

Associations, new records, and a new species of *Atopsyche* from northwestern Argentina and southern Bolivia (Trichoptera: Hydrobiosidae)

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Abstract

The larva, pupa, and the adult male of a new species of *Atopsyche* (Trichoptera: Hydrobiosidae) from northwestern Argentina and southern Bolivia are described and illustrated. *Atopsyche* (*Atopsaura*) *yunguensis* new species, is close to *A. (Atopsaura) lobosa* Ross and King 1952 and *A. (Atopsaura) spinosa* Navás 1930. In the new species the parapods are large, broadened at the tip, and dorsally curved toward the midline, the apical segment of the inferior appendages is curved toward the midline, and the phallotheca bears a dorsal bilobed lobe with lateral spines. Preimaginal stages of *A. spinosa* and *A. callosa* are described and illustrated and represent new records from Bolivia. In addition, *A. (Atopsyche) kamesa* is newly recorded from Argentina.

Key words: Trichoptera, Hydrobiosidae, *Atopsyche*, new species, associations

Introduction

Subtropical mountain forest (Yungas or Boliviano-Tucumano) extends along discontinuous mountain ranges from southern Bolivia to Catamarca province in northwestern Argentina. The “Yungas forest” ranges in altitude from 300 m to over 3000 m, presenting an altitudinal stratification of the vegetation. The climate is warm and humid, with annual temperatures ranging from 14°C to 26°C and rainfall from 1000 mm to 2500 mm (Hueck 1978). Yungas forest in northwestern Argentina and the forest in northeastern Argentina contains 50% of the total species richness of the country (Brown *et al.* 2001). Nevertheless this area has not been well collected (Flint 1983) and the caddisfly fauna from northwestern Argentina and southern Bolivia is poorly known.

Atopsyche Banks 1905 is the largest genus in the family Hydrobiosidae and occurs throughout the Neotropical Region, except in the Chilean subregion. At present, there are

122 species described, including the new species presented here. Larvae of *Atopsyche* are well known (Ross 1959; Flint 1963; Wiggins 1996), but only 7 have been associated (Edwards & Arnold 1961; Denning 1964; Flint 1963; Flint 1968; Flint 1971; Harper & Turcotte 1985; Rueda Martín 2005). In northwestern Argentina, according to Angrisano (1999), the subgenus *Atopsaura* (Ross) is represented by *A. (Atopsaura) callosa* Navás (1924) and *A. (Atopsaura) spinosa*; in Bolivia the subgenus is represented by *A. lobosa*, *A. puharcocha*, and *A. tincuracu*.

The male, larva, and pupa of *A. (Atopsaura) yunguensis*, new species are described and illustrated from northwestern Argentina and southern Bolivia. Additionally, the larvae and pupae of *A. callosa* and *A. spinosa* are described and illustrated. Both species are new records from Bolivia. *Atopsyche (Atopsyche) kamesa* is a new record for northwestern Argentina. The general morphological terminology of larvae follows that of Flint (1963) and adult terminology follows that of Schmid (1989).

Material and methods

Immature and adult specimens of *Atopsyche* were collected in the field. The adult material was collected with a light trap. Immature material was collected manually. All material was fixed in 75% alcohol. The genitalia of adult males were cleared in a 10% solution of NaOH and then neutralized with phenol.

Larvae of *A. callosa* and *A. yunguensis* **n. sp.** were associated using the metamorphotype method (Milne 1938). Some pupae of *A. spinosa* were reared to adult in the laboratory in an aquarium with an air pump.

Larval sclerites, pupal cuticle, and the cleared male abdomen of *A. spinosa*, *A. callosa*, and *A. yunguensis* **n. sp.**, and the cleared male abdomen of *A. kamesa*, were mounted in glycerin for observation and illustration. Material is preserved in 75% ethyl alcohol. All material is deposited in the Collection of the Instituto-Fundación Miguel Lillo (IML), Tucumán, Argentina.

Atopsyche (Atopsaura) yunguensis, new species

Figs. 1, 2

Atopsyche yunguensis, new species, is similar to *A. lobosa* Ross and King (1952) and to *A. spinosa* Navás (1930) in the shape of the dorsal lobe of the phallotheca. The new species is in the *falina* group (Ross & King 1952). *A. yunguensis* differs from other species in the shape of parapods which are large, broadened at the tip and dorsally curved toward the midline; the apical segment of the inferior appendages, which are curved toward the midline; and the dorsal lobe of the phallotheca, which is bilobed and curved anteriorly.

Larva. Length 14-17 mm. Head (Figs. 1A, 1B) yellowish, with dark brown dorsal and

ventral area extending laterally in vertical narrow band, with yellowish muscle scars in constant, apparently species specific pattern; dorsally, dark brown area extends anteriorly, to frontoclypeal sutures. Pronotum (Fig. 1C) ocher, with black anterolateral external margins bearing short oblique black bar; center of pronotum with colored brown area with pale spots; posterior margin irregular and black. Mesal sclerite of prosternum (Fig. 1D) with posterior margin black; 2 smaller anterolateral sclerites with internal margins rounded, bearing posterior long process and short lateral external process. Foreleg (Fig. 1E) with femur bearing curved apicoventral extension, anterior margin crenulate, with spine and long upcurved process as long as internal border of claw; tibia with apicoventral lobe bearing long seta and short seta; tarsus with short seta in apicoventral margin, claw with short tooth basally; tibia, tarsus, and claw reduced. Anal proleg (Fig. 1F) with lateral sclerite twice as long as wide in lateral view, with apical margin rounded, basal area black with upcurved black band not reaching the apico-dorsal margin; dorsal plate rectangular, bearing 2 long setae; anal claw with ventral sinuous seta and short basal spine.

Pupa. Length 9 mm. Mandibles (Fig. 1G) 3 times longer than width of base, bearing large teeth at mid-length, remaining teeth smaller. Dorsal hook plates (Fig. 1H) on abdominal segments II to VII; segment III with asymmetric hook plates; segments IV and V with 2 pairs of dorsal hook plates, the posterior ones oval and larger; dorsal hook plates anterior on segments II, III, VI and VII.

Adult male. Length of forewings 8mm. General color brown. Abdominal terga III and IV, with 2 circular concave anterior glands, anterolateral margins enlarged into flattened spatulate processes; sternum V with 2 anterolateral small lobes; sternum VI and VII each with posteromesal process, process on VI with short spine and twice as long as that on VII.

Male genitalia. Segment IX (Fig. 2A *ix*) reduced in lateral view. Segment X (Fig. 2A *x*) typical, broad at base, and narrow at apex. Parapods (Fig. 2A *par*) large, nearly as long as basal segment of inferior appendages, in lateral view, basal and medial regions straight, apical region sharply upcurved bearing ventral process; in dorsal view (Fig. 2B *par*), apex extremely curved inwardly, bearing setae along inner margin. Preanal appendages (Fig. 2A *pre*) rounded, bearing setae. Filipods (Fig. 2A *fil*) as long as the basal segment of inferior appendages, bearing setae, with rounded apex. Basal segment of inferior appendages (Fig. 2A *bas*) straight in lateral view, apex bilobed, curved toward the midline; apical segment of inferior appendages (Fig. 2A *api*) broad basally, apex tapering in lateral view; in dorsal view, (Fig. 2C) broad and curved toward the midline. Phallic apparatus (Figs. 2D, 2E) with phallosome rounded basally in lateral and dorsal views; in lateral view apex with pair of upturned, rounded dorsal lobes, (Fig. 2E *dl*) bearing small spines; in dorsal view dorsal lobe (Fig. 2D *dl*) with apical margin curved, with 2 lateral lobes oriented anteriorly and bearing lateral spines; lateral lobes (Fig. 2E *ll*) in lateral view with apex upcurved; in dorsal view (Fig. 2D *ll*) bifurcated, bearing setae along inner margin; aedeagus (Figs. 2D *ae*, 2E *ae*) slender and upcurved.

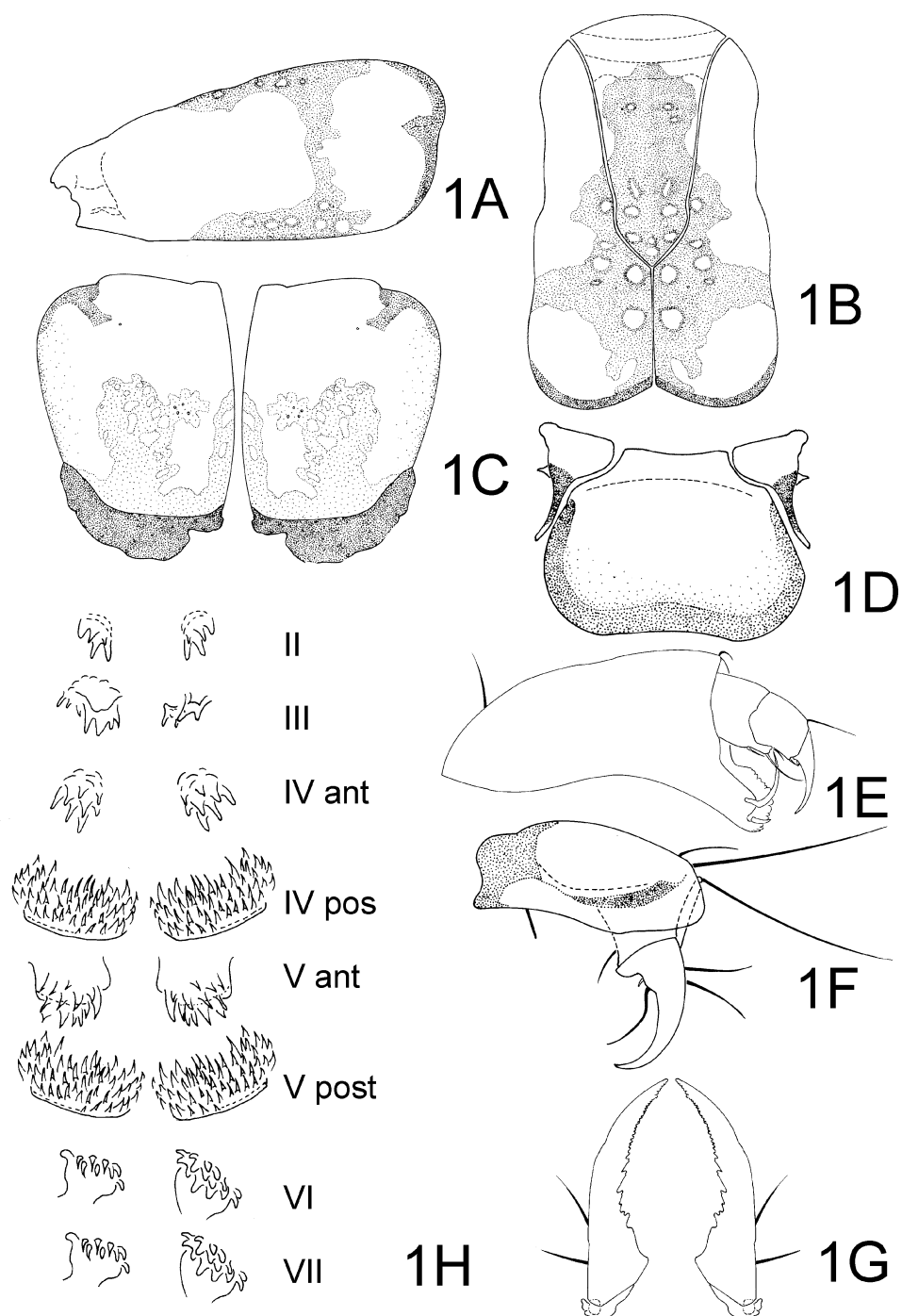


FIGURE 1. *Atopsyche (Atopsaura) yunguensis* n. sp., larva and pupa: A — head, lateral view; B — head, dorsal view; C — pronotum, dorsal view; D — prosternum, ventral view; E — anterior leg, lateral view; F — anal proleg, lateral view; G — pupal mandibles, dorsal view; H — hook plates, dorsal view.

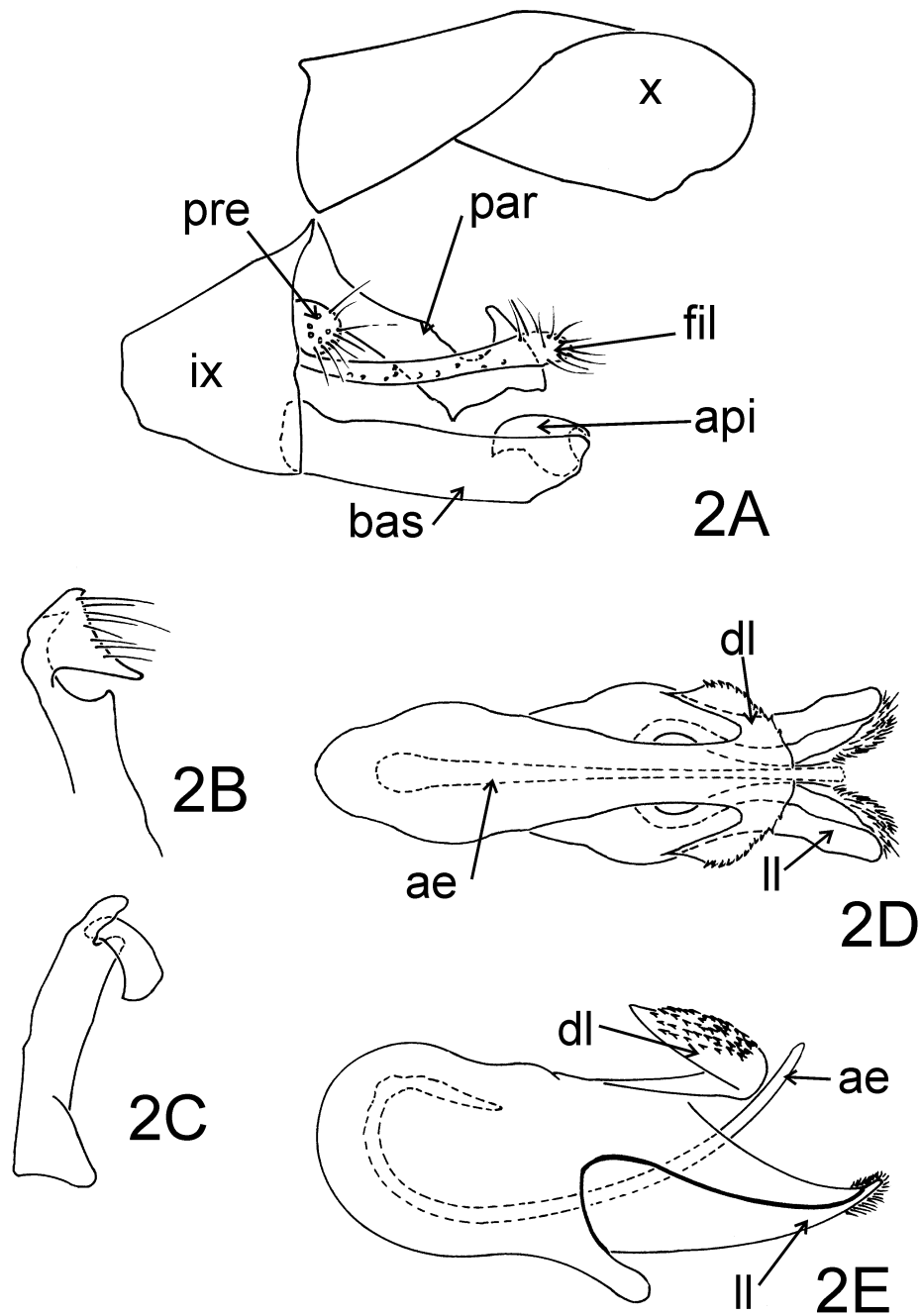


FIGURE 2. *Atopsyche (Atopsaura) yunguensis* n. sp., male: A — male genitalia, lateral view; B — parapods, dorsal view; C — inferior appendages, dorsal view; D — phallothea, dorsal view; E — phallothea, lateral view. Abbreviations: *ix* = segment IX, *x* = segment X, *par* = parapods, *pre* = preanal appendages, *fil* = filipods, *bas* = basal segment of inferior appendages, *api* = apical segment of inferior appendages, *dl* = dorsal lobe of phallothea, *ll* = lateral lobe of phallothea, *ae* = aedeagus.

Holotype male: **ARGENTINA: Salta:** Santa Victoria, Lipeo, Río Los Naranjos, 22°25'47" S, 64°44'20" W, 1109 m, 13.xi.2004, Rueda Martín.

Paratypes: **ARGENTINA: Salta:** Santa Victoria, Lipeo, Río Los Naranjos, 22°25'47"S, 64°44'20"W, 1109 m, 13.xi.2004, Rueda Martín — 5 male adults; Baritú, Río Baritú, 22°29'58"S, 64°45'67"W, 1481 m, 15.xi.2004, Rueda Martín — 5 male adults, 1 male metamorphotype, 3 male pupae, 2 prepupae, 2 larvae; Santa Victoria, Lipeo, Río Lipeo, 1109 m, 13.xi.2004, Rueda Martín — 1 prepupa, 1 female pupa, 3 larvae; Los Toldos, Río Huaico Grande, 22°16'44"S, 64°42'39"W, 1645 m, 11.xi.2004, Rueda Martín — 1 prepupa, 1 female pupa, 10 larvae; Río Huaico Grande, 22°16'44"S, 64°42'39"W, 1770 m, 27.x.1999, Molineri — 2 larvae; Río Vallecito, 27.x.1999, Molineri — 3 larvae; **BOLIVIA: Tarija: O'Connor:** Entre Río Basin, Río Salinas, 21°38'42,5"S, 64°4'8,2"W, 1160 m, 06.x.2004, C. Molineri and V. Manzo — 1 male metamorphotype, 5 prepupae, 5 female pupae, 6 larvae.

Distribution. Northwestern Argentina, Bolivia.

Etymology. *yunguensis*, from Yungas or Andean Mountain forest where it was collected.

***Atopsyche (Atopsaura) spinosa* (Navás)**

Fig. 3

This species is common in northwestern Argentina. It was first described by Navás (1930) in the genus *Vertrarma* from Palo Blanco, Buenos Aires. In 1952, this species was described as *Atopsyche (Atopsaura) falina* by Ross and King from Tucumán. In 1982, Flint discussed the type locality. Flint *et al.* (1999) synonymized both as *Atopsyche (Atopsaura) spinosa* (Navás). Larvae, pupae and adults of this species were found in northwestern Argentina (Tucumán and Salta provinces) and for the first time in southern Bolivia.

Larva. Length 15–18 mm. Head (Figs. 3A, 3B) ocher, with light brown dorsal and ventral areas extending laterally in vertical band, bearing yellowish muscle scars in constant, apparently species specific pattern. Pronotum (Fig. 3C) ocher, with black anterolateral angles bearing short black bar, and small posterior spot; internal margin and center of pronotum with light brown area with pale and dark spots; posterior margin black. Prosternum (Fig. 3D) with mesal sclerite, with posterior and lateral margins black, lateral and posterior areas before the margin with light brown irregular scars; 2 smaller lateral sclerites with internal margins rounded, bearing curved posterior black process and small lateral process. Foreleg (Fig. 3E) with femur bearing curved apicoventral extension, anterior margin crenulated, bearing short spine and translucent curved process 2/3 times length of internal border of claw; apicoventral margin of tibia with 2 subterminal setae, 1 terminal short seta and 1 longer terminal seta; tarsus with long seta; claw with basal tooth;

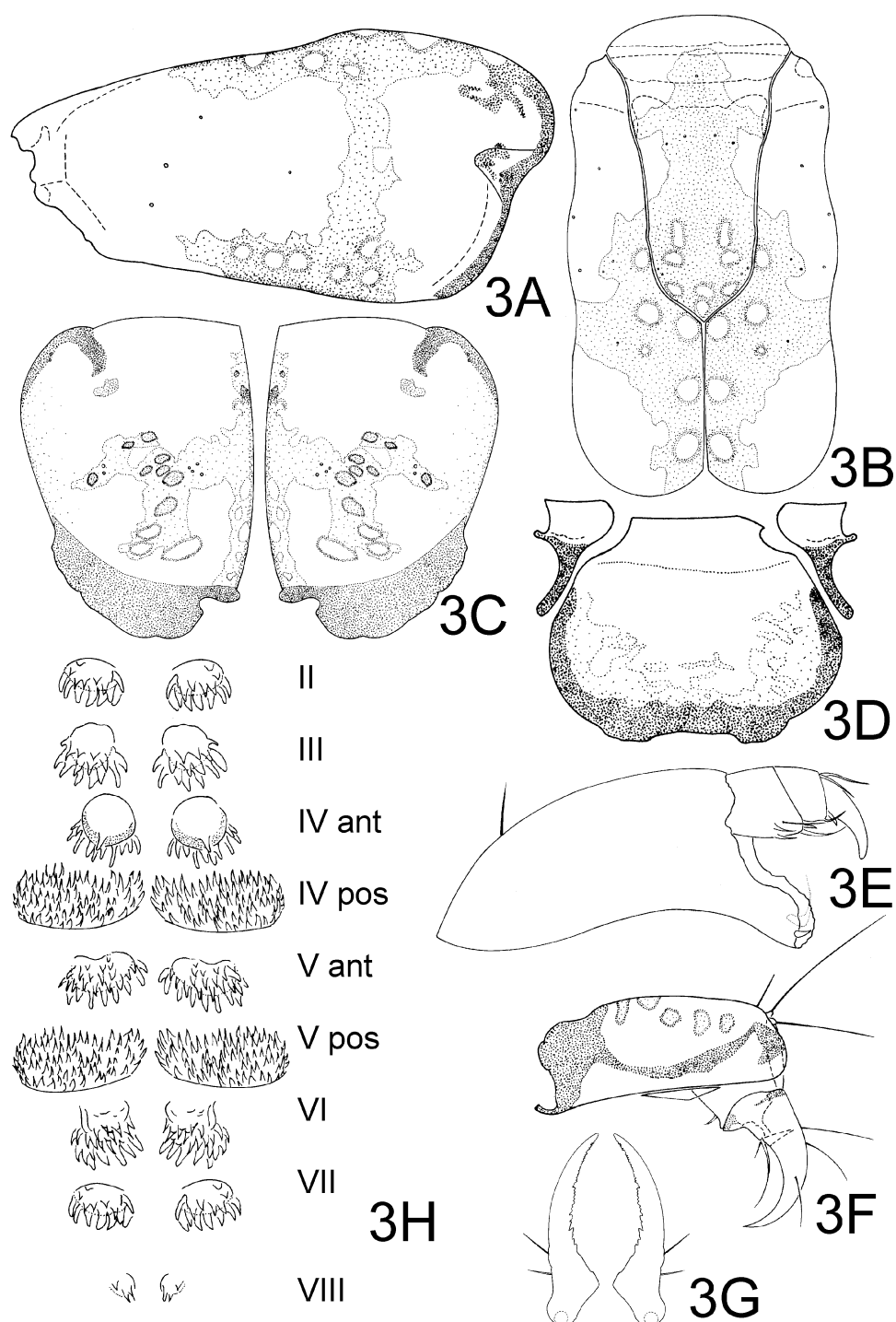


FIGURE 3. *Atopsyche (Atopsaura) spinosa* larva and pupa: A — head, lateral view; B — head, dorsal view; C — pronotum, dorsal view; D — prosternum, ventral view; E — anterior leg, lateral view; F — anal proleg, lateral view; G — pupal mandibles, dorsal view; H — hook plates, dorsal view.

tibia, tarsus and claw reduced. Anal proleg (Fig. 3F) with lateral sclerite with apical margin rounded, basal angle black bearing upcurved black bar broadened in subtriangular spot at apex extending to apico-dorsal angle; dorsal area with some light brown spots with dark brown borders, inferior basal angle with upcurved process; dorsal plate rectangular bearing 2 long setae; anal claw with ventral curved hair and basal short seta.

Pupa. Length 7 mm. Mandibles (Fig. 3G) 4 times as long as the width of base, with large teeth basally and smaller medial and apical teeth. Dorsal hook plates (Fig. 3H) on abdominal segments II to VIII; segments IV and V with 2 pairs of dorsal hook plates, posterior ones oval and larger; segments II, III, VI, VII and VIII with anterior hook plates.

Material examined. **ARGENTINA: Salta:** Santa Victoria, Los Toldos, Río Los Naranjos, 22°25'47"S, 64°44'20"W, 1109 m, 13.xi.2004, Rueda Martín — 1 male; Baritú, Río Baritú, 22°29'58"S, 64°45'67"W, 1481 m, 15.xi.2004, Rueda Martín — male metamorphotype; Río Huaico Grande, 22°16'44"S, 64°42'39"W, 26.x.1999, Molineri — 1 larva; Río Huaico Grande, 22°16'44"S, 64°42'39"W, 1645 m, 11.xi.2004, Rueda Martín — 1 larva; Vaqueros, Río Chiricote, 02.iii.2000 — 1 larva; Río Grande de El Sauce, 15.ix.1998, Domínguez, Molineri & Ubero — 3 larvae; **Tucumán:** Lules, Potrero de las Tablas, Río Los Membrillos, 26°51'23"S, 65°25'53"W, 17.xi.2004, Molineri & Giordano — male reared; 25.VIII.2004, Rueda & Fernandez — male reared, male metamorphotype; 22.ix.2004, Rueda & Domínguez — 1 larva; Río Potrero, 26°26'51"S, 65°34'12"W, 30.x.1999 — 4 larvae; Río Tacanas, 36°17'11"S, 65°32'18"W, 29.x.1999 — 6 larvae; Chulca, Río Chulca, 29.x.1999 — 2 larvae; **Jujuy:** Río Yala, 26.vi.1997, Molineri — 1 larva; **BOLIVIA: Tarija: O'connor** Entre Río Basin, Río Salinas, 21°38'42,5"S, 64°4'8,2"W, 1160 m, 06.x.2004, C. Molineri y V. Manzo — 8 pupae, 4 larvae.

Atopsyche (Atopsaura) callosa (Navás)

Fig. 4

This species is one of the most widespread in the genus. It was described by Navás (1924) in the genus *Vertrarma* and later described as *A. (A.) alcornura* by Ross (1953) and as *A. schmidi* by Denning (1965). In 1975, Flint synonymized both. It is recorded from Costa Rica, Colombia, Ecuador, Panama, Peru, Venezuela, Argentina, and now for the first time, from southern Bolivia.

Larva. Length 10–12 mm. Head (Figs. 4A, 4B) light yellow, with black dorsal and ventral areas extending laterally in vertical band, bearing light yellow muscle scars in constant, apparently species specific pattern. Pronotum (Fig. 4C) ocher with anterolateral angles black, bearing short black bar, center of pronotum with brown spots, posterior margin black. Prosternum (Fig. 4D) with mesal sclerite with black posterior and lateral margin; 2 smaller anterolateral sclerites with internal border rounded bearing long black posterior process. Foreleg (Fig. 4E) with femur bearing apicoventral concave extension, anterior border crenulate, bearing short spine and upcurved process 1/2 times length of

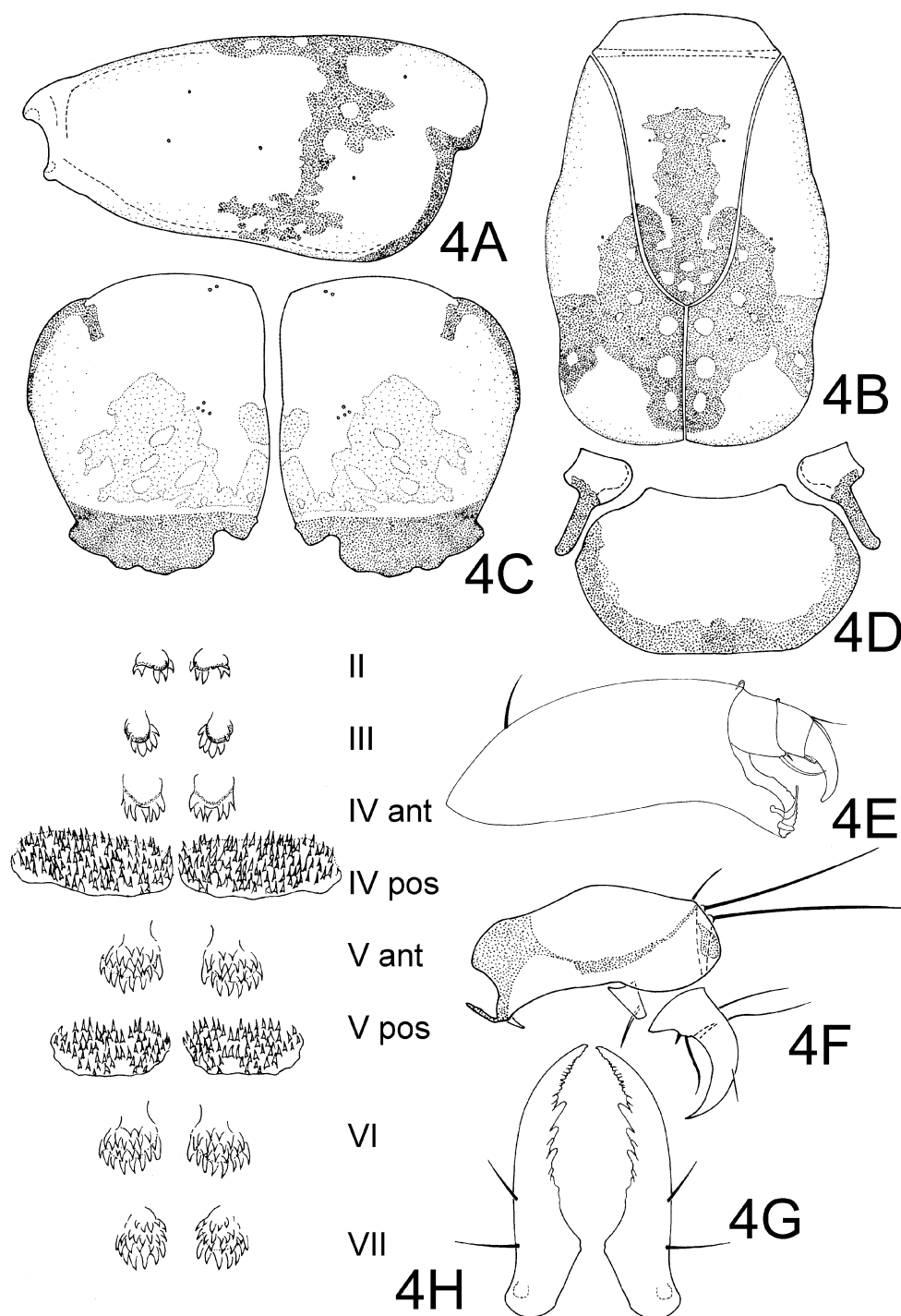


FIGURE 4. *Atopsyche (Atopsaura) callosa* larva and pupa: A — head, lateral view; B — head, dorsal, view; C — pronotum, dorsal view; D — prosternum, ventral view; E — anterior leg, lateral view; F — anal proleg, lateral view; G — pupal mandibles, dorsal view; H — hook plates, dorsal view.

internal margin of claw; tibia with apicoventral lobe bearing short seta and long seta, the second as long as ventral margin of claw; tarsus bearing ventro-apical seta; claw with basal tooth; tibia, tarsus and claw reduced. Anal proleg (Fig. 4F) lateral sclerite in lateral view, 2.5 times as long as wide, apical border rounded, basodorsal angle black with upcurved black bar extending to dorso-apical angle; basal margin with black spot; apico-ventral angle with upcurved process and ventral tooth; dorsal plate oblong bearing 2 long setae; claw with ventral sinuous hair bearing short spine in the basis.

Pupa. Length 8 mm. Mandibles (Fig. 4G) 3 times as long as the width of base; with small apical teeth and larger medial and basal teeth; dorsal hook plates (Fig. 4H) on abdominal segments II to VII; segments IV and V with 2 pairs of dorsal hook plates; segments II, III, VI and VII with anterior hook plates.

Material examined. **ARGENTINA: Salta:** Santa Victoria, Los Toldos, Río Los Naranjos, 22°25'47"S, 64°44'20"W, 1109 m, 18C, 13.xi.2004, Rueda Martín — 7 male adults; Baritú, Río Baritú, 22°29'58"S, 64°45'67"W, 1481 m, T 18,5C, 15.xi.2004, Rueda Martín — 3 larvae; **Tucumán:** Lules, Potrero de las Tablas, Río Los Membrillos, 26°51'23"S, 65°25'53"W, 17.ix.2004, Molineri & Giordano — 1 male metamorphotype; **BOLIVIA: Tarija: O'Connor:** Entre Río Basin, Río Salinas, 21°38'42,5"S, 64°4'8,2"W, 1160 m, 06.x.2004, C. Molineri and V. Manzo — 1 male pupa, 1 female pupa, 5 larvae.

Atopsyche (Atopsyche) kamesa Ross and King

This species was described by Ross and King, (1952) from Bolivia. A single adult male was collected from Salta province in northwestern Argentina, providing the first record of the species for the country.

Material examined. **Argentina: Salta:** Santa Victoria, Los Toldos, Río Los Naranjos, 22°25'47"S, 64°44'20"W, 1109 m, 13.xi.2004, Rueda Martín — 1 male.

Acknowledgments

I wish to thank E. Domínguez and E. Angrisano for reading the manuscript and giving valuable comments and corrections. Thanks also to the aquatic group from INSUE for assistance and help in collecting and to Dr. Carlos Molineri and Lic. Verónica Manzo, who provided the necessary material from Bolivia. This manuscript was done with a internal fellowship from CONICET (National Council of Scientific Research, Argentina) and financial supported by CONICET PIP 01-02563/98 and Agencia Nacional de Promoción Científica y Tecnológica PIP 01-12529/02.

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