: *S. albolineatus* Theobald 1904, Ampang Jungle, near Kuala Lumpur, Selangor, Malaya; monobasic.

Quasistegomyia Theobald 1906: 69. Type-species: *Q. unilineatus* Theobald 1906, Bahr-el-Ghazal, Sudan; monobasic.

Pseudostegomyia Ludlow 1908: 10. Type-species: *Stegomyia gardnerii* Ludlow 1905, Bulacao, Mindoro Island, Philippines; monobasic. - Apparently an

error for *Quasistegomyia* Theobald 1906 (see Theobald 1910: 135). For complete synonymy, see Knight and Stone (1977: 154).

CHARACTERISTICS.

The subgenus *Stegomyia* is characterized by the following combination of characters: ADULT (both sexes). *Head.* Vertex with largely broad and flat decumbent scales, erect forked scales not numerous, restricted to occiput; ♂ palpus not very short, more than 0.5 length of proboscis, 5-segmented, segments 4, 5 subequal, slender and with only a few short setae, total length of apical 2 segments not very short, at least 0.4 length of the remaining segments; in ♀ about 0.14-0.25 length of proboscis, 4- or sometimes 5-segmented, when present segment 5 minute. *Thorax.* Acrostichal bristles absent; spiracular bristles absent; postspiracular bristles present; scutellum with broad scales on all lobes; postnotum bare. *Wing.* With narrow scales on all veins. *Legs.* Hindtarsus with basal white band at least on tarsomere 1. *Male Terminalia.* Proctiger without cercal setae; aedeagus strongly toothed; claspette well developed, with numerous setae; distimere usually simple, elongate, or sometimes distimere complex, expanded at base apically forked, spiniform present. *Female Terminalia.* Insula longer than broad, with minute setae and 3-10 larger setae on apical 0.25-0.50; cerci short and broad; 3 spermathecae, one larger than the other 2. PUPA. Subgeneric characters not evident, see under groups. LARVA. *Head.* Seta 4-C well developed, branched, closer to 6-C than 5-C, cephalad and mesad of 6-C; 4, 6-C cephalad of antennal base; 6-C cephalad of 5, 7-C. *Abdomen.* Seta 12-I not developed; 2-VIII distant from 1-VIII; comb scales in a single row; ventral brush with 4, 5 pairs of setae on grid; without precratal tufts. This combination of characters differs from that of all other subgenera of *Aedes*.

SYSTEMATICS.

Edwards (1932) divided the subgenus *Stegomyia* into 4 groups which he designated A, B, C, and D. Knight and Rozeboom (1946) removed *Aedes albolineatus* (Theobald) from Group C and defined a 5th group for that species and its relatives which later was designated Group E (*albolineatus* group) by Knight and Hurlbut (1949). Bohart 1956 (1957) added Group F (*pandani* group) and Group G (*maehleri* group). Belkin (1962) removed *Aedes edwardsi* (Barraud) from Group B and defined a new group (*edwardsi* group) for it and its relatives. Huang (1972) redefined Group C (*scutellaris* group) and subdivided the *scutellaris* group into 2 subgroups known as the *albopictus* and *scutellaris* subgroups. Later, Huang (1977a) redefined Group B (*w-albus* group) and subdivided the *w-albus* group into 4 subgroups known as the *annandalei, desmotes, mediopunctatus* and *w-albus* subgroups. Huang (1977b) removed Group D (*vittatus* group), a monotypic species group, (*Aedes vittatus* (Bigot)), from the subgenus *Stegomyia* and placed it in the subgenus *Aedimorphus* Theobald of the genus *Aedes*. Thus, the subgenus *Stegomyia* now consists of the following 7 groups: Group A (*aegypti* group), Group B (*w-albus* group), Group C (*scutellaris* group), Group E (*albolineatus* group), Group F (*pandani* group), Group G (*maehleri* group), and Group H (*edwardsi* group).

Of the 7 recognized groups of *Stegomyia* mentioned above, 5 are represented in the Oriental region. Only Groups F and G do not occur in the Oriental region. These 5 groups with their constituent subgroups, 37 species and subspecies are indicated in Table 1.

TABLE 1. Classification of the subgenus *Stegomyia* in the Oriental region.

GROUP	SUBGROUP	SPECIES AND SUBSPECIES
1. *aegypti*		1. *aegypti* (Linnaeus)
2. *albolineatus*		2. *albolineatus* (Theobald) 3. *arboricola* Knight and Rozeboom 4. *bambusicola* Knight and Rozeboom 5. *boharti* Knight and Rozeboom 6. *hoogstraali* Knight and Rozeboom 7. *impatibilis* (Walker) 8. *laffooni* Knight and Rozeboom 9. *platylepidus* Knight and Hull 10. *pseudalbolineatus* Brug
3. *edwardsi*		11. *edwardsi* (Barraud) 12. *seampi* Huang
4. *scutellaris*	*albopictus*	13. *albopictus* (Skuse) 14. *downsi* Bohart and Ingram 15. *novalbopictus* Barraud 16. *patriciae* Mattingly 17. *pseudalbopictus* (Borel) 18. *seatoi* Huang 19. *subalbopictus* Barraud 20. *unilineatus* (Theobald)
	scutellaris	21. *alcasidi* Huang 22. *alorensis* Bonne-Wepster 23. *andrewsi* Edwards 24. *krombeini* Huang 25. *malayensis* Colless 26. *paullusi* Stone and Farner 27. *riversi* Bohart and Ingram
5. *w-albus*	*annandalei*	28. *annandalei* (Theobald) 29. *craggi* (Barraud)
	desmotes	30. *desmotes* (Giles) 31. *malikuli* Huang
	mediopunctatus	32. *mediopunctatus* (Theobald) 33. *perplexus* (Leicester) 34. *rhungkiangensis* Chang and Chang
	w-albus	35. *gardnerii gardnerii* (Ludlow) 36. *gardnerii imitator* (Leicester) 37. *w-albus* (Theobald)

In the identification of the species of the subgenus *Stegomyia*, the adult stages appear to be more useful than the immature stages. However, it must be remembered that specific differences between the members of this subgenus tend to be very slight. Some members are highly variable in both adult ornamentation and in the immature stages. Although the males of all species can be recognized on the basis of morphological features, the females and the immatures are extremely difficult or impossible to distinguish in many instances. The male terminalia of all species are distinct and the most diagnostic feature of all is the claspette of the basimere. In dealing with these, special preparations must be made and care taken to study both lateral and mesal views of the dissected claspette as well as undissected aspects.

AFFINITY.

The subgenus *Stegomyia* possesses some rather important basic characters, as follows, in common with the subgenera *Aedimorphus* Theobald, *Alanstonea* Mattingly, *Ayurakitia* Thurman and *Diceromyia* Theobald of the genus *Aedes* in the Oriental region: *Adult*. Male palpus 5-segmented; proctiger without cercal setae; aedeagus with conspicuous teeth; claspette developed; distimere with one or more spiniforms; *Larva*. Seta 12-I not developed; pecten teeth present. These shared characters indicate the affinity of *Stegomyia* to the above 4 subgenera. Of these 4 subgenera, *Stegomyia* shares more important characters in both adult and immature stages with *Diceromyia* than with any other subgenus, suggesting the strongest affinities with that subgenus. However, it differs from *Diceromyia* in the development of the male palpus and in the position of seta 4-C of the larva. The male palpus of *Stegomyia* has the total length of the apical 2 segments not very short, at least 0.4 the length of the remaining segments while in *Diceromyia*, the total length of the apical 2 segments is very short, at most 0.3 the length of the remaining segments, or segment 5 is much shorter than segment 4. The larva of *Stegomyia* has seta 4-C cephalomesad of 6-C while in *Diceromyia*, seta 4-C is caudomesad of 6-C.

DESCRIPTIONS OF THE GROUPS OCCURRING IN THE ORIENTAL REGION.

aegypti group

ADULT. *Head*. Palpi with white scales. *Thorax*. Dorsocentral bristles present; scutum with a lateral crescent-shaped white marking on anterior half of scutum; subspiracular area with broad white scales; postspiracular area without scales; paratergite with broad white scales; scutellum with broad white scales on all lobes. *Legs*. Hindtarsus with a basal white band on tarsomeres 1-4, tarsomere 5 all white. *Male Terminalia*. Apical margin of tergum IX with middle part deeply concave; paraproct with sternal arm, without apical lobed process; distimere simple, elongate, with an apical spiniform process; aedeagus strongly toothed. *Female Terminalia*. Apical margin of sternum VIII with a deep U-shaped notch at middle.

PUPA. *Paddle*. Margins with distinct denticles; seta 1-P single.

LARVA. Comb scales in a single row, not arising from a sclerotized plate; marginal spicules of anal segment very small and inconspicuous; ventral brush with 5 pairs of setae.

albolineatus group

ADULT. *Head.* Palpi without white scales. *Thorax.* Dorsocentral bristles present or absent; scutum with, or without, a long median longitudinal, white stripe of narrow scales extending from anterior margin to at least the level of wing root; subspiracular and postspiracular areas without scales; paratergite bare; scutellum with broad scales on all lobes. *Legs.* Hindtarsus with basal white band at least on tarsomere 1. *Male Terminalia.* Apical margin of tergum IX with middle part shallowly concave, flat, or slightly produced; paraproct without sternal arm, with or without apical lobed process; distimere simple, elongate, with a submedian or subbasal spiniform process; aedeagus with several lateral distal teeth. *Female Terminalia.* Apical margin of sternum VIII with middle part shallowly concave, or apical margin of sternum VIII with a deep U-shaped notch at middle.

PUPA. *Paddle.* Margins without fringe of very long hair-like spicules, or distinct denticles, at most with slight spicules; seta 1-P branched.

LARVA. Comb scales in a single row, arising or not arising from a sclerotized plate; marginal spicules of anal segment very small and inconspicuous, or very long, spine-like and conspicuous; ventral brush with 5 pairs of setae.

edwardsi group

ADULT. *Head.* Palpi with white scales. *Thorax.* Dorsocentral bristles present; scutum with a distinct, small, median oval white spot of narrow scales on anterior 0.33 of scutum; subspiracular area with or without scales; postspiracular area without scales; paratergite with broad white scales; scutellum with broad white scales on all lobes. *Legs.* Hindtarsus with a basal white band on tarsomeres 1-4, tarsomere 5 all white. *Male Terminalia.* Apical margin of tergum IX with middle part produced into a large lobe; paraproct without sternal arm, without apical lobed process; distimere simple, elongate, with an apical spiniform process; aedeagus apically widened, with 6 or 7 apical teeth on each side. *Female Terminalia.* Apical margin of sternum VIII with a deep, U-shaped notch at middle.

PUPA. *Paddle.* Margins with fringe of very long hair-like spicules; seta 1-P single.

LARVA. Comb scales in a single row, arising from a sclerotized plate; marginal spicules of anal segment very long, spine-like and conspicuous; ventral brush with 4 pairs of setae.

scutellaris group

ADULT. *Head.* Palpi with white scales. *Thorax.* Dorsocentral bristles present; scutum with a long, median longitudinal white stripe of narrow scales extending from anterior margin to about the level of wing root; subspiracular and postspiracular areas with or without scales; paratergite with broad white scales; scutellum with broad white scales on all lobes. *Legs.* Hindtarsus with a basal white band on tarsomeres 1-4, tarsomere 5 all white. *Male Terminalia.* Apical margin of tergum IX with middle part rounded, truncated, or produced into a large lobe or a median projection; paraproct without sternal arm, without apical lobed process; distimere simple, elongate, with an apical or a subapical

spiniform process; aedeagus with a distinct sclerotized, lateral toothed plate on each side. *Female Terminalia*. Apical margin of sternum VIII with a deep U-shaped notch at middle.

PUPA. *Paddle*. Margins with fringe of very long hair-like spicules; seta 1-P single.

LARVA. Comb scales in a single row, not arising from a sclerotized plate; marginal spicules of anal segment very small and inconspicuous; ventral brush with 4 pairs of setae.

w-albus group

ADULT. *Head*. Palpi with white scales. *Thorax*. Dorsocentral bristles absent; scutal markings varied; subspiracular and postspiracular areas with broad white scales; paratergite with broad white scales; scutellum with broad white scales at least on one lobe. *Legs*. Hindtarsus with a basal white band on tarsomeres 1, 2, tarsomere 3 with or without a basal white band. *Male Terminalia*. Apical margin of tergum IX with middle part concave, nearly flat, or produced into a large lobe; paraproct with or without sternal arm, without apical lobed process; distimere simple, elongate, with an apical or a subapical spiniform process, or distimere complex, expanded at base and apically forked, with spiniform process; aedeagus with a distinct, sclerotized, lateral toothed plate on each side. *Female Terminalia*. Apical margin of sternum VIII with a deep U-shaped notch at middle.

PUPA. *Paddle*. Margins with fringe of very long hair-like spicules; seta 1-P single.

LARVA. Comb scales in a single row, arising or not arising from a sclerotized plate; marginal spicules of anal segment very small and inconspicuous, or very long, stout and conspicuous; ventral brush with 4 pairs of setae.

DISTRIBUTION.

Stegomyia is confined to the Old World, except for *Aedes aegypti* which has been introduced through commerce into the New World. This subgenus occurs chiefly in the tropical and subtropical zones throughout the Old World but is also represented in the southern part of the Palearctic.

Members of the Oriental *Stegomyia* are distributed mainly in the Oriental region, with extensions into the southern part of the Palearctic area in the north, the Papuan, Western Pacific islands and South Pacific areas in the east and the Ethiopian area in the west. *Aedes albopictus* (Skuse) is also known in the Hawaiian islands (where it has been introduced) and Malagasy. In *Stegomyia*, it appears that there are several widely distributed dominant species and a number of specialized endemic species. The distribution records are given in Appendix II.

BIONOMICS.

The immature stages have been found mainly in tree holes, bamboo stumps, artificial containers (tin can, water jar, water bucket, broken bottle and tire), stump holes (palm stumps, banana stumps and coconut stumps), bamboo internodes, coconut shells (coconut halves, coconut husks and coconut spathes), bamboo cups (bamboo pots), rock holes, plant axils (*Pandanus*, banana, nipa palm, sago palm, taro and *Colocasia*), log holes, split bamboos, cut bamboos, fallen leaves (fallen abaca leaf), palm fronds (coconut fronds), rock pools, footprints, wheel ruts, root holes and shelf fungus - a wide variety of natural and

artificial container habitats. Females of 14 species and one subspecies (*aegypti, boharti, albopictus, downsi, seatoi, krombeini, malayensis, riversi, annandalei, craggi, desmotes, mediopunctatus, perplexus, w-albus* and *gardnerii imitator*) are known to bite man. The immature habitats are summarized in Appendix III.

MEDICAL IMPORTANCE.

Stegomyia is one of the most important subgenera of mosquitoes from the standpoint of the transmission of pathogens. *Aedes aegypti* is the principal vector of urban yellow fever virus in the African, Central and South American tropics. This species is likewise the primary vector of dengue viruses through most of the tropical world. It has also been shown to be a vector of Chikungunya virus in Southern Province, Tanganyika Territory [Tanzania] (Lumsden 1955) and Venezuelan equine encephalitis virus in Colombia (Sanmartin-Barberi et al. 1955) and is a known vector of other viruses. Some members of the *aegypti* group are efficient vectors of yellow fever virus in Africa (Gillett 1972). *Aedes scutellaris* (Walker) from New Guinea has been incriminated as a vector of dengue virus (Mackerras 1946). In addition to viruses, some members of the *scutellaris* group are also efficient vectors of subperiodic filaria in the South Pacific (Sasa 1976).

Both *Aedes aegypti* and *albopictus* are important vectors of dengue viruses in Southeast Asia and have been incriminated in the transmission of dengue virus during outbreaks of haemorrhagic fever in Singapore (Chan, Ho and Chan 1971) and Koi Samui Island, Thailand (Gould et al. 1968). *Aedes albopictus* from India can transmit Chikungunya virus in the laboratory (Rao et al. 1964). The larvae of *Dirofilaria immitis* have been found in wild-caught *albopictus* in Nagasaki, Japan (Suenaga and Itoh 1973) and 3rd stage larvae of *Dirofilaria* sp. have been found in wild-caught *albopictus* in Thailand (Harinasuta et al. 1970). Several viruses have been isolated from wild-caught *aegypti* and *albopictus* from the Oriental region. Table 2 shows briefly what is known in this regard.

TABLE 2. Isolation of pathogens of actual or potential medical significance from *Aedes (Stegomyia)* species in the Oriental region.

Species	Pathogen	Location	Comments	Reference
aegypti	Chikungunya virus	South India	111 isolations August-December, 1964	Myers et al. 1965
	Chikungunya virus	Nagpur City, India	5 isolations 1965	Rodrigues et al. 1972
	Chikungunya virus	Bangkok, Thailand	7 isolations from 150 pools, 1962	Halstead et al. 1969
	Dengue 1 and Dengue 4 viruses	Vellore, India	3 isolations Dengue 1 and 2 Dengue 4 from 77 pools, September-December, 1961	Carey et al. 1964

TABLE 2 (Continued).

Species	Pathogen	Location	Comments	Reference
aegypti	Dengue 4 virus	Nagpur City, India	9 isolations 1965	Rodrigues et al. 1972
	Dengue 1 and Dengue 3 viruses	Ajmer City, India	isolations September 1969	Ghosh et al. 1974
	Dengue 1 and Dengue 2 viruses	Bangalore City, India	32 isolations of both viruses, Dengue 2 more plentiful	George and Soman 1975
	Dengue 1 virus	Peninsular Malaysia		Rudnick (pers. commun.) 1975
	Dengue 3 virus	Manila, Philippines	1 isolation 1956	Hammon, Rudnick and Sather 1960
	Dengue virus	Singapore		Lim, Rudnick and Chan 1961
	Dengue 2 virus	Singapore	1 isolation 1966	Chan, Ho and Chan 1971
	Dengue 2 virus	Bangkok, Thailand	3 isolations 1958	Hammon, Rudnick and Sather 1960
	Dengue 2 virus	Koh Samui Island, Thailand	8 isolations from 27 pools July-September 1966	Gould et al. 1968
	Dengue 1-4 viruses	Bangkok, Thailand	5 isolations Dengue 1, 6 Dengue 2, 8 Dengue 3 and 1 Dengue 4 from 150 pools, 1966; 1 isolation Dengue 1, 2 Dengue 2 and 1 Dengue 4 from 90 pools, 1963	Halstead et al. 1969

TABLE 2 (Continued).

Species	Pathogen	Location	Comments	Reference
aegypti	Dengue 4 virus	Koh Samui Island, Thailand	25 isolations from 88 pools May-November 1968	Smith et al. 1971
	Dengue 2 virus	Saigon, Vietnam	1 isolation November 1963	Halstead et al. 1965
	Dengue 1-4 viruses	Saigon area, Vietnam	30 dengue isolations of all strains from 1,892 pools May-December 1967	Russell, Quy et al. 1969
	Dengue 3 virus	Rangoon, Burma	1 isolation July 1969	MI-MI-KHIN and KHIN-AYE-THAN 1976
	Zika virus	Bentong, Malaysia	1 isolation July 1966	Marchette, Garcia and Rudnick 1969
albopictus	Dengue 2 virus	Singapore	1 isolation November 1960	Rudnick and Chan 1965
	Dengue 1 and Dengue 2 viruses	Singapore	1 isolation Dengue 1 and 4 isolations Dengue 2 from pools April-October 1966	Chan, Ho and Chan 1971
	Dengue 2 virus	Koh Samui Island, Thailand	4 isolations from 141 pools July-September 1966	Gould et al. 1968
	Dengue 4 virus	Koh Samui Island, Thailand	10 isolations from 897 pools August-December 1967	Russell, Gould et al. 1969
	Dengue 4 virus	Koh Samui Island, Thailand	38 isolations from 1,829 pools May-November 1968	Smith et al. 1971
	Reovirus 3	Peninsular Malaysia	2 isolations 1974	Rudnick (pers.) commun.) 1975

TABLE 2 (Continued).

Species	Pathogen	Location	Comments	Reference
albopictus	Tembusu virus	Peninsular Malaysia	1 isolation 1974	Rudnick (pers. commun.) 1975
	Dirofilaria immitis	Nagasaki, Japan	3.2% of field dissected adults in urban areas with filarial larvae and 5.5% in rural areas with filarial larvae	Suenaga and Itoh 1973
	Dirofilaria sp.	Sangkhlaburi District, Kanchanaburi Prov., Thailand	2/571 dissected with stage 3 filarial larvae	Harinasuta et al. 1970

KEYS TO THE GROUPS, SUBGROUPS AND SPECIES OF THE SUBGENUS *STEGOMYIA*

ADULTS (MALES AND FEMALES)

1. Palpi with white scales (Fig. 1A). 2
   Palpi without white scales (Fig. 6A).
   ALBOLINEATUS GROUP (p. 13)

2(1). Dorsocentral bristles present (Fig. 1A). 3
   Dorsocentral bristles absent (Huang 1977a, Fig. 25A).
   W-ALBUS GROUP (p. 15)

3(2). Scutum with lyre-shaped white markings (Fig. 1A).
   AEGYPTI GROUP
   aegypti (p. 41)
   Scutum without lyre-shaped white markings. 4

4(3). Scutum with a long median longitudinal white stripe of narrow scales extending from anterior margin to about level of wing root (Fig. 25A). . . . . *SCUTELLARIS* GROUP (p. 14)
   Scutum with a distinct, small, median oval white spot of narrow scales on anterior 0.33 of scutum (Huang 1977a, Fig. 1A).
   EDWARDSI GROUP (p. 13)

THE *ALBOLINEATUS* GROUP

1. Scutum with a median longitudinal white stripe. 2
   Scutum without a median longitudinal white stripe.
   platylepidus (p. 44)

2(1). Scutellum with broad white scales on midlobe and with broad dark scales on lateral lobe (Fig. 6A). 3
   Scutellum with broad white scales on all lobes (Fig. 20A). 6

3(2). Median scutal stripe extending posteriorly to the scutellum (Fig. 18C). 4
   Median scutal stripe extending posteriorly only to the level of wing root (Fig. 6A). 5

4(3). Hindtarsomere 3 with white basal band (Fig. 18A). . . . *hoogstraali*
   Hindtarsomere 3 entirely dark (Fig. 18B). . . . . *impatibilis*

5(3). Posterior pronotum with narrow dark scales only. . . . *albolineatus*
   Posterior pronotum with narrow dark scales dorsally and broad white scales ventrally. . . . . *boharti*

6(2). Median scutal stripe extending posteriorly to the prescutellar area (Fig. 20A). . . . . *bambusicola*
   Median scutal stripe extending posteriorly only to the level of wing root (Fig. 20B). 7

7(6). Scutum with a patch of broad white scales on lateral margin just before the level of wing root (Fig. 20C). 8
   Scutum without a patch of broad white scales on lateral margin just before the level of wing root. . . . . *arboricola*

8(7). Male hindtarsomere 2 with at least basal 0.25 white band; female hindtarsomere 3 with at most basal 0.5 white dorsally (Fig. 23A).
   laffooni
   Male hindtarsomere 2 with at most basal 0.2 white band; female hindtarsomere 3 with at least basal 0.87 white dorsally (Fig. 23B).
   pseudalbolineatus

THE *EDWARDSI* GROUP

Posterior pronotum without narrow dark scales on upper portion; lower mesepimeron with bristles (Huang 1977a, Fig. 4C).
edwardsi

Posterior pronotum with narrow dark scales on upper portion; lower mesepimeron without bristles (Huang 1977a, Fig. 4F). . *seampi**

*The male of *seampi* is unknown.

THE *SCUTELLARIS* GROUP

1. Supraalar white line incomplete, not clearly defined and with only narrow scales over wing root (Fig. 30A). 2
Supraalar white line complete and well developed, with broad flat scales over wing root and toward scutellum (Fig. 30B). 9

2(1). Scutum with patch of broad flat white scales on lateral margin just before level of wing root (Fig. 30C). 3
Scutum without such patch. 5

3(2). Scutum with a small patch of white scales on scutal angle area; midfemur with some pale scales scattered on anterior surface (Huang 1972, Figs. 15A, 15C, 15D). 4
Scutum without such a white patch on scutal angle area; midfemur without such scales (Huang 1972, Figs. 1A, 1D, 1E). . . *albopictus*

4(3). Tergum I with a large median patch of white scales; midfemur without a large white spot on anterior surface (Huang 1972, Figs. 15A, 15D). . . . . *seatoi*
Tergum I without median patch of white scales; midfemur with a large, white spot on anterior surface (Fig. 25B). . . . . *unilineatus*

5(2). Scutum with patch of narrow curved yellowish scales on lateral margin just before level of wing root. 6
Scutum with patch of narrow curved white scales on lateral margin just before level of wing root (Fig. 30D). 8

6(5). Fore- and midfemora with some pale scales scattered on anterior surface. . . . . *novalbopictus**
Fore- and midfemora without such scales. 7

7(6). Subspiracular area with scales; hindtarsomere 4 with at most basal 0.66-0.75 white banded (Huang 1972, Fig. 20M). . . . . *patriciae*
Subspiracular area without scales; hindtarsomere 4 with basal 0.83-0.90 white banded (Huang 1972, Fig. 20N). . . . . *downsi*

8(5). Scutum with patch of broad dark scales on each side of prescutellar space between prescutellar white line and postdorsocentral white line; postspiracular area with scales (Fig. 31A). *pseudalbopictus*
Scutum without such patch of scales; postspiracular area without scales (Fig. 31B). . . . . *subalbopictus*

9(1). Abdomen with lunate, lateral, white spots only; wing without a minute basal spot of white scales on costa (Huang 1972, Fig. 20D). *andrewsi*

*The female of *novalbopictus* is unknown.

Abdomen with some complete pale bands or with indications of such bands on terga; wing with a minute basal spot of white scales on costa. 10

10(9). Midfemur with a median white line on anterior surface (Huang 1972, Fig. 20K). 11
Midfemur without such line. 12

11(10). Scutum with a few narrow white scales on lateral prescutal area and on scutal angle area (Huang 1972, Fig. 20J). . . . . *paullusi*
Scutum without any narrow white scales in these positions. *alorensis*

12(10). Hindtarsomere 3 with basal 0.4 white; hindtarsomere 4 with at most basal 0.66 white. 13
Hindtarsomere 3 with basal 0.5 white; hindtarsomere 4 with basal 0.75 white (Huang 1972, Fig. 21E). . . . . *alcasidi*

13(12). Hindtarsomere 1 with at least basal 0.25 white; hindtarsomere 2 with basal 0.33 white. 14
Hindtarsomere 1 with basal 0.20 white; hindtarsomere 2 with basal 0.25 white (Huang 1972, Fig. 31E). . . . . *riversi*

14(13). Hindtarsomere 1 with basal 0.25 white; hindtarsomere 4 with basal 0.66 white (Huang 1972, Fig. 31D). . . . . *malayensis*
Hindtarsomere 1 with basal 0.33 white; hindtarsomere 4 with basal 0.60 white. . . . . *krombeini*

THE *W-ALBUS* GROUP*

1. Tibiae with white band (Huang 1977a, Fig. 21A). (*desmotes* subgroup) *desmotes*
Tibiae without white band. 2

2(1). Scutellum with broad dark scales on midlobe and with broad white scales on lateral lobe (Huang 1977a, Figs. 9B, 9D). (*annandalei* subgroup) 3
Scutellum with broad white scales on midlobe and with broad dark, or white, or both on lateral lobe. 4

3(2). Scutum with a large median oval white patch, extending from anterior margin, narrows slightly posteriorly, to about the middle of the scutum; scutal patch posteriorly blunt (Huang 1977a, Fig. 9B). *annandalei*
Scutum with a large median triangular white patch, extending from anterior margin and about anterior half of the lateral prescutal area, narrows posteriorly, to the middle of the scutum; scutal patch posteriorly pointed (Huang 1977a, Fig. 9D). . . . . *craggi*

*_Aedes rhungkiangensis_ is not included.

4(2). Scutum with a broad median longitudinal white stripe, extending from anterior margin, tapering posteriorly, to the prescutellar area and forking at the beginning of prescutellar space; midfemur without a median white spot on anterior surface (Huang 1977a, Fig. 25A).
(*mediopunctatus* subgroup)
*malikuli**
mediopunctatus
perplexus

Scutum without such a median longitudinal white stripe; midfemur with a median white spot on anterior surface (Huang 1977a, Fig. 21B).
(*w-albus* subgroup) 5

5(4). Scutum with a broad longitudinal white stripe on each side of midline, extending from anterior margin to the middle of the scutum and fusing with the antealar white patch (Huang 1977a, Fig. 17D).
gardnerii gardnerii

Scutum with a large median white patch, or 2 lateral white patches, on anterior 0.33 of scutum. 6

6(5). Scutal median white patch broader than long, with narrow white scales reaching from anterior margin to the lateral prescutal area on each side; antealar white patch with narrow white scales mainly and with some broad white scales on the lateral margin just before the level of the wing root (Huang 1977a, Figs. 32B, 32A).
gardnerii imitator

Scutal median white patch rather narrow and long; antealar white patch with all narrow white scales (Huang 1977a, Figs. 32D, 32C).
w-albus

MALE TERMINALIA

1. Paraproct with sternal arm (Fig. 1C). 2
Paraproct without sternal arm. 3

2(1). Apical margin of tergum IX with middle part deeply concave (Figs. 1D, 2C). . . . . *AEGYPTI* GROUP
aegypti (p. 41)

Apical margin of tergum IX with middle part nearly flat (Huang 1977a, Fig. 14C). . . . . *W-ALBUS* GROUP
(*desmotes* subgroup)
desmotes

3(1). Distimere simple, elongate, with a spiniform process. 4
Distimere complex, expanded at base and apically forked, with spiniforms processes (Huang 1977a, Figs. 19C, 21C, 25C).
W-ALBUS GROUP
(*mediopunctatus* subgroup) (p. 20)

*The female of *malikuli* is unknown.

4(3). Spiniform of distimere process submedial or subbasal (Figs. 6C, 12C). . . . . *ALBOLINEATUS* GROUP (p. 17)
Spiniform of distimere process at apex or subapical. 5

5(4). Apical margin of tergum IX with middle part concave (Huang 1977a, Figs. 6C, 11C). . . . . *W-ALBUS* GROUP (*annandalei* subgroup) (p. 20)
Apical margin of tergum IX with middle part rounded, truncated, or produced into a large lobe, or a median projection. 6

6(5). Aedeagus apically widened, with 6 or 7 apical teeth on each side (Huang 1977a, Fig. 1B). . . . . *EDWARDSI* GROUP* *edwardsi*
Aedeagus with a distinct sclerotized lateral toothed plate on each side. 7

7(6). Spiniform of distimere long, at least 0.28 length of distimere; apical margin of tergum IX with large median lobe (Huang 1977a, Figs. 29C, 33C). . . . . *W-ALBUS* GROUP (*w-albus* subgroup) (p. 20)
Spiniform of distimere rather short, at most, 0.25 length of distimere, or apical margin of tergum IX without large median lobe (Figs. 25D, 27C). . . . . *SCUTELLARIS* GROUP (p. 18)

THE *ALBOLINEATUS* GROUP

1. Paraproct with apical lobed process. 2
Paraproct without apical lobed process. 8

2(1). Spiniform of distimere process before middle, at most, at about basal 0.33. 3
Spiniform of distimere process at middle, or beyond middle. . . . 4

3(2). Apical margin of tergum IX with middle part concave; basimere long, about 3.0 as long as wide, with numerous short, apically curved setae along mesal side of dorsal surface (Fig. 16C). *hoogstraali*
Apical margin of tergum IX with middle part nearly flat; basimere rather short and broad, about 2.2 as long as wide, with some long, stout, apically curved setae along mesad side of dorsal surface (Fig. 19C). . . . . *impatibilis*

4(2). Lateral plate of aedeagus with less than 10 apical teeth (Figs. 6B, 6C). . . . . *albolineatus*
Lateral plate of aedeagus with more than 10 apical teeth. 5

5(4). Claspette with 3 short, stout, spine-like setae and several shorter setae on distal part (Fig. 14C). . . . . *boharti*

*The male of *seampi* is unknown.

Claspette with 3-5 rather long, stout, spine-like setae and several long setae with slender curved tips on distal part. 6

6(5). Claspette with 3, 4 stout, spine-like setae and several long setae with slender curved tips on distal part; apical margin of tergum IX with middle concave (Fig. 10C). . . . . *arboricola*
Claspette with 4, 5 stout, spine-like setae and several long, stout setae with slender curved tips on distal part; apical margin of tergum IX with middle flat (Figs. 21C, 23C, 23D). 7

7(6). The apices of the strongest spine-like setae of claspette reaching to the level of apex of basimere (Fig. 21C). . . . . *laffooni*
The apices of the strongest spine-like setae of claspette not reaching to the level of apex of basimere (Fig. 23D). . . . *pseudalbolineatus*

8(1). Spiniform of distimere process subbasal (Fig. 12C).
bambusicola
Spiniform of distimere process submedial (Fig. 24C).
platylepidus (p. 44)

THE *SCUTELLARIS* GROUP

1. Apical margin of tergum IX with a median lobe or projection. . . . 2
Apical margin of tergum IX with middle broadly rounded or truncated. 8

2(1). Apical margin of tergum IX with conspicuous horn-like median projection (Huang 1972, Fig. 2C). . . . . *albopictus*
Apical margin of tergum IX with middle part produced into a lobe. . 3

3(2). Apical margin of tergum IX with middle part produced into large lobe with apex serrated (Huang 1972, Fig. 4C). . . . . *downsi*
Apex of lobe not serrated. 4

4(3). Claspette long, slender, reaching to about 0.75 of basimere, expanded portion facing mesad (Fig. 25D; Huang 1972, (Fig. 16C). 5
Claspette large, broad, reaching to about 0.5 of basimere, expanded portion horizontal in position (Huang 1972, Figs. 9C, 11C, 18C). 6

5(4). Apical margin of tergum IX with large median lobe; claspette with numerous setae and several widened specialized curved ones on mesal side of slightly expanded distal part, without any setae on basal 0.4 area (Huang 1972, Fig. 16C). . . . . *seatoi*
Apical margin of tergum IX with rounded median lobe; claspette with numerous setae and several stouter widened ones on distal part, with a small, mesally directed projection on basal 0.4 bearing one large seta and with 3 smaller setae near to it (Figs. 25D, 25C).
unilineatus

6(4). Specialized setae on sternal side of expanded portion of claspette spine-like, curved with sharply pointed tips and varying length (Huang 1972, Figs. 8C, 9C). . . . . *novalbopictus*
These specialized setae blade-like or clubbed, without sharply pointed tip (Huang 1972, Figs. 11C, 18C). 7

7(6). Claspette with broad stem and lateral distal angle turned through 90° in lateral aspect (dissected) (Huang 1972, Fig. 18C). *subalbopictus*
Claspette with narrower stem and without a 90° lateral distal angle (Huang 1972, Fig. 11C). . . . . *patriciae*

8(1). Claspette complex with numerous setae on expanded distal part, each seta on distinct cone, a tergal mesal finger-like process bearing 6 modified setae at tip (Huang 1972, Fig. 24B). . *alorensis*

9(8). Claspette truncate, with a distinct oval face at apex; with numerous setae and several long, stout ones on tergal side and with 4 spine-like setae on sternal side of oval face; apical margin of tergum IX with middle truncated (Huang 1972, Fig. 29C). . . . . *paullusi*
Claspette with apex more or less cylindrical. 10

10(9). Claspette long, slender, reaching to 0.7 of basimere, with one widened specialized spine-like seta and numerous setae distal to it (Huang 1972, Fig. 13C). . . . . *pseudalbopictus*
Claspette rather short, with several widened specialized setae and numerous unmodified setae. 11

11(10). Claspette with distal expanded part rectangular in lateral aspect (dissected), sternal and tergal sides more or less parallel, apicosternal angle present (Fig. 27C). 12
Claspette with distal expanded part subtriangular in shape in lateral aspect (dissected), sternal and tergal sides not parallel but tapering, without apicosternal angle. 13

12(11). Apicotergal area of claspette with several distinctly long and stout setae (Huang 1972, Fig. 24A). . . . . *andrewsi*
Apicotergal area without any such setae (Fig. 27C). *krombeini*

13(11). Apicotergal area of claspette with several distinctly long setae (Huang 1972, Figs. 22C, 26C). . . . . *alcasidi*
Apicotergal area without any such setae. 14

14(13). Claspette with 7-10 modified setae forming a prominant row at center of sternal side and occupying about 0.5 of it (Huang 1972, Figs. 26D, 27C). . . . . *malayensis*
Claspette with 6-8 modified setae at center of sternal side, closer to sternal angle area than to apicotergal angle area and occupying about 0.4 of it (Huang 1972, Figs. 26A, 26B). . . . . *riversi*

THE *W-ALBUS* GROUP

annandalei subgroup

Claspette short and broad, with 3 widened, leaf-like setae on tergal side and with 2 stout, spine-like setae on sternal side of expanded distal part, with several slender setae scattered in-between (Huang 1977a, Figs. 6C, 10B). . . . . *annandalei*

Claspette longer and narrower, reaching to 0.75 of basimere, with 3 widened specialized setae on dorsal basal part and with numerous long setae ventral and distal to it (Huang 1977a, Figs. 11C, 10D). *craggi*

mediopunctatus subgroup*

1. Claspette simple, with numerous long setae on the slightly expanded distal part and with few shorter ones on sternal side (Huang 1977a, Fig. 19C). . . . . *malikuli*

Claspette large and bilobed, with numerous setae and with a distinct stout spine-like seta on apicosternal angle of expanded distal part. 2

2(1). Claspette with several distinctly long and stout setae on tergal portion of expanded distal part (Huang 1977a, Figs. 21C, 21D). *mediopunctatus*

Claspette without several distinctly long and stout setae on tergal portion of expanded distal part (Huang 1977a, Fig. 25C). *perplexus*

w-albus subgroup

Claspette with numerous setae on the expanded distal part and occupying about 0.5 of it (Huang 1977a, Fig. 29C). . *gardnerii gardnerii gardnerii imitator*

Claspette with numerous stouter, widened setae on the expanded distal part and occupying 0.67 or more of it (Huang 1977a, Fig. 33C). *w-albus*

PUPAE**

1. Paddle margins without fringe of very long hair-like spicules (Figs. 2A, 7A). 2

Paddle margins with fringe of very long hair-like spicules (Fig. 27A). 3

**Aedes rhungkiangensis* is not included.

**The pupa of *rhungkiangensis* is unknown.

2(1). Paddle margins with distinct denticles; seta 1-P single (Fig. 2A).
AEGYPTI GROUP
aegypti (p. 41)
Paddle margins without distinct denticles, at most with slight spicules seta 1-P branched (Figs. 7A, 10A, 12A, 14A, 16A, 19A, 21A)
ALBOLINEATUS GROUP (p. 21)

3(1). Seta 2-IV, V directly anteriad of 1-IV, V; seta 5-C strong, usually double. . . . . *EDWARDSI* GROUP*
Seta 2-IV, V laterad of, or mesad of 1-IV, V. 4

4(3). Seta 2-IV, V laterad of 1-IV, V. 5
Seta 2-IV, V mesad of 1-IV, V (Fig. 27A; Huang 1977a, Figs. 29A, 33A). . . . . *SCUTELLARIS* GROUP (p. 22)
W-ALBUS GROUP
(*w-albus* subgroup)

5(4). Seta 2-IV, V laterad of 3-IV, V; seta 1-II usually with 3-6 branches, not dendritic (Huang 1977a, Fig. 14A). . . . . *W-ALBUS* GROUP
(*desmotes* subgroup)
desmotes
Seta 2-IV, V mesad of 3-IV, V; seta 1-II usually well developed, with many dendritic branches. 6

6(5). Male genital lobe short and broad, about as long as wide (Huang 1977a, Figs. 19A, 22A, 26A). . . . . *W-ALBUS* GROUP
(*mediopunctatus* subgroup)
malikuli
mediopunctatus
perplexus
Male genital lobe long and broad, slightly longer than wide (Huang 1977a, Figs. 6A, 11A). . . . . *W-ALBUS* GROUP
(*annandalei* subgroup) (p. 23)

THE *ALBOLINEATUS* GROUP**

1. Seta 5-C short, about length of 4-C (Figs. 12B, 16B, 19B). 2
Seta 5-C strongly developed, very long, much longer than 4-C. . . 3

2(1). Seta 9-VII single, small and slender, about same magnitude as 9-VI; 1-P well developed, with at least 9 branches (Fig. 12A).
bambusicola
Seta 9-VII single or branched, much longer and stouter than 9-VI; 1-P with at most 5 branches (Figs. 16A, 19A). . . . . *hoogstraali*
impatibilis

3(1). Seta 5-VI usually single (1, 2), short, not reaching beyond posterior margin of following segment (Figs. 7A, 14A). 4

*Known from unpublished material from Andaman islands.
**The pupae of *platylepidus* and *pseudalbolineatus* are unknown.

Seta 5-VI single or double, or 2,3 forked, usually long, reaching beyond posterior margin of following segment. 5

4(3). Seta 9-VII usually with 2,3 branches; 6-VII usually single or double and smaller than 9-VII (Fig. 7A). . . . . *albolineatus*
Seta 9-VII usually with 3-5 branches; 6-VII usually with 2-6 branches (Fig. 14A). . . . . *boharti*

5(3). Seta 9-VIII usually with 17 (14-21) branches (Fig. 21A). . . *laffooni*
Seta 9-VIII usually with 13 (11-16) branches (Fig. 10A). . *arboricola*

THE *SCUTELLARIS* GROUP*
THE *W-ALBUS* GROUP
w-albus subgroup

1. Seta 9-III-V strongly developed, thickened, much stouter than 9-II (Huang 1972, Fig. 16A; Huang 1977a, Fig. 33A). 2
Seta 9-III-V not strongly developed, slender, about same magnitude as 9-II. 3

2(1). Seta 1-II usually with 8-10 branches (Huang 1972, Fig. 16A). *seatoi*
Seta 1-II usually with 2,3 branches (Huang 1977a, Fig. 33A). *w-albus*

3(1). Seta 9-VI much stouter than 9-V, at least 2.0 length of 9-V (Fig. 27A; Huang 1972, Figs. 4A, 18A). 4
Seta 9-VI about as thick as 9-V, less than 2.0 length of 9-V. 6

4(3). Seta 9-VI usually single and barbed; 9-VII usually single and barbed or with 2 apical branches; 9-VIII usually with 2 main stems (1,2) reaching beyond fringe of paddle, each stem with lateral branches of varying length (Huang 1972, Fig. 4A). . . . . *downsi*
Seta 9-VI single and simple (Fig. 27A; Huang 1972, Fig. 18A). . . . 5

5(4). Seta 9-VIII usually with 2 main stems, barbed, not reaching beyond fringe of paddle (Huang 1972, Fig. 18A). . . . . *subalbopictus*
Seta 9-VIII usually with single main stem (1,2) reaching beyond fringe of paddle, with lateral branches of varying length (Fig. 27A). *krombeini*

6(3). Seta 9-VII single, stout and barbed or split at apex. 7
Seta 9-VII single, simple. 9

7(6). Seta 6-C much shorter than 7-C (Huang 1972, Fig. 9B). *novalbopictus*
Seta 6-C about length of 7-C. 8

*The pupa of *unilineatus* is not included. The pupae of *alorensis* and *andrewsi* are unknown.

8(7). Seta 6-C much stouter than 7-C and usually slightly longer; 1-II usually with 10, 11 branches arising from a common stem at base; 9-VIII usually with 2 main stems, reaching beyond fringe of paddle, each stem with lateral branches of varying length; paddle margins fringed close to base, on more than apical 0.75 of paddle (Huang 1972, Figs. 29B, 29A). . . . . *paullusi*

Seta 6-C usually about length of 7-C; 1-II branched, without a common stem at base; paddle margins with fringe on less than apical 0.75 of paddle (Huang 1972, Figs. 22B, 22A). . . . *alcasidi* (in part)

9(6). Seta 9-VIII usually with 2 (1, 2) branches, each barbed, not reaching beyond fringe of paddle (Huang 1972, Fig. 11A). . . . . *patriciae*

Seta 9-VIII reaching beyond fringe of paddle. 10

10(9). Seta 6-C about 0.5 length of 7-C. 11

Seta 6-C about 0.75-1.00 length of 7-C. 13

11(10). Seta 9-VIII with 2 branches (Huang 1972, Fig. 13A). *pseudalbopictus*

Seta 9-VIII usually single (1, 2). 12

12(11). Male genital lobe short and broad, about as long as wide (Huang 1972, Fig. 2A). . . . . *albopictus*

Male genital lobe long and broad, longer than wide (Huang 1977a, Fig. 29A). . . . . *gardnerii gardnerii gardnerii imitator*

13(10). Seta 6-C about 0.75 length of 7-C. 14

Seta 6-C about 1.0 length of 7-C (Huang 1972, Fig. 22B). *alcasidi* (in part)

14(13). Seta 9-VIII usually with single main stem (1, 2), with lateral branches of varying length; 1-II with many primary and secondary branches (Huang 1972, Fig. 27A). . . . . *malayensis*

Seta 9-VIII usually with 2 branches (1, 2), barbed; 1-II with very few secondary branches (Huang 1972, Fig. 32A). . . . . *riversi*

annandalei subgroup

Male genital lobe with a triangular-shaped fold on ventral side (Huang 1977a, Fig. 11A). . . . . *craggi*

Male genital lobe without a triangular-shaped fold on ventral side (Huang 1977a, Fig. 6A). . . . . *annandalei*

FOURTH STAGE LARVAE*

1. Ventral brush with 5 pairs of setae (Figs. 3C, 8C). 2

Ventral brush with 4 pairs of setae (Fig. 28C). 3

**Aedes rhungkiangensis* is not included.

2(1). Comb scale with very strong basal denticles (Fig. 3C).
AEGYPTI GROUP
aegypti (p. 41)
Comb scale without very strong basal denticles (Figs. 8C, 11C, 13C, 15C, 17C, 22C). . . . . *ALBOLINEATUS* GROUP (p. 25)

3(1). Marginal spicules of anal segment well developed and conspicuous. . 4
Marginal spicules of anal segment not well developed, very small and inconspicuous. 6

4(3). Seta 1-S inserted at level of, or before last pecten tooth. 5
Seta 1-S inserted beyond last pecten tooth (Huang 1977a, Figs. 20C, 23C, 27C). . . . . *W-ALBUS* GROUP
(*mediopunctatus* subgroup)
malikuli
mediopunctatus
perplexus

5(4). Marginal spicules of anal segment very long, spine-like.
EDWARDSI GROUP*
Marginal spicules of anal segment stout, rather short and bluntly rounded at apex (Huang 1977a, Figs. 7C, 12C).
W-ALBUS GROUP
(*annandalei* subgroup)
annandalei
craggi

6(3). Comb scales in a single row, arising from a sclerotized plate (Huang 1977a, Fig. 15C). . . . . *W-ALBUS* GROUP
(*desmotes* subgroup)
desmotes
Comb scales in a single row, not arising from a sclerotized plate. . 7

7(6). Ventral brush with 4d-X well developed, single or branched and with bars (Fig. 28C; Huang 1977a, Fig. 34C).
SCUTELLARIS GROUP (p. 25)
W-ALBUS GROUP
(*w-albus* subgroup)
w-albus
Ventral brush with 4d-X not well developed, single, very small, much smaller than 4a, b, c-X and without bars (Huang 1977a, Fig. 30C). . . . . *W-ALBUS* GROUP
(*w-albus* subgroup)
gardnerii gardnerii
gardnerii imitator

*Known from unpublished material from Andaman islands.

THE *ALBOLINEATUS* GROUP*

1. Marginal spicules of anal segment small and inconspicuous (Figs. 13C, 17C). 2
   Marginal spicules of anal segment well developed, very long and conspicuous (Figs. 8C, 11C, 15C, 22C). 3

2(1). Comb scales in a single row, arising from a sclerotized plate (Fig. 13C). . . . . *bambusicola*
   Comb scales in a single row, not arising from a sclerotized plate (Fig. 17C). . . . . *hoogstraali*

3(1). Seta 5-P long, about 1.0 length of 7-P (Fig. 8B). . . . *albolineatus*
   Seta 5-P short, much shorter than 7-P (Figs. 11B, 15B. 22 B). . . 4

4(3). Comb scale with free portion widened at base and sharply pointed at apex, with fine denticles on basal portion of apical spine (Fig. 15C). . . . . *boharti*
   Comb scale with free portion rather slender and long, about 2.0 length of attached portion, without fine denticles on basal portion of apical spine (Figs. 11C, 22C). 5

5(4). Comb scales in a single row, arising from a sclerotized plate (Fig. 11C). . . . . *arboricola*
   Comb scales in a single row, not arising from a sclerotized plate (Fig. 22C). . . . . *laffooni*

THE *SCUTELLARIS* GROUP**
THE *W-ALBUS* GROUP
w-albus subgroup

1. Comb scale with prominent denticles at base of apical spine; seta 2-VII usually with 6 (5-8) branches (Fig. 31C). . . . . *seatoi*
   Comb scale without such denticles. 2

2(1). Siphon with acus; pecten teeth 3-6, each tooth short and stout; usually with 3, 4 basal denticles (Huang 1972, Fig. 14C). *pseudalbopictus*
   Siphon without acus; pecten tooth long, at least 4.0 as long as wide. 3

3(2). Anal segment with complete saddle (Huang 1972, Figs. 10C, 19C). . 4
   Anal segment with incomplete saddle. 5

*The larvae of *impatibilis* and *platylepidus* are unknown. The larva of *pseudalbolineatus* is not included.

**The larva of *unilineatus* is not included. The larvae of *alorensis* and *andrewsi* are unknown.

4(3). Seta 2-X 2-branched; pecten tooth usually with 3 (2, 3) basal denticles; 1-S inserted beyond last pecten tooth and ventrad of teeth (Huang 1972, Fig. 10C). . . . . *novalbopictus*
Seta 2-X usually single, when 2-branched one much smaller than the other; pecten tooth usually with 2 (2, 3) basal denticles; 1-S inserted well beyond last pecten tooth and in line with teeth (Huang 1972, Fig. 19C). . . . . *subalbopictus*

5(3). Siphon short, 1.7 as long as wide at middle (Huang 1977a, Fig. 34C). . . . . *W-ALBUS* GROUP (*w-albus* subgroup) *w-albus*
Siphon about 2.0-2.5 as long as wide at middle. 6

6(5). Seta 2-X 3-branched; 2-VII usually with 3 (2, 3) branches; pecten tooth with one large and occasionally 1, 2 very small basal denticles (Huang 1972, Fig. 30C). . . . . *paullusi*
Seta 2-X 2-branched. 7

7(6). Seta 1-VII usually with 4 (3, 4) branches, short, less than 2.0 length of 5-VII. 8
Seta 1-VII usually with 2 (2, 3) branches, long, at least 2.5 length of 5-VII. 10

8(7). Seta 2-VII with 3, 4 branches. 9
Seta 2-VII usually single (1, 2) (Huang 1972, Fig. 3C). . . . *albopictus*

9(8). Comb scale with free portion widened at base and sharply pointed at tip (Fig. 31D). . . . . *downsi*
Comb scale with free portion rather slender, nearly parallel-sided from base and at least length of attached portion (Fig. 31E). *patriciae*

10(7). Seta 1-VII with 2, 3 branches; siphon about 2.0 as long as wide; pecten teeth 10-21, closely arranged in a line; 1-S usually inserted beyond middle of siphon; comb scale sometimes with apical spine split at tip (Huang 1972, Fig. 33C). . . . . *riversi*
Seta 1-VII usually with 2 long branches (2, 3), when 3-branched then one much smaller than other 2; siphon about 2.5 as long as wide; pecten teeth 10-19; 1-S inserted at middle or before middle of siphon. 11

11(10). Seta 1-S usually inserted at middle of siphon; pecten teeth 10-14, each with 2-4 basal denticles (Huang 1972, Fig. 28C). . . . *malayensis*
Seta 1-S usually inserted before middle of siphon. 12

12(11). Pecten tooth with one large and 1-3 small basal denticles (Fig. 31F). *alcasidi*
Pecten tooth with 1-3 basal denticles (Fig. 28C). . . . . *krombeini*

NOMEN DUBIUM

Aedes rimandoi Basio. Philippines. 1971a: 52 (♂*, ♀). Type-locality: U.P. College of Forestry Campus, Los Banos, Laguna, Luzon, Philippines (NE).

TAXONOMIC DISCUSSION. According to Basio (1971a: 53), the original description was based on 2♂, 1♀ and the type of *rimandoi* was deposited in the "RGB", Ruben G. Basio Mosquito Collection, Manila, Philippines (Basio 1971b: 31). However, numerous enquiries addressed to several persons in Manila, Philippines have failed to show that any type-material is still in existence. Based on the original description, *rimandoi* is unrecognizable and should be considered a *nomen dubium*.

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APPENDIX I. PRESENT STATUS OF THE SPECIES OF *AEDES (STEGOMYIA)* IN THE ORIENTAL REGION

	SPECIES	STAGES					BIONOMICS
		A		P	L	E	
		♂	♀				
1.	*aegypti*	X*	X*	X*	X*	X*	Immature habitats known, female bites man
2.	*albolineatus*	X*	X*	X*	X*	-	Immature habitats known
3.	*arboricola*	X*	X	X*	X*	-	Immature habitats known
4.	*bambusicola*	X*	X*	X*	X*	-	Immature habitats known
5.	*boharti*	X*	X	X*	X*	-	Immature habitats known, female bites man
6.	*hoogstraali*	X*	X*	X*	X*	-	Immature habitats known
7.	*impatibilis*	X*	X*	X*	-	-	Immature habitats known
8.	*laffooni*	X*	X*	X*	X*	-	Immature habitats known
9.	*platylepidus*	X*	X*	-	-	-	Immature habitats known
10.	*pseudalbolineatus*	X*	X*	-	X	-	Immature habitats known
11.	*edwardsi*	X*	X*	-	-	-	Immature habitats known
12.	*seampi*	-	X*	-	-	-	Unknown
13.	*albopictus*	X*	X*	X*	X*	X*	Immature habitats known, female bites man
14.	*downsi*	X*	X*	X*	X*	-	Immature habitats known, female bites man
15.	*novalbopictus*	X*	-	X*	X*	-	Immature habitats known
16.	*patriciae*	X*	X*	X*	X*	-	Immature habitats known
17.	*pseudalbopictus*	X*	X*	X*	X*	X*	Immature habitats known
18.	*seatoi*	X*	X	X*	X*	-	Immature habitats known, female bites man
19.	*subalbopictus*	X*	X*	X*	X*	-	Immature habitats known
20.	*unilineatus*	X*	X*	X*	X*	-	Immature habitats known
21.	*alcasidi*	X*	X*	X*	X*	X*	Immature habitats known
22.	*alorensis*	X*	X*	-	-	-	Unknown
23.	*andrewsi*	X*	X*	-	-	-	Unknown
24.	*krombeini*	X*	X*	X*	X*	-	Immature habitats known, female bites man
25.	*malayensis*	X*	X*	X*	X*	-	Immature habitats known, female bites man
26.	*paullusi*	X*	X*	X*	X*	-	Immature habitats known, female bites buffalo
27.	*riversi*	X*	X*	X*	X*	-	Immature habitats known, female bites man
28.	*annandalei*	X*	X*	X*	X*	X*	Immature habitats known, female bites man
29.	*craggi*	X*	X*	X*	X*	-	Immature habitats known, female bites man
30.	*desmotes*	X*	X*	X*	X*	X*	Immature habitats known, female bites man
31.	*malikuli*	X*	-	X*	X*	-	Immature habitats known

APPENDIX I (Continued).

SPECIES	STAGES					BIONOMICS
	A		P	L	E	
	♂	♀				
32. *mediopunctatus*	X*	X*	X*	X*	-	Immature habitats known, female bites man
33. *perplexus*	X*	X*	X*	X*	X*	Immature habitats known, female bites man
34. *rhungkiangensis*	X*	X	-	X*	-	Unknown
35. *gardnerii gardnerii*	X*	X*	X*	X*	-	Immature habitats known
36. *gardnerii imitator*	X*	X*	X*	X	X*	Immature habitats known, female bites man
37. *w-albus*	X*	X*	X*	X*	-	Immature habitats known, female bites man

X* = Stage or sex described and illustrated.
- = Stage or sex unknown.
X = Stage or sex described.

APPENDIX II. DISTRIBUTION LIST OF THE ORIENTAL SPECIES OF *AEDES (STEGOMYIA)*

SPECIES	ORIENTAL REGION																														
	Ryukyu Islands	Taiwan	China (S. of Yangtze Kiang)	Hong Kong	Hainan	Vietnam	Laos	Cambodia	Thailand	Burma	Assam (India)	Philippines	Sangi Islands, Taroena	Celebes, Kabaena	Sabah	Sarawak	Kalimantan, Tarakan	W. Malaysia	Poeloch Weh	Singapore	Sumatra	Nias	Java	Bali	Flores	Alor	Soemb	Christmas Island
1. aegypti	●	●				●	●	●	●	●	●	●		●	●		●	●		●	●		●					●
2. albolineatus		●			?	●		●	●		?	●		●	●	●	●	●			?		?				?	
3. arboricola												●																
4. bambusicola												●																
5. boharti												●			●													
6. hoogstraali												●																
7. impatibilis												●		●														
8. laffooni												●		●														
9. platylepidus												●																
10. pseudalbolineatus													?	●														
11. edwardsi						?																						
12. seampi																												
13. albopictus	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		
14. downsi	●																											
15. novalbopictus									●																			
16. patriciae			?			●			●									●										
17. pseudalbopictus		?				●			●	●								●					●					
18. seatoi									●																			
19. subalbopictus					?																							
20. unilineatus																												
21. alcasidi		?										●			●													
22. alorensis																										●		
23. andrewsi																												●
24. krombeini																												
25. malayensis		●				●		●	●									●		●								
26. paullusi												●	●	●	●			●										
27. riversi	●																											
28. annandalei		●	?			●			●	●	●			●							?		●	●	●			
29. craggi									●		●																	
30. desmotes		●							●		●	●		●			●	●									?	
31. malikuli		●							●																			
32. mediopunctatus											●	●																
33. perplexus		?							●									●										
34. rhungkiangensis			?																									
35. gardnerii gardnerii												●		●	●											●	?	
36. gardnerii imitator		?	●	●	●	●		●	●									●	?									
37. w-albus						●			●																			

● = Areas from which specimens were available for examination.

? = Species recorded from the area but have not been seen by the author.

APPENDIX II (Continued)

SPECIES	ORIENTAL REGION							OTHER AREAS																					
								Pale-arc-tic		W. Paci-fic Is.		Papuan					Malagasy				Pa-ci-fic Is.	S. Pa-ci-fic	Ethiopian						
	Andaman Islands	Nepal	Pakistan	Bangladesh	India	Sri Lanka	Chagos Islands	Japan	China (N. of Yangtze Kiang)	Bonin Islands	Mariana Islands	Morotai	Ceram	Ambon	Buru	Timor	New Guinea	Seychelles	Mauritius	La Reunion	Madagascar	Hawaiian Islands	Solomon Islands	Sudan	N. Rhodesia	Nigeria	Gold Coast	Transvaal
1. aegypti	●		●	●	●	●				●	●						●	●	●			●	●		●	●	●	●
2. albolineatus												●	?				●						●						
3. arboricola																													
4. bambusicola																													
5. boharti																													
6. hoogstraali																													
7. impatibilis																													
8. laffooni																													
9. platylepidus																													
10. pseudalbolineatus																													
11. edwardsi	●																												
12. seampi	●																												
13. albopictus		●	●	?	●	●	●	●	●	●	●		●			●	?	●	●	●	●	●							
14. downsi																													
15. novalbopictus					●																								
16. patriciae			?		●																								
17. pseudalbopictus					●																								
18. seatoi																													
19. subalbopictus					●																								
20. unilineatus			●		●																			●	●	●	●	●	●
21. alcasidi																													
22. alorensis																													
23. andrewsi																													
24. krombeini						●																							
25. malayensis																													
26. paullusi														●															
27. riversi								?																					
28. annandalei				?	●								?		?		?												
29. craggi					●																								
30. desmotes					●																								
31. malikuli																													
32. mediopunctatus					●	●																							
33. perplexus																													
34. rhungkiangensis																													
35. gardnerii gardnerii																													
36. gardnerii imitator	?	●			●																								
37. w-albus		?	●	?	●																								

● = Areas from which specimens were available for examination.

? = Species recorded from the area but have not been seen by the author.

APPENDIX III.

SUMMARY OF THE IMMATURE HABITATS OF THE SPECIES OF *AEDES (STEGOMYIA)* IN THE ORIENTAL REGION*

SPECIES \ IMMATURE HABITATS	Tree holes	Bamboo stumps	Artificial containers (tin can, water jar, water bucket, broken bottle, tire)	Stump holes (palm stumps, coconut stumps, banana stumps)	Bamboo internodes	Coconut shells (coconut halves, coconut husks, coconut spathes)	Bamboo cups (bamboo pots)	Rock holes	Plant axils (*Pandanus*; banana, nipa palm, sago palm, taro, *Colocasia*)	Log holes	Split bamboos	Cut bamboos	Fallen leaves (fallen abaca leaf)	Palm fronds (coconut fronds)	Rock pools	Footprints (wheel ruts)	Root holes	Shelf fungus
1. aegypti			●															
2. albolineatus	●	●	●			●		●	●				●					
3. arboricola	●																	
4. bambusicola		●																
5. boharti	●	●	●	●		●												
6. hoogstraali	●	●	●															
7. impatibilis	●																	
8. laffooni	●	●																
9. platylepidus	●	●				●				●								
10. pseudalbolineatus	●	●	●															
11. edwardsi	●																	
12. albopictus	●	●	●			●		●	●				●	●				
13. downsi	●	●	●						●			●						
14. novalbopictus	●				●													
15. patriciae	●			●														
16. pseudalbopictus	●	●	●		●	●	●				●							
17. seatoi		●	●	●			●											
18. subalbopictus	●	●			●													
19. unilineatus	●																	
20. alcasidi	●	●	●	●		●												●
21. krombeini	●	●	●	●	●					●					●	●	●	
22. malayensis	●	●	●			●	●	●							●			
23. paullusi	●	●	●			●		●		●			●	●				
24. riversi	●							●				●						
25. annandalei		●			●		●					●						
26. craggi	●	●		●							●							
27. desmotes		●			●						●							
28. malikuli	●	●			●													
29. mediopunctatus		●							●			●						
30. perplexus	●	●		●	●		●			●	●							
31. gardnerii gardnerii	●	●																
32. gardnerii imitator	●	●		●			●			●								
33. w-albus	●																	

*Immature habitats are unknown for the following species: *seampi, alorensis, andrewsi* and *rhungkiangensis.*

APPENDIX IV. *Aedes (Stegomyia) aegypti* (Linnaeus)

Type species: *Aedes (Stegomyia) aegypti* (Linnaeus)
(Figs. 1, 2, 3, 4, 5)

Culex aegypti Linnaeus 1762: 470 (A).
Culex argenteus Poiret 1787: 245 (♀).
Culex fasciatus Fabricius 1805: 36 (A).
Culex calopus Meigen 1818: 3 (♂, ♀).
Stegomyia fasciata var. *queenslandensis* Theobald 1901d: 297 (♀).
Stegomyia fasciata persistans Banks 1906: 996 (♂, ♀).
Duttonia alboannulis Ludlow 1911: 132 (♀).
For complete synonymy, see Knight and Stone (1977).
Aedes (Stegomyia) aegypti (Linnaeus), Dyar 1920a, 1920b: 181, 204 (taxonomy); Edwards 1932: 161 (systematics); Barraud 1934: 221 (♂*, ♀, L*, variations); Bohart and Ingram 1946: 6, 11, 22, 27, 37, 66 (♂*, ♀*, P*, L*, bionomics, Pacific distribution); Knight and Hull 1952: 167 (♂, ♀, L*); Bonne-Wepster 1954: 75 (♂, ♀*, L*); Mattingly 1957: 392 (taxonomy, bionomics); Belkin 1962: 441 (♂*, ♀, P*, L*); Mattingly 1965: 23 (♂*, ♀*, P*, L*; Neotype designated).
Aedes (Stegomyia) fasciatus (Fabricius), Bonne-Wepster and Brug 1932: 47 (♂*, ♀, L*, biology).
Aedes (Stegomyia) argenteus of authors.
Stegomyia fasciata of authors.
Aedes calopus of authors.
Stegomyia calopus of authors.

MALE (Fig. 1A). *Head.* Proboscis dark scaled, without pale scales on ventral side, longer than forefemur; palpus 5-segmented, as long as proboscis, dark, with a white basal band on each of segments 2-5; those on segments 4, 5 dorsally incomplete; segments 4, 5 subequal, slender, upturned, and with only a few short setae; antenna plumose, shorter than proboscis; torus covered with white scales except on dorsal and ventral sides; clypeus bare; erect forked scales pale, not numerous, restricted to occiput; vertex with a median stripe of broad white scales, with broad dark ones on each side interrupted by a lateral stripe of broad white scales followed ventrally by a patch of broad white scales. *Thorax.* Scutum with narrow dark scales and a distinct, small, median white spot of narrow scales on anterior border; a narrow submedian longitudinal stripe of narrow pale yellowish scales on each side of midline, submedian stripes reach to anterior 0.66 of scutum; a few narrow white scales on the posterior portion of midline forming a short median white stripe just in front of prescutellar space; on each side a narrow prescutellar white line present; broad curved lateral prescutal and posterior fossal lines of crescent-shaped silvery white scales followed by a narrow line of narrow white scales reaching to the posterior margin of scutum; a patch of broad white scales on lateral margin just in front of wing root and a few narrow curved pale scales over wing root; acrostichal bristles absent; dorsocentral bristles present; scutellum with broad white scales on all lobes and with a few broad dark scales at apex of midlobe; anterior pronotum with broad white scales; posterior pronotum with a patch of broad white scales and some dark and pale narrow scales dorsally; paratergite with broad white scales; postspiracular area without scales; patches of broad white scales on propleuron, on the subspiracular and hypostigial areas, on prealar, on the

upper and lower portions of sternopleuron, and the mesepimeron; upper sternopleural scale patch not reaching to anterior corner of sternopleuron; upper mesepimeral scale patch not connecting with lower mesepimeral scale patch; lower mesepimeron without bristles; metameron bare. *Wing*. With dark scales on all veins except for a minute basal spot of white scales on costa; cell R_2 1.5 length of R_{2+3}. *Halter*. With dark scales. *Legs*. Coxae with patches of white scales; knee spots present on all femora; fore- and midfemora with a narrow white longitudinal stripe on ventral half of anterior surface; hindfemur anteriorly with a broad, white, longitudinal stripe which widens at base and is separated from apical white scale patch; all tibiae dark anteriorly; fore- and midtarsi with a basal white band on tarsomeres 1, 2; hindtarsus with a basal white band on tarsomeres 1-4, the ratio of length of white band to the total length of tarsomere is 0.33, 0.33, 0.33 and 0.75; tarsomere 5 all white; foreleg with tarsal claws unequal, the larger one toothed, the smaller one simple; midleg with tarsal claws unequal, both simple; hindleg with tarsal claws equal, simple. *Abdomen*. Segment I with white scales on laterotergite and a large, median, pale patch; terga II-VIII with basolateral white spots; terga III-VI each with a basal pale band which does not connect with the basolateral white spots; sterna I-III largely covered with pale scales; sterna IV-VI each with a basal pale band and lateral white spots which do not connect with the basal bands. *Terminalia* (Figs. 1B, 1C, 1D, 2C). Basimere about 2.2 as long as wide, scales restricted to lateral and ventral areas, with a few setae on basomesal area of dorsal surface, mesal surface membranous; claspette large, oval, lobelike, with numerous setae and with several widened specialized setae, of which 3 or 4 of these setae bent at tip, on mesal side of expanded distal part; distimere simple, elongate, about 0.63 length of basimere, apical 0.28 rather narrow and curved, with a short spiniform process at apex and with a few setae on apical 0.25; aedeagus strongly toothed; paraprocts with sternal arms; cercal setae absent; apical margin of tergum IX deeply concave medially and with 3 setae on each lateral lobe; sternum IX without bristles.

FEMALE. Essentially as in the male, differing in the following respects: *Head*. Palpus about 0.2 length of proboscis, with white scales on apical half, 4-segmented, or sometimes 5-segmented, when present segment 5 minute; clypeus with lateral white scale patches. *Wing*. Cell R_2 about 2.0 length of R_{2+3}. *Legs*. Hindtarsomere 4 with basal 0.4 white band; fore- and midlegs with tarsal claws equal, all toothed. *Abdomen*. Terga II-VI each with a basal white band and basolateral white spots which do not connect with the basal bands; tergum VII with lateral white spots only; a row of small white scales along posterior border on II-VII; segment VIII largely retracted. *Terminalia* (Figs. 4, 5). Apical margin of sternum VIII with a deep U-shaped notch at middle and with conspicuous rounded lateral lobes; insula longer than broad, with minute setae and with 5 larger setae on apical 0.25; apical margin of tergum IX with well developed lateral lobes, each with 5 or 6 setae; apical margin of postgenital plate with a shallow notch; cerci short and broad; 3 spermathecae, one larger than the other 2.

PUPA (Figs. 2A, 2B). *Cephalothorax*. Trumpet short, about 2.0 as long as wide at the middle; setae 1,3-C usually single (1,2), longer than 2-C, 2-C usually double (1,2), 4-C usually single (1,2), 5-C usually with 2,3 branches, 6-C single, longer than 7-C, 7-C usually double (1,2), 8-C usually double (2,3), 9-C single, 10-C 2-branched, mesad and caudad of 11-C, 11-C single, stout, 12-C usually single (1-3). *Abdomen*. Seta 1-I well developed, with more than 10 branches, dendritic, 2-I single, 3-I single, long, 2,3-I widely separated, distance between them about 1.5 of the distance between 4, 5-I; seta 1-II usually

with 3 branches (2-4); 3-II, III usually single (1, 2), shorter than segment III; 1-III usually double (1-3); 1-IV usually double (1, 2); 2-IV, V slightly mesad of 1-IV, V; 5-IV-VI usually single (1, 2), short, not reaching beyond posterior margin of following segment; seta 9-I-VI small, single, simple, sometimes 9-VI double; 9-VII usually single (1, 2) and barbed; 9-VII, VIII much longer and stouter than preceeding ones; 9-VIII usually with 5 branches (3-7) and barbed. *Paddle.* Margins with distinct denticles, without fringe of very long hair-like spicules; apex rounded; seta 1-P single. Male genital lobe short and broad, much shorter than wide.

LARVA (Fig. 3). *Head.* Antenna 0.5 length of head, without spicules; seta 1-A inserted slightly before middle of shaft, single, small, spine-like; inner mouth brushes pectinate at tip; seta 4-C well developed, usually with 5 branches (4-7), closer to 6-C than 5-C, cephalad and mesad of 6-C, 5-C usually single, long, 6-C usually single, 7-C usually single, rarely double, 8-10, 13-C single, 11-C usually with 3 branches (2, 3), 12-C usually double (2, 3), 14, 15-C usually with 2, 3 branches; mentum usually with 12 (10-14) teeth on each side. *Thorax.* Setae 1, 7, 14-P usually with 3 branches (2, 3), 2, 6-P single, 3-P double, 4, 9, 11-P usually single (1, 2), 5-P usually double; 5, 7-M single, 6-M usually 3-branched, 8-M usually with 4 branches (3, 4), 9-M usually 2-branched (2, 3), 10, 12-M single, long, stout and barbed, 11-M single, small; 7-T usually with 4 branches (4, 5), 9-T usually 2-branched, 10, 11-T similar to those on mesothorax, 12-T much reduced; basal spine of meso- and metapleural seta long, stout, pointed at tip and apically hooked. *Abdomen.* Seta 6-I-III usually with 3 branches (2-4), 7-I single; 7-II usually double (2, 3); 6-IV, V usually double (2, 3); 6-VI usually single (1, 2); 1-VII usually double (1-3), 2-VII single; 2-VIII distant from 1-VIII, 1, 5-VIII usually with 3, 4 branches, 3-VIII usually with 6 branches (5-7), 2, 4-VIII single; comb of 8 (6-12) scales in a row, each scale with very strong denticles at the base of the apical spine; anal segment with saddle incomplete, marginal spicules very small and inconspicuous; seta 1-X usually double (1, 2), short, 2-X usually with 3 branches (2, 3), 3-X usually single (1, 2); ventral brush with 5 pairs of setae on grid, each seta usually 2-branched (2, 3), sometimes 4e-X single; no precratal tufts; anal papillae about 2.5-3.0 length of saddle, sausage-like. *Siphon.* About 1.8-2.5 as long as wide, acus absent; pecten teeth usually 8-20, evenly spaced, or sometimes with the last pecten tooth widely spaced, each tooth with 1-4 basal denticles; seta 1-S with 3, 4 branches, usually inserted beyond last tooth and beyond middle of siphon.

MATERIAL EXAMINED. More than 1,070 adults (♂ and ♀), 390 individual rearings (291 l, 390 p), 43 ♂ terminalia, 25 ♀ terminalia, 210 whole larvae from the Oriental region.

REMARKS. Adult specimens of "variety *queenslandensis*" have more pale scales present on the vertex, thorax and abdomen than that of typical *aegypti*. The range of scaling varies from that almost referable to typical *aegypti* to complete covering of the vertex and abdomen with white scales. The main character used to identify "variety *queenslandensis*" is the white scales present on at least the first and 2nd abdominal tergite. Typical *aegypti* has white scales present on the first abdominal tergite.

APPENDIX V.

Aedes (Stegomyia) platylepidus Knight and Hull
(Fig. 24)

Aedes (?) *platylepidus* Knight and Hull 1951: 201 (♀).
Aedes (Diceromyia) platylepidus Knight and Hull, Mattingly 1959: 43 (♀); Reinert 1970: 12 (♂*, ♀*).

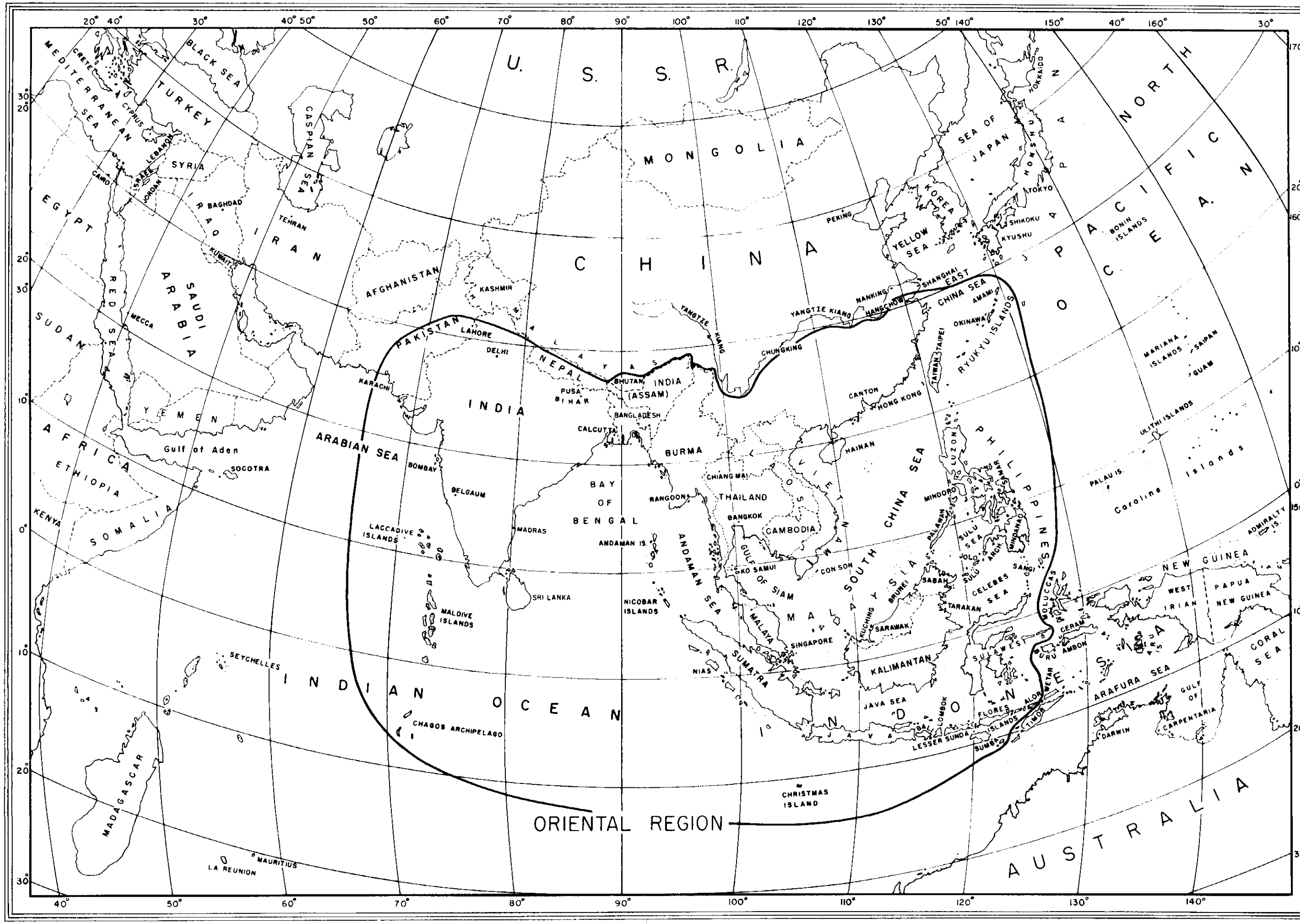
MALE. *Terminalia.* (Figs. 24A, 24B, 24C). Basimere short and broad, about 2.0 as long as wide, scales restricted to lateral and ventral areas, with several irregular rows of stout, flattened, long setae along mesal side of dorsal surface, with several short setae scattered on lateral half of dorsal surface; claspette with 5 stout, spine-like setae and several long, stout setae with slender curved tips on distal part; distimere simple, elongate, about 0.8 length of basimere, tapering to a blunt apical point, with a long, stout, spiniform process at basal 0.4, apex of the spiniform blunt and mesally curved; aedeagus with several apical teeth on each side; paraproct long, without apical lobe-like process; cercal setae absent; apical margin of tergum IX flat at middle, with 5 setae on each side.

REMARKS. The above description was based on the only known terminalia, (slide #68/1142 from adult #2252, Isabella, Basilon Is., Philippine Is., 27 Sept. 1945) in USNM, which was used by Reinert (1970) in his original description of ♂ *platylepidus*. Figure 24C was drawn from the original undissected view of the ♂ terminalia.

In order to give a correct and detailed description of the ♂ terminalia, I have dissected the claspette and remounted the terminalia.

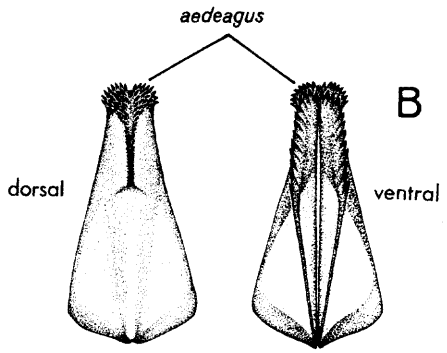
MATERIAL EXAMINED: 1♂, 2♀, 1♂ terminalia, 1♀ terminalia.

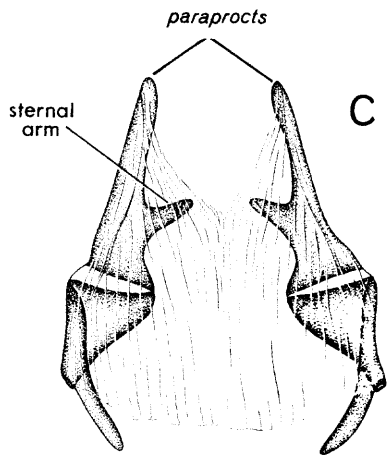
MAP I

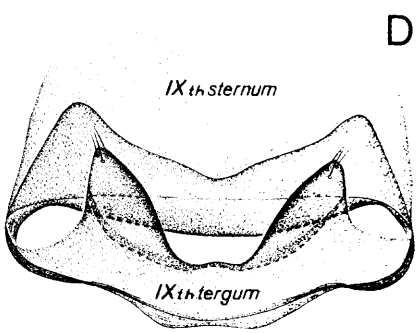

U. S. S. R.
MONGOLIA
CHINA
NORTH PACIFIC OCEAN
INDIAN OCEAN
ORIENTAL REGION
AUSTRALIA
AFRICA
INDONESIA
MALAYSIA
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
TURKEY
CYPRUS
CRETE
LEBANON
ISRAEL
JORDAN
CAIRO
SYRIA
EGYPT
IRAQ
BAGHDAD
KUWAIT
IRAN
TEHRAN
SAUDI ARABIA
MECCA
RED SEA
SUDAN
YEMEN
Gulf of Aden
SOCOTRA
ETHIOPIA
KENYA
SOMALIA
AFGHANISTAN
KASHMIR
PAKISTAN
LAHORE
DELHI
KARACHI
INDIA
ARABIAN SEA
BOMBAY
BELGAUM
MADRAS
LACCADIVE ISLANDS
MALDIVE ISLANDS
SRI LANKA
CHAGOS ARCHIPELAGO
SEYCHELLES
MADAGASCAR
LA REUNION
MAURITIUS
NEPAL
PUSA
BIHAR
BHUTAN
INDIA (ASSAM)
BANGLADESH
CALCUTTA
BAY OF BENGAL
ANDAMAN IS.
NICOBAR ISLANDS
ANDAMAN SEA
BURMA
RANGOON
CHIANG MAI
THAILAND
BANGKOK
CAMBODIA
GULF OF SIAM
KO SAMUI
CON SON
VIETNAM
LAOS
MALAYA
SINGAPORE
SUMATRA
NIAS
KUCHING
SARAWAK
BRUNEI
SABAH
KALIMANTAN
JAVA SEA
JAVA
LOMBOK
LESSER SUNDA ISLANDS
SUMBA
FLORES
ALOR
TIMOR
WETAR
SULAWESI
TARAKAN
CELEBES SEA
SULU SEA
SULU ARCH
JOLO
SANGI
MOLUCCAS
BURU
AMBON
CERAM
SOUTH CHINA SEA
HAINAN
CANTON
HONG KONG
TAIWAN
TAIPEI
PHILIPPINES
LUZON
MINDORO
PALAWAN
SAMAR
MINDANAO
CHUNGKING
YANGTZE KIANG
NANKING
HANGCHOW
SHANGHAI
EAST CHINA SEA
PEKING
YELLOW SEA
KOREA
SEA OF JAPAN
HOKKAIDO
HONSHU
TOKYO
SHIKOKU
KYUSHU
OKINAWA
AMAMI
RYUKYU ISLANDS
BONIN ISLANDS
MARIANA ISLANDS
SAIPAN
GUAM
ULITHI ISLANDS
PALAU IS.
Caroline Islands
ADMIRALTY IS.
NEW GUINEA
WEST IRIAN
PAPUA
NEW GUINEA
ARAFURA SEA
GULF OF CARPENTARIA
DARWIN
CORAL SEA
CHRISTMAS ISLAND

LIST OF FIGURES

Fig. 1







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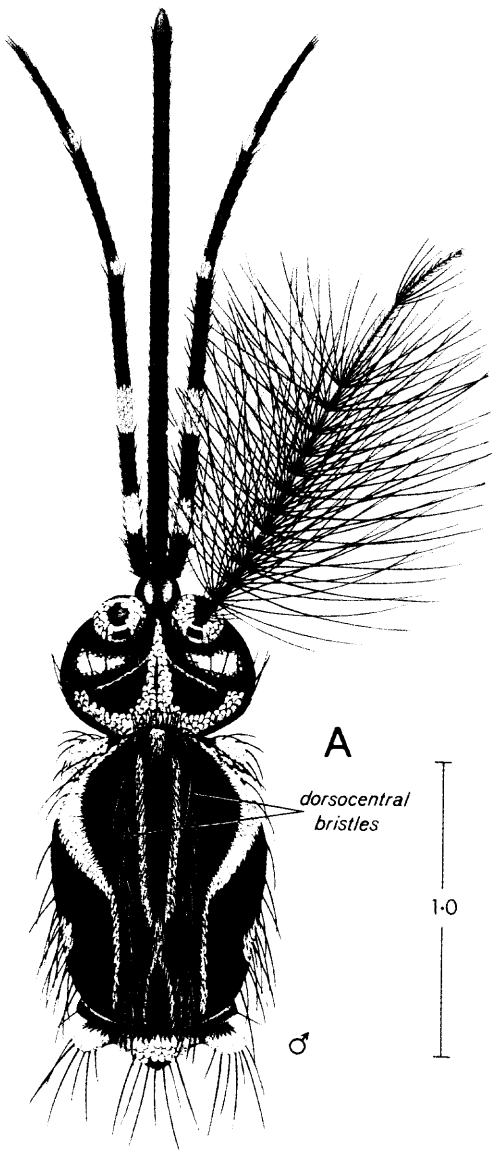
Aedes (Stegomyia) aegypti (Linnaeus)



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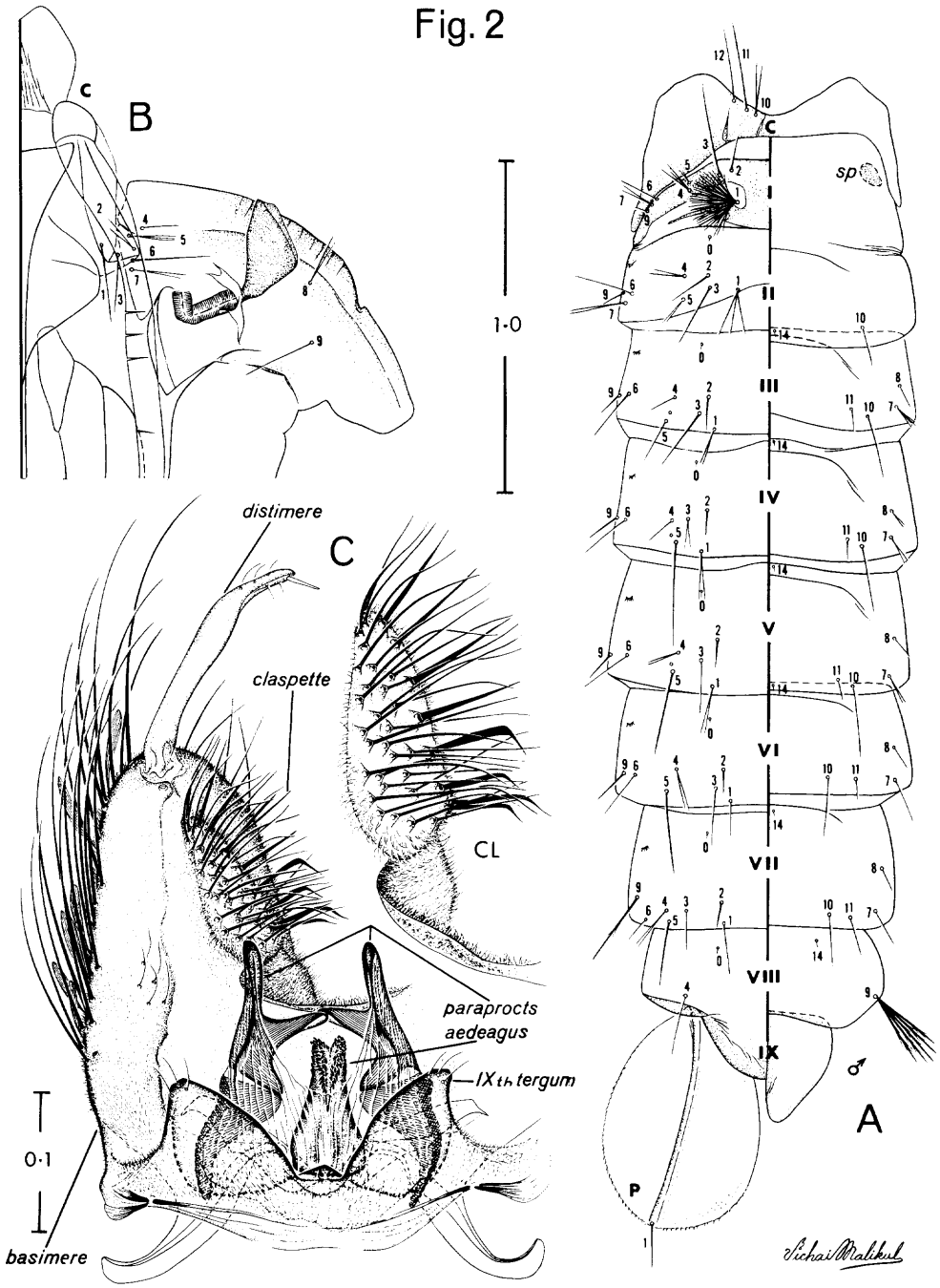

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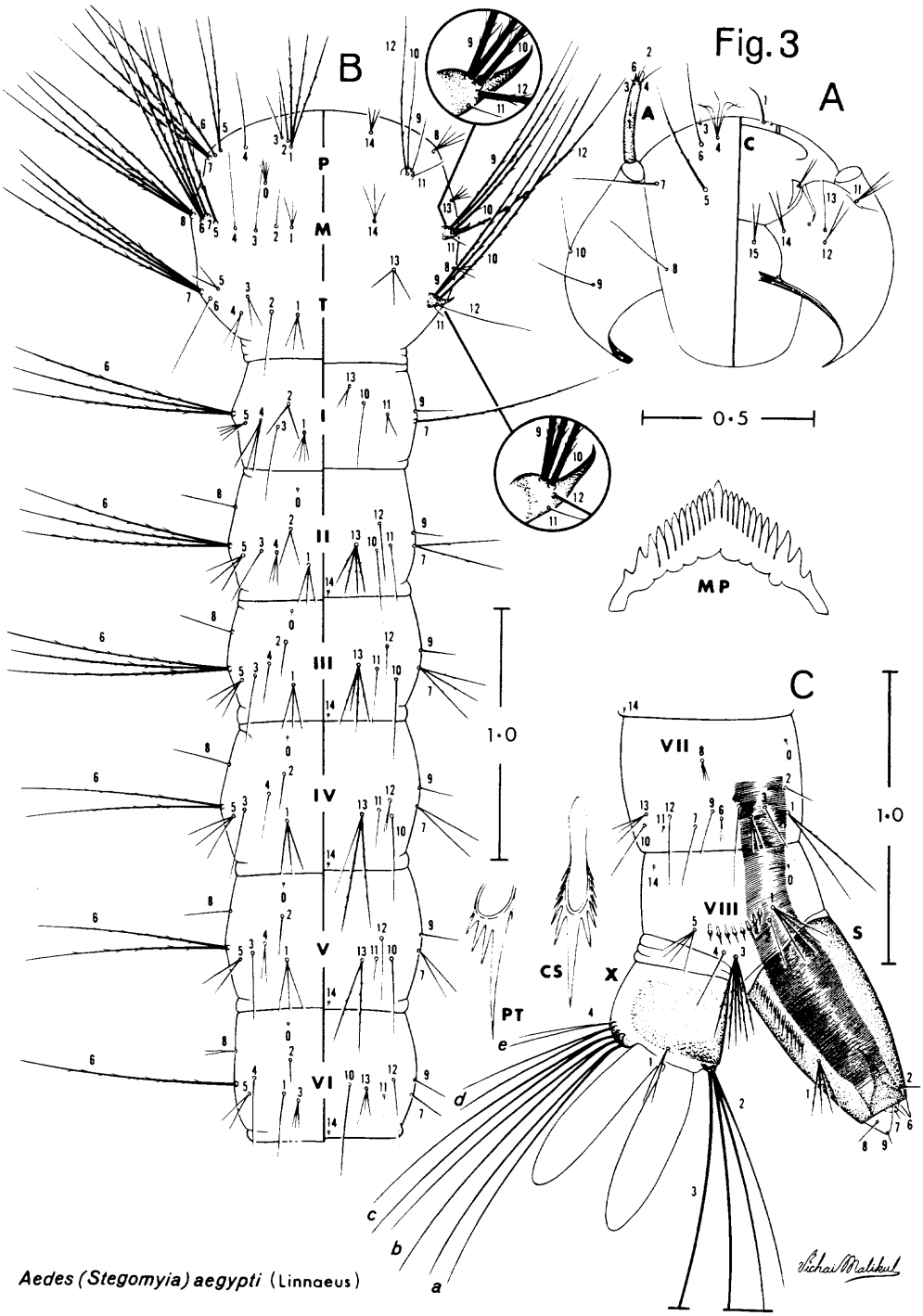

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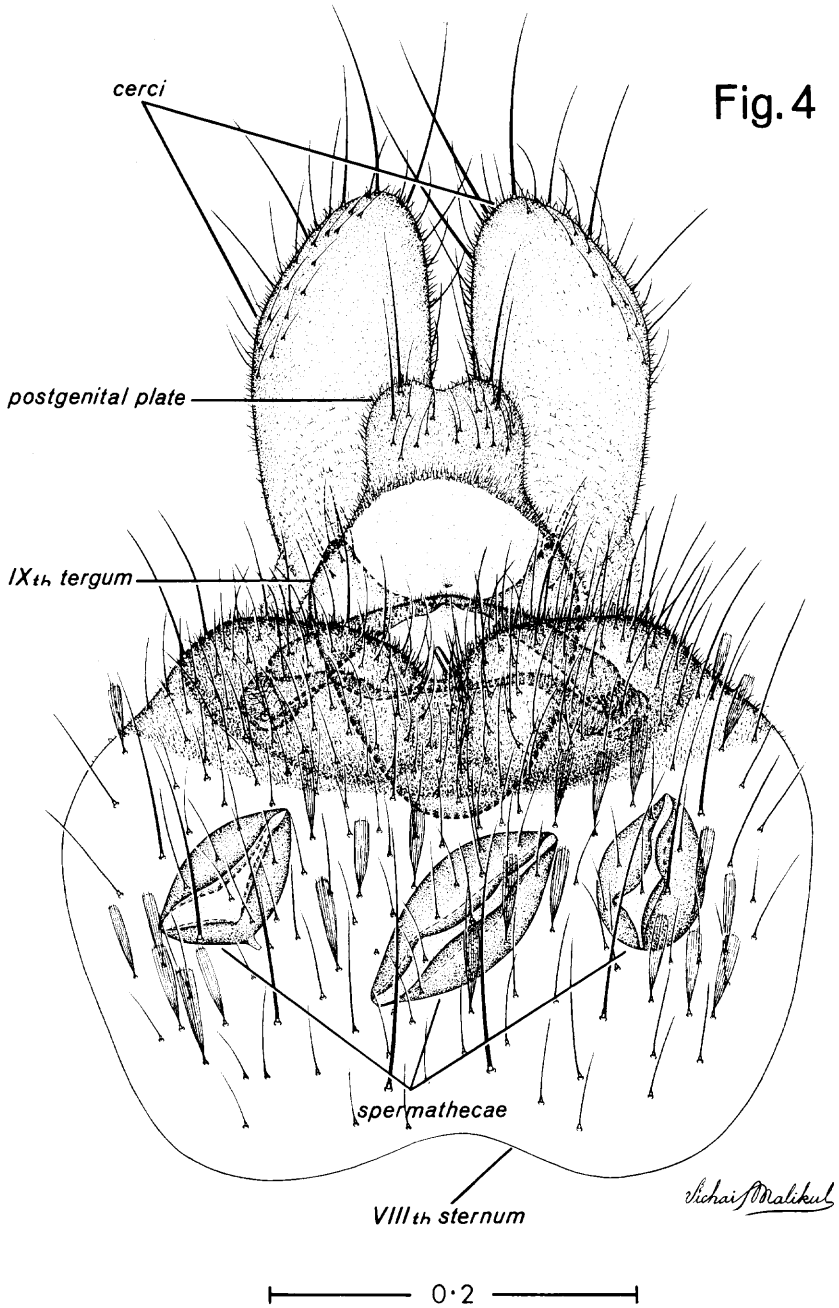

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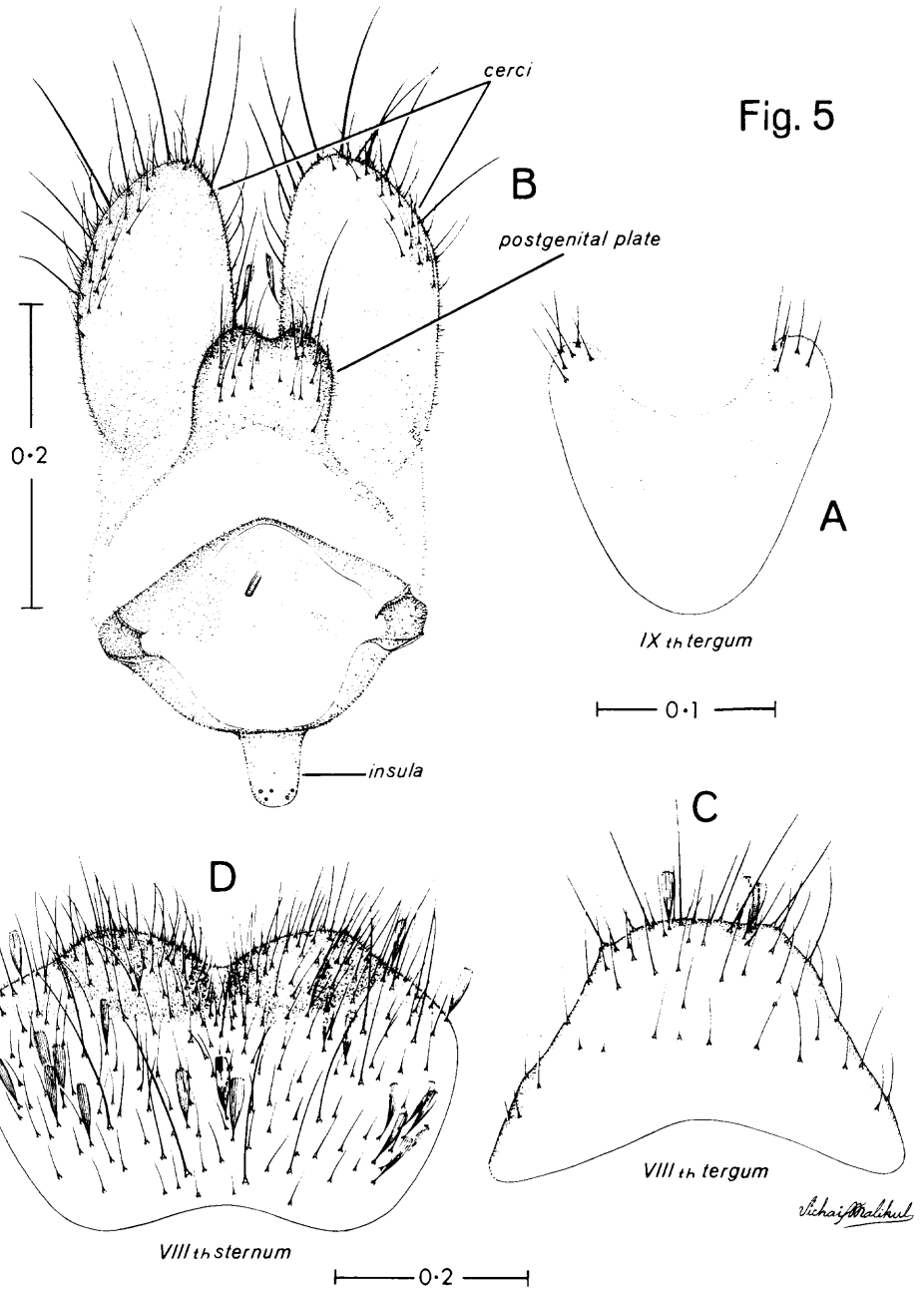
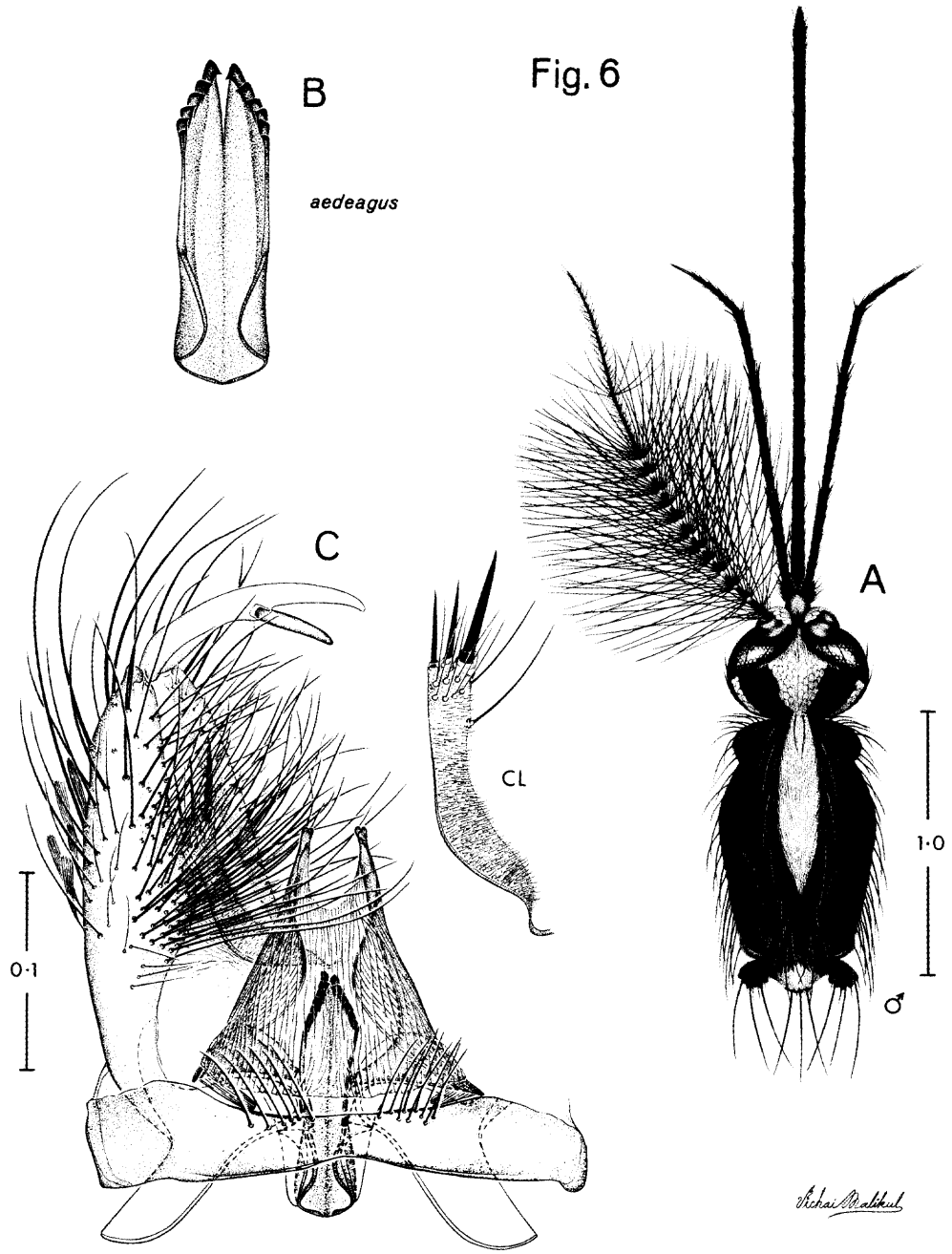
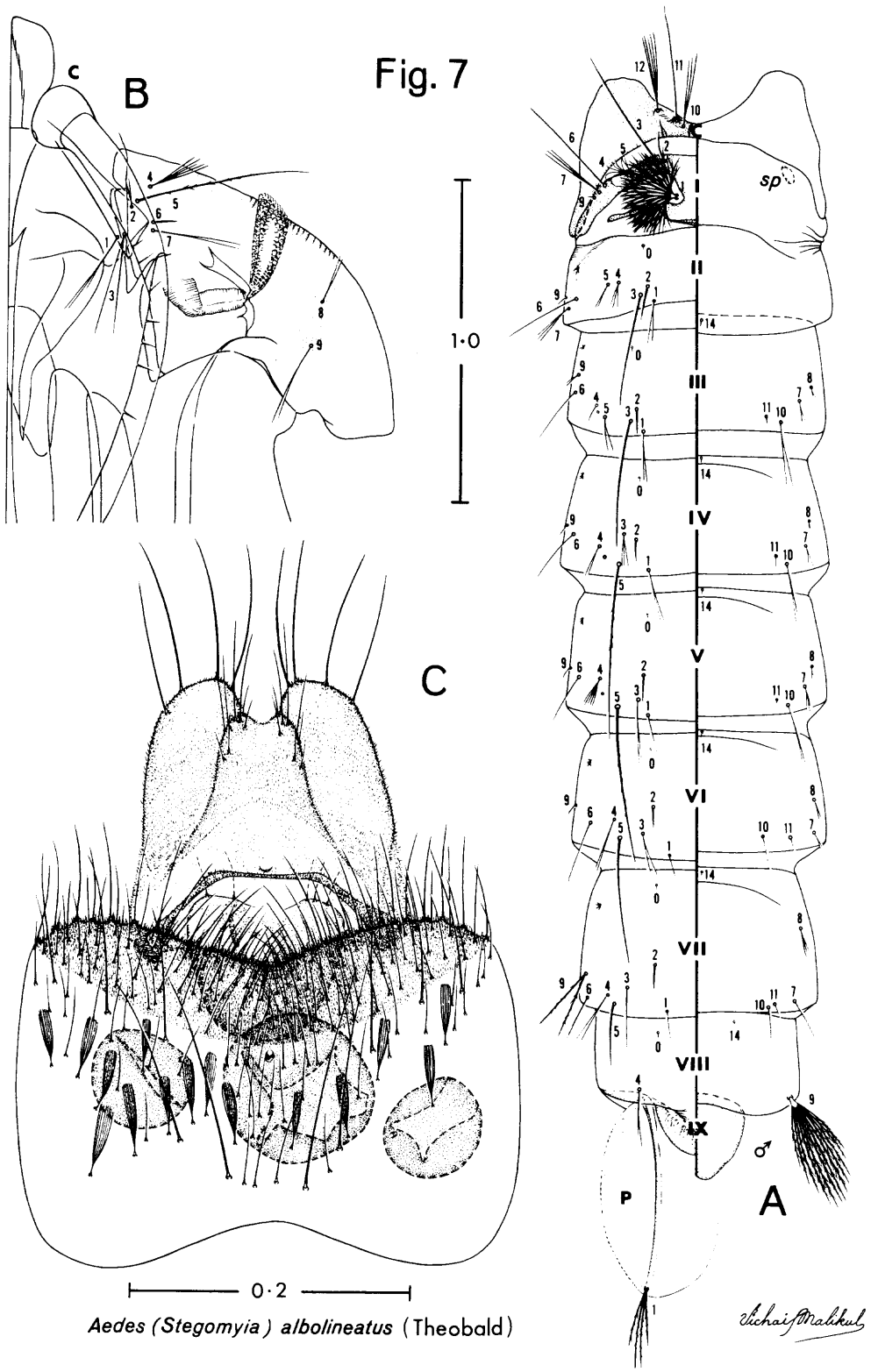


Aedes (Stegomyia) aegypti (Linnaeus)

Fig. 6



Aedes (Stegomyia) albolineatus (Theobald)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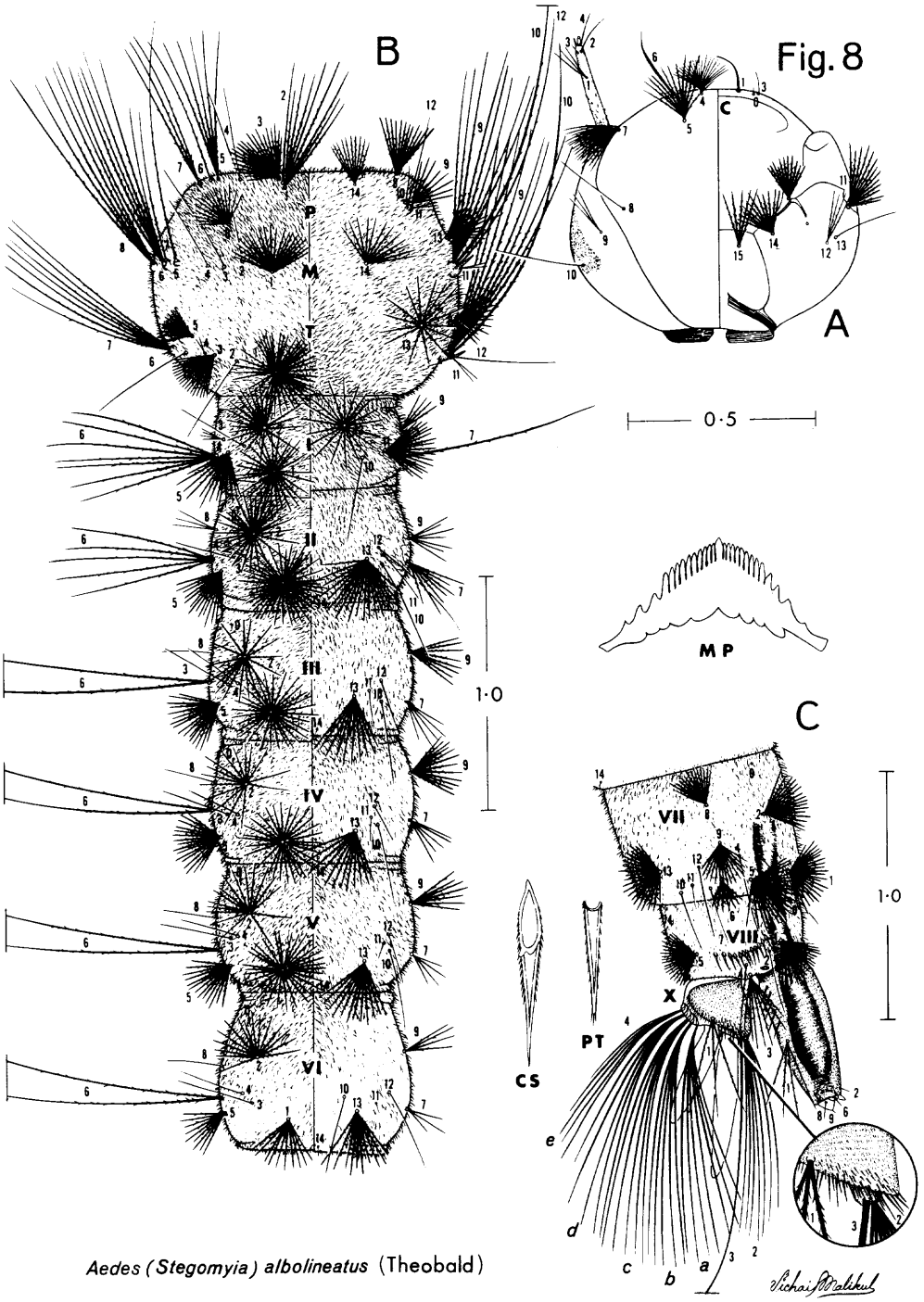
Aedes (Stegomyia) albolineatus (Theobald)



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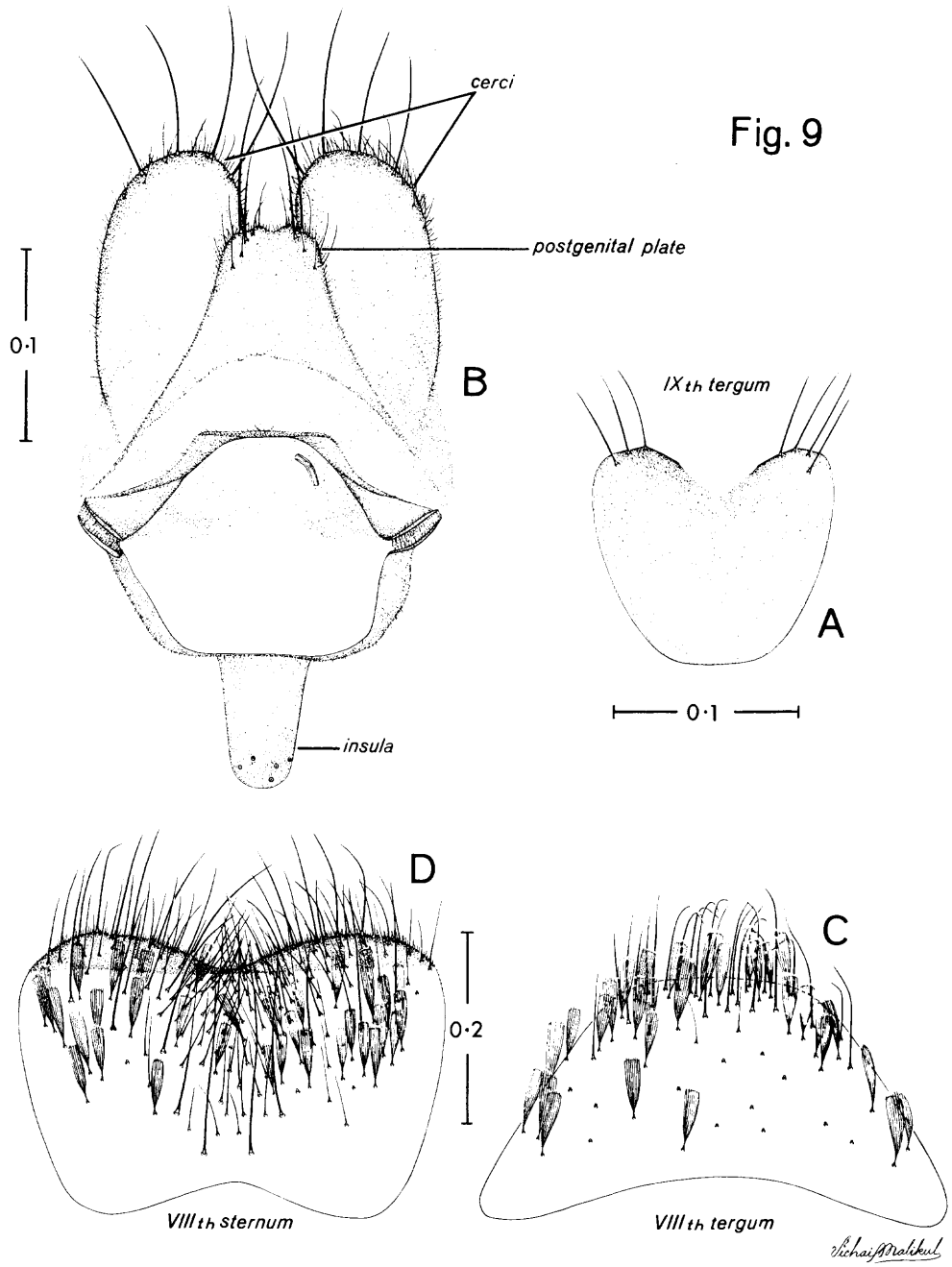

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Aedes (Stegomyia) albolineatus (Theobald)

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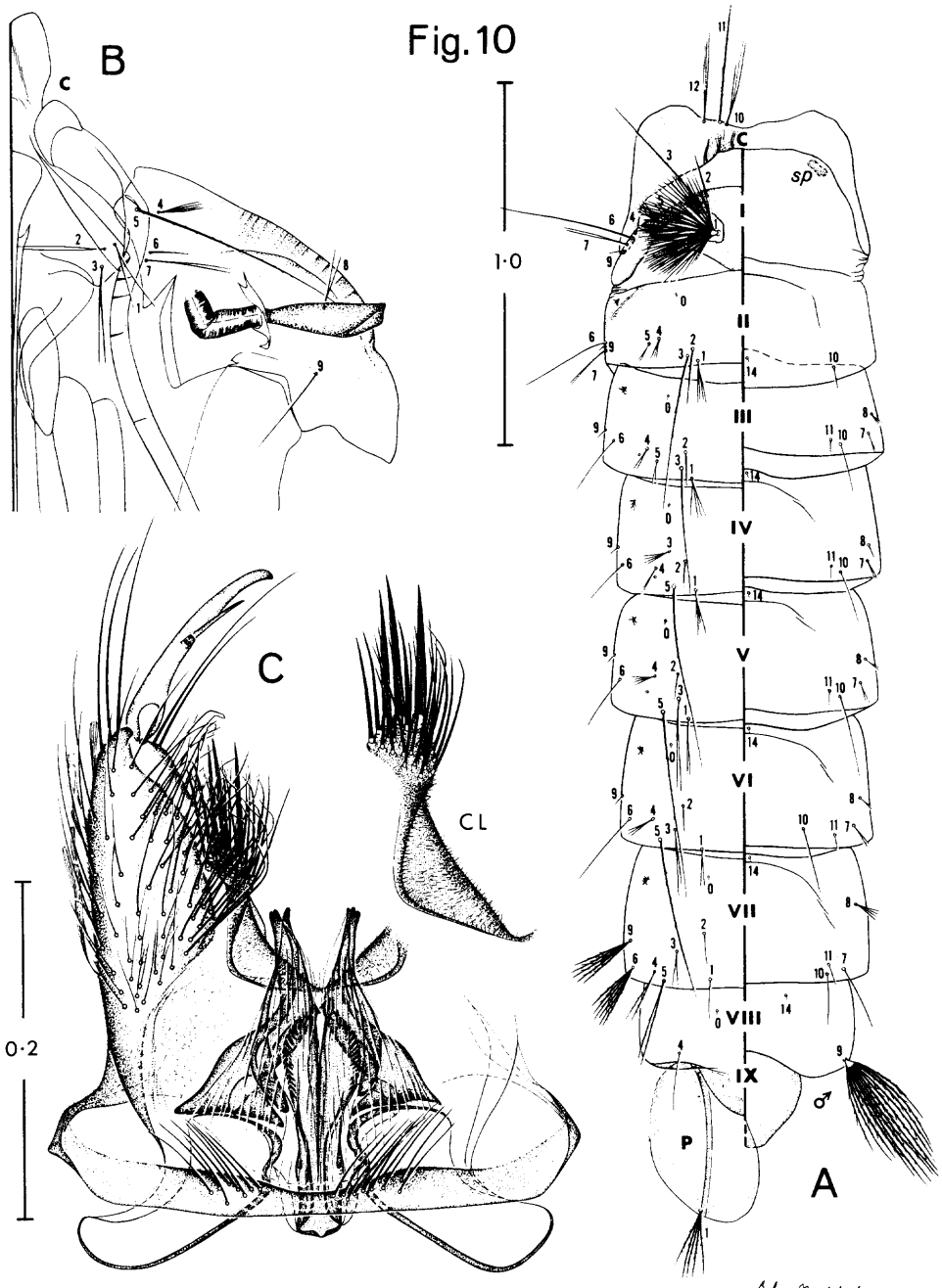
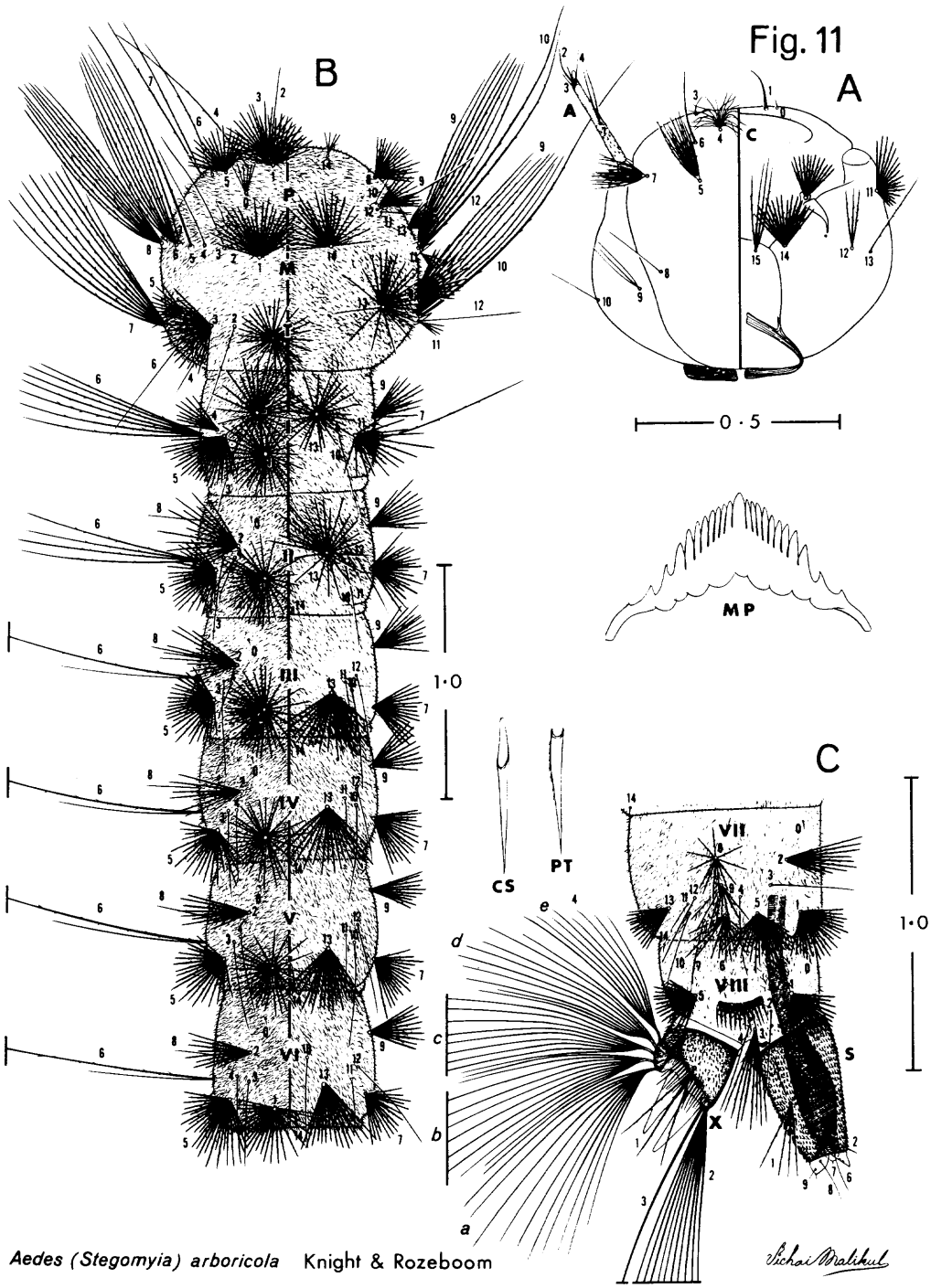


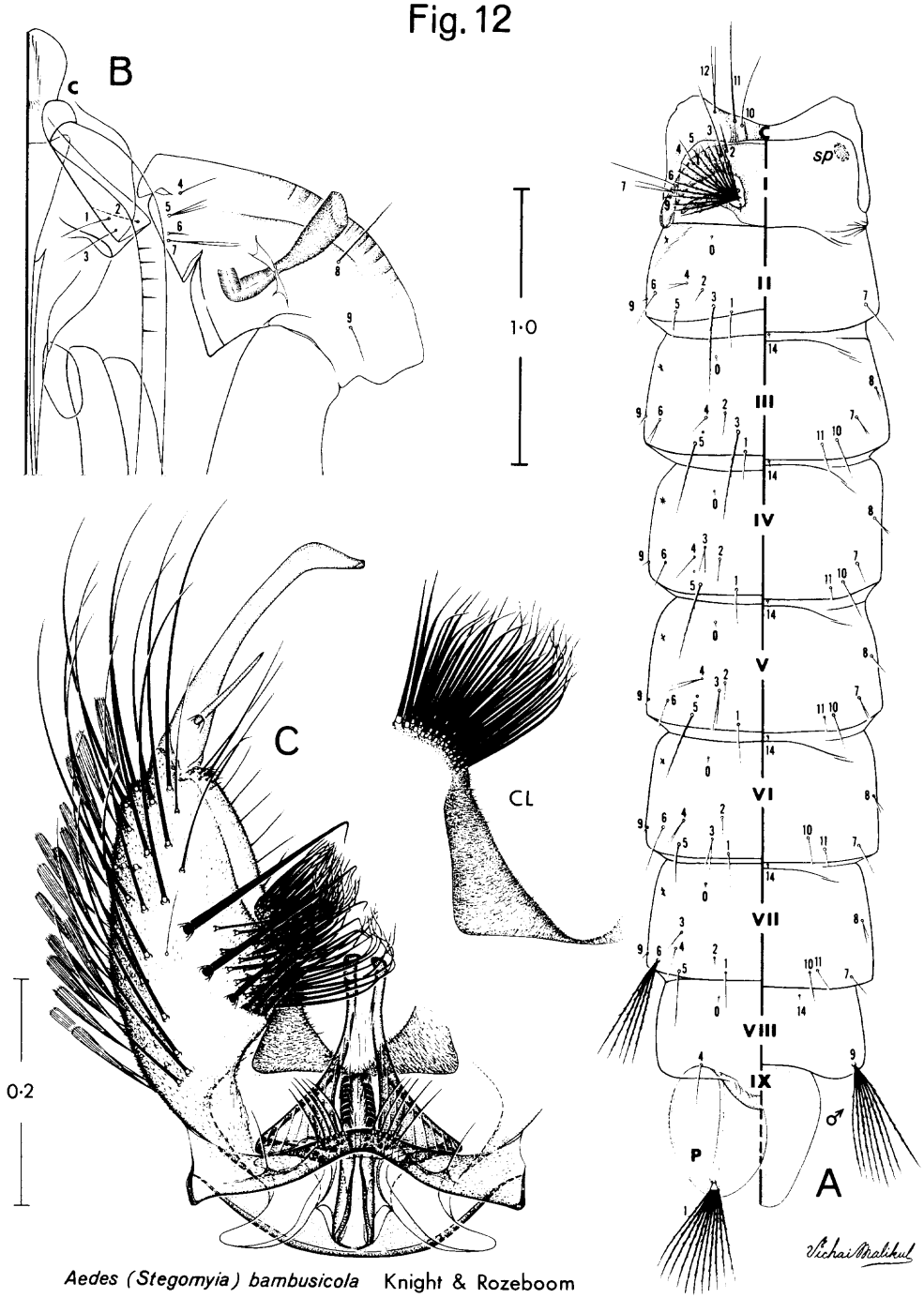
Aedes (Stegomyia) arboricola Knight & Rozeboom

Fig. 11



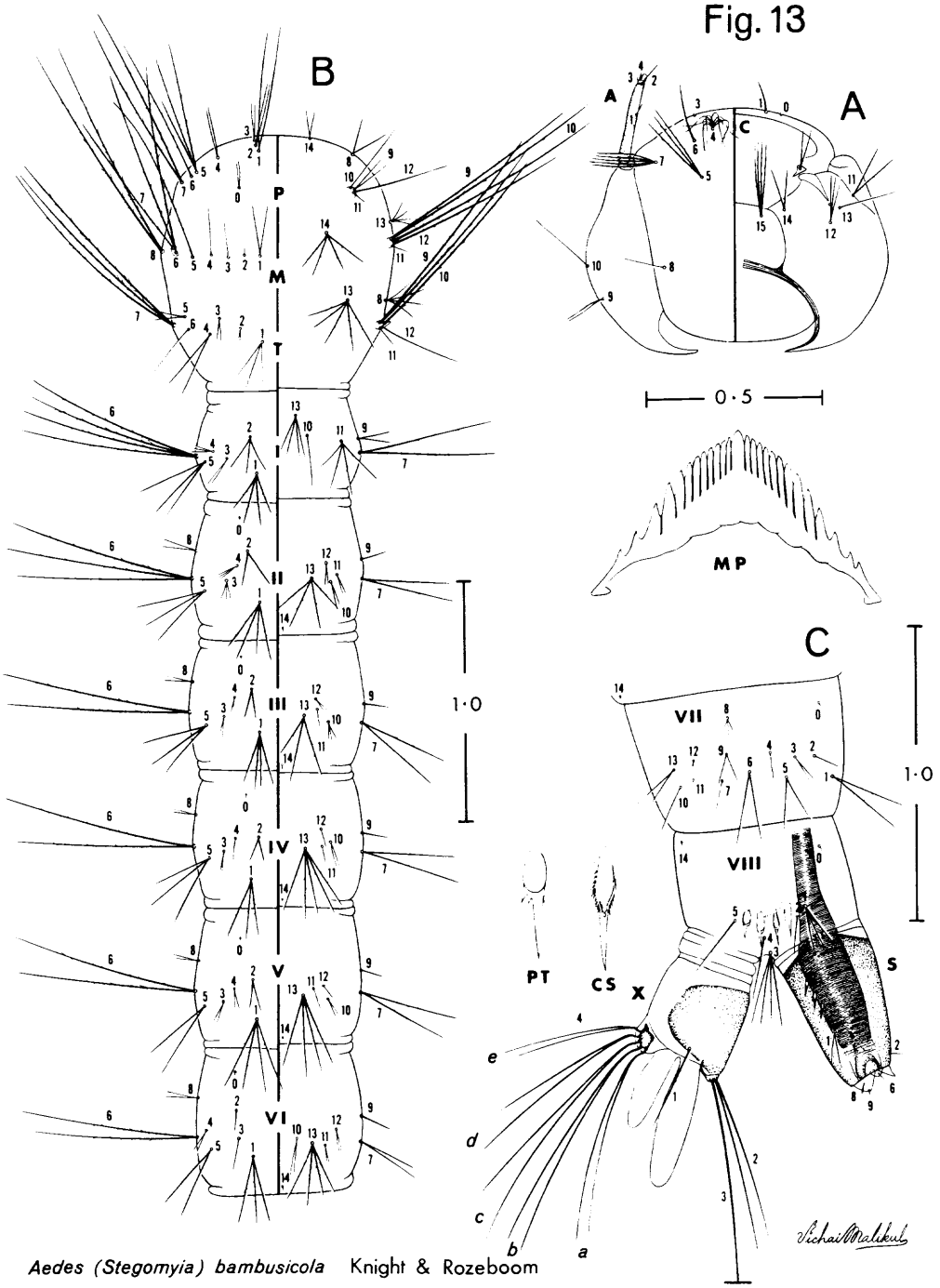
Aedes (Stegomyia) arboricola Knight & Rozeboom

Fig. 12

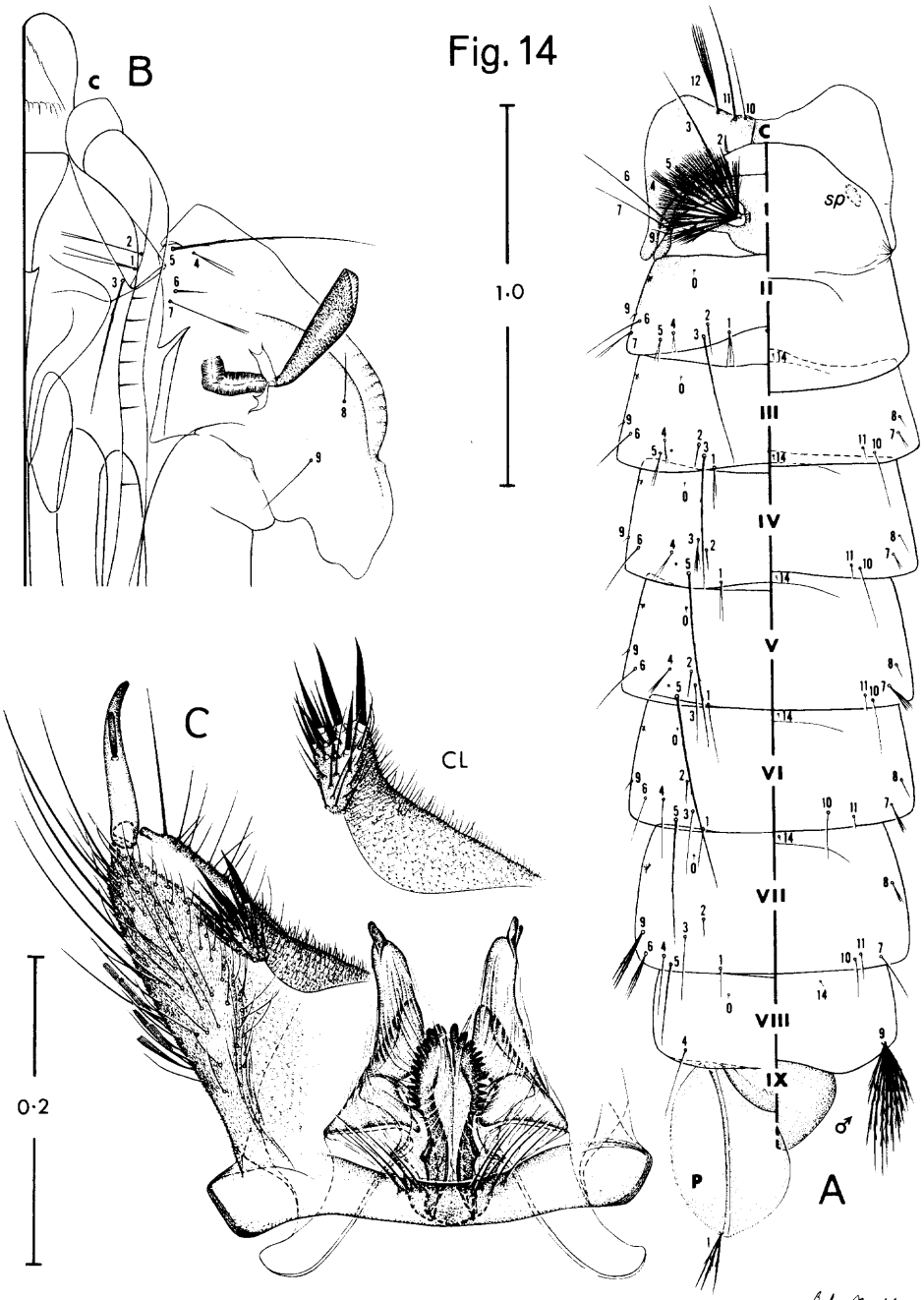


Aedes (Stegomyia) bambusicola Knight & Rozeboom

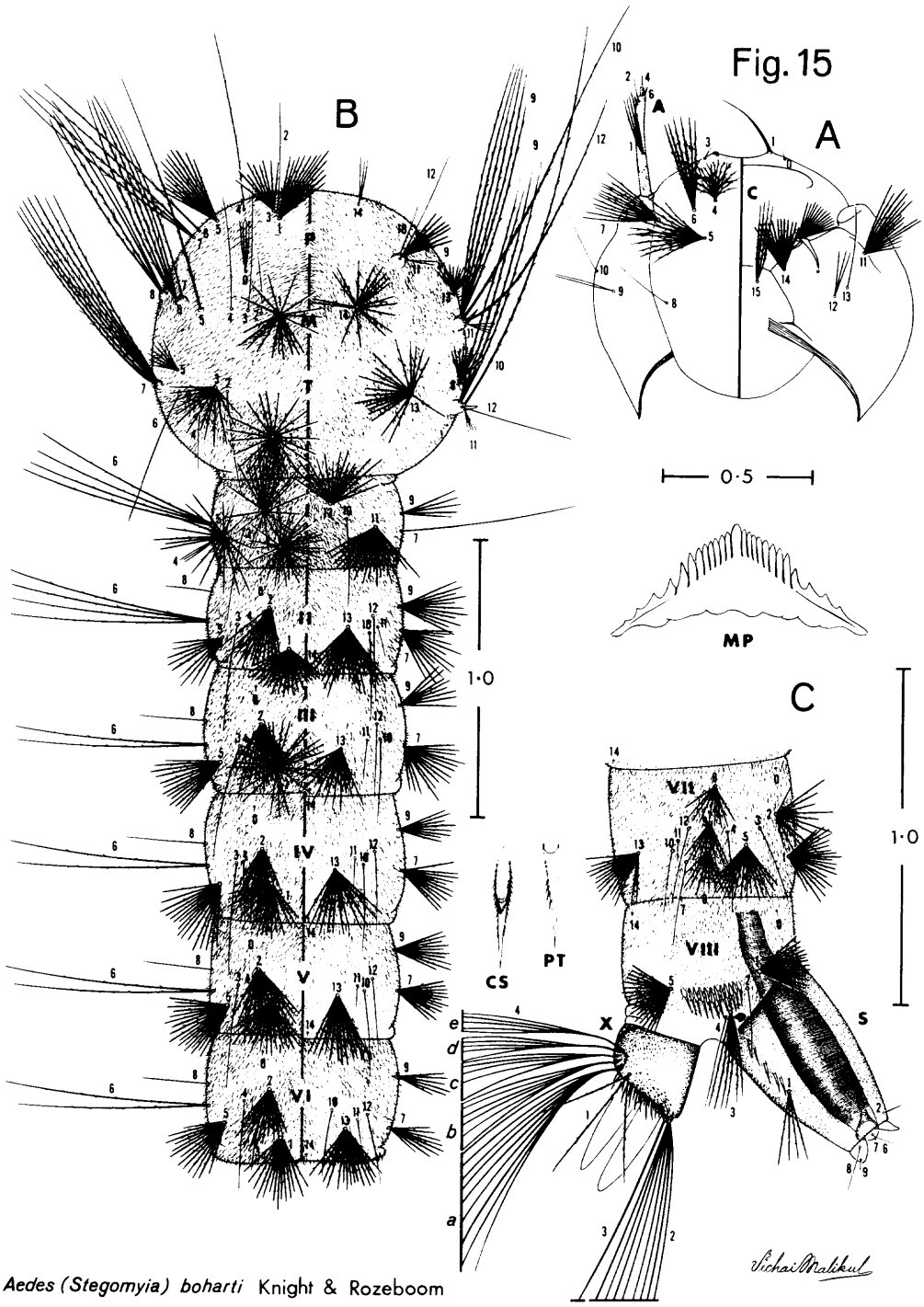
Fig. 13



Aedes (Stegomyia) bambusicola Knight & Rozeboom



Aedes (Stegomyia) boharti Knight & Rozeboom



Aedes (Stegomyia) boharti Knight & Rozeboom

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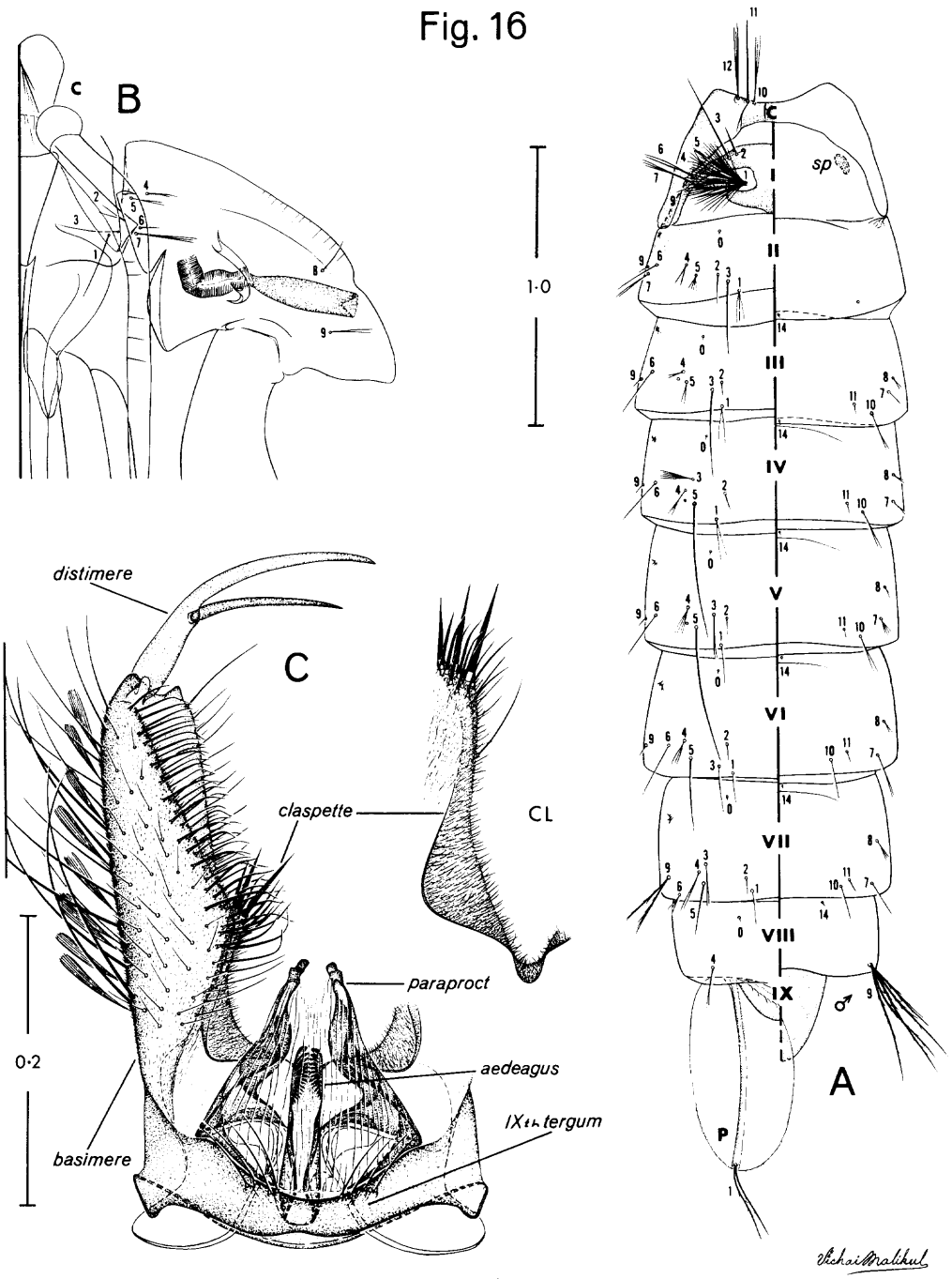
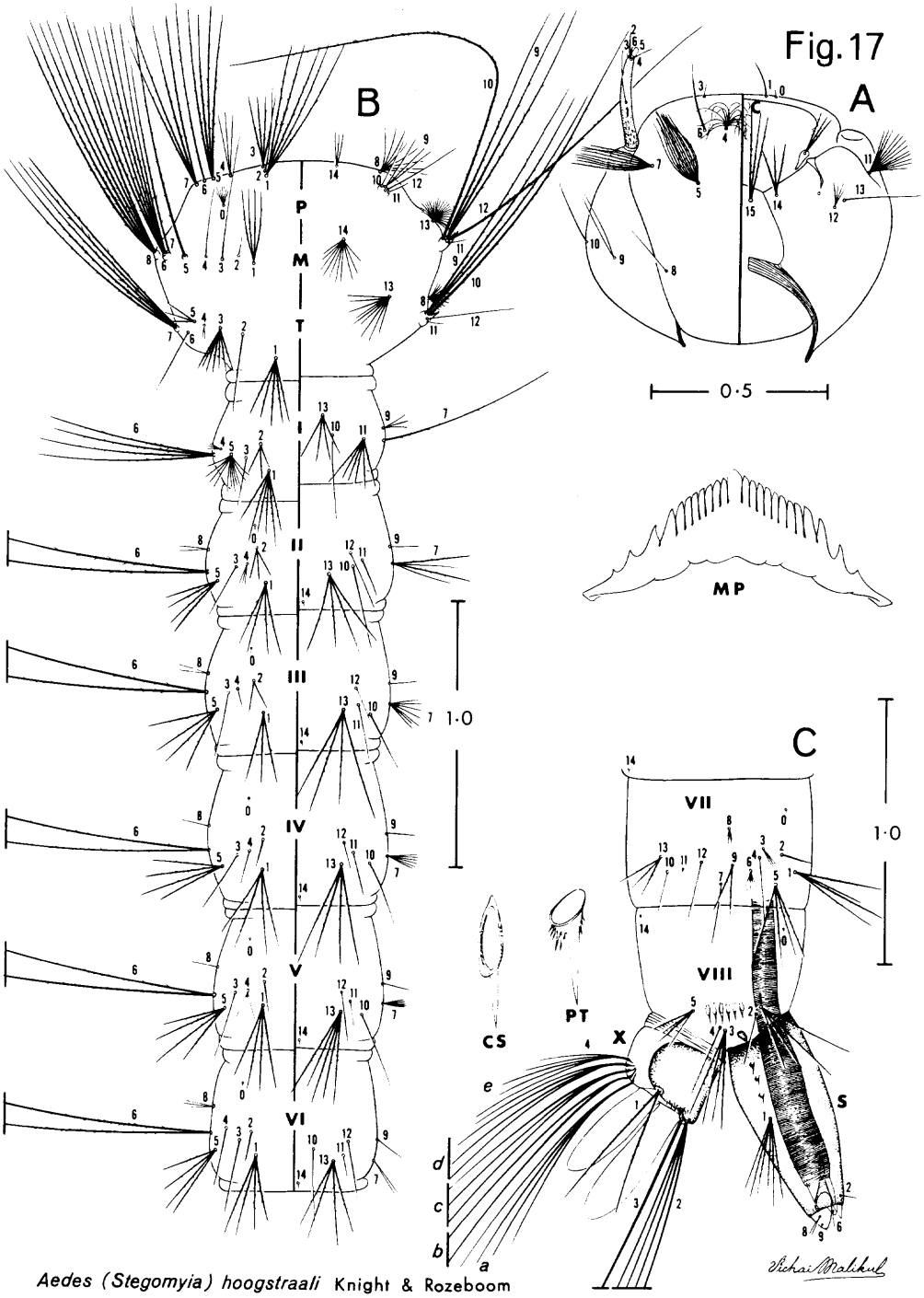
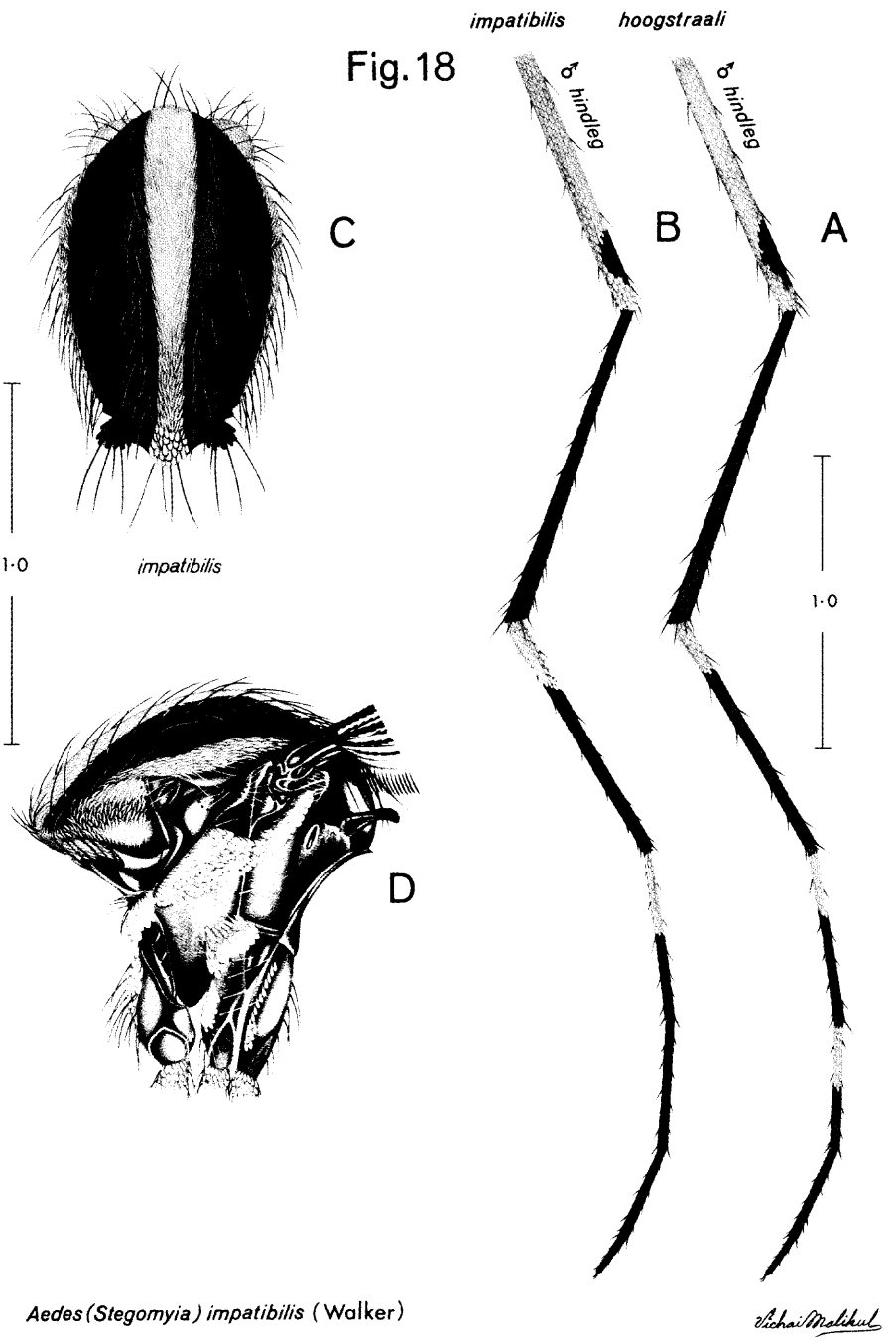


Aedes (Stegomyia) hoogstraali Knight & Rozeboom



Aedes (Stegomyia) hoogstraali Knight & Rozeboom



Aedes (Stegomyia) impatibilis (Walker)

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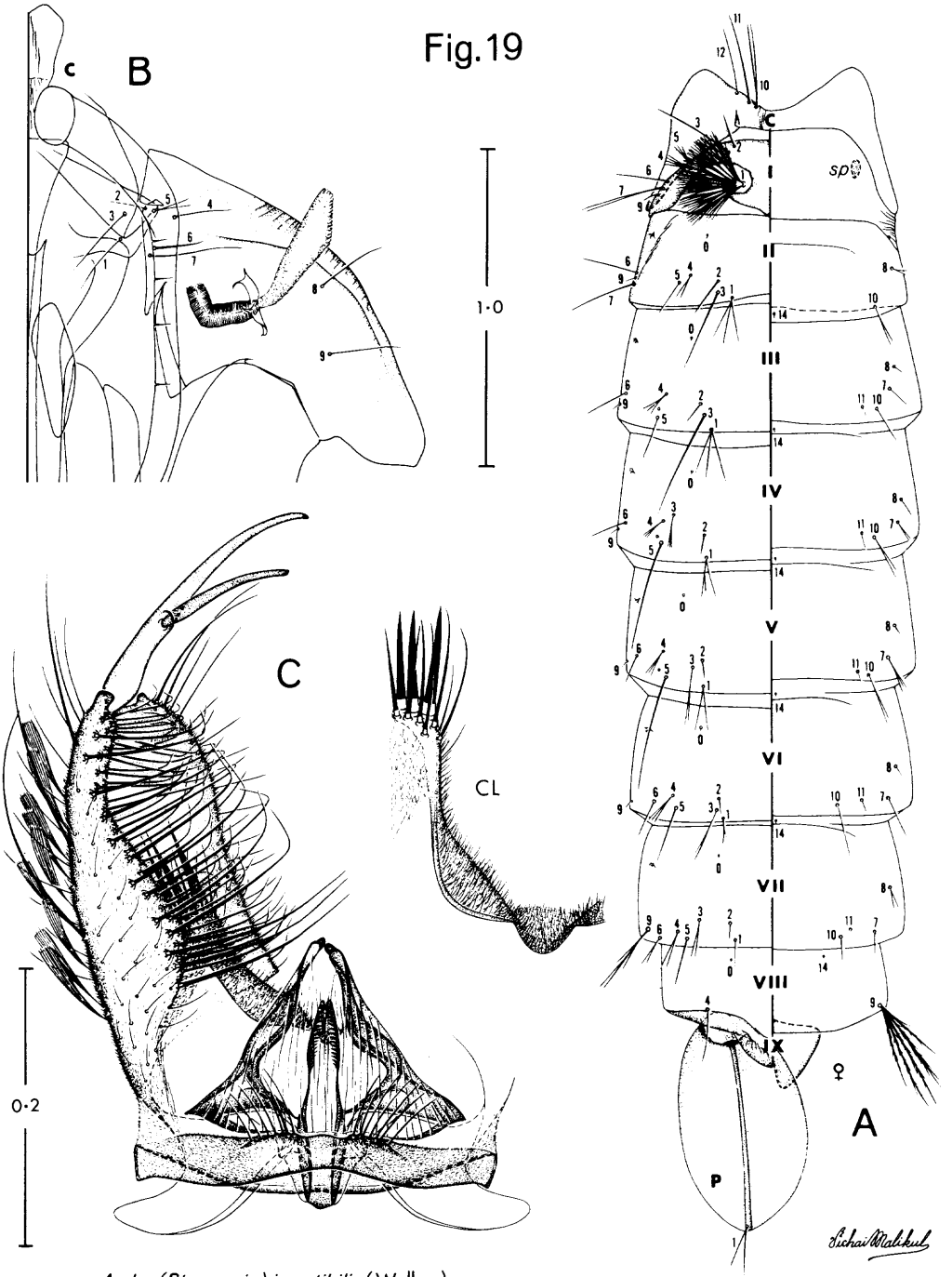
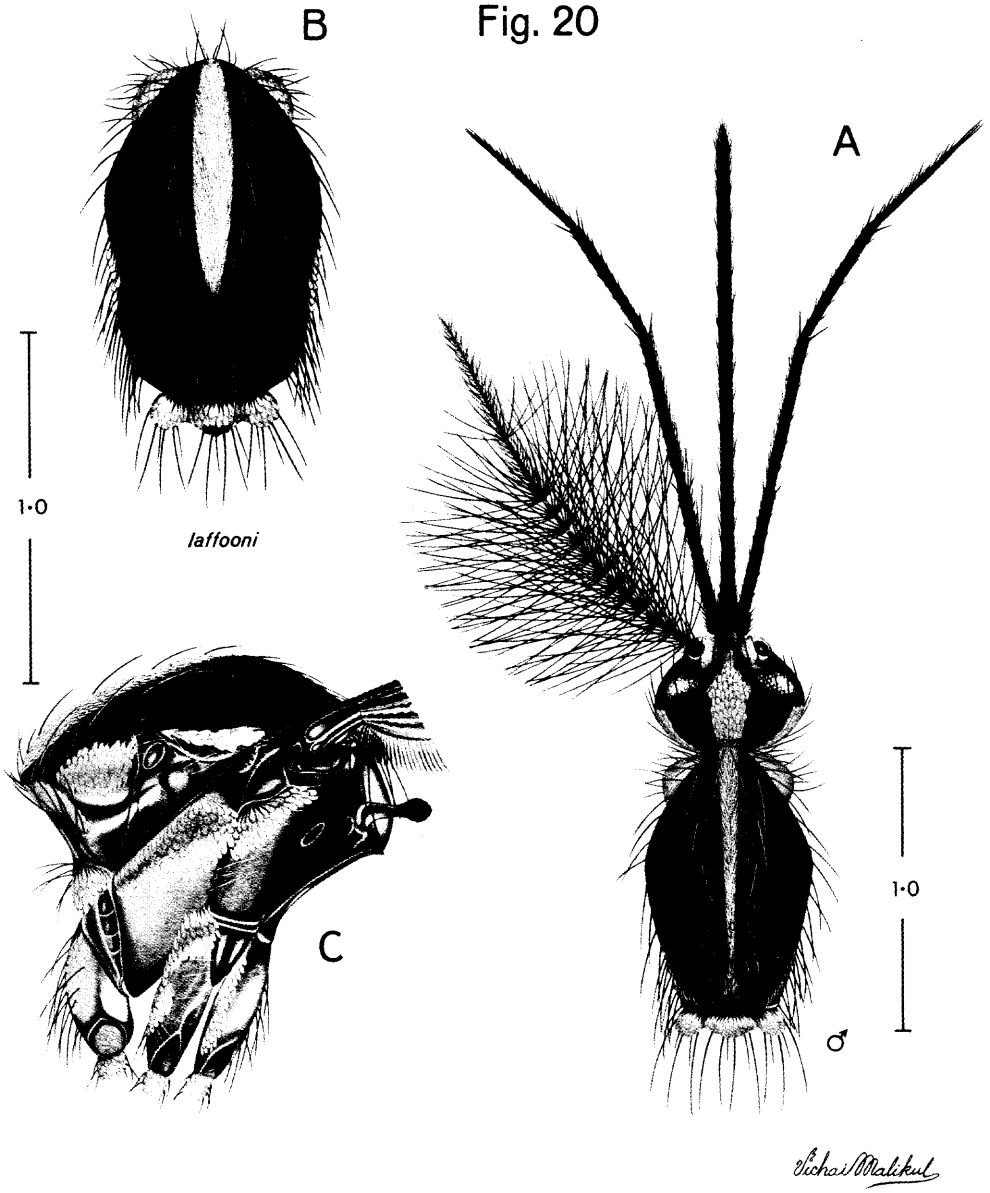


Aedes (Stegomyia) impatibilis (Walker)

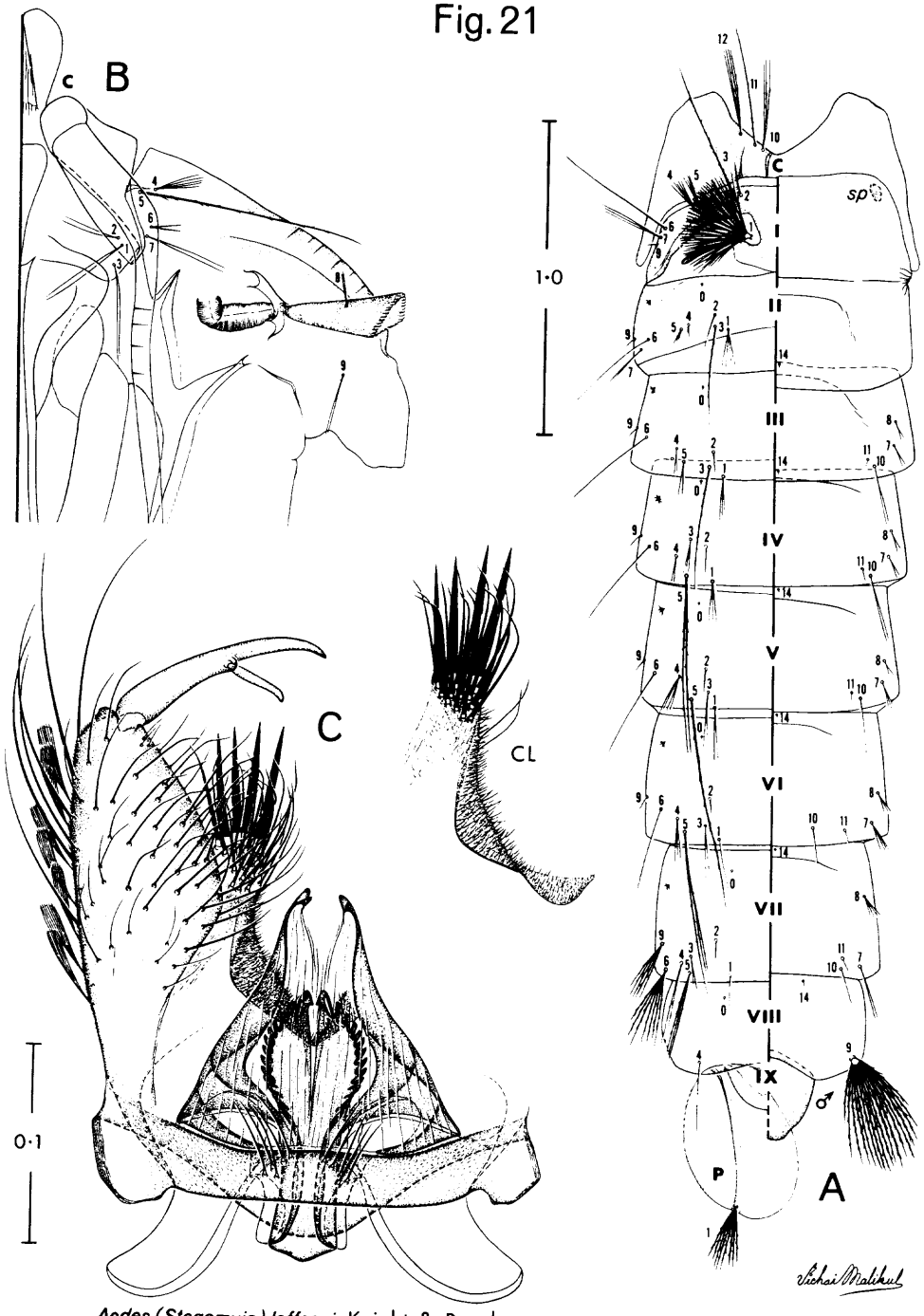
Fig. 20



Aedes (Stegomyia) laffooni Knight & Rozeboom

Aedes (Stegomyia) bambusicola Knight & Rozeboom

Fig. 21



Aedes (Stegomyia) laffooni Knight & Rozeboom

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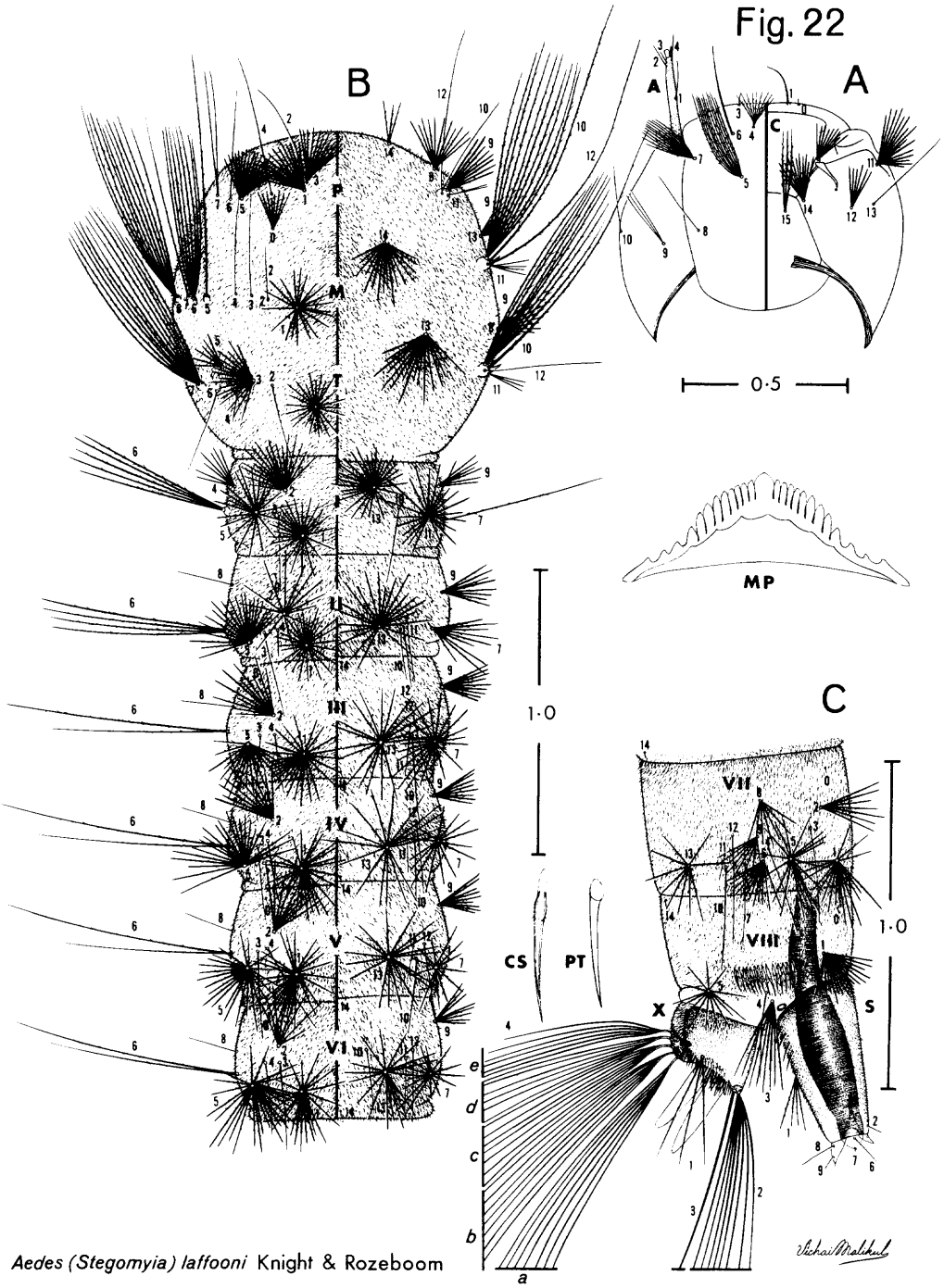
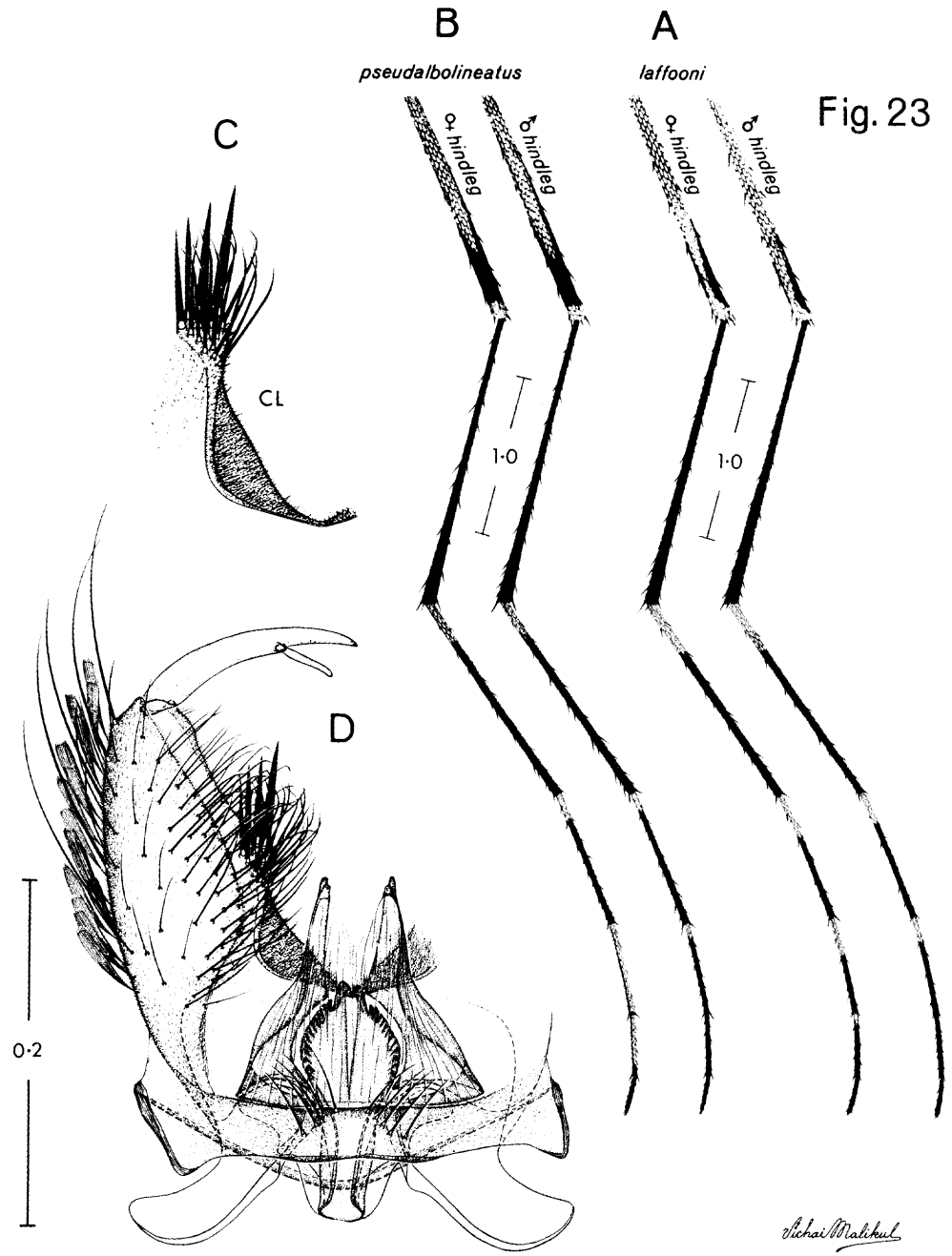


Aedes (Stegomyia) laffooni Knight & Rozeboom



Aedes (Stegomyia) pseudalbolineatus Brug

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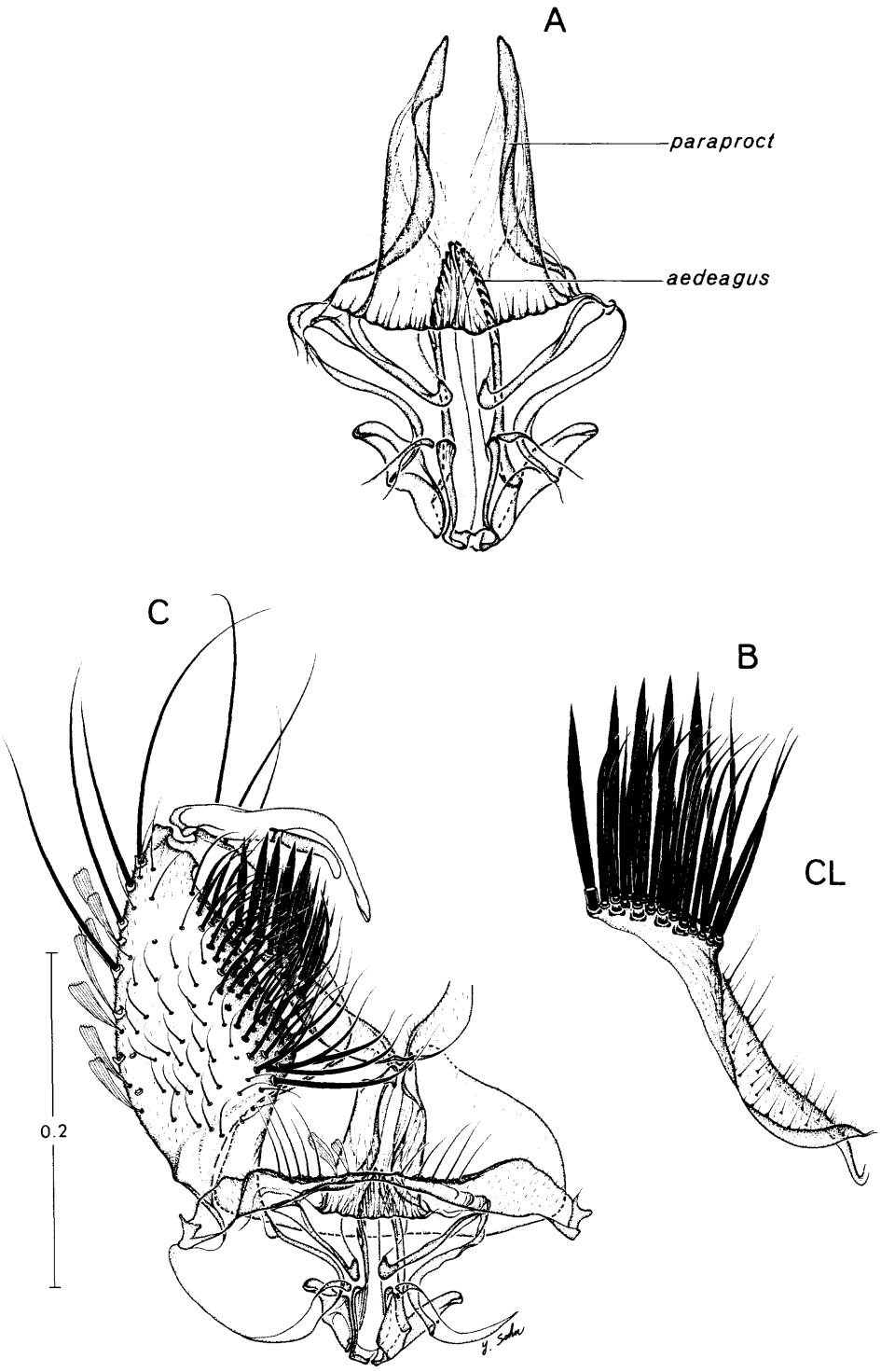

Aedes (Stegomyia) platylepidus Knight & Hull

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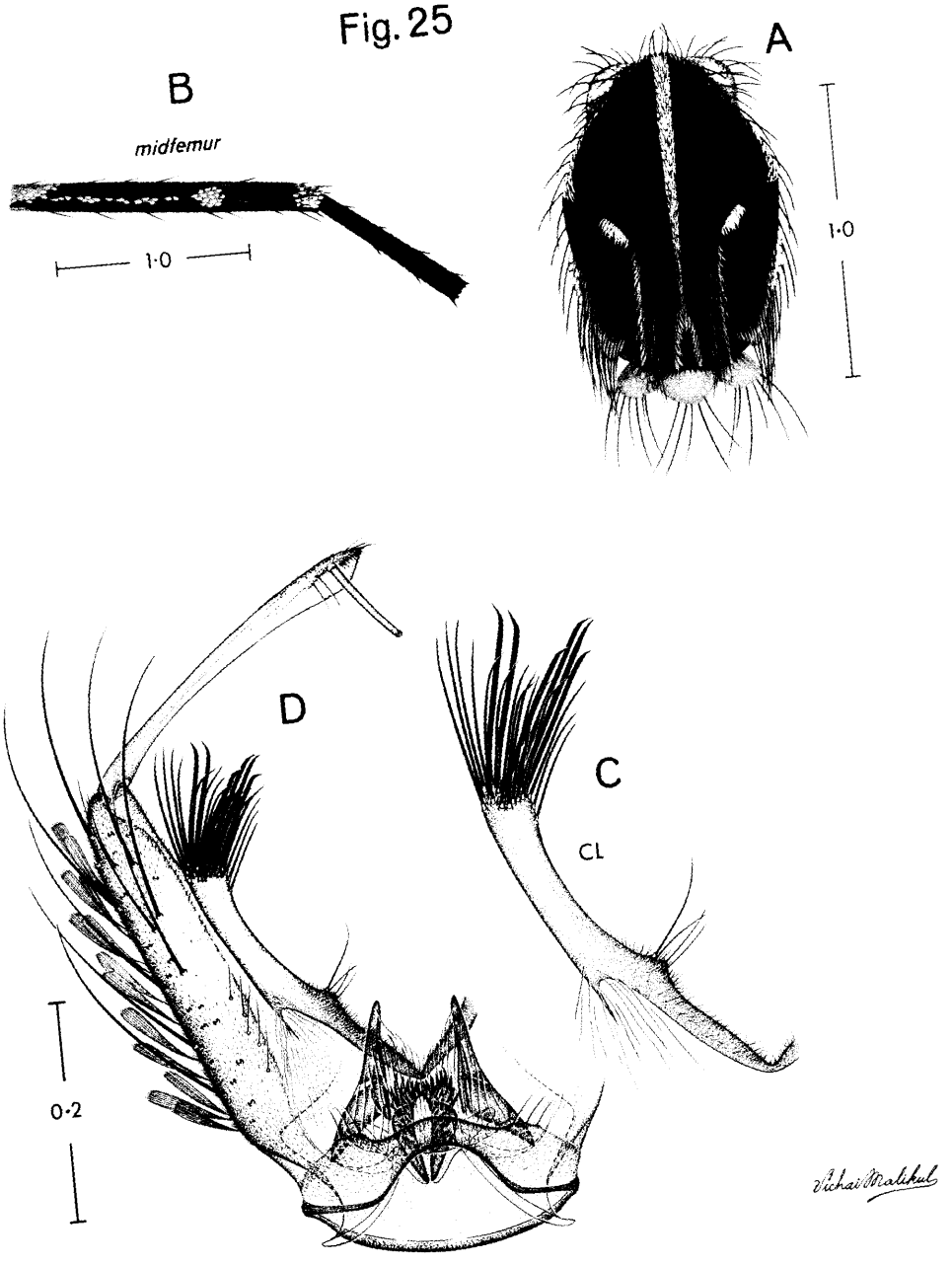

Aedes (Stegomyia) unilineatus (Theobald)

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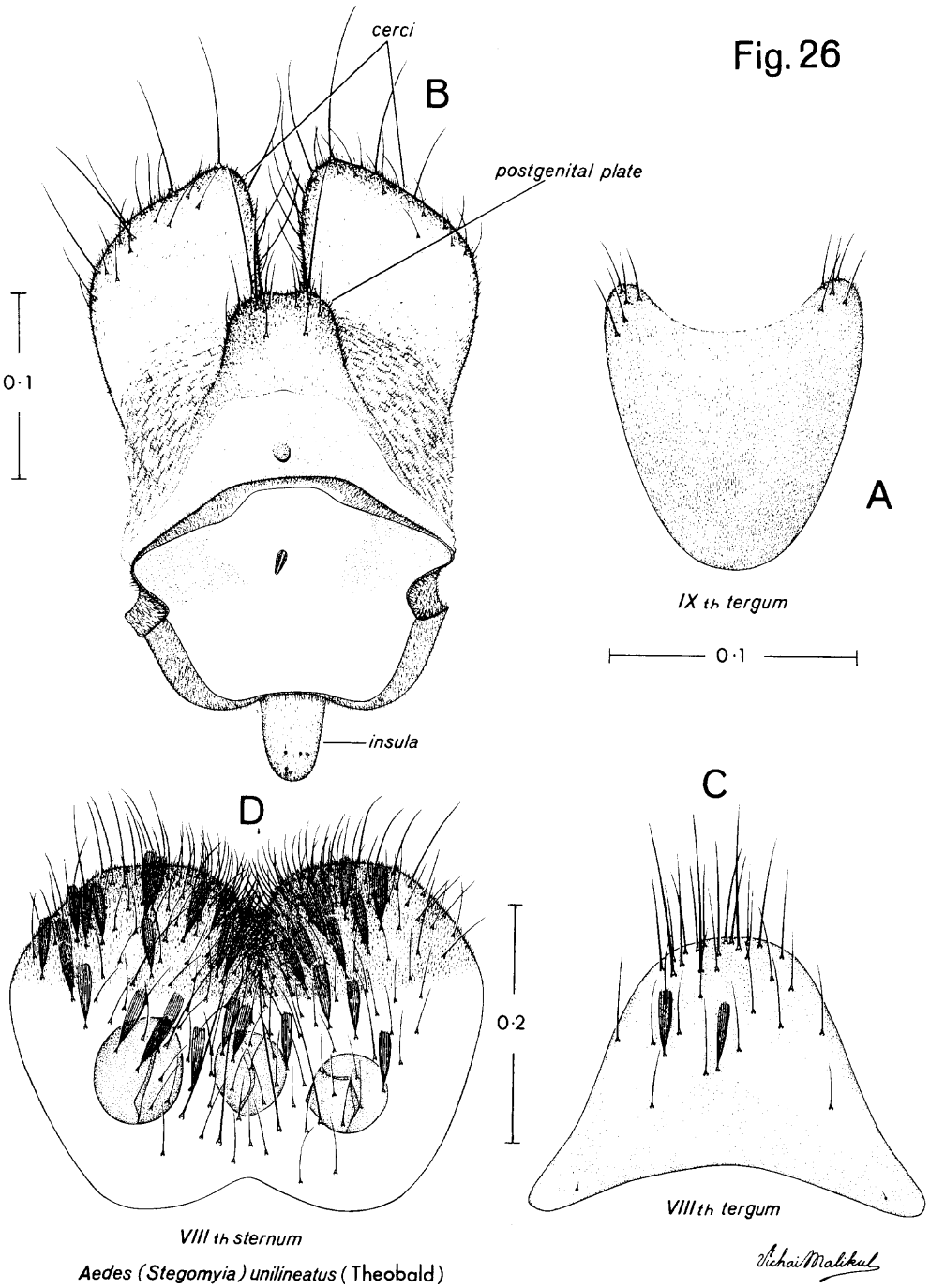

Aedes (Stegomyia) unilineatus (Theobald)

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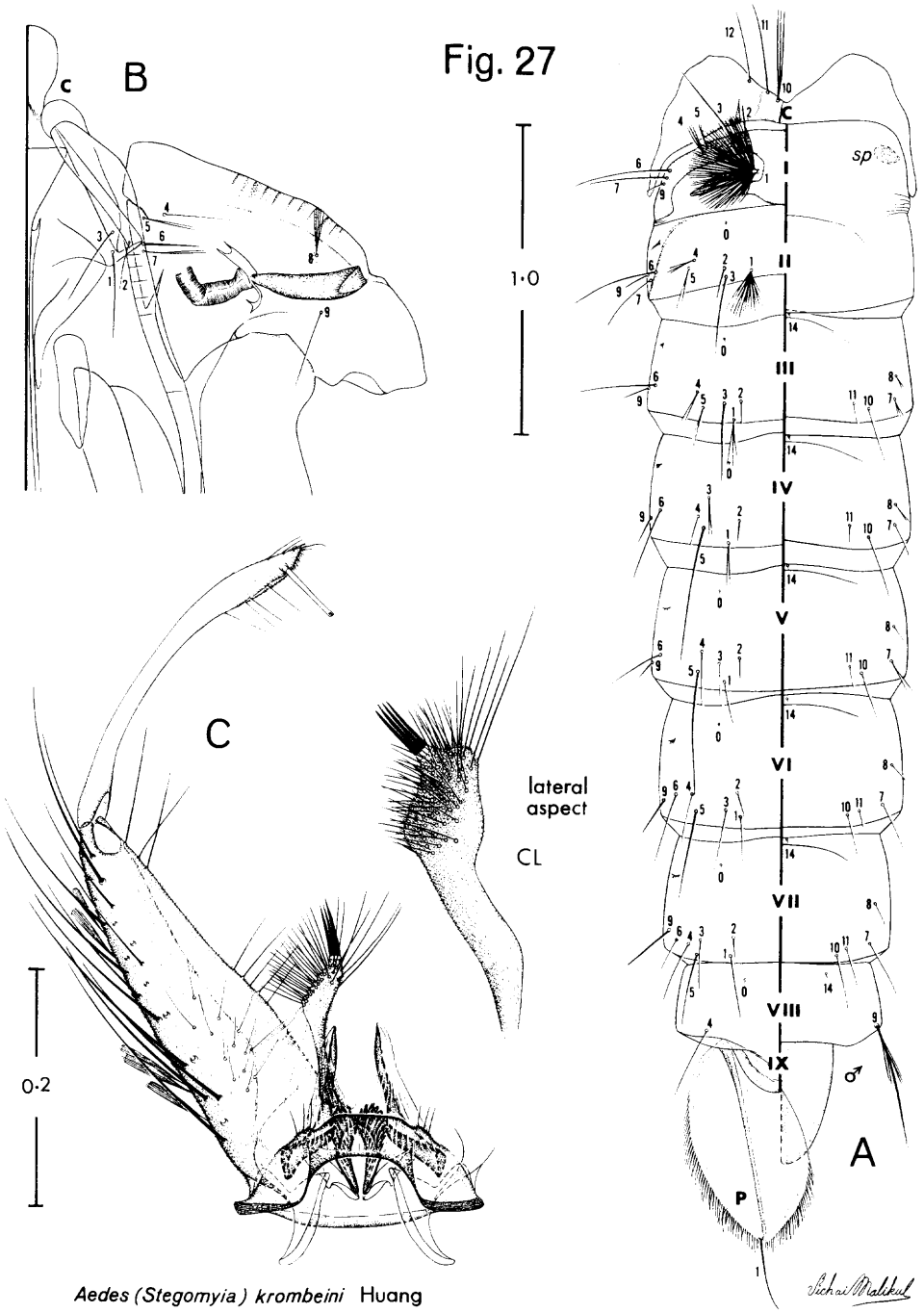
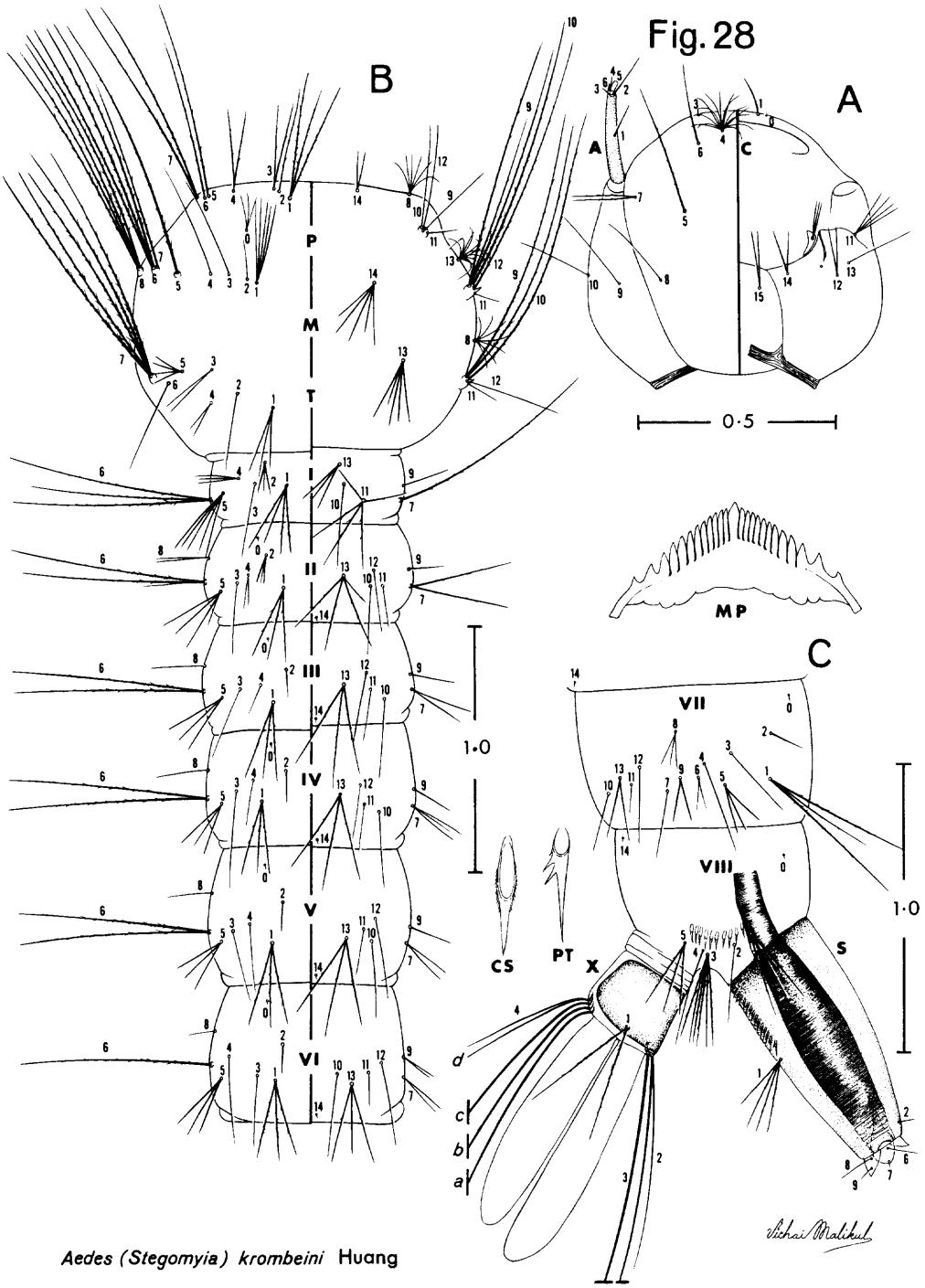
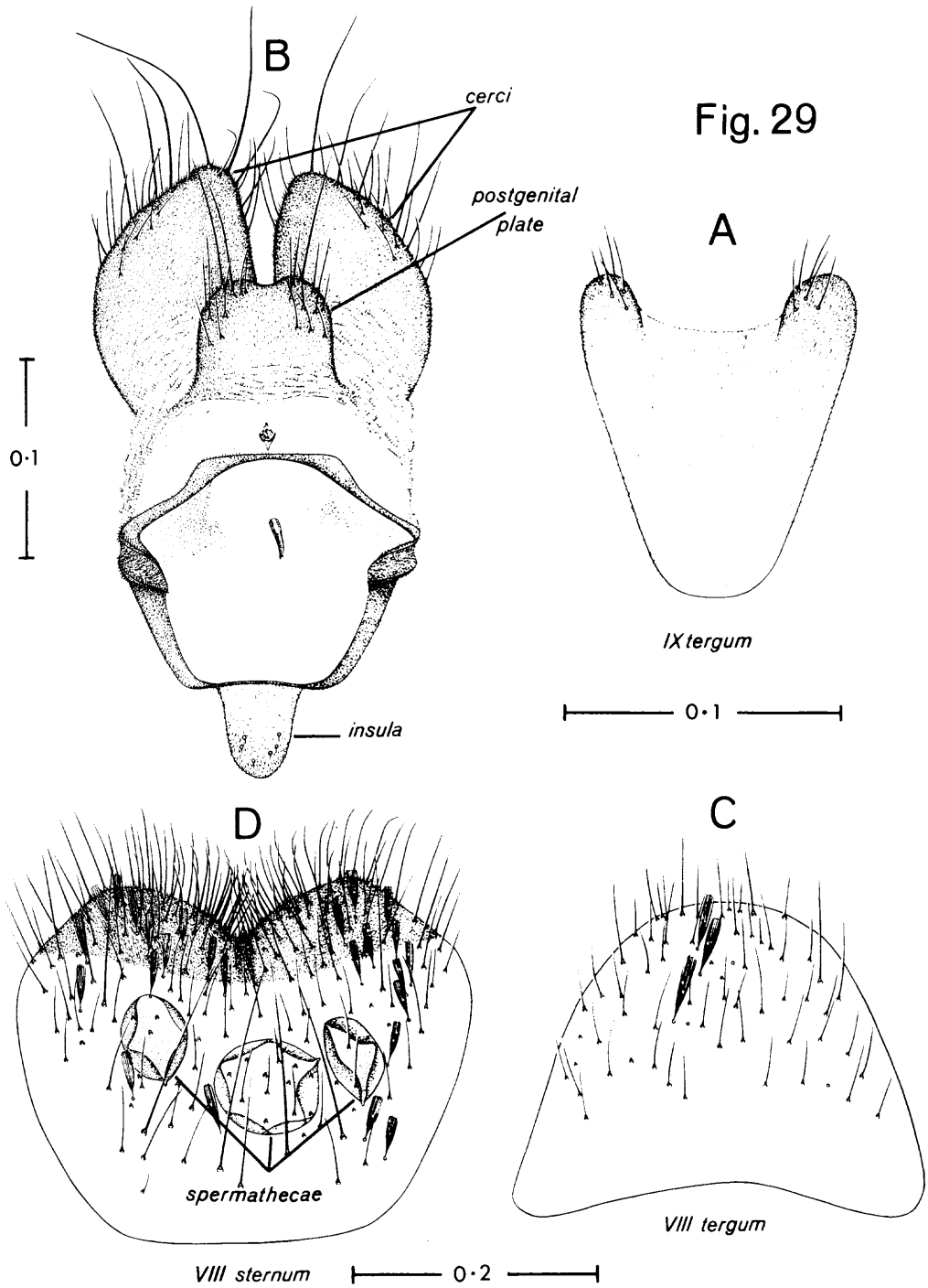


Aedes (Stegomyia) krombeini Huang



Aedes (Stegomyia) krombeini Huang



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Aedes (Stegomyia) krombeini Huang

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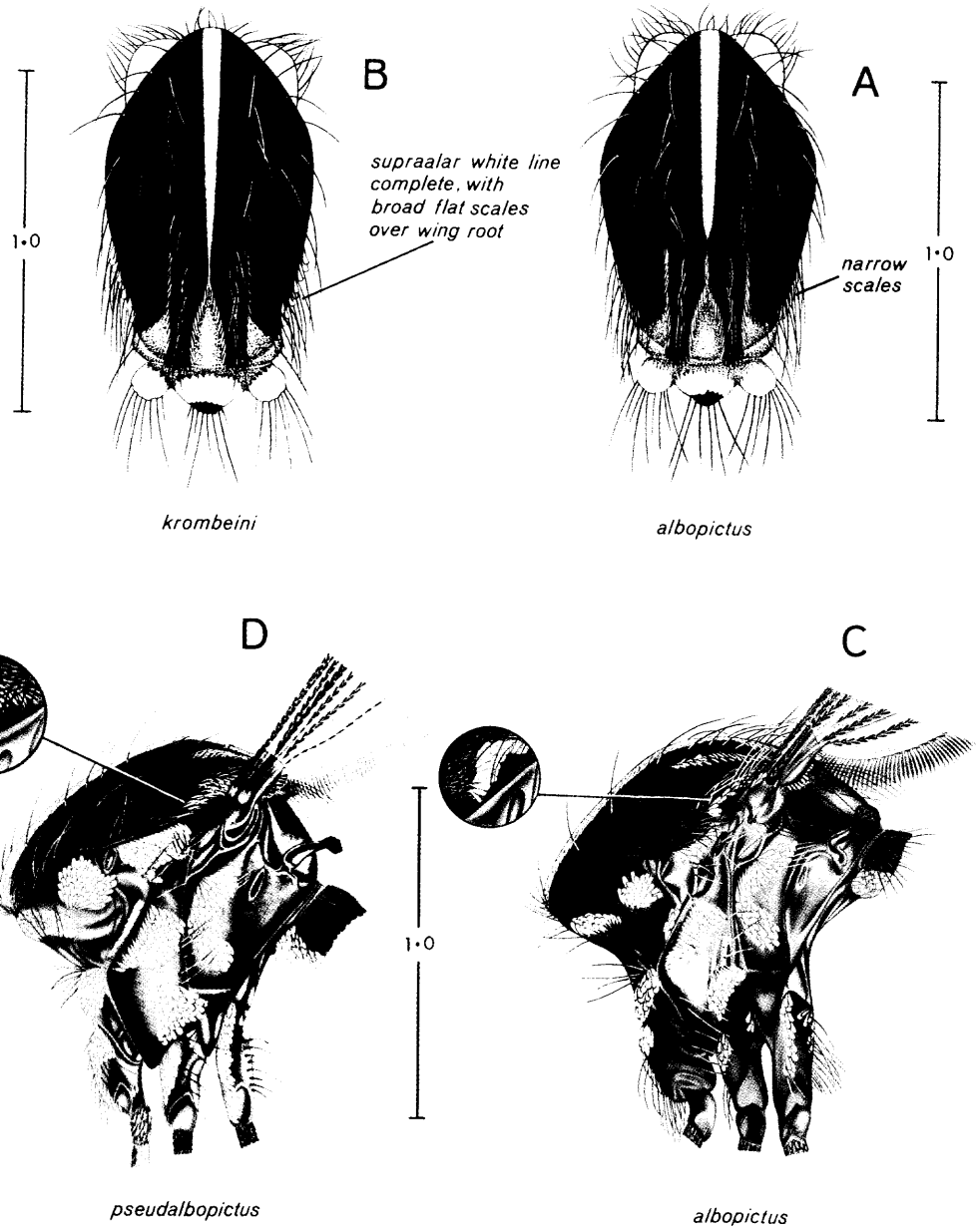

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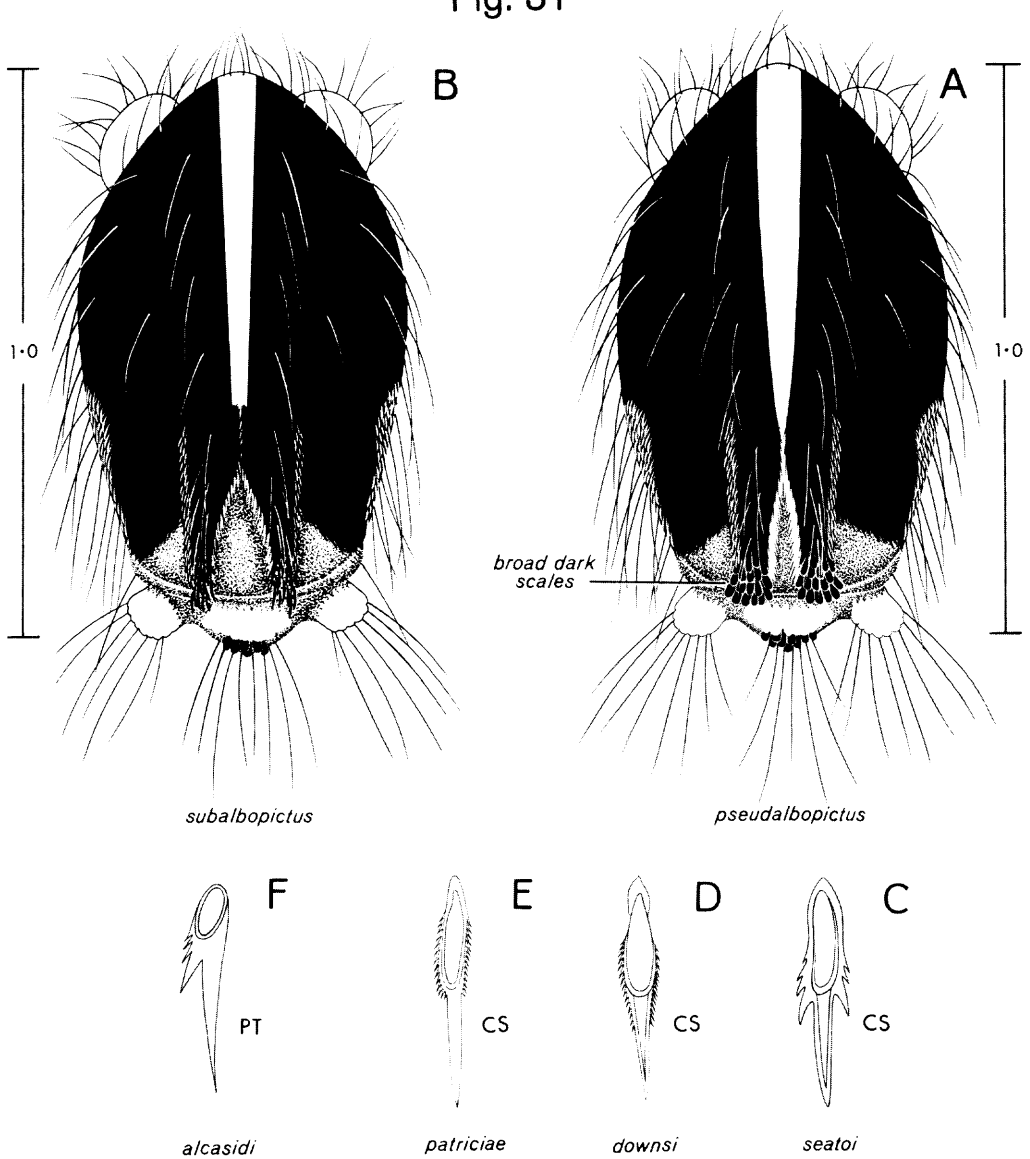

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