

CULEX SALTANENSIS MORPHOLOGICAL REDESCRIPTION OF THE IMMATURE AND ADULT STAGES

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ABSTRACT. *Culex (Culex) saltanensis* is redescribed in the adult, pupal, and larval stages. The male genitalia, pupae, and 4th-stage larvae are illustrated. Information about distribution, bionomics, and taxonomy is included. *Culex saltanensis* adults are separated from the closely related species *Cx. (Cux.) coronator* on the basis of morphometric characters.

KEY WORDS *Culex (Culex) saltanensis*, adult, pupa, larva, redescription

INTRODUCTION

Culex (Culex) saltanensis was described by Dyar (1928) based upon male genitalia. *Culex beauperthuyi* was nominated by Anduze (1943), who described and illustrated the male genitalia, and described the female as “a medium size insect, brown with golden scales, with whitish bands separating the abdominal segments, legs with white rings on the femoral, tibial and tarsal joints.” Immature stages were also briefly described. Bram (1967) established synonymy when comparing the holotype male genitalia of both species, and provided a brief larval redescription.

Cotrim et al. (1974) characterized the species based on 2 *Cx. beauperthuyi* male and female paratypes, a male and its pupal exuviae, and a female and its larval and pupal exuviae. Again, the female description was incomplete, providing only details on the proboscis and larval and pupal chaetotaxy. This article provides a complete description of *Cx. saltanensis* that will also help separate it from closely related species. Morphological terminology follows Harbach and Knight (1980, 1982). Examined specimens were deposited in the Centro de Investigaciones Entomológicas de Córdoba, National University of Córdoba, Argentina.

TAXONOMIC TREATMENT

Culex (Culex) saltanensis Dyar

Culex (Culex) saltanensis Dyar, 1928

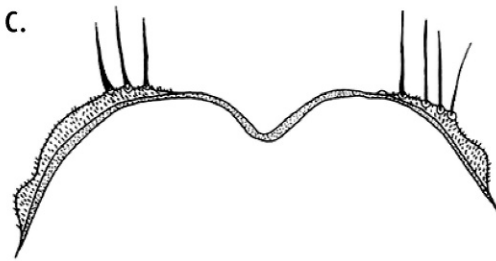
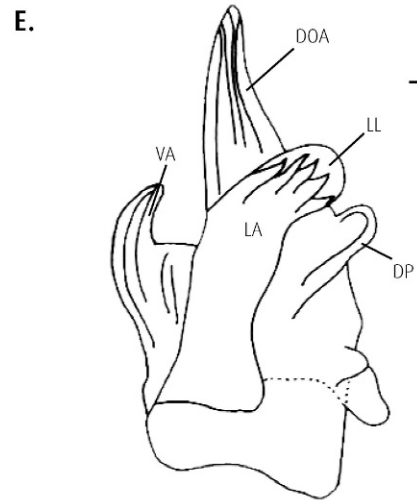
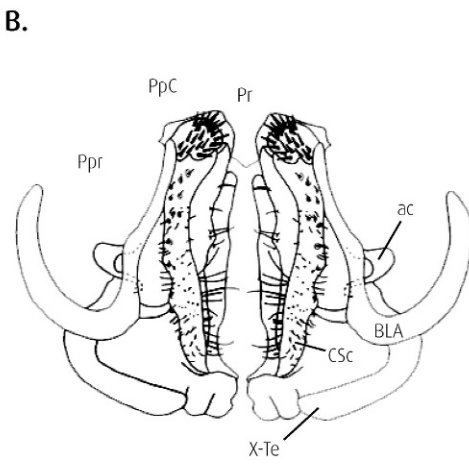
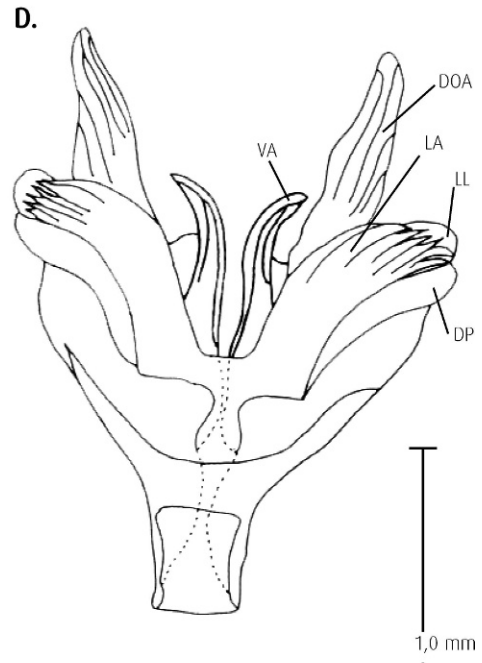
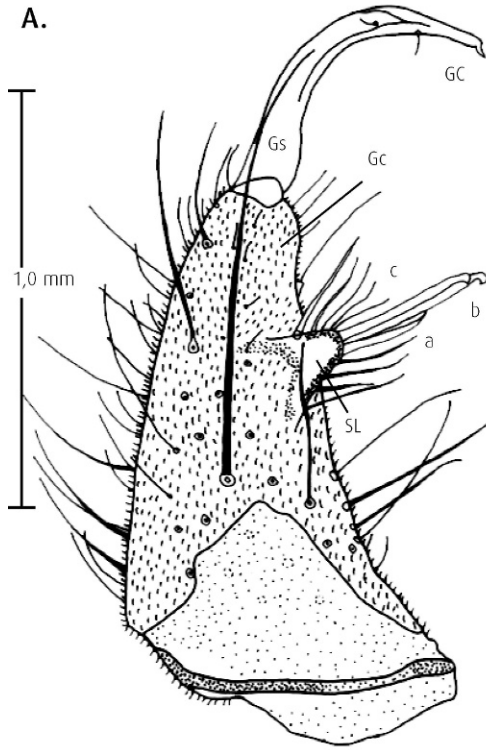
saltanensis Dyar, 1928: 386 (♂). Type locality: Campo Santo, Salta Province, Argentina (USNM). Lane (1953): 329 (♂*). Forattini (1965): 171 (♂*, P, L). Cotrim et al. (1974): 14 (♂*, P, L).

beauperthuyi Anduze, 1943. 459 (♂*, ♀, P, L). Type locality: Borburata, Carabobo, Vene-

zuela (IHC). Bram (1967): 97 (♂*, L; syn. with *saltanensis* Dyar).

Female. *Head:* Occiput erect scales brown or darker at the apex, narrow decumbent scales golden and white uniformly distributed, or golden forming a triangle with its base toward anterior. Erect scales of vertex with the same variability than in occipital region, and with dark setae to anterior. Ocular scales white, broad, and decumbent; ocular setae brown, and interocular golden to brown. Scarce postgenal setae, brown to yellowish. Antenna 0.98–1.04 (\bar{x} = 1.02) length of proboscis; lateral surface of pedicel with pale scales, remainder golden scaled, without setae; flagellomere 1 is the longest, yellowish at base, without scales, distal portion and the other flagellomeres with narrow decumbent and pale to golden scales. Proboscis 1.94–2.19 mm (\bar{x} = 2.03 mm), 0.97–1.04 (\bar{x} = 1) length of fore femur; 0.25 distal dark scaled dorsally, 0.75 remainder golden; ventrally, 0.75 apical with dark scales, varying at base from white to golden. Maxillary palpus golden scaled and conspicuous setae on basal half; distal half dark scaled with less and shorter setae; length 0.41–0.45 mm (\bar{x} = 0.42 mm), 0.2–0.24 (\bar{x} = 0.21) length of proboscis. *Thorax:* Scutal integument dark brown, golden scaled; white scales on anterior promontory extending to base of scutum lengthwise of margins; usually with a spot of golden scales on half and both sides of midline. Acrostichal, dorsocentral, and supraalar setae dark brown. Prescutellar area pale scaled. Pleural integument brown–yellowish, predominantly yellowish, antepnotum and meskatopisternum darker; meskatopisternum with white scales between the upper and the lower setae. Mesanepimeron with a patch of white scales in medial area and between upper mesanepimeral setae, another patch in the proepisternum. Antepnotum with dark brown setae and narrow and pale scales mainly toward ventral. Postpronotum with 5–9 (6) dark brown setae and narrow pale scales; remainder of pleural setae yellow to golden: 4–9 proepisternal, 8–16 (8)

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prealar, 4–7 (6) and 3–6 upper and lower meskatepisternal, respectively, 6–14 (7) and 2–3 (2) upper and lower mesanepimeral, respectively. Pre- and postspiracular setae absent. Scutellum with narrow pale scales confined to the lobes; 8–12 (10) and 6–10 (9) median and lateral large scutellar setae, dark brown with golden brightness; median and lateral small scutellar setae usually opaque, variable in number. Mesopostnotum shiny, pale, and velvety appearance with 2 brown opaque spots, without scales and setae. *Wing*: Length 3.66–4.32 mm (\bar{x} = 3.86 mm), golden scaled, usually with pale scales at base of costa. Subcosta intersects costa at furcation of R_2 and R_3 . Halter: scabellum and pedicel very pale to light brown. Capitellum pale, toward distal and posterior tan to brown, with white scales. *Legs*: Coxal integument very pale; fore- and hindcoxa with a line of golden-brown setae lengthwise the posterior margin; midcoxa whitish scaled toward anterior, with a medial line of golden-brown setae. Trochanters, white and yellow mixed scales and short golden setae. Femora and tibia front face brown and golden setae, posterior face pale scaled and 2 lines of short, golden, and thorny aspect setae. The femur–tibia and tibia–tarsal joints with shining golden rings of scales. Tarsus golden to dark scaled; joints between tarsomeres golden scaled; this may be indistinct on fore- and midlegs. Pulvillus pale to golden; empodium inconspicuous; unguis dark and simple. *Abdomen*: Tergum I with golden setae, brown scaled, occasionally with a complete basal band of white scales. Terga II–V variables: with a complete basal band of pale scales, or reduced to a basomedial spot, with or without basolateral spots to the absence of spots in tergum III. Terga VI–VII with basal band of pale scales joined to the basolateral spots, which extends from 0.75 of segment or reaches the apical margin. If basal band is complete, it could overtake until 0.2 broad of tergum. Remainder surface of terga II–VII brilliant dark scaled, golden setae lengthwise of lateral and apical margins. Tergum VIII with a complete basal band of pale scales, until 0.5 of broad, rest golden or brown scaled. Sternum with white and broad scales, occasionally golden. Golden setae more abundant than on tergum.

Male. Like female except for the following sexual differences. *Head*: Antenna strongly verticillate, length 1.35–2.01 mm (\bar{x} = 1.59 mm), 0.67–0.94 (\bar{x} = 0.79) length of proboscis; 4th distal

dark scaled, occasionally with subapical white scaled ring, remainder light golden scaled; length of proboscis 1.66–2.24 mm (\bar{x} = 2.02 mm), 1.07–1.23 (\bar{x} = 1.16) of forefemur. Maxillary palpus longer than proboscis, length 2.23–2.91 mm (\bar{x} = 2.62 mm), 1.28–1.39 (\bar{x} = 1.34) of proboscis, palpomere 1 + 2 and 3 golden ventrally and darker dorsally, palpomere 4 with a basal ring, apically dark scaled and pale scales in midregion, few ventral setae; 5th palpomere with 3 pale rings at basal, medial, and apical position, ventral and lateral surface densely covered with setae. *Thorax*: Postpronotal setae 4–8, proepisternal 10–23 (10), prealar 5–10 (10), 5–9 (5), and 5–8 (7) upper and lower meskatepisternal, respectively; 4–8 (5) and 1–2 (1) upper and lower mesanepimeral. Six–nine (7) and 5–8 large scutellar setae medial and lateral, respectively. *Wing*: Length 2.66–3.56 mm (\bar{x} = 3.26 mm). Scabellum white scaled. Hindtarsomere 5 usually golden scaled; unguis stronger than in female with secondary teeth in forelegs, occasionally in midlegs, never in hind legs. *Abdomen*: Tergum I brown scaled. Terga II–VII with complete white basal band, which could reach 0.5 segment broad; basal band occasionally reduced to a basomedial spot (II, III). Tergum VIII variable: basal band since 0.33 to 0.75 broad of segment or completely pale scaled, remainder with golden scales; setae disposition follows female pattern.

Male genitalia (Fig. 1). *Tergum IX*: Thin, with 2 dorsal lobes, tiny spicules, simple and strong setae in a straight row, varying in number (3–7); unilobulated ventrally. *Gonocoxite*: Twice longer than basal width, minutely spiculated, long and strong setae in dorsal surface, shorter and thinner setae generally in dorsolateral position. *Subapical lobe*: Prominent, without division, covered with spicules. Setae *a*, *b*, and *c* distally, strongly developed (as a spindle), hooklike at apex, *a* shorter than *b* and *c*, both similar in size. Strong but less developed and sharp apex setae surrounding apical setae. *Gonostylus*: Stout, thinner to apex, curved, with 2 fine and simple setae on distal 3rd; short but straight and strong claw. *Phallosome*: Longer than width. *Lateral plate*: Ventral arm shorter than dorsal arm, evident curvature to lateral, sharp apex and longitudinal striation; dorsal arm straight, thicker and longer than ventral arm, striated longitudinally; lateral arm broad with numerous denticles distally, shorter than dorsal and ventral arms; lateral lobe bigger than lateral arm and extending a few beyond from

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Fig. 1. Male genitalia structures of *Culex (Culex) saltanensis*: (A) gonocoxopodite (lateral); (B) paraproct (dorsal); (C) tergum IX (dorsal); (D), (E) lateral plate. Abbreviations: ac = acetabulum; BLA = basal lateral arm; CSc = cercal sclerite; DOA = dorsal arm; DP = dorsal process; GC = gonostylar claw; Gc = gonocoxopodite; Gs = gonostylus; LA = lateral arm; LL = lateral lobe; PpC = paraproct crown; Ppr = paraproct; Pr = proctiger; SL = subapical lobe; VA = ventral arm; X-Te = tergum X.

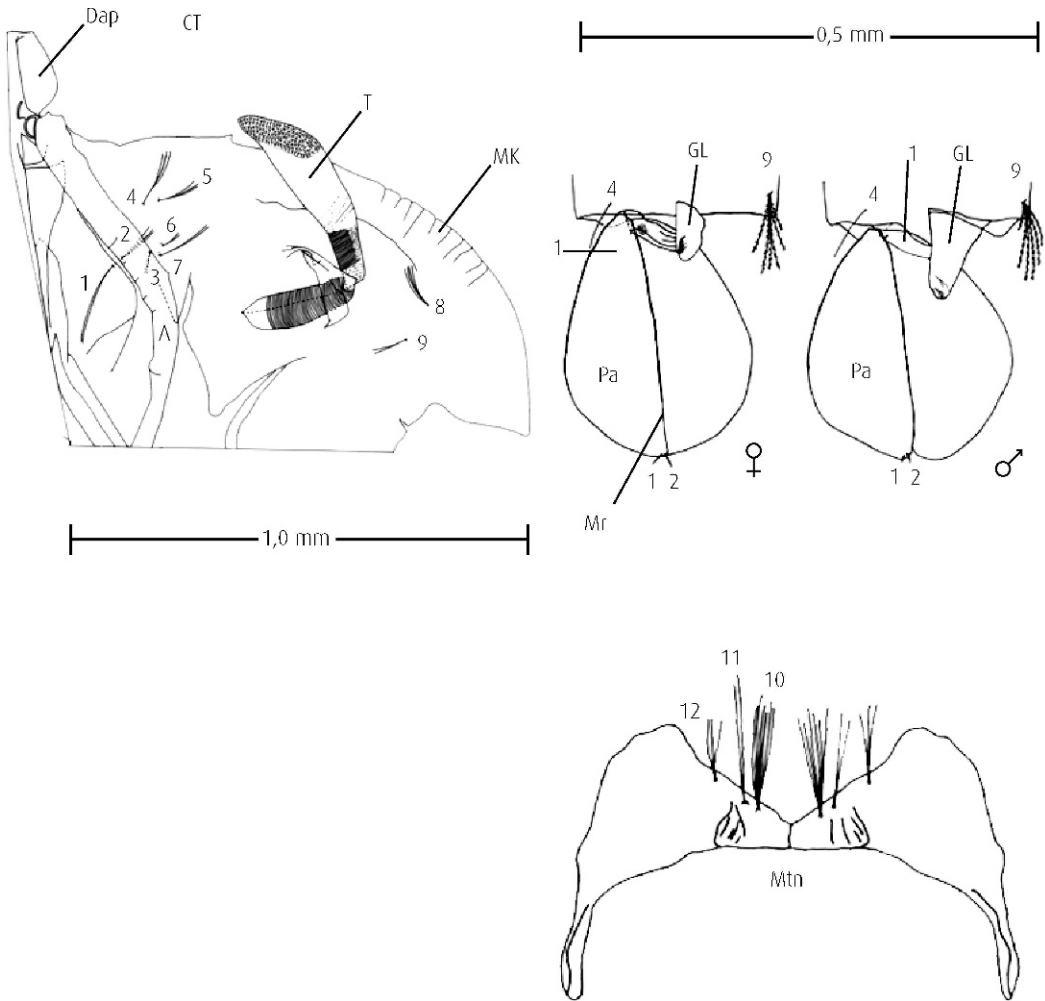


Fig. 2. Elements of pupal anatomy of *Culex (Culex) saltanensis*. A = antenna; CT = cephalothorax; Dap = dorsal apotome; GL = genital lobe; MK = median keel; Mr = midrib; Mtn = metanotum; Pa = paddle; T = trumpet.

it, smooth, round extreme, dorsal process salient, expanded, smooth aspect and round margin, narrower than lateral arm and lateral lobe, no longer than the 1st 1. *Paramere*: In lateral view roughly as an oval, basal extreme rounded, sharp apical margin with sclerotization that projects until half of ventral fringe; with a longitudinal rib. *Basal piece*: Similar in size to paramere, homogeneous aspect. *Paraproct*: Crown with many, short and strong spicules. *Basolateral arm* nearly 0.5 total length of paraproct or equal in size and strongly curved, acetabulum evident, wide base and round apex. *Proctiger*: Practically transparent, covered with tiny spicules. *Cercal sclerite*: With pilous aspect. *Tergum X*: As a strap that articulates with paraproct from its base.

Pupa (Fig. 2). Placement and character of setae as figured; range and modal number of branches in Table 1. *Cephalothorax*: Unevenly tanned, legs margin and under median keel darker; postscu-

tellar area with tiny spicules. Setae 1, 6, 7, 11-CT usually double; 2-5, 12-CT usually triple; 8-CT 4-5; 9-CT double; 10-CT 3-8 (6). *Metanotum* usually tanned. *Trumpet*: Cylindrical, tanned to yellow; length 0.62-0.82 mm (\bar{x} = 0.73 mm), width 0.12-0.17 mm (\bar{x} = 0.15 mm), index 4.11-6 (\bar{x} = 5.02); reticular area surrounding pinna dark like tracheoid area, extending about 0.21-0.27 mm (\bar{x} = 0.24 mm) from base. *Abdomen*: Length 2.32-3.5 mm (\bar{x} = 2.78 mm); slightly tanned to yellow, midarea of tergum I brown, basomedial region of terga III and IV tan, darker in V and VI; medial zone of terga II and III with tiny spicules, and, in general, the same pattern occurs in IV-VI. Seta 0-II-VIII present in all terga, simple; 2-I-VII simple; 10-I if present, simple; 10, 11-II if present, simple; 11-I, 8-II and 10-VIII absent; medial caudal lobe with simple setae. *Genital lobe*: Uniformly and slightly tanned, length varies in females between 0.22

Table 1. Number of branches for setae of pupa of *Culex (Culex) saltanensis* (12 specimens, modes in parentheses).

Seta	Cephalothorax	I	II	III	IV	V	VI	VII	VIII	IX	Paddle
0	—	—	1	1	1	1	1	1	1,2(1)	—	—
1	1-3(2)	28-59	7-27(18)	5-11(8)	2-6(6)	2-4(2)	2	2	—	1	1
2	2,3(3)	1,2(1)	1,2(1)	1	1	1	1	1	—	—	1
3	1-4(3)	1-3(2)	1,2(2)	1,2(2)	3-7	1,2(1)	1,2(2)	1,2	—	—	—
4	1-4(3)	2-8	2-5(3)	3-6(3)	2-4(2)	3-5(3)	1-5(2)	1,2(2)	1,2	—	—
5	2-4(3)	1-6(3)	2-5(4)	4-6(5)	2,3(2)	1	1	1-3(1)	—	—	—
6	2-4(2)	1	1,2(1)	2,3(3)	2,3(2)	1-3(2)	1-3(2)	4-7	—	—	—
7	1,2(2)	1,2(2)	1	3-6	2-4(3)	4-7(4)	1	1	—	—	—
8	4,5(4)	—	—	2-4	2-4	2-4(4)	2-4(3)	3,4(3)	—	—	—
9	2	1-3(2)	1,2(1)	1	1	1	1	4-8(6)	7-10(10)	—	—
10	3-8(6)	1	1,2(1)	1,2(2)	1,2(2)	1	1	1	—	—	—
11	1,2(2)	—	1	1	1	1,2(1)	1,2(1)	1,2(2)	—	—	—
12	2,3(3)	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	1,2(1)	—	—

and 0.27 mm (\bar{x} = 0.25 mm), 0.32–0.38 mm (\bar{x} = 0.34 mm) in males. *Paddle*: Lightly tanned, nearly transparent except for outer margin, less visible distally; midrib evident lengthwise of paddle; length 0.91–1.15 mm (\bar{x} = 0.96 mm); without spicules on margin; setae 1, 2-P simples.

Larva (Fig. 3). Placement and character of setae as figured; range and modal number of branches in Table 2. *Head*: Wider than long, 1.17 mm broad, 0.85-mm length, posterior region of dorsal apotema and the lateralia heavily tanned; dark collar. Dorsomentum with 5–6 (6) teeth on each side of median tooth, dark brown, clearer in basal and apex of each tooth. Setae 1, 3-C simples, the 1st 1 stronger; 4-C, thin, translucent; 5–7-C pinnated; 10, 11, 13, 14-C generally simple; 13-C usually bifid; 15-C short. *Antenna*: Length 0.55–0.64 mm (\bar{x} = 0.6 mm), tanned to pale, basal portion of flagellum stout and heavily aciculated, spine cover diminishes until seta 1-A, distal part thinner with few spicules, scape yellow to brown; seta 1-A at 0.39–0.46 mm (\bar{x} = 0.42 mm) from base, with 10–30 branches; 2–6-A simples; 5, 6-A shorter than the others. *Thorax*: Integument hyaline with homogeneous distribution of spicules in pro-, meso-, and metathorax; tubercles of 1–8-P and 6–8-M brown, tubercles of 9–12-P, M, T tanned and 7-T dark brown. Setae 1–3-P simples; 4-P generally double; 5, 6-P simples; 7-P triple, 8-P generally double; 9, 10, 12-P simples, the last 1 more developed; 11-P short with 1–6 branches; 13-P absent; 14-P simple. Seta 1-M usually double, being the shorter of the segment; 2-M triple in general; 3-M simple; 4-M simple or double; 5–7-M simples; 8-M with 4–7 branches; 10, 12-M simple; 11-M with 2–4 branches. Setae 7, 9-T pinnated and strongly developed; 10-T pinnated and simple. *Abdomen*: Integument hyaline with smaller and more scattered spicules than thorax, more evident on tergum VIII. Tubercles of 6-I–VI and 7-I moderately tanned; tubercle of 1, 3-VIII brown.

Seta 6-I–II triple in general; 6-III–VI principally double; 7-I double, shorter than 6-I or equals; 1-III–VI similar in size; 10-I–VI simple and similar length; 13-III–IV generally triple, and variable in length. *Segment VIII*: Comb with 20–33 (28) scales arranged in 3–4 (3) rows; frequently fringed on sides and apex; 2, 4-VIII simples; 1-VIII with 6–9 (7) branches; 3-VIII and 5-VIII with 7–11 (8) and 2–4 (3) branches, respectively. *Siphon*: Length 1.11–1.5 mm (\bar{x} = 1.35 mm), broad 0.26–0.39 mm (\bar{x} = 0.3 mm), index 3–5.52 (\bar{x} = 4.63); covered with spicules, more evident at apex; acus, if present, and siphon base, dark brown, clearer to spiracular apparatus. Pecten at 0.34 mm from base of siphon, with 13–17 spines, the longest with 1–3 basal denticles. Seta 1-S lined, with variable number of elements; 4 and 5 setae (8%), 5 pairs (17%), 5 and 6 setae (42%), with 6 pairs (25%) and with 6 and 7 setae (8%); setae 2, 6, 7, 8, 9-S simples. *Segment X*: Saddle complete, length 0.31–0.41 mm (\bar{x} = 0.35 mm), light brown, darker in dorsal and basal region, occasionally in ventral; spiculated, increasing in size to posterior border, meeting in groups on dorsal–posterior region; siphon/saddle index 2.96–3.92 (\bar{x} = 3.42). Seta 1-X double in general; 2-X with 4–7 (5) branches; 3-X simple; 4-X in 7 pairs. Anal papillae large, tapering toward apex, dorsal and ventral papillae about 1.22 and 1.17 length of saddle.

Material Examined. *Culex saltanensis*. 7♂G, 5♀, 12Pe, 12Le, 12L, as follows: Argentina, Córdoba Province, San Agustín, XI/25/1987 Almirón coll. 1♂G 1Pe 1Le; Altos de Chipión, III/13/2005 Laurito and Visintin coll. 3L, IV/5/2005 Laurito and Visintin coll. 3L, IV/27/2005 Laurito and Visintin coll. 1♂G 1♀ 2Pe 2Le 3L, V/24/2005 Laurito and Visintin coll. 2♂G 1♀ 3Pe 3Le 3L, VI/15/2005 Laurito and Visintin coll. 1♂G 1♀ 2Pe 2Le, VI/30/2005 Laurito and Visintin coll. 1♂G 1♀ 2Pe 2Le, VIII/4/2005 Laurito and Visintin coll. 1♀ 1Pe 1Le; Santiago del Estero

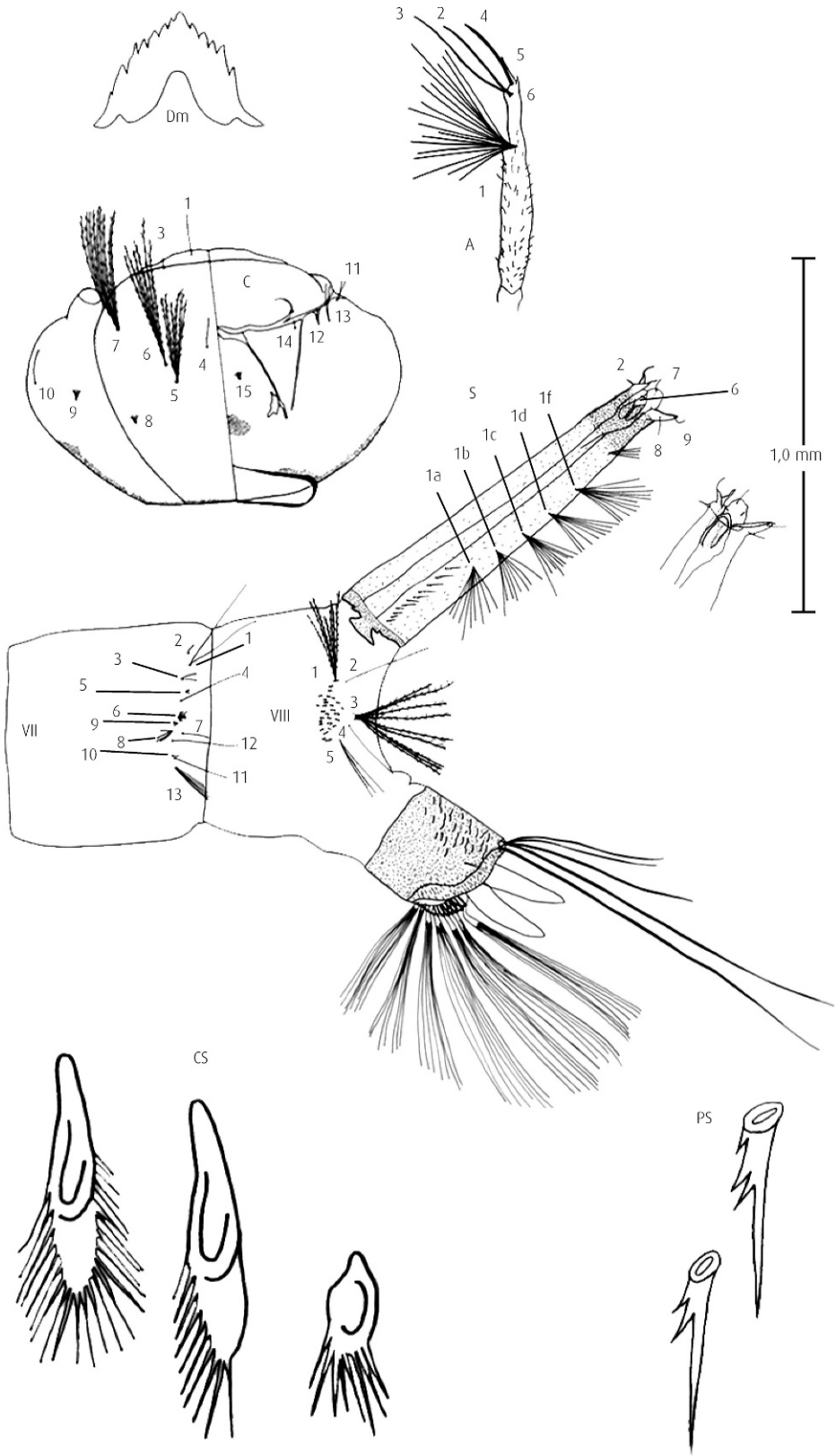


Table 2. Number of branches for 4th-stage larva setae of *Culex (Culex) saltanensis* (12 specimens, modes in parentheses).

Seta no.	Head		Thorax				Abdominal segments							
	C	P	M	T	I	II	III	IV	V	VI	VII	VIII	X	
0	0	10	-	-	-	-	-	-	-	-	-	-	-	
1	1	1,2(1)	1-4(2)	2,3	2-5(4)	1-3(2)	1-3(2)	2	2	2	2,3(2)	6-9(7)	1-4(2)	
2	-	1	1-3(3)	-	1,2(1)	1	1	1	1	1	1	1	4-7(5)	
3	1	1	1	3-8(6)	1-4	1,2(2)	1,2(2)	1-3(2)	1	1	2-5(3)	7-11(8)	1,2(2)	
4	1	1,2(2)	1,2(2)	2-5	1-14	3-8(5)	2-4(2)	1-3(2)	2-8(5)	1-4(3)	1	1	5-16(11)	
5	4-7(6)	1	1	1	3-6(4)	1-3	1-3(2)	1-4(2)	2-4(2)	1-5(3)	2,3(3)	2-4(3)	-	
6	4-7(6)	1	1	1	2,3(3)	3,4(3)	2-5(2)	2-4(2)	2-4(2)	2,3(2)	9-15(14)	-	-	
7	6-10(9)	3	1	6-9	1,2(2)	4-9	7-9	5-9(8)	6-11(8)	1	1	1 a-S	9-18	
8	2-6	1,2(2)	4-7(6)	8-12(10)	-	1	1	1,2(2)	1,2(2)	2-4(3)	4-11	1 b-S	10-17 (10)	
9	4-7(5)	1	4-7(6)	10 May	2-4(2)	1,2(1)	1	1	1,2(1)	1	3-6	1 c-S	7-15	
10	1,2(1)	1	1	1	1	1	1	1	1	1	1	1 d-S	9-17	
11	1,2(1)	1-6(4)	2-4(4)	3-5(4)	3-8(3)	1-3(2)	1-4(2)	1-4	1-3	2,3(2)	1-5	1 e-S	5-18	
12	2-4(3)	1	1	1-3(1)	1-4	1,2(2)	1-3	1,2(1)	1,2(1)	1	1	1 f-S	4-12 (4)	
13	1,2(1)	-	>25	4-10	1-3	>20	2-4(3)	2-4(3)	2-5(4)	>28	3-7(6)	2 S	1	
14	1-4(1)	1,2(1)	>12	-	-	-	-	-	-	-	-	-	-	
15	3-5(4)	-	-	-	-	-	-	-	-	-	-	-	-	

Province, Ojo de Agua, XII/5/1987 Almirón coll. 1♂G 1Pe 1Le.

Distribution. Argentina (provinces of Chaco, Córdoba, Corrientes, Formosa, Misiones, Salta, Santiago del Estero and Tucumán), Brasil, Panamá and Venezuela (Almirón 2002).

Bionomics. Females were captured on humans (de-Oliveira et al. 1985), occasionally inside houses (de-Oliveira and Hieden 1986), and with chicken-baited traps. Females are considered the primary vector of *Plasmodium juxtanculare*, Versiani and Gomes, which affects hens (Rotraut and de-Oliveira 1994), and also are efficient experimental vectors of *P. cathemerium* Manwell, another avian parasite (de-Oliveira and Castro 1991).

Taxonomy. *Culex saltanensis* is similar to *Cx. (Cux.) duplicator* Dyar and Knab, which was previously differentiated solely based upon the shape of the subapical lobe of gonocoxite and ventral arm of the phallosome (Cotrim et al. 1974). The other closely related species, *Cx. (Cux.) bonnae* Dyar and Knab, was distinguished based upon differential pilosity in the lateral margin of sternum X (Bram 1967).

Culex saltanensis is also similar to *Cx. (Cux.) coronator* Dyar and Knab but differs in the male genitalia and the larval stage. *Culex saltanensis* is recognized by a minutely spiculated siphon, most evident at the apex. In adults Rotraut and de-Oliveira (1994) stated that the mesomeron is pale in *Cx. saltanensis* but darker in *Cx. coronator* and the scutum integument is brown in *Cx. saltanensis*, but paler in *Cx. coronator*. In *Cx.*

saltanensis the scutum has pale scales. However, the *Cx. coronator* and *Cx. saltanensis* adults examined in the present study did not differ in the mesomeron color pattern, although we did observe darker coloration of the scutum in *Cx. saltanensis*. Coloration is problematic as a differential character because it is variable among individuals from different collection sites, but also in older specimens. Forattini (1965) and Darsie (1985) separated *Cx. coronator* from *Cx. saltanensis* by colors of the scutal scales, and by the presence of 2 pale scaled spots on both sides of midline in *Cx. coronator*. According to these authors, the *Cx. saltanensis* scutum is covered with light golden to whitish scales, and *Cx. coronator* has golden, bronze, or brown scales. *Culex coronator* adults examined in the present study had light to dark golden scales. Moreover, *Cx. saltanensis* adults had 2 pale scaled spots on both sides of midline.

We found no morphologic characters that distinguish *Cx. coronator* from *Cx. saltanensis* females. However, the length of the mediocubital cross vein (m-cu) and the distance between this vein and the radiomedial cross vein (r-m) provided an unequivocal character to distinguish both species. In *Cx. saltanensis* the distance between these cross veins is always < the length of m-cu, whereas in *Cx. coronator* this distance ≥ length of m-cu.

The presence of white scales at the costa vein base is the character included in Darsie (1985) to separate *Cx. maxi* Dyar, *Cx. fernandesi* Casal, García and Cavalieri, *Cx. lahillei* Bachman and

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Fig. 3. Elements of larval anatomy of *Culex (Culex) saltanensis*. A = antenna; C = cranium; CS = comb scales; Dm = dorsomentum; PS = pecten spines; S = siphon; VII, VIII, X = abdominal segments.

Casal, and *Cx. apicinus* Philippi from the rest of the species in the subgenus *Culex* from Argentina. White scales at costa vein base were usually observed in *Cx. coronator* and *Cx. saltanensis* specimens examined for this work. This observation and other problems in identifying members of this subgenus suggest that an intensive revision of this subgenus is necessary.

ACKNOWLEDGMENTS

This work was supported by grants from FONCYT 01-12572, CONICET, SECYT-UNC, and Agencia Córdoba Ciencia. W.R.A. is a member of the Scientific Career of CONICET, Argentina.

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