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Morphological description of the pupa and fourth-instar larva and redescription of the adults of *Psorophora* (*Psorophora*) *pallescens* Edwards (Diptera: Culicidae)

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Abstract

The adult male and female of *Psorophora* (*Psorophora*) *pallescens* Edwards are redescribed. The pupa and fourth-instar larva are described for the first time. The male genitalia, pupa and fourth-instar larva are illustrated. Information on distribution, bionomics and taxonomy is also included. *Psorophora pallescens* adults differ from the other species of the subgenus in the coloration of the scutum and abdomen. The larva can be distinguished from *Psorophora ciliata* based on characters of the head, thorax and abdomen.

Key words: *Psorophora* (*Psorophora*) *pallescens*, unknown immature stages, description, adult redescriptions

Introduction

Psorophora (*Psorophora*) *pallescens* was described by Edwards (1922) from adults (1 M and 4 F cotypes) collected in Paraguay. These plus other specimens were sent by Dr. Kertèsz to Theobald for identification at the British Museum (Natural History) in 1911, and then passed to Edwards in 1921. At the same time, Dyar (1922) described this species based on two females from Paraguay and a male from Argentina but named it *Ps. stigmatephora*. Regarding specimens examined by these two authors, the specimens identified by Lynch Arribálzaga (1891) as *Ps. ciliata* (Fabricius) included misidentified specimens of *Ps. pallescens*. Shannon & Del Ponte (1927) also concluded that some specimens identified by Lynch Arribálzaga (1891) as *Ps. ciliata* were actually *Ps. pallescens*. Del Ponte & Castro (1952) redescribed the adults and included an illustration of the male genitalia based on material deposited in the collection of the Natural Sciences Museum "Bernardino Rivadavia" (Buenos Aires Province). Stone (1956) examined the genitalia of the male syntype deposited in the British Museum (now the Natural History Museum), drew the gonostylus and reported some differences from that figured by Lane & Cerqueira (Lane 1953). Guedes *et al*. (1965) illustrated the female genitalia. Belkin (1968) examined specimens deposited in the collection of British Museum and designated a lectotype male for *Ps. pallescens*.

None of the authors mentioned in the previous paragraph described the larva and pupa. Therefore, the purpose of this paper is to provide a complete description of all life stages of *Ps. pallescens* to aid the unequivocal recognition of the species.

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Material and methods

During sampling carried out in the provinces of Chaco and Córdoba (Argentina), larvae belonging to the genus *Psorophora* were collected from pools. Several larvae were individually reared to obtain adults. Some larvae could not be identified to species level using to the keys by Darsie (1985), but the respective adults were identified as *Ps.* (*Psorophora*) *pallescens*. The adults are pin-mounted and the immature stages and male genitalia are mounted in Canada balsam on microscope slides. The morphological terminology follows Harbach & Knight (1980, 1982) and the abbreviations for the genus and subgenus are those of Reinert (2001). Voucher specimens are deposited in the Departmento de Entomología, Instituto de Medicina Regional (National University of Northeast) and Centro de Investigaciones Entomológicas de Córdoba (National University of Córdoba), Argentina. An asterisk following an abbreviation indicates that the drawings are available, and the life stages are indicated as follows: M (male), MG (male genitalia), F (female), Pe (pupal exuviae) and Le (larval exuviae). Measurements are given in millimetres, as a range followed by the mean in parentheses; counts and ratios are formatted similarly.

Psorophora (*Psorophora*) *pallescens* Edwards

Psorophora pallescens Edwards, 1922: 76 (M, F). Type locality: Paraguay (BM). Del Ponte & Castro 1952: 221 (M*, F*, tax.). Lane 1953: 737 (M*, F). Stone 1956 (1957): 337 (M*). Guedes *et al.* 1965: 18 (F*). Belkin 1968: 28 (lectotype desig.).

Psorophora stigmatephora Dyar, 1922: 116 (M, F*). Type locality: Río Tapenaga, Colonie Florencia, Gran Chaco, Argentina (USNM).

FEMALE: *Head*: Occiput with broad white scales, midline without scales, erect scales thin and pale. Torus and clypeus ochre. Maxillary palpus and proboscis with mixed yellowish, dark and shiny semi-erect scales at base, dark-scaled apically. Maxillary palpus 0.80–1.30 mm (1.10 mm). Proboscis straight, 3.00–3.50 mm (3.10 mm), slightly longer than forefemur. *Thorax*: Scutal integument light brown, scutum with broad white scales. Acrostichal area with narrow golden scales, dorsocentral area with yellow to pale scales. Disc of scutum with a spot of dark semi-erect scales on anterior half and both sides of midline followed by 2 parallel stripes, which extend up to prescutellar area, separated by yellowish to pale scales. Pleura covered with broad white scales, except for lower mesokatepisternum with slender scales. Acrostichal and dorsocentral setae dark. Upper proepisternal and prealar setae golden, antealar area with strong dark setae. Pleural setae golden: 19–22 (22) proepisternal, 14–19 (17) prealar, 11–17 (15) and 6–9 (6) upper and lower mesanepimeral, respectively, 4–7 (6) and 3–8 (8) upper and lower mesokatepisternal, respectively, 2–4 (3) prespiracular and 6–9 (8) postspiracular. Scutellum with white scales confined to lobes: 20–26 (20) and 14–18 (14) large median and lateral scutellar setae. *Wing:* With mixed broad whitish and dark scales on posterior side of costa, subcosta and R; R_2 and R_3 lightly scaled; other veins predominantly dark-scaled. Basal and ventral surface of R with a spot of erect white scales. *Halter*: Integument pale, capitellum with white to yellowish scales. *Legs*: Integument light brown, fore-, mid- and hindcoxae white-scaled basally, middle region of anterior surface of fore- and midcoxae with mixed white and black scales. Fore- and midfemora basally yellowish-scaled, apically black. Hindfemur with yellowish scales on anterior 0.75, some erect at base, remainder with erect black scales. Tibia with erect yellowish scales at base, black at apex. Joints between tarsomeres with a ring of white scales, foretarsomere II with erect scales. Ungues toothed. *Abdomen*: Integument light brown. Terga with broad and white to yellow scales. Sterna white-scaled, black-scaled on midline.

MALE: Like female except for sexual differences. *Genitalia* (Fig.1c,d): Gonocoxite 2x longer than basal width, minutely spiculate, with long strong setae on dorsal surface, shorter and thinner ventrally. Gonostylus narrow, round basally, 0.75 length of gonocoxite, gonostylar claw small, pointed. *Claspette*: Divided, narrow, apical lobe with 29–31 tubercles bearing long thin setae, and external part leaflet-shaped, mesal part bent forward. *Proctiger:* Narrow, heavily sclerotized apically, toothed. *Aedeagus:* Heavily sclerotized apically,

ovoid with sharp-pointed apex, with 2 lateral expansions, attenuated portion toothed. Ninth tergum with 7 conspicuous setae on each lobe.

PUPA (Fig.1a,b): Placement and character of setae as figured; range and modal number of branches in Table 1. *Cephalothorax*: Integument light brown. Trumpet cylindrical, lightly tanned, length 0.93–1.35 mm (1.11 mm), width 0.20–0.35 mm (0.23 mm), index 3.85–5.50 (4.79); pinna 0.45–0.57 (0.50) length of trumpet; tracheoid area 0.41–0.51 (0.46) length of trumpet. *Abdomen*: Lightly tanned, similar to cephalothorax, with a darker median longitudinal strip. Abdominal segments II,V with 2 discontinuous (broken) thin oblique dark lines to each side. Setae 1-II-IV-V and 5-II,VI usually double and longer than corresponding segment. Minute marginal spicules present on external buttress. *Genital lobe*: Hyaline in both sexes. Length 0.35–0.45 mm (0.40 mm) in females and 0.52–0.58 mm (0.56 mm) in males. *Paddle:* Length 1.18–1.40 mm (1.30 mm), width 1.15–1.35 mm (1.25 mm), paddle index 1.02–1.04 (1.03). Paddle ovoid, hyaline, buttress darker. Midrib evident, distinct except apically; length 0.98–1.20 mm (1.03 mm). Seta 1-Pa usually double, 2-Pa 0.16 of 1-Pa.

TABLE 1. Number of branches for pupal setae of *Psorophora* (*Psorophora*) *pallescens* Edwards (54 specimens, modes in parentheses).

Seta N°	CT[a]	Abdominal segment								Paddle
		I	II	III	IV	V	VI	VII	VIII	
0	-	-	1	1	1	1	1	1	1	-
1	1–3(2)	-[b]	1–5(2)	2–6(4)	2,3(2)	2,3(2)	1–3(1)	1–4(3)	-	1–4(2)
2	1–4(3)	1–3(2)	1,2(1)	1,2(1)	1,2(1)	1,2(1)	2–7(3)	1,2(1)	-	1
3	1–4(2)	1–7(3)	1–5(1)	1–5(3)	3–9(3)	2–5(3)	1–3(1)	1–3(2)	-	-
4	2–6(4)	c	c	1–4(3)	2–5(3)	2–11(6)	2–6(3)	1–5(3)	1–3(2)	-
5	1–5(5)	2–5(4)	1–3(2)	1–5(2)	1–3(2)	2	2–4(2)	2–6(2)	-	-
6	2–5(3)	1–5(3)	2–5(2)	2,3(3)	2,3(2)	2,3(2)	2,3(2)	6–11(9)	-	-
7	1–3(3)	2–7(3)	1–5(3)	3–10(3)	2-8(6)	3–9(4)	1–3(1)	1–3(2)	-	-
8	1–3(1)	-	-	1–6(2)	1-4(1)	1–4(3)	4–8(4)	7	-	-
9	1–4(2)	1–3(1)	1–3(1)	1	1	1	1	2–9(7)	2–6(5)	-
10	2–9(4)	-	-	1–5(2)	2-5(3)	1–3(1)	1,2(1)	1–3(1)	-	-
11	1	-	-	1–7(3)	1-5(2)	2–6(4)	1–5(3)	1–4(3)	-	-
12	1–4(2)	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	1	1	1	1	1	1	-

[a] CT = cephalothorax.

[b] For seta 1-I, five to nine branches and 25-40 secondary branches.

[c] Not counted.

LARVA (fourth-instar) (Fig. 2): Placement and character of setae as figured; range and modal number of branches in Table 2. *Head*: Square, slightly wider than long, width 1.75 mm, length 1.45 mm. Integument hyaline, homogeneously colored, sometimes darker laterally. Collar brown, dark, thin. Dorsomentum with dark brown teeth, basally clearer, with 7–9 (8) teeth on each side of median tooth, 2 or 3 lateral teeth longer than median tooth. Maxilla (Fig. 2a) of *Psorophora* (*Psorophora*) type. Seta 0-C single, 2-C absent; 3,6-C simple, 4-C long with 1,2 (1) branches, 8,9-C similar in length. *Antenna*: Length 0.40–0.54 mm (0.47 mm), pale and homogeneously colored, covered in stout spines. Seta 1-A 0.36–0.50 mm (0.43 mm) from base, always single, 2-6-A single, 3-A broad, with blunt apex. *Thorax*: Integument hyaline. Tubercles of setae 9-12-M,T with a rounded apical denticle. Seta 0–P dendritic, setae 1,5,7-P always single, 2,3-P similar in length, 6-P multiple, 0.33 length of 5-7-P, 13-P absent. Setae 3,4-M similar in length with 5–12 (9) and 4–12 (9) branches,

TABLE 2. Number of branches for fourth-instar larval setae of *Psorophora* (*Psorophora*) *pallescens* Edwards (20 specimens, modes in parentheses).

Seta Nº	Head	Thorax			Abdominal segments								
		P[a]	M[b]	T[c]	I	II	III	IV	V	VI	VII	VIII	X
0	1–7(5)	[d]	-	-	-	1	1	1	1	1	1	1	-
1	1	1	4–9(4)	1–5(1)	1	1	4–7(5)	2–6	3–6(5)	6–11(9)	8–13(9)	6–13	2–9(5)
2	-	2–7(5)	3–7(5)	8–12(9)	1,2(1)	1	1	1	1	1	1	4–16(8)	5–12(8)
3	1	4–8(7)	5–12(9)	6–13(9)	6–9(8)	5–11(8)	7–10(7)	5–10(8)	4–7	5–8(7)	5–9	7–13	1
4	1,2(1)	5–9(5)	4–12(9)	5–13(5)	11–22	8–17	4–7(5)	3–7(5)	8–21(15)	7–11(8)	5,6(5)	5–10(8)	7 cratal + 5 precratal
5	1-5(3)	1	1	1	4–7(6)	6–14(7)	6–12(6)	5–9(7)	5–10(6)	5–8(5)	5–8(5)	7–15	-
6	1	4–6(6)	1	3–8	2	2,3(2)	1,2(1)	1,2(2)	2,3(2)	1	[d]	-	-
7	3–7(6)	1	3–8(5)	4–9(7)	5–12(8)	6–10(7)	4–19	8–16(8)	8–19(13)	5–10(4)	4–8	-	-
8	3–8(5)	4–8(8)	2–8(7)	[d]	-	1,2(1)	1	1	1,2(1)	4–8	5–7(6)	1-S	1
9	5–8(5)	3–5	3–6	2–7(2)	4–7(6)	1–4(4)	1,2(1)	1	1	1	[d]	2-S	1
10	4–12(4)	2–4	1,2(1)	1	4–11(6)	2–9(7)	4–7	4–8(4)	2–6(5)	3,4(4)	3–7	6-S	1
11	2–4(4)	3–7	-	2	1,2(1)	4–9(6)	3–6(5)	4–6(5)	4–7(5)	4–7(6)	4–8(5)	7-S	1
12	2–7(4)	3–6	3–5(3)	3–8(5)	4–11(6)	2–6(5)	3,4(4)	3,4(4)	2,3(2)	4–7(6)	4–8(4)	8-S	4–6(5)
13	8–13(9)	-	[d]	5–15(6)	1	[d]	2–5	2–5(4)	3–5(3)	[d]	10–16(10)	9-S	1
14	1	2–4(3)	[d]	-	-	1	1	1	1	1	-	1	-
15	1	-	-	-	-	-	-	-	-	-	-	Comb scales	Pecten spines
16	1–3	-	-	-	-	-	-	-	-	-	-	12–18(16)	22–33(30)

[a] P = prothorax.
[b] M = mesothorax.
[c] T = metathorax.
[d] Not counted.

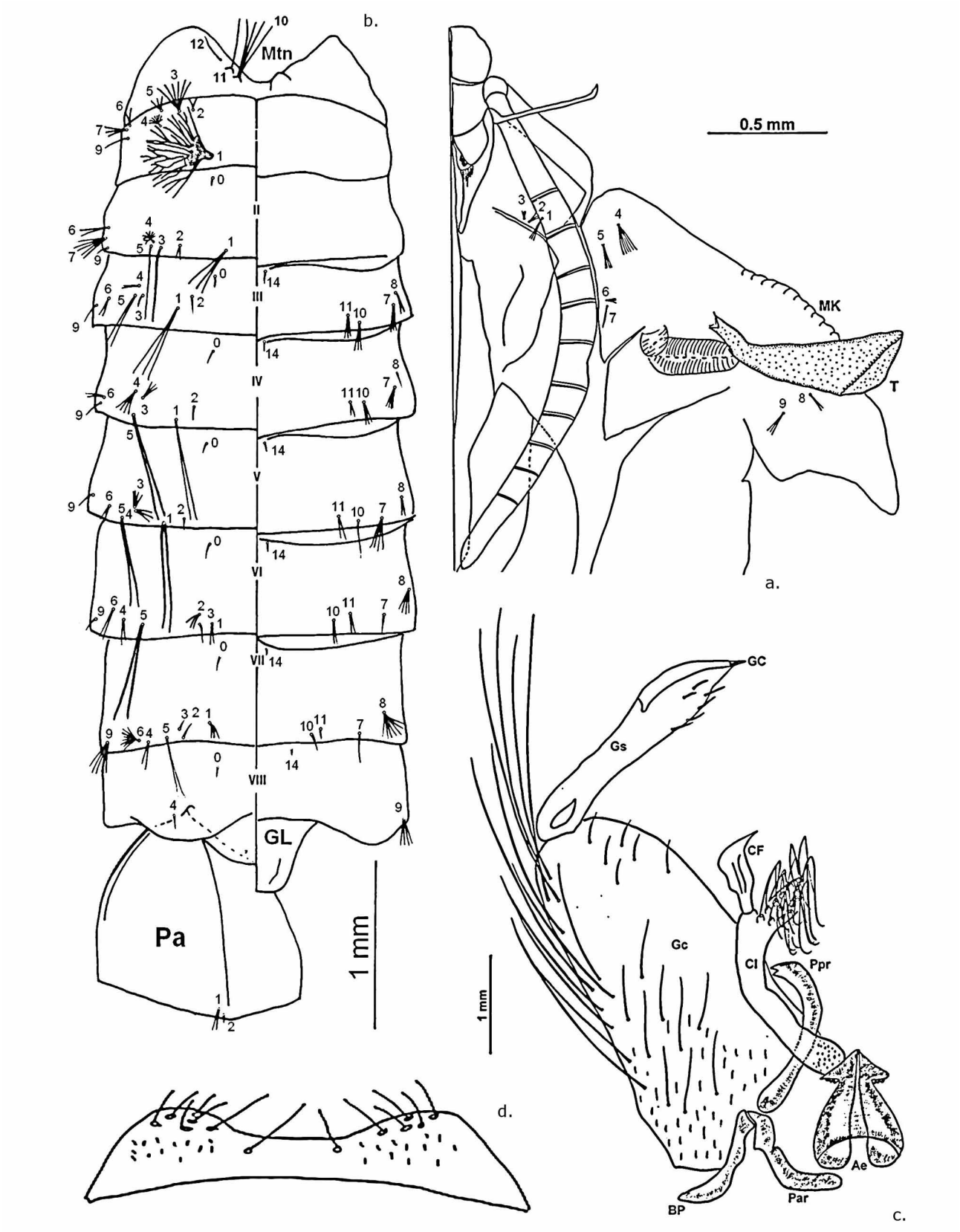

FIGURE 1. Pupa and male genitalic structures of *Psorophora* (*Psorophora*) *pallescens* Edwards. a: Cephalothorax; b: Metanotum and abdomen; c: Gonocoxopodite and phallosome; d: tergum IX. Ae = aedeagus; BP = basal piece; CF = claspette filament; Cl = claspette; Gc = gonocoxite; GC = gonostylar claw; GL = genital lobe; Gs = gonostylus; MK = median keel; Mtn = metanotum; Pa = paddle; Par = paramere; Ppr = paraproct; T = trumpet; I-VIII = abdominal segments.

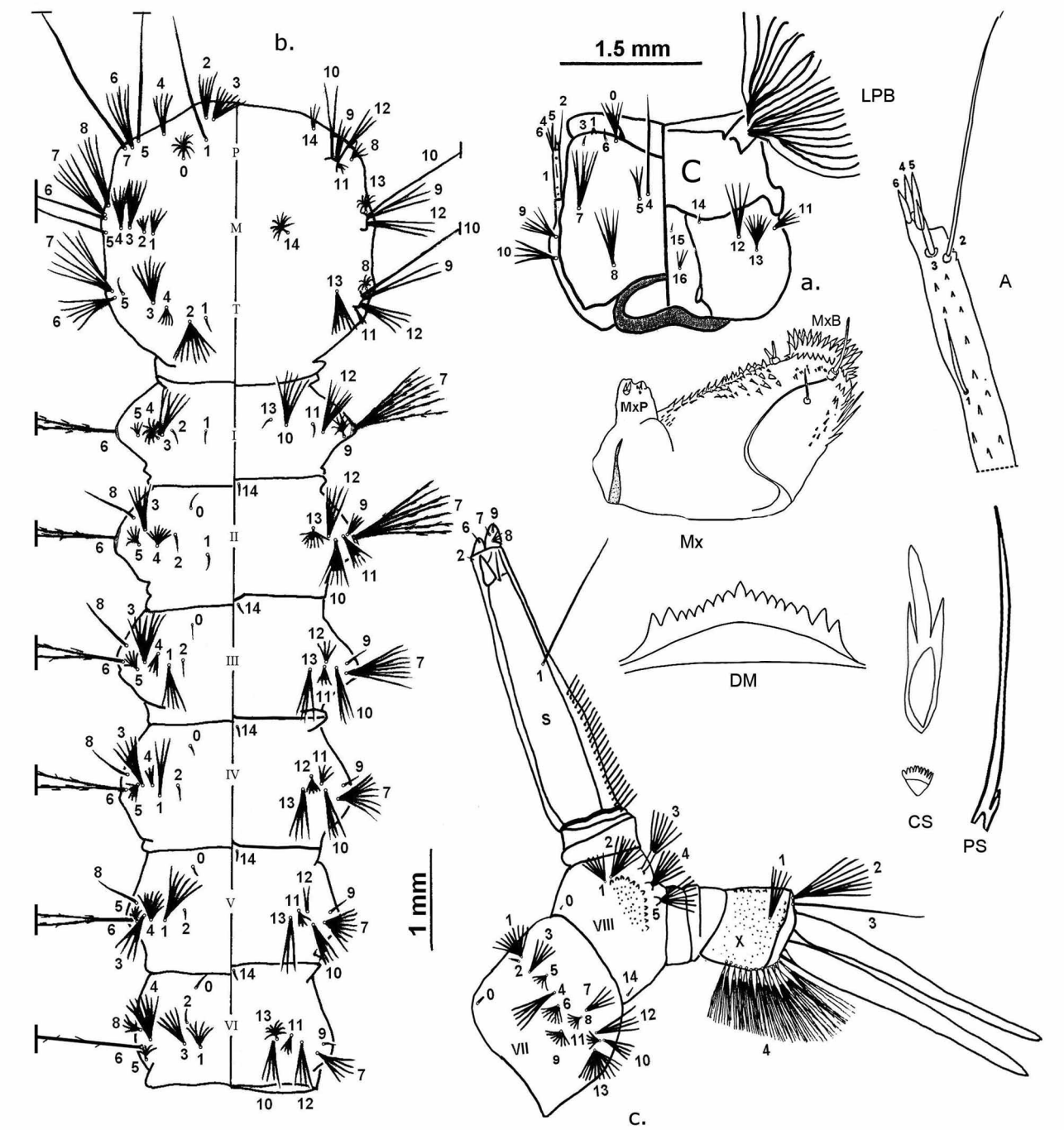

FIGURE 2. Larva of *Psorophora* (*Psorophora*) *pallescens* Edwards. a: Head; b: Thorax and abdominal segments I-VI; c: Abdominal segments VII-X. A = antenna; C = cranium; CS = comb scales; DM = dorsomentum; LPB = lateral palatal brush; M = mesothorax; Mx = Maxilla; MxB = maxillary brush; MxP = maxillary palpus; P = prothorax; PS = pecten spine; S = siphon; T = metathorax; I-X = abdominal segments.

respectively, 5,6-M always single, 10-M generally single, 11-M absent, 13,14-M dendritic. Setae 5,10-T always single, 8-T dendritic. *Abdomen*: Integument hyaline. Tubercles of setae 6,7-II-III pale and homogeneously colored. Seta 6-I-V generally double, 6-VI always single, seta 8-VI multiple. *Segment VIII*: Minutely spiculate basally. Comb with 12–18 (16) scales arranged in a row; each scale with 3–5 sharp points, median point longer than lateral ones. *Segment X*: Covered in minute spicules arranged in groups, increasing in size on dorsal and ventral regions. Saddle complete, length 0.70–0.89 mm (0.80 mm), light brown, siphon/saddle index 3.15–3.54 (3.35). Seta 4-X with 8 precratal setae and 4 setae on grid. Anal papillae large, tapering toward apex, papillae about 3x length of saddle, ventral papillae very slightly longer. *Siphon*: Length 2.32–3.12 mm (2.67 mm), wide

at base 0.60–1.00 mm (0.78 mm), index 2.87–4.60 (3.48). Light yellow, intense brown basally, with rows of minute spicules, acus yellowish. Pecten on basal 0.46 with 22–33 (30) spines, spines each with 1 basal denticle, sometimes 2.

Material examined. *Psorophora* (*Psorophora*) *pallescens*: 6M, 6MG, 9F, 54Pe, 16Le, 4L as follows: ARGENTINA, Chaco Province: Monte Alto (27º 26' S – 58º 55' W), 1M, 1MG, 5F, 2Pe, 3Le, 23-X-2003; 1M, 1MG, 4F, 5Pe, 5Le, III-2004, Stein & Willener coll.; Córdoba Province: El Tío (31º 22' S – 62º 49' W), 4M, 4MG, 44Pe, 5Le, 16-XII-1993, Almirón coll.; La Para (30º 53' S – 62º 58' W), 4L, 7-II-1996 and 1Pe, 1Le, 11-IX-1997, Almirón coll.; Las Garzas (31º 10' S – 64º 28' W) 2Pe, 2Le, 7-II-1996, Almirón coll.

Distribution. This species is known from Argentina, Bolivia and Paraguay (Walter Reed Biosystematics Unit 2001). It is recorded from the following provinces in Argentina: Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Salta, Santa Fe, Santiago del Estero (Campos & Maciá 1998), Mendoza (Rossi *et al*. 2006), La Rioja and Jujuy (Visintin *et al*. 2009).

Bionomics. Females of *Psorophora pallescens* were captured in horse-baited traps (Mitchell *et al*. 1985); Western Equine Encephalitis virus was isolated from females of these mosquitoes (Mitchell *et al*. 1987). Immature stages were collected from ground ponds, in wild and urban environments, temporary habitats with clear shallow water, grass and full sun, in association with larvae of *Ps. ciliata* and *Ps. paulli* Paterson & Shannon.

Taxonomy. *Psorophora pallescens* is distinguishable from other species of the subgenus (Del Ponte & Castro 1952), which have similar size, by the light brown integument of the adults. Larvae of *Ps. pallescens* are very similar to those of *Ps. ciliata*, from which they can be separated by having setae 7,9,10,12-C branched from the base, seta 16-C present, setae 8,10-M smooth, seta 2-A 0.30 length of the antenna, seta 1-A almost at middle of the antenna and seta 8-VI multiple branched. The male genitalia exhibit the general characteristics of the subgenus, being similar to *Ps. ciliata* from which they differ in having the claspette filament less curved and the base of gonocoxite twice as wide as the apex (Belkin *et al*. 1970). The pupa is similar to *Ps. ciliata* and *Ps. howardii* Coquillett, but differs in having seta 9-VIII and 8-CT usually double and 9-CT triple. The pupa of *Ps. pallescens* can also be distinguished in having two discontinuous thin oblique dark lines on both sides of abdominal segments II-V, whereas *Ps. ciliata* has three and *Ps. howardii* has a mottled appearance (Barr & Barr 1969).

References

Barr, A.R. & Barr, S. (1969) Mosquito studies (Diptera: Culicidae). XIII. Pupae of the genus *Psorophora* in North America and Puerto Rico. *Contributions of the American Entomological Institute*, 4(4), 1–20.

Belkin, J.N. (1968) Mosquito studies (Diptera: Culicidae). IX. The type specimens of New World mosquitoes in European museums. *Contributions of the American Entomological Institute*, 3(4), 1–69.

Belkin, J.N., Heinemman, S.J. & Page, W.A. (1970) Mosquito studies. XXI. The Culicidae of Jamaica. *Contributions of the American Entomological Institute*, 6(1), 1–458.

Campos, R.E. & Maciá, A. (1998) Culicidae. *In:* Morrone JJ. .& Coscarón S. (Eds.), *Biodiversidad de Artrópodos Argentinos. Una Aproximación Biotaxonómica*. Ediciones Sur, La Plata, pp. 291–303.

Darsie, R.F. (1985) Mosquitoes of Argentina. Part I. Keys for identification of adult females and fourth stages larvae in english and spanish (Diptera: Culicidae). *Mosquito Systematics*, 17(3), 153–253.

Del Ponte, E. & Castro, M. (1952) Las especies argentinas de *Psorophora* (*Psorophora*) (Diptera: Culicidae). *Revista de la Sociedad Entomológica Argentina*, 15, 211–230.

Dyar, H.G. (1922) The species of *Psorophora* of the ciliata group. *Insecutor Inscitiae Menstruus*, 10, 113–117.

Edwards, F.W. (1922) Mosquito notes-III. *Bulletin of Entomological Research*, 13, 75–77.

Guedes, A.S., Souza, M.A., Maciel, C.S. & Xavier, S.H. (1965) Catalogo Ilustrado dos mosquitos da coleção do Instituto Nacional de endemias rurais. I. Gênero *Psorophora* Robineau-Desvoidy, 1827. *Revista Brasileira de Malariologia e Doenças Tropicais*,12, 3–24.

Harbach, R.E & Knight, K.L. (1980) *Taxonomists' Glossary of Mosquito Anatomy.* Plexus Publishing, Marlton, New Jersey, 415 pp.

Harbach, R.E & Knight, K.L. (1982) Corrections and additions to Taxonomists' glossary of mosquito anatomy. *Mosquito*

Systematics, 13, 201–217.

Lane, J. (1953) *Neotropical Culicidae*. Editora da Universidade de São Paulo, São Paulo, 1112 pp.

Lynch Arribálzaga, F. (1891) Dipterología Argentina. *Revista del Museo de La Plata, I*, 347–377.

Mitchell, J.C., Monath, T.P., Sabattini, M.S., Cropp, C.B., Daffner, J., Calisher, C. & Christensen, H. (1985) Arbovirus investigations in Argentina. II. Arthropod collections and virus isolations from mosquitoes, 1977–1980. *American Journal of Tropical Medicine and Hygiene*, 34(5), 945–955.

Mitchell, J.C., Monath, T.P., Sabattini, M.S., Daffner, J., Cropp, C.B., Calisher, C.H., Darsie, R.F. & Jakob, W.L. (1987) Arbovirus isolations from mosquitoes collected during and after the 1982–1983 epizootic of western equine encephalitis in Argentina. *American Journal of Tropical Medicine and Hygiene*, 36(1), 107–113.

Reinert, J.F. (2001) Revised list of abbreviations for genera and subgenera of Culicidae (Diptera) and notes on generic and subgeneric changes. *Journal of the American Mosquito Control Association*, 17(1), 51–55.

Rossi, G.C., Lestani, E.D. & D'Oria, J.M. (2006) Nuevos registros y distribución de mosquitos de la Argentina (Diptera: Culicidae). *Revista de la Sociedad Entomológica Argentina*, 65(3–4) 51–56.

Shannon, R.C. & Del Ponte, E. (1927) Los culicidos de la Argenina. *Revista del Instituto Bacteriológico*, 5, 29–140.

Stone, A. (1956) Corrections in the taxonomy and nomenclature of mosquitoes (Diptera: Culicidae). *Proceedings of the Entomological Society of Washington*, 58, 333–344.

Visintin, A.M., Laurito, M., M Molina, G., Lorenzo, P.R. & Almirón, W.R. (2009) A new species of *Culex* (*Culex*) (Diptera: Culicidae) for Argentina and new records for five Provinces. *Journal of the American Mosquito Control Association. In press*

Walter Reed Biosystematics Unit (2001) *Systematic Catalog of Culicidae.* Available from http://www.mosquitocatalog.org/main.asp (accesed July 2009).