Mem. Inst. Oswaldo Cruz, Rio de Janeiro, Vol. 83(1):67-77, jan./mar. 1988

REDESCRIPTION, AND RESURRECTION FROM SYNONYMY, OF *AEDES (OCHLEROTATUS) RHYACOPHILUS* COSTA LIMA, 1933

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Aedes (Ochlerotatus) rhyacophilus *Costa Lima is resurrected from the synonymy with* Aedes (Ochlerotatus) scapularis *(Rondani). Lectotype and paralectotypes are designated. Larval, pupal and both sexes of adult stages are redescribed and illustrated. Bionomics include a picture of a breeding place. Diagnostic characters for distinguishing* rhyacophilus *from other species of the Scapularis Group are provided. Some data about known distribution are presented.*

Key words: *Aedes rhyacophilus* – *Aedes (Ochlerotatus)* – Culicidae – mosquito-borne infections

Several immature stages of *Aedes* belonging to the Scapularis Group were obtained from collections made in the Ribeira Valley in southern São Paulo State, Brazil. Reared in laboratory condition, both female and male adults were identified as *Aedes (Ochlerotatus) rhyacophilus* Costa Lima, which had previously been placed in the synonymy of *Aedes (Ochlerotatus) scapularis* (Rondani) by Arnell (1976). As it was possible to study the Costa Lima (1933) type-series, this led to the conclusion that these are different species. So this paper resurrects and redescribes the former one.

The terminology is that of Harbach & Knight (1980) and the general descriptive lines of Arnell (1976) are followed.

As the type material was not in good condition, the pupal setae branches were not counted.

Aedes (Ochlerotatus) rhyacophilus Costa Lima

Aedes (Ochlerotatus) rhyacophilus Costa Lima, 1933: 403-407. Types: syntypes 2 males, 5 females, 2 pupae, 4 larval exuviae, 6 4th-instar larvae, Coqueto Farm, "5 de novembro" river, 13 km from São João de Petrópolis and 9 km from Santa Tereza County, Canaan Valley, Espírito Santo State, Brazil, 1932, coll. J. Serafim; Lane, 1953: 671; Forattini, 1965: 368; Garcia & Casal, 1968: 108; Belkin et al., 1971: 19 (LU; not in IOC); Arnell, 1976: 57 [synonymy with *Ae. scapularis* (Rondani)].

ADULT. A species resembling *Aedes scapularis* and *Ae. patersoni* Shannon and Del Ponte, but differing in some details of the adult, as well as in others of the gonocoxite of the male genitalia and larva.

FEMALE. (Fig. 1). Body dark clothed with dark brown and white scales. *Head:* Antenna dark, length about 2.01 mm, pedicel with yellowish integument, lightly darker, with a few diminute dark setae mesally. Clypeus dark brown, bare. Proboscis completely covered with dark scales, length about 2.52 mm, about 1.20 of forefemur. Maxillary palpus (Fig. 1-A and Fig. 2 MP1p) entirely coated with dark scales, length about 0.39 mm, aproximately 0.15 of proboscis length, 4 segmented, observed in two heads mounted in slides, a small supernumerary article at apex of palpomere 4. Vertex (Fig. 1-B, C, D) with narrow falcate white scales near longitudinal midline and along ocular line; dorsolateral surface with a patch of broad mostly dark, occasionally white, scales, lateral and ventral surfaces with broad dingy white scales; occiput with narrow falcate white scales, shorter than the vertex ones; forked scales white on midline and some dark dorsolaterally; interocular setae length, white; ocular setae long, white dorsally, dark laterally. *Thorax:* Integument dark brown. Scutum (Fig. 2) covered with narrow curved scales, median and lateral prescutellar areas and small spaces on anterior promontory bare; scales dark with large rectangular irregularly outline patch of silvery white scales disposed longitudinally, lateral borders ondulated with a prolongation

Supported by Grant n. MVR-BR-2-84-6 – National Academy of Sciences, USA.

Received July 25, 1987.
Accepted September 30, 1987.

♀ *Ae. (Och.) rhyacophilus*

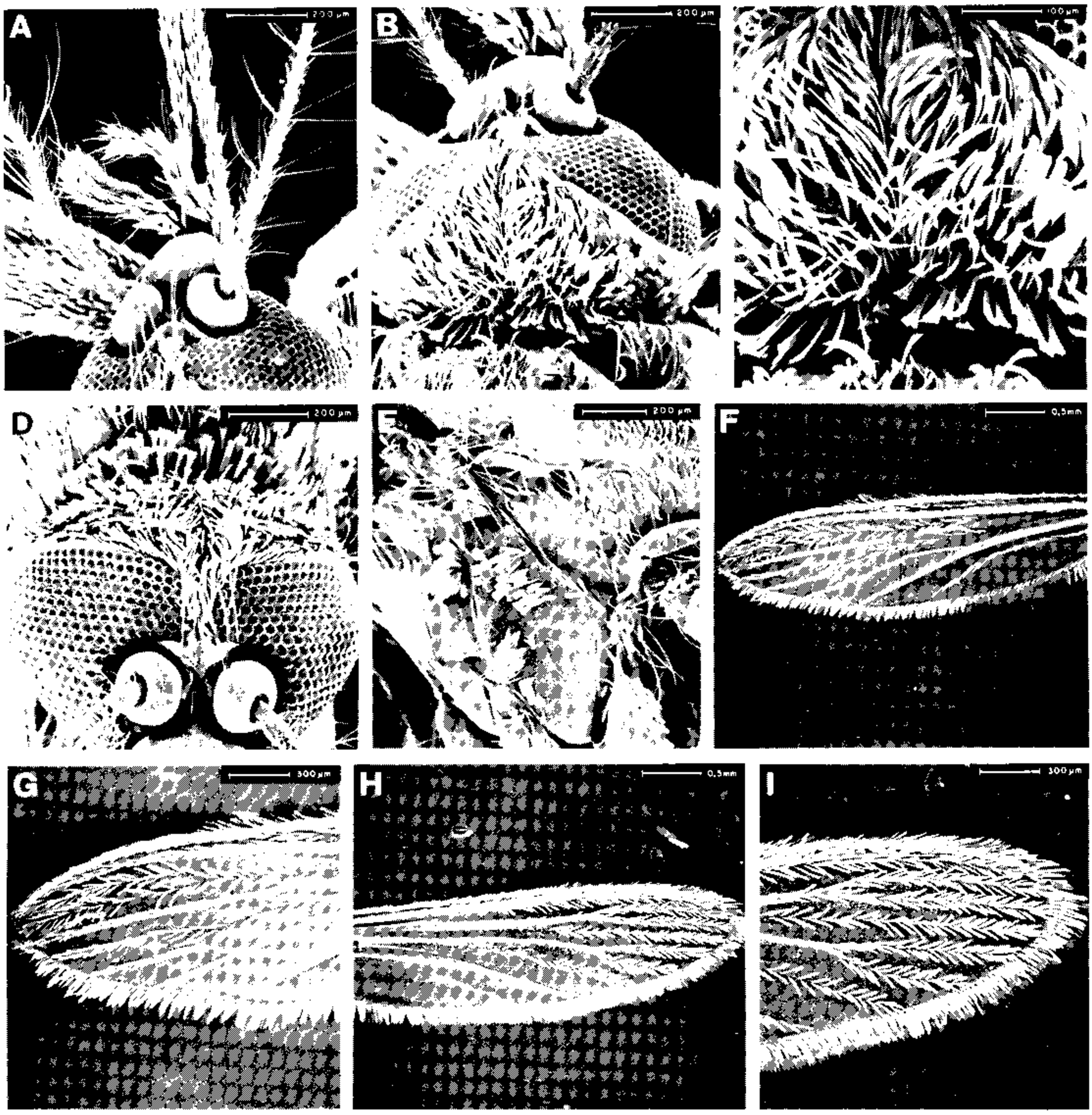

Fig. 1: *Aedes (Och.) rhyacophilus*, female. A: Dorsal aspect of anterior head surface. B: Posterodorsal aspect of head. C: Detail of figure B focusing falcate and forked scales. D: Anterodorsal aspect of head. E: Aspect of lateral right side of thorax showing pleural scale patches. F: Dorsal aspect of left wing scaling. G: Dorsal aspect of distal left wing scaling. H: Ventral aspect of left wing scaling. I: Ventral aspect of distal left wing scaling. *Collection place*. J, K: Pariquera-Açú river with gravely bottom and rockhole breeding places of immature stages.

on posterior margin along acrostichal line extending to prescutellar area, sometimes with indefinite line of silvery white scales disposed posterolaterally; acrostichal setae light, well developed in complete row, more numerous on anterior promontory; dorsocentral setae well developed, anterior absent, light on promontory and darker posteriorly; prescutellar setae developed, dark; supraalar setae numerous, dark and light; posterior scutal fossal setae dark and well developed. Scutellum (Fig. 2) with narrow dark scales on all lobes and frequently with a few narrow white scales on median scutellar lobe. Mesopostnotum and paratergite dark brown, bare. Antepronotum with narrow white scales, sparse dark setae on surface. Postpronotum covered with mostly dark narrow scales and a small patch of broad white scales posteroventrally; posterodorsal margin with long dark setae. Pleural sclerites with patches of broad white scales on proepisternum, subspiracular area, postspiracular area, lower prealar area, upper and lower portions of mesokatepisternum and on anterior and upper mesepimeral portions; anterior mesepimeral scale patch connecting with upper mesepimeral scale patch; pleural setae yellowish and golden shining on upper proepisternal, postspiracular, prealar, lower and upper mesokatepisternal and upper mesepimeral areas (Fig. 1-E). *Wing:* With dark scales except for a small basal spot of white scales on costa; length about 3.85 mm; cell R_2 about 3.5 length of R_{2+3}. Dorsal scaling (Fig. 1-F, G): appressed spatulate scales on costa, subcosta, R, R_1, R_{4+5}, 0.7 distal of M_1, M_2, M_{3+4}, mcu, CuA, 1A; linear plume scales on R_S, R_{2+3}, R_2, R_3, M, M_{1+2}, 0.3 basal of M_1. Ventral scaling (Fig. 1-H, I): appressed spatulate scales on costa, subcosta, R_S, R_{2+3}, M, M_{1+2}, 0.3 basal of M_1; linear plume scales on 0.9 distal of R_1, R_2, R_3, R_{4+5}, 0.7 distal of M_1, M_2, M_{3+4}, mcu, CuA after mcu, distally 1A; R, 0.1 basal of R_1, proximally both CuA and 1A devoid of scales. *Halter:* Scabellum pale, pedicel and capitellum covered with clear scales dorsally, capitellum with dark scales ventrally. *Legs* (Fig. 2): Hindcoxa subequal to midcoxa, its base below upper margin of mesomeron. Anterior surface of forecoxa with dark scales and apical and basal patches of white scales; anterior surfaces of mid- and hindcoxae with longitudinal patch of white scales. Forefemur with dark scales except on posterodorsal surface white-scaled little after middle, midfemur mainly dark-scaled except on posterosurface white scaling expanded basally and restricted near middle, fore- and midfemora with basal ring of white scales, hindfemur white-scaled with basal dark line beginning at near base gradually widening distally, expanded over whole of dorsal and ventral surfaces after middle; white knee-spot present on femora. Tibiae and tarsi entirely dark-scaled. Fore-, mid- and hindlegs with tarsal claws equal, with acute submedian tooth. *Abdomen:* Length about 2.87 mm; tergum I dark-scaled dorsally, bare laterally. Terga II-VII each with basolateral patches of white scales. Sterna II-VII mostly white-scaled; segment VIII completely retracted into segment VII. Tergum VIII narrowed distally; on midline about 0.59 – 0.61 of tergum VII, distal 0.80 with scattered short setae and scales becoming more dense distally and few longer setae near distal margin. Sternum VIII almost 1.04 – 1.20 of tergum VIII, broader distally; distal margin slightly rounded and uniformly sclerotized; with scattered short setae and a few others longer on surface, more numerous distally and scales on lateral to middle. *Genitalia* (Fig. 2): Tergum IX narrow in middle and widened, more sclerotized on posterolateral margin where there are 2-5 setae on each side, maximum length about 0.44-0.47 of tergum VIII. Upper vaginal lip narrow, distinct, heavily sclerotized; upper vaginal sclerite distinct but weakly sclerotized; lower vaginal lip distinct, weakly sclerotized; insula distinct moderately tanned, with 2,3 setae on each side of midline. Postgenital lobe short and broad, ventral length 0.44 – 0.49 of tergum VIII; ventral index about 1.50 – 1.75; apex evidently emarginate in ventral view; with 4-7 setae and 1 more developed on either side of midline, setae mostly on ventral surface; basal median apodeme weakly developed. Cercus long, about 0.73 – 0.76 of tergum VIII; apex rounded; with setae numerous, more dense on dorsal surface; a few scales only on dorsal surface. Proximal portion of spermathecal duct weakly sclerotized; spermathecal capsules 3, strongly sclerotized, spherical, 1 larger than the other 2.

MALE. Like female except for following sexual differences. *Head:* Antenna strongly plumose; length about 1.70 mm, shorter than proboscis. Maxillary palpus entirely dark-scaled; length about 2.54 mm, about 0.98 of proboscis; palpomere 3 slightly elevated and swollen near apex, palpomere 4 dorsally curved and palpomere 5 slightly downturned, ventral surface of palpomere 3 apex, all of palpomere 4 and base of palpomere 5 densely setose. Vertex

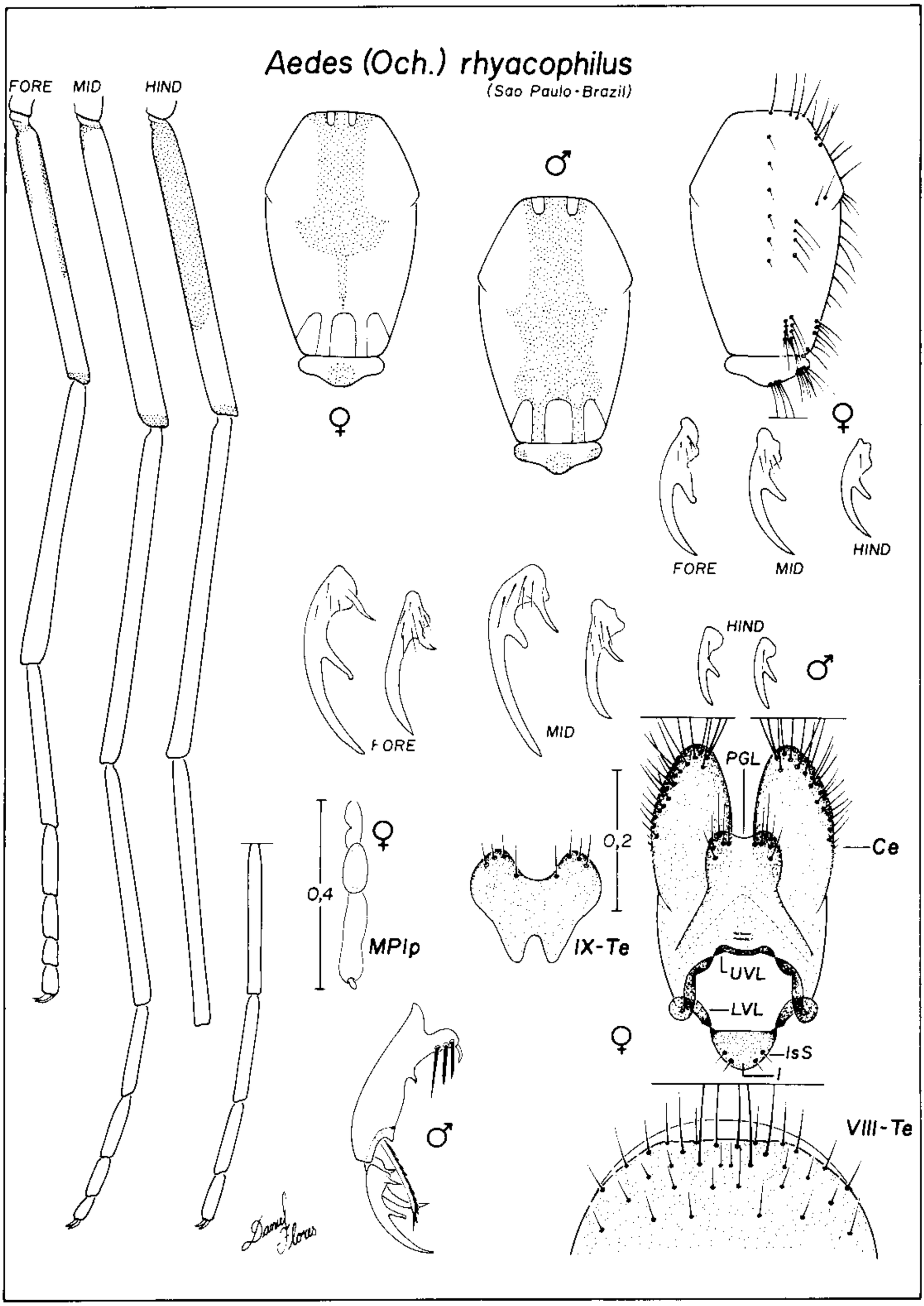

Fig. 2: *Aedes (Och.) rhyacophilus* – Abbreviations used: Ce – cercus; I – insula; IsS – insular seta; LVL – lower vaginal lip; MPlp – maxillary palpi; PGL – postgenital lobe; UVL – upper vaginal lip; VIII-Te – tergum VIII; IX-Te – tergum IX.

similar to female but not interrupted by dorsolateral patch of broad flat dark scales; forked scales dark, fewer than the female. *Thorax:* Scutal scale pattern (Fig. 2) with light scales more extensive than in female, with posterolateral prolongations extending to supraalar area and scutellum. *Legs:* Anterior claws of fore- and midlegs enlarged with submedian and basal teeth, posterior claws of fore- and midlegs smaller with basal teeth; hindleg with tarsal claws equal, short, both with submedian teeth (Fig. 2). *Abdomen:* Terga II, III with basal white bands, sometimes interrupted; terga IV, V with broader white basal bands; terga VI, VII with white basal bands; bands narrowed medially; sterna II-VI mostly white-scaled with apicolateral spots of dark scales; sterna III-VI sometimes with small patches of dark scales near middle; sternum VII with apical narrow band of dark scales; tergum VIII (ventral in position) with small basolateral white spots, occasionally with a few white scales on median anterior; sternum VIII (dorsal in position) with indefinite basal band of white scales. Genitalia (Fig. 3): Tergum IX well developed, middorsal portion deeply emarginate on anterior margin, with weakly sclerotized moderately broad caudal bridge connecting the small prominent tergal lobes; each lobe with 2-11 spiniform setae; sternum IX large with 5-9 setae distally. Gonocoxite cilindrical, length about 3.81 – 5.10 times median width; mesal surface membranous; scales restricted to dorsolateral, lateral and ventral surfaces; short and moderately long scattered setae on dorsomesal surface, besides 2,3 thickened elongate subapicodorsomesal setae; lateral surface with dark strongly developed setae; ventral surface with few thickened elongate setae and others shorter; mesal margin of ventral surface with 18-37 short to long setae; apicodorsal lobe not developed; basal dorsomesal lobe attached to gonocoxite moderately developed with anterior and posterior sides subequal, with 1 specialized basal differentiated seta, seta thickened from base to near middle and tapers abruptly to a straight apex, a cluster of 16-28 undifferentiated setae, a row of usually 5-7 projecting distad from posterior edge of lobe and occasionally 1 enlarged seta near that differentiated seta, stronger than undifferentiated seta but weaker than differentiated seta; claspette with stem slender and elongate, curved dorsad, with a conspicuous tubercle bearing single apical seta on ventral surface near base; filament subequal in length to stem, uniformly narrow and straight, enlarged after middle with small sharply retrorse process, and tapered to acute recurved apex. Gonostylus simple, elongate, length about 8-10 times its greatest width; gonostylar claw spiniform. Phallosome with aedeagus simple, pyriform, sclerotized dorsally with slight apical emargination. Proctiger elongate; paraproct strongly sclerotized, broadly fused to tergum X, with single strongly sclerotized apical tooth and short heavily sclerotized mesal process; cercal setae short, delicate, 2-4.

PUPA (Fig. 3). General aspect of chaetotaxy as figured; range and modal number of branches listed in Table I. *Cephalothorax:* Moderately but unevenly tanned, scutum, legs and metanotum darker. Setae 1, 2, 9-CT generally single, occasionally double; 3-CT single; 4, 6-CT frequently triple; 5, 7, 8-CT usually double; 10-CT with 2-7 branches; 11-CT single; 12-CT with 1-4 branches. *Trumpet:* Strongly and evenly tanned; broadening gradually from base to apex; index 0.41 – 0.58, mean 0.51; pinna small. Reticulate sculpturing strong; tracheoid area absent. *Abdomen:* Moderately tanned, lighter posteriorly; generally with area darker on anterior margin of terga particularly on terga II-IV; length 2.43 – 3.49 mm, mean 2.91 mm. Setae 1-II strong, multiple, generally more than 22 branches, closer to midline than 1-I; 1-III, VII single or double; 1-IV similar in development to 1-V, with 1-3 branches, 1-IV generally double, 1-V usually single; 2-II variable in position, slightly mesad or laterad of 3-II, 2-III-VII single, mesad of seta 1 of corresponding segment; 3-II single or double, more developed than 5-II, 3-III long and single, 3-IV with 3-7 branches, 3-V frequently single, occasionally double, 3-VI, VII single; 5-IV-VI heavily developed, variable in length, 5-IV with length more than that of following tergum usually reaching to 0.5 of tergum VI, 5-V sometimes extending to 0.5 of tergum VII, 5-VI at times reaching the apex of tergum VIII, 5-IV, V frequently double, 5-VI simple, 5-VII shorter than 3-VII, with 1-4 branches, generally triple; 6-I single or double, 6-II with 1-4 branches, 6-III-VI simple, 6-VII double or triple; 9-VII strong, slightly barbed, generally single, occasionally double, 9-VIII more developed than 9-VII, heavily barbed, usually with 5 branches (3-6). *Genital lobe:* Moderately tanned in male and in female; length about 0.26 mm in female, 0.36 mm in male. Female cercus projecting beyond genital lobe, more sclerotized externally. *Paddle:*

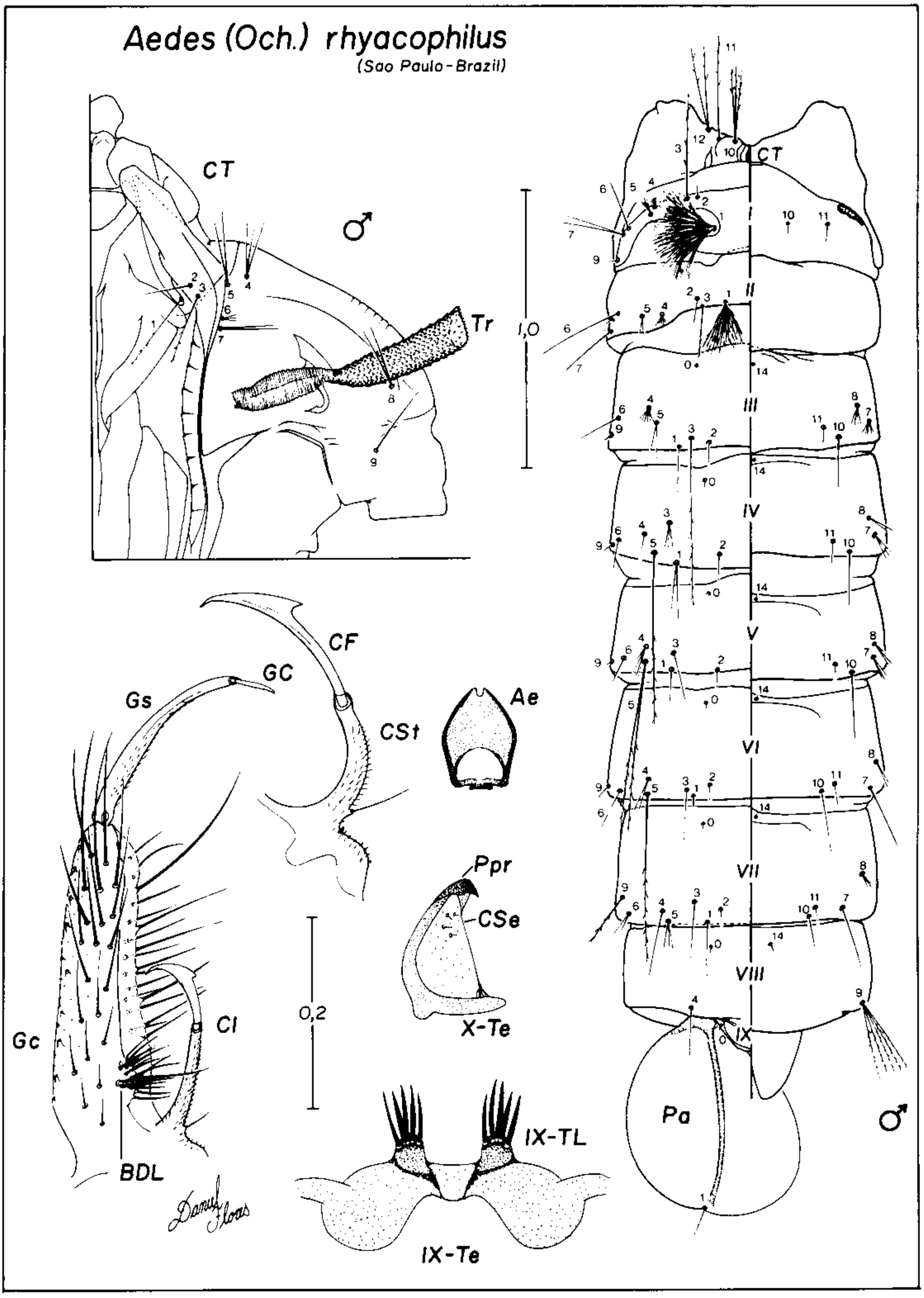

Fig. 3: *Aedes (Och.) rhyacophilus* – Abbreviations used: Ae – aedeagus; BDL – basal dorsomesal lobe; CF – claspette filament; Cl – claspette; CSe – cercal seta; CSt – claspette stem; CT – cephalothorax; Gc – gonocoxite; GC – gonostylar claw; Gs – gonostylus; Pa – paddle; Ppr – paraproct; Tr – trumpet; I-IX – abdominal segments; IX-Te – tergum IX; IX-TL – tergum IX lobe; X-Te – tergum X (= basolateral sclerotization).

TABLE I

Number of branches for setae of the pupa of *Aedes (Ochlerotatus) rhyacophilus**

Seta Nº	Cephalothorax CT	Abdominal Segments									Paddle P
		I	II	III	IV	V	VI	VII	VIII	IX	
0	–	–	1	1	1	1	1	1	1	–	–
1	1,2(1)**	6-12(9)	> 22	1,2	1-3(2)	1-3(1)	1	1,2(1)	–	1	1
2	1,2(1)	1,2(1)	1	1	1	1	1	1	–	–	–
3	1	1	1,2(1)	1	3-7***	1,2(1)	1	1	–	–	–
4	2-4(3)	5-8(6)	4-8(6)	4-8(6)	2-4(3)	2-5(4)	1-3(2)	1,2(1)	1,2(1)	–	–
5	1-4(2)	2-8(5)	1,2(2)	1-3(2)	1-4(2)	1,2(2)	1	1-4(3)	–	–	–
6	1-4(3)	1,2(1)	1-4(1)	1	1	1	1	2,3(2)	–	–	–
7	2-4(2)	1-3(2)	1-4(2)	3-7(5)	2,3(3)	1-6(3)	1	1	–	–	–
8	1-3(2)	–	–	3,4(4)	1-4(2)	2,3(3)	2-5(2)	2-4(3)	–	–	–
9	1,2(1)	1,2(1)	1	1	1	1	1	1,2(1)	3-6(5)	–	–
10	2-7(4)	1	–	1-3(1)	1-4(1)	1	1	1	–	–	–
11	1	1	–	1	1	1	1	1	–	–	–
12	1-4(2)	–	–	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–	–	–
14	–	–	–	1	1	1	1	1	1,2(1)	–	–

* Based on counts made on 10 specimens; ** Range (mode); *** Mode indefinite.

TABLE II

Number of branches for setae of the fourth-instar larva of *Aedes (Ochlerotatus) rhyacophilus**

Seta Nº	Head C	Thorax			Abdominal Segments								
		P	M	T	I	II	III	IV	V	VI	VII	VIII	X
0	1	9-17(11)	–	–	–	1	1	1	1	1	1	1	–
1	1	2,3(2)	2-5(4)	2-4(3)	2-7(3)	2-5(3)	2-4(2)	1-4(3)	1-4(2,3)	1-3(2)	2-4(3)	2-5(3)	1
2	–	1	2-5(3)	1,2(2)	1-4(2)	1,2(1)	1	1	1	1	1	1	5-8(7)
3	1	3-6(5)	1	3-10(6)	1,2(1)	1,2(1)	1	1,2(1)	1	1	1,2(1)	5-10(8,9)	1
4	2-5(3)**	1	1,2(2)	2-7(4)	7-17(10)	6-12(7)	1-4(2)	1-3(2)	2-4(3)	1,2(1)	1	1	2-10(7)
5	1,2(1)	1	1	1,2(1)	5-10(7)	3-8(4)	2-4(3)	2-4(3)	1-4(2)	2-4(2)	3-7(6)	3-6(5)	–
6	2,3(2)	1	5-11(6)	1	2	2	1,2(1)	1	1	1	3-8(3)	1a-S,	4-7(5)
7	5-8(6)	2-4(2,3)	1	8-11(9)	1,2(1)	1-3(2)	2-5(4)	3-6(3)	3-5(4)	1	1	2-S,	1
8	1,2(1)	1	6-10(9)	9-16(12)	–	1-3(2)	1	1	1	2-6(4)	3-6(5)	–	–
9	1-3(2)	1	6-11(8)	2-7(4)	2-4(2)	1	1	1	1	1	1-3(2)	–	–
10	1-3(1)	1	1	1	1	1	1	1	1	1	1	–	–
11	4-9(5)	4-8(4)	2-7(3)	3-6(3)	1-8(3)	1	1,2(1)	1-3(2)	1-3(2)	1-3(2)	1	–	–
12	1-4(2)	1	1	1	1	1	1-3(2)	1,2(1)	1	1	1	–	–
13	1	–	7-19(12)	4-10(5)	2-6(3)	7-16(12)	1-5(3)	2-4(3)	1-4(3)	9-21(16)	2-6(2)	–	–
14	1,2(1)	1	8-15(11)	–	–	1-3(1)	1,2(1)	1,2(1)	1-4(2)	1-3(2)	–	1-3(1)	–
15	2-5(3)	–	–	–	–	–	–	–	–	–	–	–	–

* Based on counts made on the paralectotypes and 10 specimens; ** Range (mode).

Lightly tanned, midrib darker not extending to apex; buttress distinct at base only; marginal spicules very poorly developed; length 0.67 – 0.83 mm, mean 0.74 mm, width 0.60 – 0.70 mm, mean 0.66 mm, index 1.07 – 1.38, mean 1.14. Seta 1-P long, single.

LARVA (Fig. 4). General aspect of chaetotaxy as figured; range and modal number of branches listed in Table II. *Head:* Wider than long; length 0.74 – 0.93 mm, mean 0.81 mm; width 0.91 – 1.07 mm, mean 0.99 mm; moderately tanned, area of lateralia around compound eyes lighter, with little defined darker areas symmetrically situated on the posterior part of dorsal apotome and on lateralia. Median labral plate narrowed but distinct dorsally, anterior margin straight between insertions of setae 1-C. Labiogula larger than broad, broader posteriorly; hypostomal suture complete, extended from the posterior tentorial pit to near collar. Collar poorly developed, heavily pigmented. Dorsomentum (Fig. 4) with one median tooth and 7-10 similar on each side, with outer 3-5 very reduced teeth widely spaced. Seta 1-C stout; 4,6-C displaced caudad, not near median labral plate, 4-C short, caudad of level 6-C, with 2-5 branches; 5-C usually single, occasionally double, more or less in line with 6-C and slightly laterad of 1-C; 6-C normally double, sometimes triple; 7-C frequently with 6 branches (5-8); 8-10-C similar, 8,10-C most often

single and 9-C double; 15-C with 2-5 branches. *Antenna:* Length 0.37 – 0.38 mm, mean 0.38 mm; moderately pigmented, darker on proximal part to seta 1-A. Scape and pedicel indistinct; flagellum with few small spicules uniformly distributed; antennal puncture distinct. Seta 1-A moderately long, usually triple (2-4), inserted near middle of flagellum. *Thorax:* Integument hyaline, covered with very sparse and short spicules; thoracic segments without conspicuous pigmentation under integument; all large seta tubercles moderately tanned, tubercles of setae 5-7-P separate and 9-12-P, M, T on common tubercles. Seta 1-P usually double; 2-P single; 3-P normally with 5 branches (3-6); 4-6-P single; 7-P frequently double or triple (2-4). Seta 1-M usually with 4 branches, rarely double or with 5 branches (2-5); 11-M present, frequently triple. *Abdomen:* Integument hyaline, with minute inconspicuous spicules, spicules more evident on segments I-III, VIII; 6-I, II and 3-VIII on moderately tanned tubercles. Seta 1-III moderately developed, usually double (2-4), 1-IV, V strongly developed, with 1-4 branches, 1-IV frequently triple, 1-V normally double or triple, 1-VII strongly developed, commonly triple; 3-IV, V developed, generally single, 3-IV occasionally double; 6-I, II double, 6-III-VI single, 6-III rarely double; 8-II weakly developed, usually double (1-3); 13-II weakly developed, usually 12 branches (7-16), 13-III-V strongly developed, generally triple. *Segment VIII:* Comb with 64-97 scales, mean 72.17; scales short, with distinct fringe on sides and apex; scales arranged in 6 roughly irregular rows, comb forming a whole nearly triangular outline. *Siphon:* Index 1.71-2.57, mean 2.11 as long as wide 0.5 from base; moderately to strongly tanned, darkened ring at base; acus distinct, attached, moderate in size. Pecten of 10-19 spines, mean 14.06, extending from base to 0.4 the length of siphon; spines evenly spaced, with basal denticles. Seta 1-S slightly distad of pecten, usually with 5 branches (4-7); seta 2-S single, inserted on apex of siphon. *Segment X:* Saddle complete, without acus and spicules; length 0.28 – 0.32 mm, mean 0.30 mm; weakly to moderately tanned, sometimes darker on dorsal and lateral areas, darkened ring at base. Seta 1-X single; 2-X frequently with 7 branches; 3-X single; 4-X usually with 7 paired setae, anterior setae (4 pairs) with 5-9 branches, posterior setae (3 pairs) with 2-10 branches, setae borne from grid, except the end posterior paired setae arise on margin of saddle. Anal papillae little more length than saddle, gradually tapering.

TYPE-DATA. – *Lectotype* ♀ (Instituto Oswaldo Cruz, Departamento de Entomologia, nº 929, suporte 93) Coqueto Farm, "5 de novembro" river, 13 km from São João de Petrópolis and 9 km from Santa Tereza County, Canaan Valley, Espírito Santo State, Brazil, May, 1932, coll. J. Serafim, det. Costa Lima, 1933, collected as larva from a rockhole in riverbed. *Paralectotype* – 1 ♀, 2 ♂, 2 male genitalia, 6 4th-instar larvae, 4 larval skins, 2 pupae, same data as lectotype, related as follows: 1 ♀ (IOC nº 929, suporte 93); 2 ♂ without associated genitalia (IOC nº 928, suporte 93) and 2 male genitalia on slides (IOC nº 1784, D 14, box 60 and nº 1785, D 15, box 60); 1 larval skin on slide (IOC nº 1780, D 10, box 60); 2 larval skins on slide (IOC nº 1781, D 11, box 60); 1 larva, 1 larval skin and 1 larva without head on slide (IOC nº 1782, D 12, box 60); 3 larvae, 1 larva without head and 2 pupae on slide (IOC nº 1783, D 13, box 60).

OTHER MATERIAL EXAMINED. – The specimens examined numbered 30 ♂, 28 ♀, 7 4th-instar larvae, related as follows: Brazil, Rio de Janeiro State, Terezópolis County, Carlos Guinle Farm, August 2, 1943, coll. L. Gomes, det. N. L. Cerqueira, 1943, collected as pupae from a rockhole, 1 ♂ and 1 ♀ with associated pupal skins on slides, with male genitalia on slide (FSP-USP nº 4355 and 4356). Brazil, São Paulo State, Pariquera-Açú County, Galiléia Farm, July 27, 1985, coll. D. Natal, as larvae from a rockhole at edge of the Pariquera-Açú river in forest found in regions near the Atlantic Coast, 3 ♂ and 3 ♀ with associated larval and pupal skins on slides, with male genitalia on slides, 4 ♂ and 2 ♀ with associated pupal skins on slides, with male genitalia on slides, 1 ♂ with associated pupal skin on slide, 2 ♀ with associated larval and pupal skins on slides, with head on slide, 2 ♀ with associated larval and pupal skins on slides, with genitalia on slides, 1 ♀ with associated larval and pupal skins on slide, with genitalia and tarsal claws on slides, 2 female (FSP-USP); same data, 2 ♂ and 2 ♀ with associated larval and pupal skins on slides, with male genitalia on slides (USNM); same data, 2 ♂ and 1 ♀ with associated larval and pupal skins on slides, with male genitalia on slides (BM); same data, 2 ♂ and 1 ♀ with associated larval and pupal skins on slides, with male genitalia on slides (IOC); same data except

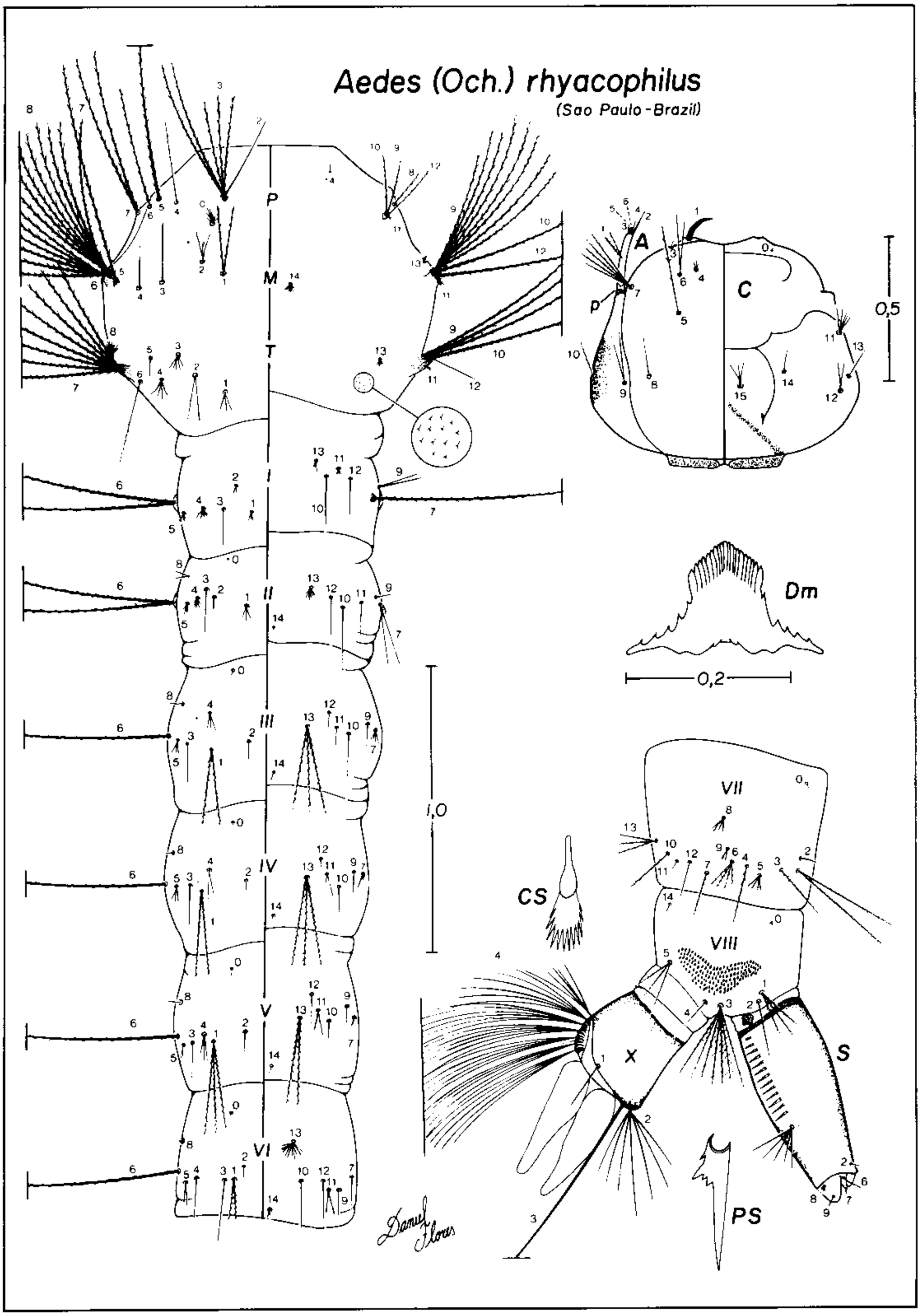

Fig. 4: *Aedes (Och.) rhyacophilus* – Abbreviations used: A – antenna; C – cranium; CS – comb scale; Dm – dorsomentum; M – mesothorax; p – puncture; P – prothorax; PS – pecten spine; S – siphon; T – metathorax; I-VIII, X – abdominal segments.

October 15, 1985, coll. Forattini and Gomes, 2 ♂ and 2 ♀ with associated larval and pupal skins on slides, 3 ♂ with associated pupal skins on slides, 2 ♂ and 4 ♀ with genitalia on slides, 1 ♂ with genitalia and tarsal claws on slides, 7 4th-instar larvae on slides (FSP-USP); same data, 1 ♂ with associated pupal skin on slide, with genitalia on slide, 1 ♀ with associated larval and pupal skin on slide (USNM); same data, 1 ♂ and 1 ♀ with associated pupal skins on slides, with male genitalia on slide (BM); same data, 1 ♂ and 1 ♀ with associated pupal skins on slides, with male genitalia on slide (IOC); same data except widening of the riverbed with gravelly bottom, October 29, 1985, coll. Gomes and Kakitani, 1 ♂ and 2 ♀ with associated larval and pupal skins on slides, with male genitalia on slide (FSP-USP); same data except September 17, 1986, coll. E. X. Rabello, 3 ♂ with associated larval and pupal skins on slides, with male genitalia on slides (FSP-USP).

DISTRIBUTION – Until now the distribution of the *Ae. rhyacophilus* has been represented by a large geographical region of southern South America, including probably the Tropical Atlantic System area. It has been found in the States of Espírito Santo, Rio de Janeiro and São Paulo in Brazil, and the Province of Misiones in Argentina (Lane 1953; Forattini 1965; Garcia & Casal, 1968).

BIONOMICS – Breeding places have been found in rockholes at river sides and in shallow riverbeds with gravelly bottoms (Fig. 1-J, K). The stream, situated in a mountainous region, flowed through a forested area of the Tropical Atlantic System. These aspects are similar to those of the species type-locality. The following species were found associated in these breeding places: *Anopheles (Anopheles) lutzi* Cruz, *An. (Ano.) punctimacula* Dyar and Knab, *Culex (Culex) dolosus* (Arribálzaga), *Cx. (Cux.) mollis* Dyar and Knab, *Cx. (Cux.) usquatus* Dyar, *Cx. (Lutzia) bigoti* Bellardi, *Uranotaenia (Uranotaenia) calosomata* Dyar and Knab.

DISCUSSION – *Aedes (Och.) rhyacophilus* was placed in the synonymy of *Ae. scapularis* by Arnell (1976) who, for this purpose, took the variations in the scutal marking of the females into consideration as well as the details of the masculine genitalia and considered them as strictly individual and not populational characteristics. Probably Arnell (1976) was unable to examine the syntypes since they were considered, by Belkin and others (1971), to have been deposited in some unknown place. However, it was later possible to localise these specimens in the Entomological Collection of the Instituto Oswaldo Cruz, in 1986. Thus is was possible to carry out more detailed studies of the morphological characteristics of the syntypes and of the examples collected in other regions, which the permitted the conclusion that *rhyacophilus* was a valid species which could be characterized as follows.

The female adults of *rhyacophilus* can be distinguished from those of *scapularis* by the following combination of characters: (1) scutal pattern of white scales; (2) acrostichal and posterior scutal fossal setae present; (3) postspiracular area with a patch of broad white scales; (4) lower and upper mesokatepisternum with patches of broad white scales separated; (5) tibiae and tarsi entirely dark; (6) abdomen without pale median longitudinal stripe on posterior segments. The male genitalia differing in 2 features of the gonocoxite: (1) apicodorsal lobe not developed; (2) differentiated seta of basal dorsomesal lobe straight distad of middle. The larvae can be distinguished by the following characters: (1) spicules of integument very sparse and short; (2) median labral plate poorly developed dorsally; (3) dorsomentum with general triangular outline, narrowing to apex where assumes pentagonal outline distally; (4) setae 5-C usually single, occasionally double; 6-C generally double; 1-P normaly double; 3-P frequently with 5 branches; 1-III usually double; 13-III generally triple; (5) 4-X with 7 pairs of setae.

From the close resemblance between the adults of the *rhyacophilus* and those of *Ae. patersoni* in the scutal marking and aspect of anterior surface of the hindtibia in can be inferred that *rhyacophilus* belongs to the Infirmatus Subgroup of the Scapularis Group in the classification proposed by Arnell (1976). However, adults of *rhyacophilus* can be distinguished from those of *patersoni* by the presence of acrosthical and posterior scutal fossal setae beside a small basal spot of white scales on costa. The male genitalia of *rhyacophilus* are easily differentiated from *patersoni* and all other members of the Infirmatus Subgroup by the claspette filament which has the retrorse process moderately developed without spicules basad of this process. The larvae of *rhyacophi-*

lus differ from *patersoni* by setae 3-P usually with 5 branches; 1-IV, V generally double or triple and 6-III frequently simple.

The male genitalia of *rhyacophilus* are very similar to those of *Ae. pectinatus* Arnell by the differentiated setae of basal dorsomesal lobe that is straight distad of middle and by the apicodorsal lobe not developed. However, this species can be easily distinguished from *pectinatus* by the tergum-IX which has the anterior middorsal emargination round in shape and caudal bridge connecting tergal lobes moderately broad.

RESUMO

Redescrição e Revalidação de *Aedes (Ochlerotatus) rhyacophilus* Costa Lima, 1933 – *Aedes (Ochlerotatus) rhyacophilus* Costa Lima é retirada da sinonímia com *Aedes (Ochlerotatus) scapularis* (Rondani). São designados lectótipo e paralectótipos. As formas larval, pupal e adulta de ambos os sexos são redescritas e acompanhadas de ilustrações representativas desses estádios, além do aspecto de um criadouro natural. Apresentam-se caracteres diagnósticos que permitem separar *rhyacophilus* das outras espécies do Grupo Scapularis, e alguns dados sobre a distribuição geográfica até agora conhecida.

Palavras-chave: *Aedes rhyacophilus* – *Aedes (Ochlerotatus)* – Culicidae – infecções veiculadas por mosquitos

ACKNOWLEDGMENTS

We express our thanks to Ricardo Lourenço de Oliveira, Department of Entomology of the Oswaldo Cruz Institute, for the loan of the Costa Lima (1933) type-series and Daniel Marucci, Department of Epidemiology of the School of Public Health, University of S. Paulo, Brazil, for taking the scanning electron micrographs and other pictures.

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