

First Description of the Immature Stages of *Aedes (Verrallina) pseudomediofasciatus* and *Ae. (Ver.) yerburyi* (Diptera: Culicidae)

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ABSTRACT. Pupae and fourth stage larvae of *Aedes pseudomediofasciatus* (Theobald) and *Ae. yerburyi* Edwards are described and illustrated for the first time. Biometrics of the 2 species are given. India is reported as a new country record for *Ae. yerburyi*.

INTRODUCTION

Since publication of a review of the subgenus *Verrallina* Theobald in the genus *Aedes* Meigen by Reinert (1974), immature stages of 2 species became available. Pupae and fourth stage larvae of *Ae. pseudomediofasciatus* and *Ae. yerburyi* are described and illustrated below for the first time. This treatment is based on whole larvae and associated immature skins from individually reared adults. Specimens from Sri Lanka were obtained during a field collecting trip in 1975 jointly sponsored by the Smithsonian Institution projects "Biosystematic Studies of the Insects of Ceylon" and the "Medical Entomology Project" (MEP). Indian specimens were obtained through the MEP.

Nomenclature and chaetotaxy used follow Knight (1971), Knight and Laffoon (1971), Laffoon and Knight (1973), and Harbach and Knight (1977). In pupal and larval descriptions the range of setal branching is followed by the modal value in parentheses.

Aedes (Verrallina) pseudomediofasciatus (Theobald)

PUPA (Fig. 1). Chaetotaxy and measurements based on 10 pupal skins which have associated adult specimens. *Cephalothorax*. Ocular plate with moderately well developed cuticular facets. Setae 1,4,7-CT with 2-3(2) branches; 2,9-CT single to 3(2) branched; 3-CT single to 2(2) branched; 5,8-CT with 2-4(3) branches; 6-CT single. *Metanotal plate*. Seta 10-CT with 5-12(6) branches; 11-CT single; 12-CT with 2-3(3) branches. *Respiratory trumpet*. Moderately pigmented; index 3.46-4.15, mean 3.69. *Abdomen*. Terga nearly all uniformly lightly pigmented. Seta 1-I with 15-38 (28) branches; 2,6,9-11-I single; 3-I with 2-4 (2) branches; 4-I with 5-9(6) branches; 5-I with 4-8(5) branches; 7-I with 2-3(2) branches; 0,2,3,9-II single; 1-II with 14-30(23) branches; 4-II with 3-7(4) branches; 5-II with 2-4(3) branches; 6-II single or 2(1) branched; 7-II single to 5(3) branched; 0,2,3,9,11,14-III single; 1-III with 3-6(5) branches; 4-III single to 3(2) branched; 5-III with 3-6(3) branches; 6-III single to 3(1) branched; 7,8-III with 2-4(3) branches; 10-III with 2-3(3) branches; 0,2,9,11,14-IV single; 1-IV with 2-5(3) branches; 3-IV with 3-5(4) branches; 4-IV single or

2(2) branched; 5-IV with 2-3(2) branches; 6,8 -IV single to 3(1) branched; 7-IV single to 3(2) branched; 10-IV with 2-3(3) branches; 0,2,9,11,14-V single; 1,6, 10-V single or 2(1) branched; 3-V with 2-3(3) branches; 4-V with 2-5(4) branches; 5-V single or 2(2) branched; 7-V single to 4(3) branched; 8-V single to 3(1) branched; 0,6,7,9,11,14-VI single; 1,2,10-VI single or 2(1) branched; 3,5-VI single or 2(2) branched; 4-VI single to 5(3) branched; 8-VI with 2-3(2) branches; 0,2,9,11,14-VII single; 1,7,10-VII single or 2(1) branched; 3-VII with 2-4(3) branches; 4-VII single or 2(2) branched; 5-VII single to 3(1) branched; 6,8-VII single to 3(2) branched; 0,14-VIII single; 4,9 -VIII single to 3(2) branched.

Paddle. Ovoid; minute serrations on most of basal 0.64-0.69 of outer margin; minute spicules on apical 0.31-0.36 of outer and apical 0.21-0.30 of inner margins; seta 1-P single; index 1.35-1.57, mean 1.45.

LARVA (Fig. 2). Chaetotaxy and measurements based on 6 whole larvae and 4 larval skins with associated adult specimens. *Head.* Lightly pigmented; setae 0,1,3,18,20-C single; 4-C with 7-12(8) branches; 5-C with 5-9(6) branches; 6-C with 3-6(5) branches; 7-C with 9-17(10) branches; 8-C single to 3(2) branched; 9-C single to 5(3) branched; 10-C with 2-5(3) branches; 11-C with 4-7(4) branches; 12-C with 6-8(8) branches; 13-C with 2-4(2) branches; 14-C single or 2(1) branched; 15-C with 4-6(5) branches; 5,6-C each with branches approximately equal in length; 5-7-C heavily pigmented, stout and barbed; dorsosentum heavily pigmented, with 35-39(37) teeth; ventromedian cervical sclerite moderately pigmented. *Antenna.* Moderately long; light to moderately pigmented; with a number of small spicules over most of shaft; seta 1-A with 4-6(4) branches, attached 0.39-0.43 from base of shaft. *Thorax.* Seta 0-P with 14-26(21) branches; 1, 5,6,10,12-P single; 2,9,14-P with 2-3(2) branches; 3-P with 2-4(2) branches; 4-P with 2-4(3) branches; 7-P with 2-3(3) branches; 8-P single or 2(2) branched; 11-P with 4-6(4) branches; 1-M with 2-5(3) branches; 2-M single to 7(3) branched; 3,5,7,10-12-M single; 4-M with 4-7(5) branches; 6-M with 5-9(5) branches; 8-M with 6-9(6) branches; 9-M with 5-10(10) branches; 13-M with 11-23(12) branches; 14-M with 11-14(13) branches; 1-T with 4-5(4) branches; 2-T with 3-5(4) branches; 3-T with 10-18(16) branches; 4-T with 3-8(5) branches; 5,10-12-T single; 6-T with 2 branches; 7-T with 7-10(8) branches; 8-T with 10-20(18) branches; 9-T with 3 branches; 13-T with 10-16(13) branches. *Abdomen.* Seta 1-I single to 3(2) branched; 2,7-I single; 3-I with 5-10(7) branches; 4-I with 17-27(21) branches; 5-I with 3-6(5) branches; 6-I with 2 branches; 9-I with 2-5(2) branches; 10-I with 2-3(2) branches; 11-I single to 4(4) branched; 13-I single or 2(1) branched; 0,2,9,14-II single; 1-II with 3-6(4) branches; 3-II with 4-7(6) branches; 4-II with 6-16(14) branches; 5-II with 3-8(3) branches; 6-II with 2 branches; 7-II with 4-10(5) branches; 8-II with 2-3(2) branches; 10-II single or 2(2) branched; 11-II single to 4(3) branched; 12-II with 2-4(3) branches; 13-II with 5-22(11) branches; 0,2,6,8,9,14-III single; 1-III with 7-12(9) branches; 3-III with 3-5(4) branches; 4-III with 2-4(3) branches; 5-III with 2-5(2) branches; 7-III with 6-14(9) branches; 10-12-III with 2-3(2) branches; 13-III with 6-9(7) branches; 0,2,6,8,9,14-IV single; 1-IV with 6-10(8) branches; 3-IV with 3-5(4) branches; 4,10,12-IV with 2-3(2) branches; 5-IV single to 4(2) branched; 7-IV with 6-11(7) branches; 11-IV single to 3(2) branched; 13-IV with 4-7(5) branches; 0,2,6,8,9,14-V single; 1-V with 6-9(6) branches; 3-V with 3-5(3) branches; 4-V with 6-11(8) branches; 5-V single to 4(2) branched; 7-V with 7-12(10) branches; 10-V single or 2(2) branched; 11-V single to 3(2) branched; 12-V single or 2(1) branched; 13-V with 4-6(5) branches; 0,2,6,9,10,14-VI single;

1-VI with 4-8(6) branches; 3-VI with 3-5(4) branches; 4-VI with 4-6(5) branches; 5-VI with 2-4(4) branches; 7-VI with 3-5(3) branches; 8-VI with 3-6(4) branches; 11-VI with 2-3(3) branches; 12-VI with 2-4(3) branches; 13-VI with 14-20(20) branches; 0,2,14-VII single; 1-VII with 3-6(4) branches; 3-VII with 4-8(5) branches; 4-VII with 3-4(4) branches; 5-VII with 3-7(5) branches; 6-VII with 9-13 (11) branches; 7-VII with 2-4(3) branches; 8-VII with 6-11(11) branches; 9-VII single or 2(2) branched; 10-VII with 3-5(3) branches; 11-VII single to 3(2) branched; 12-VII with 3-5(4) branches; 13-VII with 5-10(7) branches; 0,14-VIII single; 1-VIII with 4-6(5) branches; 2-VIII with 2-3(2) branches; 3-VIII with 6-9(6) branches; 4-VIII with 2 branches; 5-VIII with 6-10(9) branches; VIII with comb composed of 9-12(10) scales arranged in a single curved row, each scale with a moderately long median spine and with short denticles on latero-basal areas, moderately pigmented; seta 1-X moderately long, single, attached near middle of posterior area of saddle; 2-X moderately long, 6-10(9) branched; 3-X very long, single; ventral brush with 12-13 setae, all multiple branched, 10-11 setae on grid and 1-3 precratal shorter ones; saddle lightly pigmented, incompletely rings segment X, acus absent; 4 anal papillae, long and narrow. *Siphon*. Lightly pigmented, moderately long; index 2.86-3.32, mean 3.12; acus well developed; pecten on basal 0.56-0.61 of siphon, composed of 10-14(12) teeth, apical 2-3 longer, without denticles and wider spaced than remainder of teeth, basal teeth long, slender and with 1-3(usually only one) denticles on ventro-basal area; seta 1-S short, with 2-5(4) branches, base attached on basal 0.70-0.73 of siphon distad of last pecten tooth; 2,6,7,9-S single; 8-S with 2-4(3) branches.

DISTRIBUTION. The following immature specimens and associated adults were examined: 102 ♀pl, 21 ♀p, 1 ♀l, 22 ♂pl, 41 ♂p, 2 ♂l and 12 L.

INDIA. *Madras*, Nilgiri Hills, Kallar; 1 ♂pl, 1 ♂p (23 May 1974, B.N. Mohan), 6 ♀pl, 1 ♀p (17 September 1974, B.N. Mohan), 1 ♀pl (11 October 1974, B.N. Mohan), 14 ♀pl, 5 ♀p, 1 ♀l, 1 ♂pl (29 July 1975, B.N. Mohan).

SRI LANKA. *Central*, Kandy District, Udawattekele; 6 ♀pl, 5 ♀p, 5 ♂pl, 7 ♂p, 1 ♂l (22 June 1975, E.L. Peyton and Y-M. Huang), Matale District, Matale; 1 ♂p (26 June 1975, E.L. Peyton and Y-M. Huang). *North Western*, Puttalam District, Tabbowa; 4L (27 July 1975, E.L. Peyton and Y-M. Huang). *Sabaragamawa*, Vaddagala, Sinharaja Forest Reserve; 74 ♀pl, 7 ♀p, 15 ♂pl, 31 ♂p, 1 ♂l, 8L (17 July 1975, E.L. Peyton and Y-M. Huang). *Southern*, Galle District, Kanneliya, Sinharaja Forest; 1 ♀pl, 3 ♀p, 1 ♂p (14 July 1975, P.A. Panawatta).

Distribution from the literature.

INDIA. (Edwards 1922, 1932); Nilgiri Hills (Barraud 1928); *Bombay Deccan*, Kambarganvi, Dharwar District, *Madras*, Guindy, Nilgiri Hills, Kallar (Barraud 1934); Nilgiri Hills, Coimbatore District, Kallar, Mettupalaiyam (Rahman et al. 1973).

SRI LANKA. (Carter 1950; Chow et al. 1954); Peradenya, Hakgala (Theobald 1910); Colombo (James 1914); Peradenya, Hakgala (Barraud 1928); Colombo, Marble, Kurunegalla District (Barraud 1934); *North Western* (Carter 1948); Ganemulla, Ramkukkana, Kurunegala, Mantivu, Badulla, Udugama, Akaragama, Godakawela, Yakka-lamulla, Labuduwa, Pannala, Kadugannawa, Matale, Avissawella, Wettagama (Wijesundara 1951); *North Central*, Anuradhapura District, Hunuwilagama, Wilpattu, *Northern*, Vavuniya District, Parayanalankulam, *Sabaragamawa*, Ratnapura District, Uggalkaltota (Harrison et al. 1974).

DISCUSSION. The pupa and larva of *Ae. pseudomediofasciatus* unquestionably belong to Section A, Series III as previously interpreted (Reinert 1974). The pupae of *pseudomediofasciatus* are similar to those of other members of *Verrallina* but can usually be separated by the combination of seta 8-CT with 2-4 branches, 1-II with 14-30 branches, 4-III single to 3 branched, and 1-V, VI single or 2 branched.

The larvae of *Ae. pseudomediofasciatus* can be distinguished from those of related species by a combination of the following features: seta 4-C with 7-12 branches; 5-C with 5-9 branches, all approximately equal in length; head capsule and siphon lightly to moderately pigmented; 6-I with 2 branches; 7-I single; 1-II with 3-6 branches; 1-III with 7-12 branches; 3-IV with 3-5 branches; 4-VIII with 2 branches; and pecten composed of 10-14 teeth.

The above descriptions and illustrations of the pupa and larva are the first for *pseudomediofasciatus*. Senior-White (1927) illustrated the head and terminal segments of a larva which he determined to be *pseudomediofasciatus*. As Senior-White's illustration differs in a number of important features from the larval specimens with reared associated adults reported here, I believe his specimen was a species other than *pseudomediofasciatus*. The following is a list of characters illustrated by Senior-White (1927: Fig. 28) and a comparison of those reported here in parentheses: seta 1-A with 3 branches (4-6 branched); antenna with spicules on lateral margin (numerous spicules over most of shaft); 1-C single (single); 4-C with 3 branches (7-12 branched); 5-C with 4 branches (5-9 branched); 6-C with 4 branches (3-6 branched); 7-C with 4-5 branches (9-17 branched); 8-C with 2 branches (single to 3 branched); 9-C with 2 branches (single to 5 branched); 10-C with 2 branches (2-5 branched); 1-VIII with 5 branches (4-6 branched); 2-VIII with 2 branches (2-3 branched); 3-VIII with 6 branches (6-9 branched); 4-VIII single (2 branched); 5-VIII with 8 branches (6-10 branched); comb scale with denticles to apex (denticles only on basal area); comb composed of 8 scales (9-12 scales); 1-S with 4 branches (2-5 branched); pecten composed of 11 teeth (10-14 teeth); 1-X single (single); 2-X with 8 branches (6-10 branched); 3-X single (single); and ventral brush with tufts 2-3 branched (tufts multiple branched). It is noted that Senior-White's larval figure differs in the following significant features: setae 1-A, 4, 5, 7-C, 4-VIII; number and form of comb scales; and development of the ventral brush.

Aedes pseudomediofasciatus was first described from the adult male by Theobald (1910). He also illustrated the wing and male genitalia. Edwards (1917) illustrated the male genitalia. Barraud (1928, 1934) briefly described the adult and illustrated the male and female genitalia. Reinert (1974) presented a more detailed description of the adults and illustrated the female genitalia and male and female posttarsi.

BIONOMICS. Immatures in Sri Lanka were collected during June and July from colored or turbid, fresh, temporary, unmoving water, usually with leaves or grass, in small flood pools (twice), large shallow flood pool (once), large shallow ground pools (4 times), a wheel rut in a large ground pool (once), and a small animal footprint in a seepage area, located in partially shaded areas (twice in an unshaded area) of secondary rain forests (once in a cultivated field with secondary scrub), in mountainous terrain (once in a plain), and at elevations from 30-915 m (usually between 600-610 m). In India, immatures were taken during May, July, September and October from clear or turbid, fresh, temporary, unmoving water in small ground pools located in arecanut palm plantations.

Rahman et al. (1973) reported the larval habitats of *pseudomediofasciatus* in India as water in grinding stones (with cavities 30 cm deep and 20 cm wide and containing household refuse), cement tanks (with decaying organic matter), irrigation or artificial water channels (edged with grass), arecanut beds (trees watered during dry season allowed 6-8 days standing water and contained decaying leaves and fruit). In Sri Lanka, Wajesundara (1951) records the immature habitats as borrow pits, coconut trenches, drains and depressions, and pools and swamps.

Aedes (Verrallina) yerburyi Edwards

PUPA (Fig. 3). Chaetotaxy and measurements based on 10 pupal skins which have associated adult specimens. *Cephalothorax*. Area between respiratory trumpets moderately to heavily pigmented; ocular plate with well developed cuticular facets; seta 1-CT with 2-5(4) branches; 2,3-CT with 2-3(2) branches; 4-CT with 3-6(5) branches; 5-CT with 5-8(5) branches; 6-CT single; 7-CT with 3-6(4) branches; 8-CT with 4-10(6) branches; 9-CT with 2-6(3) branches. *Metanotal plate*. Seta 10-CT with 6-11(7) branches; 11-CT single; 12-CT with 2-6(3) branches. *Respiratory trumpet*. Moderately to heavily pigmented; index 3.51-4.13, mean 3.87. *Abdomen*. Terga I-VI (occasionally VII) with dorsobasal areas moderately to heavily pigmented and with a few circular pale areas on median basal areas. Seta 1-I with 17-27(19) branches; 2,9-11-I single; 3-I with 3-6(4) branches; 4-I with 5-11(6) branches; 5-I with 3-6(5) branches; 6-I single to 3(2) branched; 7-I with 3-5(4) branches; 0,2,9-II single; 1-II with 7-22(12) branches; 3-II single or 2(1) branched; 4-II with 4-8(4) branches; 5-II with 5-7(7) branches; 6-II single to 3(2) branched; 7-II with 3-7(5) branches; 0,2,3,9,14-III single; 1-III with 5-13(8) branches; 4,5-III with 3-7(5) branches; 6-III with 2-6(5) branches; 7-III single to 5(4) branched; 8-III with 4-5(4) branches; 10-III with 2-5(3) branches; 11-III single or 2(1) branched; 0,2,9,14-IV single; 1-IV with 4-8(5) branches; 3-IV with 4-9(6) branches; 4,8-IV with 2-4(3) branches; 5,10-IV with 2-6(3) branches; 6-IV with 2-5(4) branches; 7-IV with 2-5(3) branches; 11-IV single or 2(1) branched; 0,2,9,14-V single; 1-V with 3-6(5) branches; 3-V with 3-5(4) branches; 4-V with 3-8(5) branches; 5,8-V with 2-4(3) branches; 6-V with 2-5(2) branches; 7-V with 3-7(4) branches; 10-V with 2-3(2) branches; 11-V single or 2(1) branched; 0,2,9,14-VI single; 1-VI with 3-7(6) branches; 3-VI with 2-4(3) branches; 4-VI with 3-7(5) branches; 5-VI with 2-4(4) branches; 6-VI single to 5(2) branched; 7-VI single to 4(2) branched; 8-VI with 2-5(4) branches; 10-VI single to 3(1) branched; 11-VI single to 3(2) branched; 0,2,14-VII single; 1-VII with 2-6(5) branches; 3-VII with 4-7(5) branches; 4,6-VII with 2-5(4) branches; 5-VII with 2-5(3) branches, 7,11-VII single to 3(2) branched; 8-VII with 3-5(3) branches; 9-VII single or 2(1) branched; 10-VII with 2-4(2) branches; 0,14-VIII single; 4-VIII with 2-4(3) branches; 9-VIII single or 2(1) branched. *Paddle*. Ovoid; well developed serrations on most of basal 0.79-0.82 of outer margin; minute spicules on apical 0.18-0.21 of outer and apical 0.11-0.20 of inner margins; seta 1-P single; index 1.40-1.58, mean 1.49.

LARVA (Fig. 4). Chaetotaxy and measurements based on 10 larval skins with associated adult specimens. *Head*. Heavily pigmented with pattern of lightly pigmented areas; patch of small spicules on compound eye; setae 0,1,3,14,18,20-C single; 4-C with 4-8(5) branches; 5-C with 3 branches, one branch longer than others; 6-C with 2-3(2) branches, one branch longer than others; 7-C with 7-11(8) branches; 8-C with 2-4(3) branches; 9-C with 3-7(4)

branches; 10-C with 2-5(2) branches; 11-C with 3-6(4) branches; 12-C with 3-5(5) branches; 13-C with 3-5(4) branches; 15-C with 3-4(3) branches; 5-7-C heavily pigmented, stout and barbed; dorsomentum heavily pigmented, with 36-42(39) teeth; ventromedian cervical sclerite heavily pigmented. *Antenna*. Moderately long; moderately pigmented; with a number of small to well developed spicules over most of shaft; seta 1-A with 4-6(4) branches, flattened and barbed, attached 0.34-0.40 from base of shaft. *Thorax*. Seta 0-P with 6-12(12) branches; 1-P single to 3(2) branched; 2-P with 2-4(2) branches; 3-P with 2-3(3) branches; 4-P with 3-5(3) branches; 5,10,12-P single; 6-P single or 2(1) branched; 7,9,14-P with 2-3(2) branches; 8-P with 2 branches; 11-P with 3-6(4) branches; 1-M with 3-6(5) branches; 2-M with 3-6(4) branches; 3,5,7,10-12-M single; 4-M with 5-8(6) branches; 6,8-M with 5-8(7) branches; 9-M with 6-10(7) branches; 13-M with 14-26(16) branches; 14-M with 8-12(8) branches; 1-T with 2-8(3) branches; 2-T with 3-7(4) branches; 3-T with 7-13(8) branches; 4-T with 3-6(4) branches; 5,11,12-T single or 2(1) branched; 6-T with 2-4(3) branches; 7-T with 8-11(9) branches; 8-T with 14-17(14) branches; 9-T with 2-3(2) branches; 13-T with 9-15(11) branches. *Abdomen*. Seta 1-I single to 4(1) branched; 2,13-I single; 3-I with 5-8(6) branches; 4-I with 9-13(13) branches; 5-I with 4-5(4) branches; 6-I with 2 branches; 7,9-I with 2-3(2) branches; 10-I with 4-6(5) branches; 11-I single to 3(2) branched; 0,1,2,9,14-II single; 3-II with 4-11(9) branches; 4-II with 5-8(7) branches; 5-II with 2-6(3) branches; 6-II with 2 branches; 7-II with 5-9(7) branches; 8,10-II with 2-3(2) branches; 11-II with 3-6(4) branches; 12-II with 3-6(3) branches; 13-II with 8-13(13) branches; 0,2,9,14-III single; 1-III with 2-4(3) branches; 3-III with 6-10(6) branches; 4,13-III with 5-8(5) branches; 5-III with 2-3(3) branches; 6-III single or 2(2) branched; 7-III with 6-10(7) branches; 8-III single or 2(1) branched; 10-III with 2-4(4) branches; 11-III with 3-4(3) branches; 12-III with 2-5(3) branches; 0,2,6,9,14-IV single; 1-IV with 5-8(6) branches; 3-IV with 7-10(8) branches; 4-IV with 3-4(3) branches; 5,12-IV with 2-4(4) branches; 7-IV with 8-10(8) branches; 8-IV single or 2(1) branched; 10-IV with 3-8(3) branches; 11-IV with 2-3(3) branches; 0,2,6,8,14-V single; 1-V with 4-11(6) branches; 3-V with 4-8(5) branches; 4-V with 5-9(8) branches; 5-V with 2-3(3) branches; 7-V with 5-8(5) branches; 9-V single or 2(1) branched; 10-V with 2-4(3) branches; 11-V with 3 branches; 12-V with 2-3(2) branches; 13-V with 4-8(8) branches; 0,2,6,9,14-VI single; 1-VI with 5-11(5) branches; 3,5-VI with 3-4(3) branches; 4-VI with 4-6(5) branches; 7,11-VI with 4-7(4) branches; 8-VI with 4-7(5) branches; 10-VI with 2-5(2) branches; 12-VI with 2-5(3) branches; 13-VI with 17-32(21) branches; 0,2,14-VII single; 1-VII with 5-8(5) branches; 3-VII with 5-7(5) branches; 4-VII with 3-5(4) branches; 5,11-VII with 3-4(4) branches; 6-VII with 5-9(5) branches; 7,10-VII with 2-3(3) branches; 8-VII with 4-5(4) branches; 9-VII with 2-4(3) branches; 12-VII with 3-5(5) branches; 13-VII with 7-8(7) branches; 0,4,14-VIII single; 1-VIII with 3-6(4) branches; 2-VIII single to 4(2) branched; 3-VIII with 5-8(6) branches; 5-VIII with 6-12(7) branches; 1,2-VIII both attached to a small heavily pigmented plate; VIII with comb composed of 8-10(10) scales arranged in a single curved row, each scale with a long stout median spine and with short denticles on laterobasal areas, heavily pigmented; seta 1-X moderately long, single, stout, attached near middle of posterior area of saddle; 2-X moderately long, 6-10(7) branched; 3-X very long, single; ventral brush with 16-18(18) setae, all multiple branched, 13-16 setae on grid and 2-3 precratal shorter ones; saddle heavily pigmented, incompletely rings segment X, acus absent; 4 anal papillae, long and narrow, approximately 2.5-3.0 times length of saddle. *Siphon*. Heavily pigmented,

moderately long; index 1.88-2.07, mean 1.94; acus well developed; pecten on basal 0.60-0.64 of siphon, composed of 14-17(15) teeth, apical 2-3 teeth longer, without denticles and wider spaced than remainder of teeth, basal teeth long, slender and with 1-4 small stout denticles on ventrobasal area; seta 1-S short, with 4-6(4) branches, base attached on basal 0.68-0.71 of siphon distad of last pecten tooth; 2,6,7,9-S single; 8-S with 3-4(3) branches.

DISTRIBUTION. The following immature specimens and associated adults were examined: 21 ♀pl, 2 ♀p, 2 ♂pl and 1 ♂p.

INDIA. *Madras*, Nilgiri Hills, Kallar; 1 ♀pl, 1♂pl, 1♂p, (23 May 1974, B.N. Mohan), 5 ♀pl, 1 ♂pl (11 October 1974, B.N. Mohan), 10 ♀pl, 1 ♀p (15 May 1975, B.N. Mohan), 5 ♀pl, 1 ♀p (27 August 1975, B.N. Mohan).

Distribution from the literature.

SRI LANKA.(Edwards 1922, 1932; Carter 1950; Chow et al. 1954); Kitli Station (Edwards 1917); Trincomale (Edwards *in* Barraud 1934); Kulinjadiya, Negombo, Mantivu, Ratmalana, Pothuhera (Wijesundara 1951); *North Central*, Anuradhapura District, Padaviya, *Northern*, Vavuniya District, Parayanalankulam (Harrison et al. 1974).

DISCUSSION. The pupa and larva of *Ae. yerburyi* conform well to those of species in Section A, Series III of *Verrallina* as described by Reinert (1974). The pupae of *yerburyi* show similarities to those of other species of the subgenus but are distinguished by the following features: pigmentation of cephalothorax and abdominal terga; seta 5-CT with 5-8 branches; 8-CT with 4-10 branches; 1-III with 5-13 branches; 1-V with 3-6 branches; 1-VI with 3-7 branches; and heavy serrations on outer margin of the paddle.

Larvae of *yerburyi* can be separated from those of other species of the subgenus by the following combination of features: head capsule broad, darkly pigmented and with patterns of lightly pigmented circular areas; a patch of small spicules on compound eye; seta 5-C with 3 branches; 5,6-C each with one branch noticeably longer than others; 1-A with 4-6 branches; 8-P and 6-I each with 2 branches; 7-I with 2-3 branches; 1-II and 4-VIII each single; 1-III with 2-4 branches; 3-IV with 7-10 branches; 1,2-VIII attached to a common plate; and 14-17 pecten teeth.

The present descriptions and illustrations of the pupa and larva are the first for *yerburyi*. This species was first described by Edwards (1917) from an adult male collected at Kitli Station, Sri Lanka. The original description included only an illustration and brief description of the male genitalia. Edwards *in* Barraud (1934) included *yerburyi* in an adult key and presented a description and illustration of the male genitalia. Wijesundara (1951) described the female and illustrated the female genitalia for the first time. In 1974, Reinert presented an expanded description of the female and male and illustrated the female genitalia and male and female posttarsi.

Specimens of *yerburyi* reported above represent the first record of this species from India and extend the geographical range of this species outside Sri Lanka.

BIONOMICS. In India, immatures were collected from fresh, clear, unmoving water in small temporary ground pools located in arecanut palm plantations.

ACKNOWLEDGMENTS

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LIST OF FIGURE ABBREVIATIONS

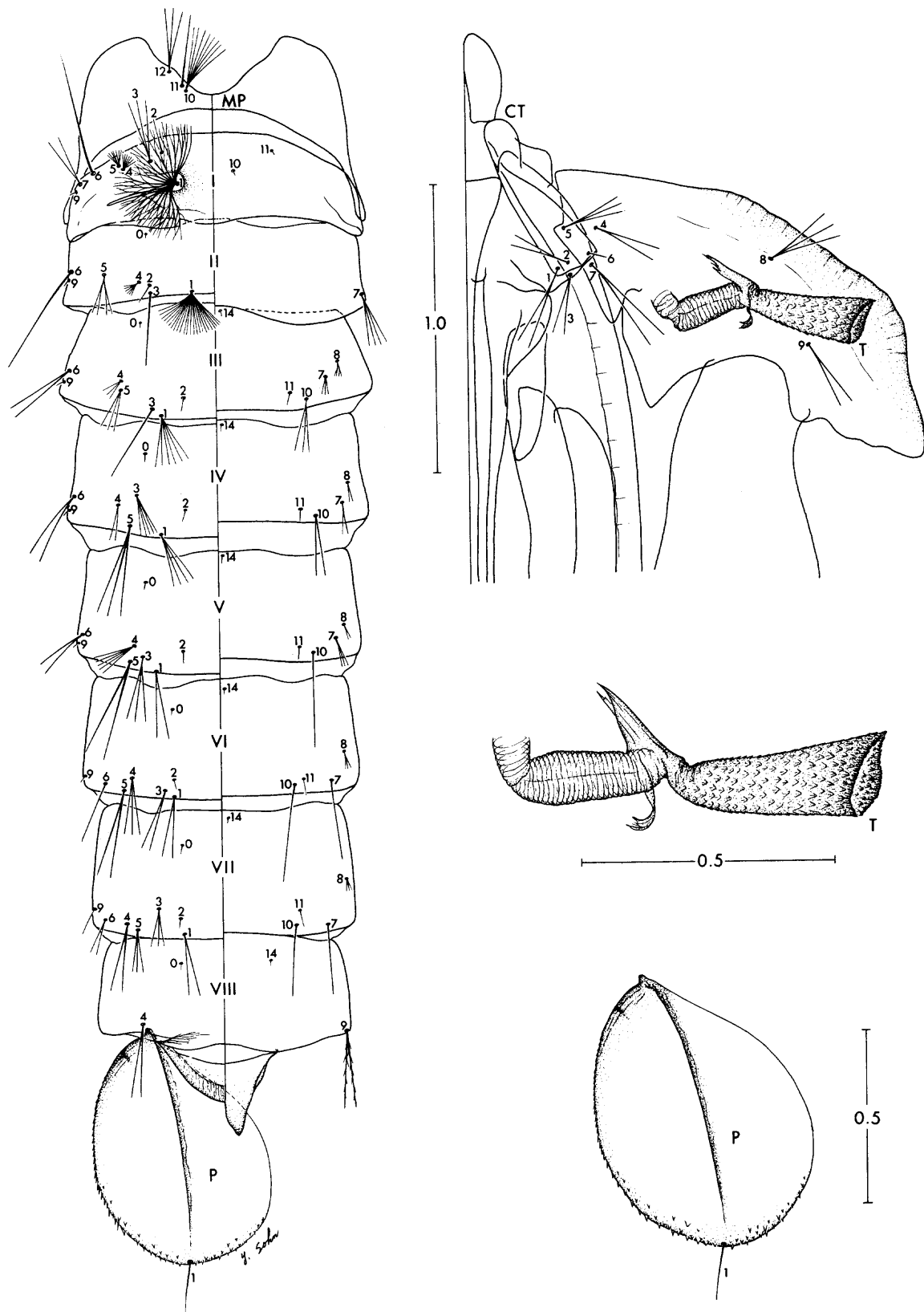
Pupa

CT	=	Cephalothorax	MP	=	Metanotal plate
I - VIII	=	Abdominal segments 1 to 8	P	=	Paddle
			T	=	Respiratory trumpet

Larva

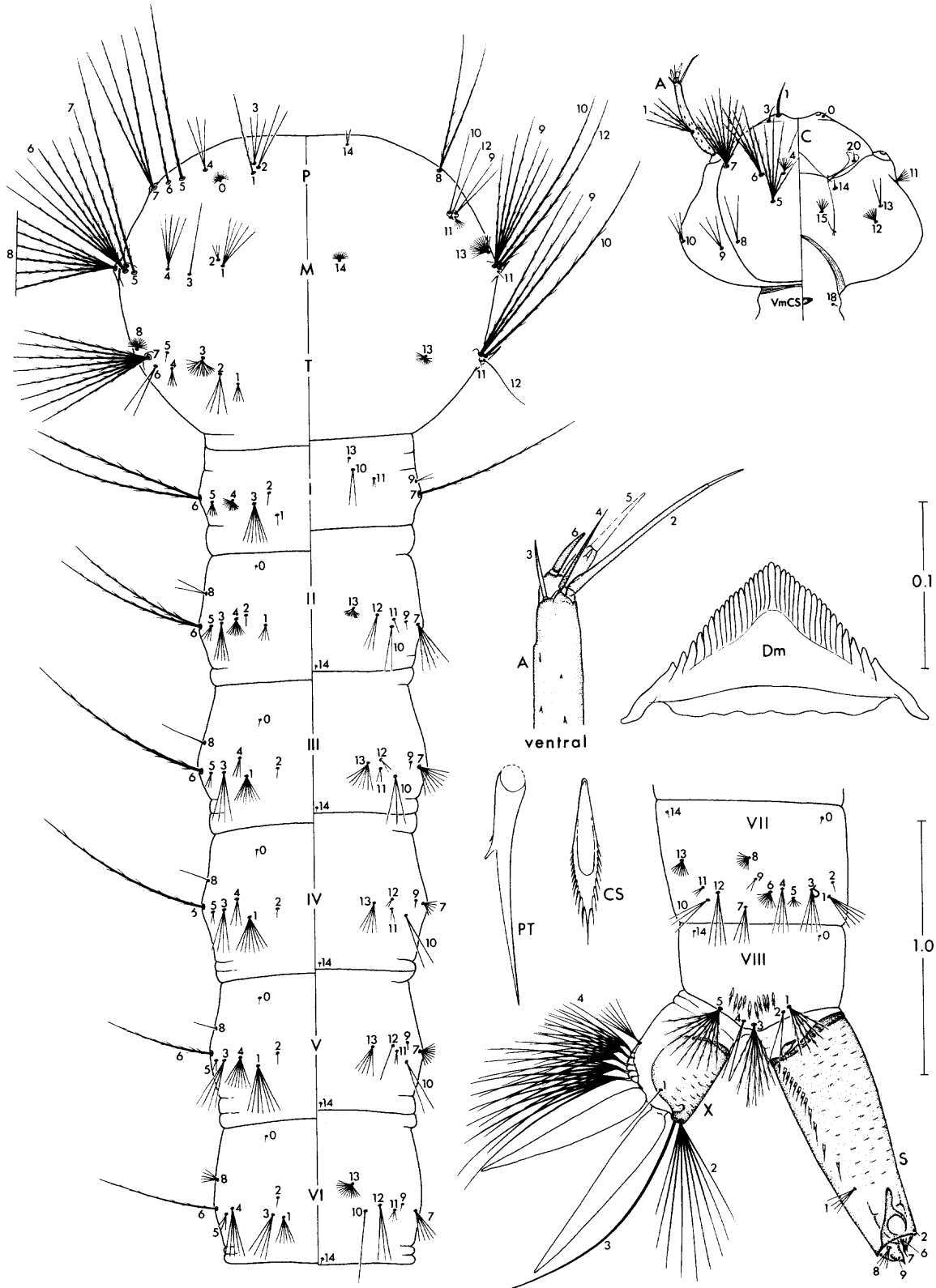
A	=	Antenna	M	=	Mesothorax
C	=	Head	P	=	Prothorax
CS	=	Comb scale	PT	=	Pecten tooth
Dm	=	Dorsomentum	S	=	Siphon
1 - VIII, X	=	Abdominal segments 1 to 8, 10	T	=	Metathorax
			VmCS	=	Ventromedian cervical sclerite

Fig.1



pseudomediofasciatus

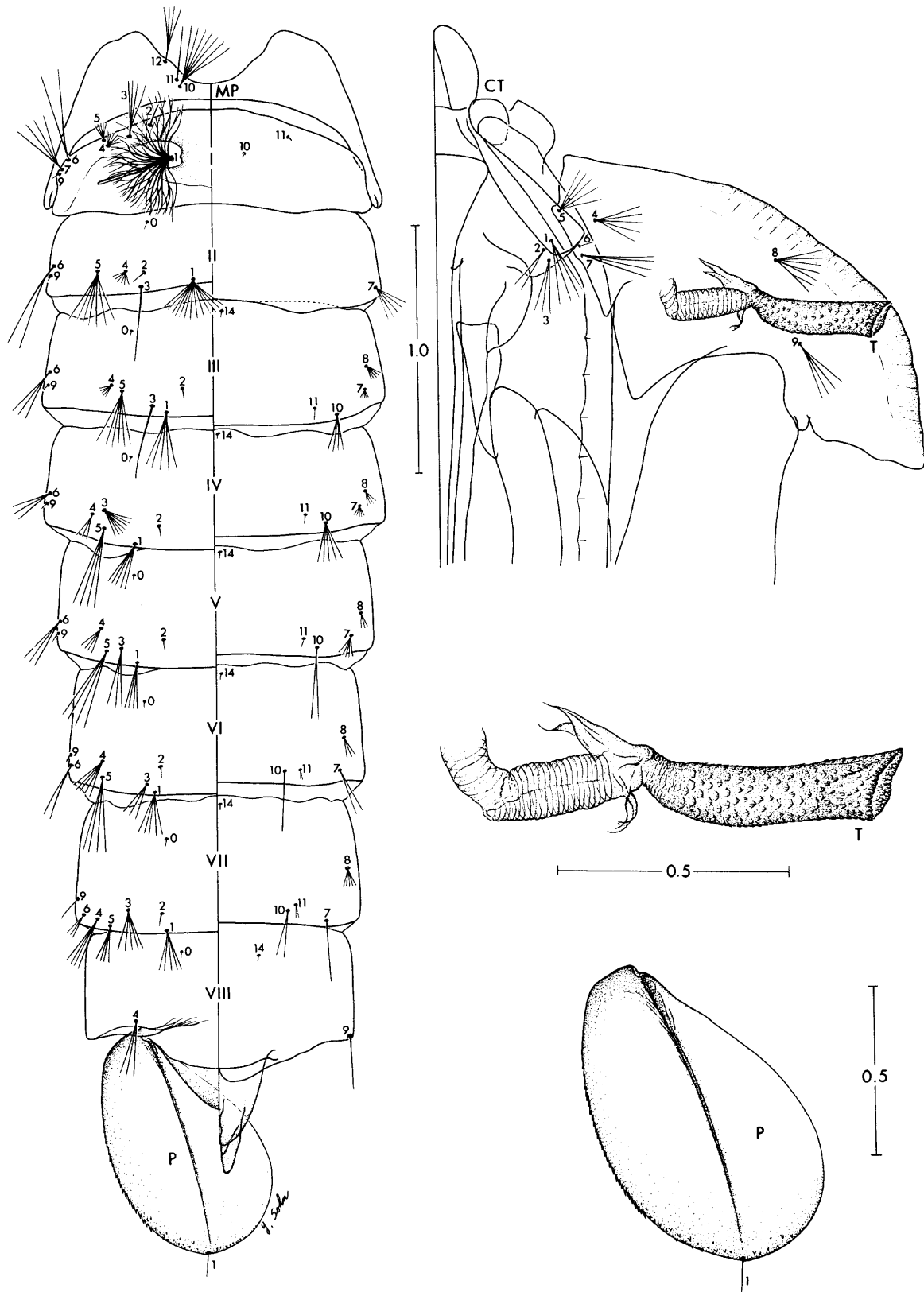
Fig. 2



H. Soler

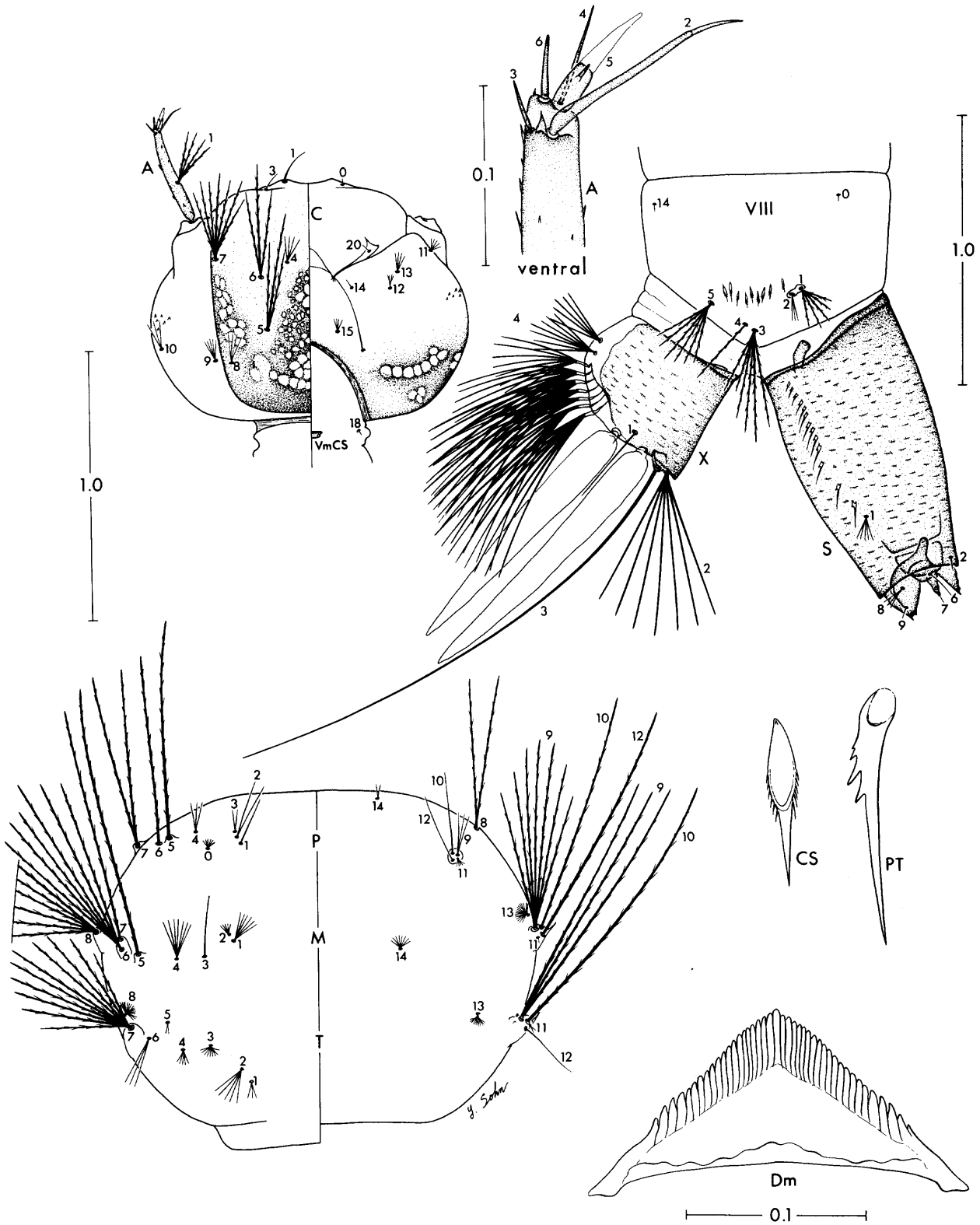
pseudomediofasciatus

Fig.3



yerburyi

Fig. 4



yerburyi