

# South American Baetidae (Ephemeroptera): a New Generic Synonymy

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## Abstract

The South American genera *Andesiops* and *Deceptiviosa* were established by Lugo-Ortiz and McCafferty (1999). A review of the type material of both genera and examination of additional specimens has revealed that both imagos and nymphs of the two taxa lack significant characters to distinguish between them. Therefore, *Deceptiviosa* is placed as a junior subjective synonym of *Andesiops*. The species *D. ardua* and *D. torrens* are transferred to *Andesiops*; *A. ardua* comb. n. and *A. torrens* comb. n.

## Resumen

Dos géneros de América del Sur: *Andesiops* y *Deceptiviosa* fueron establecidos por Lugo-Ortiz & McCafferty en 1999. Tanto los imagos como las ninfas de ambos géneros no presentan caracteres relevantes para su separación. Luego de revisar el material tipo de ambos géneros, sumado a nuevo material disponible de otras localidades y colecciones, se propone a *Deceptiviosa* como sinónimo subjetivo de *Andesiops*.

## Introduction

*Andesiops* was established by Lugo-Ortiz and McCafferty (1999). A single species, *A. peruvianus* (Ulmer, 1920) was included in the new genus. The species was previously placed in the genus *Baetis*. This species, known from both adults and nymphs, is distributed at high altitudes between Colombia and Argentina along Andean highlands. The genus *Deceptiviosa* was established in the same publication

(Lugo-Ortiz & McCafferty, 1999). Included were two new species: *D. torrens*, known from adults and nymphs and *D. ardua* known only from nymphs. The distribution of this genus is restricted to the region of Patagonia in Chile and Argentina.

After an examination of the type material of the three species, *Deceptiviosa* is placed as a junior subjective synonym of *Andesiops*, and the species *D. ardua* and *D. torrens* are transferred to *Andesiops*; *A. ardua* comb. n. and *A. torrens* comb. n. The material examined is housed in the following institutions: Fundación-Instituto Miguel Lillo, Tucumán, Argentina (IFML); Florida A&M University, Tallahassee, Florida, USA (FAMU); and National Museum of Natural History, Smithsonian Institution, Washington, DC (NMNHS).

## Results

### *Andesiops* Lugo-Ortiz & McCafferty

*Andesiops* (Lugo-Ortiz & McCafferty, 1999: 89).

*Deceptiviosa* (Lugo-Ortiz & McCafferty, 1999: 93 syn. n).

Type species: *Baetis peruvianus*, original designation.

Species included: *A. ardua* (Lugo-Ortiz & McCafferty) comb. n., *A. peruvianus* (Ulmer), and *A. torrens* (Lugo-Ortiz & McCafferty) comb. n.

### Generic description

Imago. Length: body, 4.0–5.0 mm. Turbinate eyes tubular or ellipsoidal, height of stalk as long as eye diameter or half of

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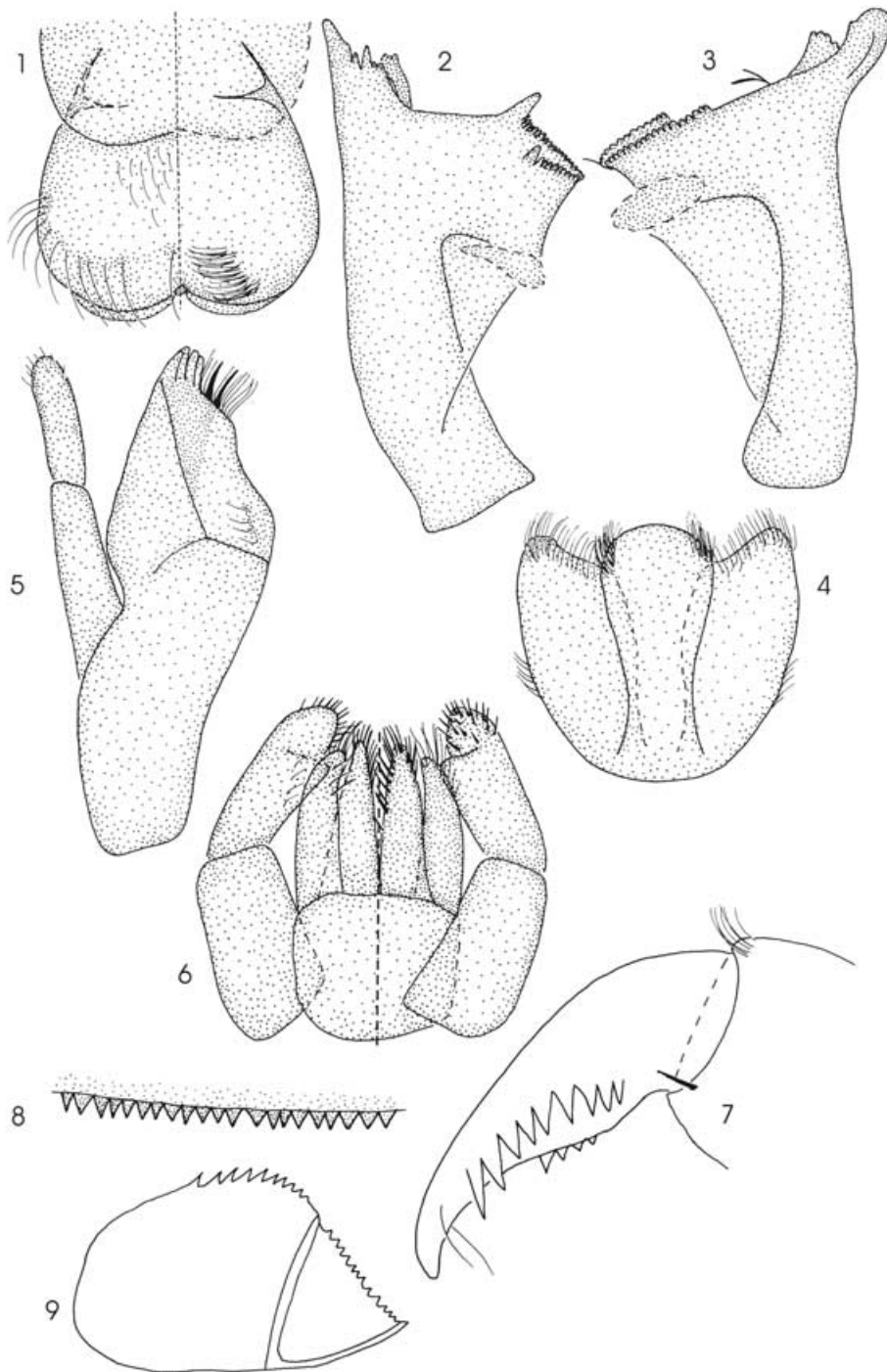
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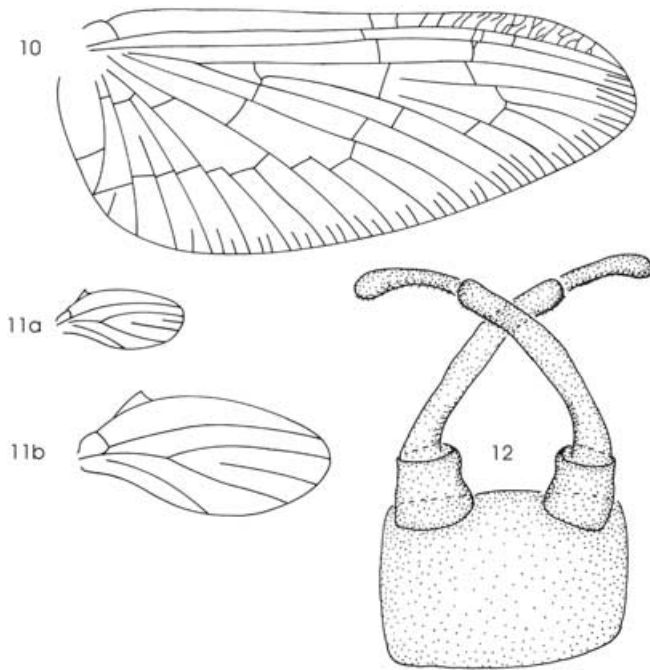
eye diameter. Forewings with paired (Fig. 10) or single (Fig. 23) marginal intercalaries. Hind wings with three longitudinal veins (Fig. 11b), middle vein forked; a small sharp-pointed costal process in basal third. A small dorsal projection of the hump of the metascutellum (Fig. 25). Forceps three segmented (Figs. 12 and 26), segment I short and subcylindrical; segment III elongate, approximately

0.50× segment II length. Cerci very long, approximately 3.0× body length.

Nymph. Length: body, 6.0–9.5 mm. Head longer than broad or broader than long. Antennae 1.5–3× length of head capsule; scape subequal in length to pedicel. Mouthparts: labrum (Figs. 1, 13 and 27a) wider than long, with antero-medial cleft and a small lobe; dorsal surface with two kinds



Figs. 1–9. *Andesiops ardua*. Nymph: mouthparts (1) labrum, left d.v., right v.v.; (2) left mandible v.v.; (3) right mandible v.v.; (4) hypopharynx v.v.; (5) maxilla v.v.; (6) labium, left d.v., right v.v.; (7) tarsal claws detail; (8) posterior margin of tergum IV; (9) paraproct.



Figs. 10–12. *Andesiops peruvianus*. Male imago (10) fore wing; (11a) hind wing; (11b) detail of hind wing; (12) male genitalia v.v.

of bipectinate marginal setae: basally bifid near the midline of the labrum and apically bifid near the lateral margin (Fig. 27b); with one pair of subapical simple setae medially and a row of 2–8 subapical setae laterally. Mandibles without setae between prostheca and mola. Left mandible (Figs. 2, 14 and 28a) with incisors apically fused; prostheca robust, apically denticulate; teeth of molar with (Fig. 28b) or without constrictions. Right mandible (Figs. 3, 15 and 29) with incisors cleft apically; prostheca bifid. Hypopharynx (Figs. 4, 16 and 30) with lingua subequal in length to superlingua. Maxillae (Figs. 5, 17 and 31) palp two-segmented, shorter or as long as galea-lacinia. Labium compact (Fig. 32) or not (Figs. 6, 18a and b), glossae subequal in length and width to paraglossae. Glossae and paraglossae: outer margins with a row of spine-like setae, paraglossae dorsally with 2–3 spine-like setae. Segment III of labial palpi partially fused to segment II, rounded, ventrally with small spines and setae; segment II with a small distomedial projection, dorsally with 3–4 spines.

Thorax. Legs (Figs. 19 and 33): dorsal margin with a row of long simple spine-like setae. Tibiae and tarsi dorsally with a row of long simple setae. Tibiae nearly twice the length of tarsi. Ventral margin of tarsi with a row of spines. Tarsal claws with two rows of denticles (Figs. 7, 20 and 34), first row well developed, second row reduced in size or reduced in number of denticles, with a subapical pair of fine setae. Hind wing pads present. Abdomen: posterior margins of terga with small spines pointed (Figs. 8, 21) or rounded (Fig. 35). Gills on segments I–VII, slightly ser-

rated or smooth. Paraprocts: posterior margins with large (Figs. 9 and 22) or small spines (Fig. 36). Inner margins of cerci with abundant simple setae. Terminal filament 0.15–0.60× length of cerci, with or without simple setae along margins.

## Discussion

Lugo-Ortiz and McCafferty (1999) distinguish the genus *Andesiops* by the following combination of characters. In the nymph: (1) right mandible with prostheca bifid (Fig. 15); (2) segment II of labial palpi with a small distomedial projection (Fig. 18b); (3) gills without tracheae or poorly tracheated; (4) tarsal claws with two rows of denticles (Fig. 20); (5) terminal filament 0.65–0.70× length of the cerci. In the male imago the authors propose the following characters: (1) hind wings with a small sharp-pointed costal process in basal 1/3 (Figs. 11a and b); (2) hind wings with three longitudinal veins, the middle vein forked (Figs. 11a and b); (3) segment III of the forceps elongate (Fig. 12).

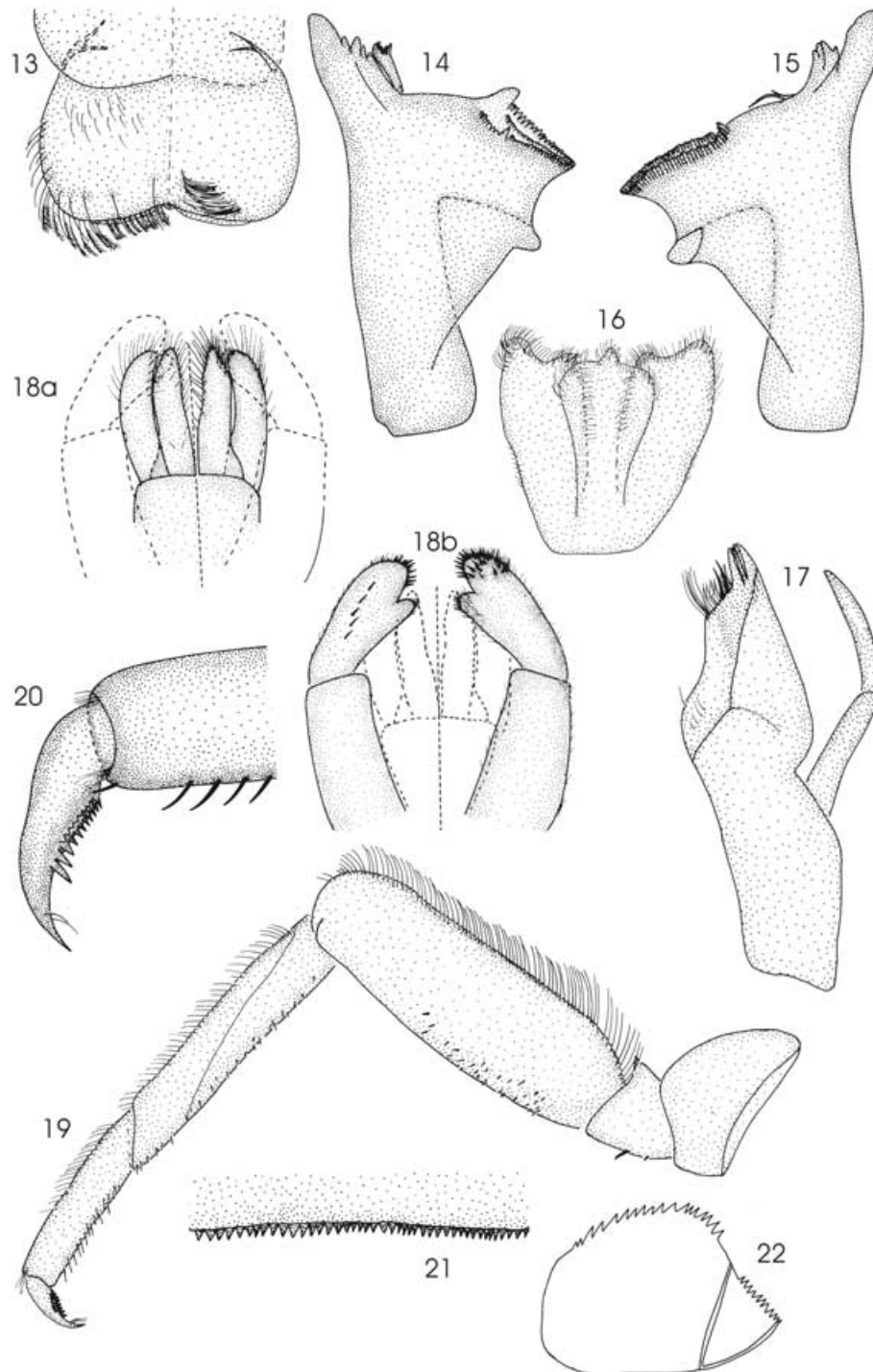
*Deceptiviosa* is distinguished, according to Lugo-Ortiz and McCafferty (1999), from other genera of Baetidae by the following combination of characters in the nymph: (1) prostheca of right mandible bifid (Figs. 3 and 29); (2) legs elongate with a dorsal row of long fine simple setae (Fig. 33); (3) tarsal claws with one subapical denticle (Fig. 34); (4) creased terga; (5) terminal filament 0.15–0.60× the length of the cerci. The characters which distinguish the imago are the same as those of *Andesiops*.

The three species included in this analysis have the same generic characters. The imagos of *Andesiops* and *Deceptiviosa* lack differences at the generic level. The nymphs of both genera share: (1) right mandible with prostheca bifid (Figs. 3, 15 and 29); (2) segment II of labial palpi with a small distomedial projection (Figs. 6, 18b and 32); (3) gills without tracheae or poorly tracheated; (4) dorsal margin of legs with a row of long simple setae (Figs. 19 and 33); (5) tarsal claws with a subapical pair of fine setae (Figs. 7, 20 and 34). The tarsal claws are variable with respect to number of denticles. In *A. peruvianus* the second row of denticles has as many denticles as the first row (Fig. 20). In *A. ardua* the second row has half the denticles of the first row (Fig. 7) and *A. torrens* has the second row reduced to only one denticle (Fig. 34).

The length of the caudal filament is also variable from species to species. In *A. torrens* the terminal filament is 0.15–0.20× the length of the cerci. In *A. ardua* the terminal filament is 0.50–0.60× the cerci length and in *A. peruvianus* the terminal filament is 0.65–0.70× the length of the cerci.

The length of the terminal filament and the number of denticles of the tarsal claws are good characters to distinguish species, but not to distinguish genera.

Both genera also share the following characteristics: (1) right mandible with incisors cleft apically (Figs. 3, 15 and 29); (2) dorsal margin of femora with a row of long



Figs. 13–22. *Andesiops peruvianus*. Nymph: mouthparts (13) labrum, left d.v., right v.v.; (14) left mandible v.v.; (15) right mandible v.v.; (16) hypopharynx v.v.; (17) maxilla v.v.; (18a) labium: glossae and paraglossae, left d.v., right v.v.; (18b) labium: palps, left d.v., right v.v.; leg: (19) fore leg; (20) tarsal claws detail; (21) posterior margin of tergum IV; (22) paraproct.

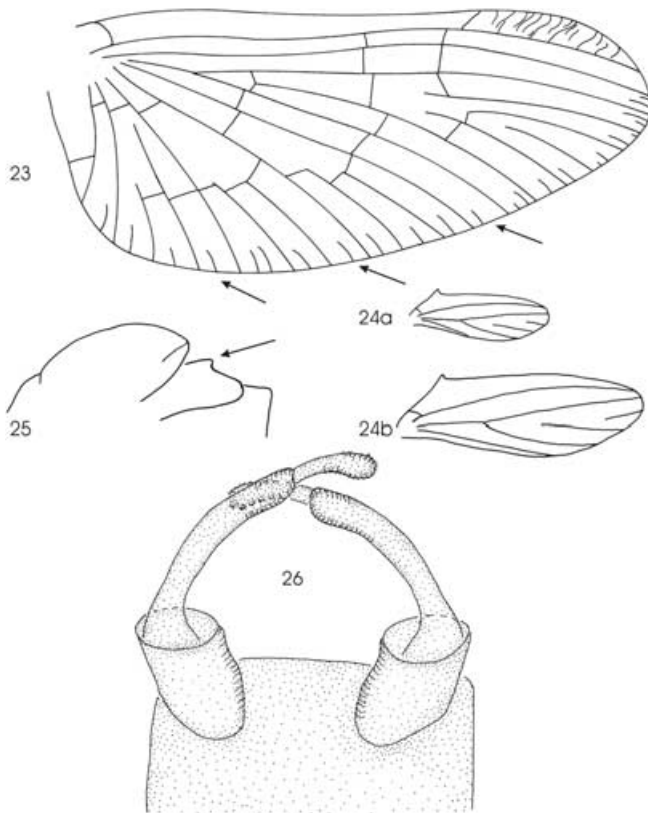
spine-like setae, tibiae twice the length of tarsi (Figs. 19 and 33); (3) hind wing pads present; (4) maxillae with palp shorter (Figs. 17 and 31) or as long as galea-lacinia (Fig. 5).

After analysis of the characters of nymphs and adults of both genera, *Deceptiviosa* is placed as a junior subjective synonym of *Andesiops*.

**Key to species of *Andesiops***

**Nymphs**

1a Head broader than long; antennae short (1.5× length of head capsule); terminal filament 0.15–0.20× length of cerci; tarsal claws with only one denticle in the second row (Fig. 34). . . . . *A. torrens*



Figs. 23–26. *Andesiops torrens*. Male imago (23) fore wing; (24a) hind wing; (24b) detail of hind wing; (25) lateral view of male imago; (26) male genitalia v.v.

- 1b Head longer than broad; antennae long (3× length of head capsule); terminal filament 0.50–0.70× length of cerci; tarsal claws with at least 4–5 denticles in the second row (Figs. 7 and 20) . . . . . 2
- 2a Terminal filament 0.65–0.70× length of cerci (mature nymph); second row of denticles of the tarsal claws with as many denticles as the first row (Fig. 20); lingua apically with a pointed projection (Fig. 16) . . . . . *A. peruvianus*
- 2b Terminal filament 0.50–0.60× length of cerci (mature nymph); second row of tarsal claws with half as many denticles as the first row (Fig. 7); lingua apically rounded (Fig. 4) . . . . . *A. ardua*

*Andesiops ardua* (Lugo-Ortiz & McCafferty) comb. n. (Figs. 1–9)  
*Deceptiviosa ardua* (Lugo-Ortiz & McCafferty, 1999: 95).

**Imago. Unknown**

Nymph. Adequately characterized by Lugo-Ortiz and McCafferty (1999) with the following necessary change: tarsal claws of *A. ardua* with two rows of denticles, the second with half as many denticles as the first row, but with at least 4–5 denticles (Fig. 7).

Discussion. *D. ardua* can be distinguished from the other species of the genus by the following combination of characters in the nymph: (1) antennae long, 3× the length of the

head capsule; (2) head longer than broad; (3) tarsal claws with second row of denticles with half as many denticles as the first row (Fig. 7); (4) hypopharynx with lingua apically rounded (Fig. 4); (5) terminal filament 0.50–0.60× length of cerci.

Material examined. Chile: six nymphs, Talca Prov., río Lircay Altos de Vilches, 800m, 22.XI.1972, Pescador & Barrios colls.; six nymphs, Linares Prov., río Longavi, San Pablo, Parral, 425 m, 28.XI.1972, Pescador & Barria colls.; seven nymphs, Coquimbo Prov., río Caren, Sta. Virginia, Hda. Illapel, Illapel, 18.XI.1972, Pescador & Barria colls. The material is housed at NMNHS.

*Andesiops peruvianus* (Ulmer) (Figs. 10–22)

*Baetis peruvianus* (Ulmer, 1920: 53).

*Baetis weiseri* (Navás, 1922: 385).

*Andesiops peruvianus* (Lugo-Ortiz & McCafferty, 1999: 91).

Imago and nymph. Adequately characterized by Lugo-Ortiz and McCafferty (1999).

Discussion. *A. peruvianus* can be distinguished from the other species of the genus by the following combination of characters. In the nymph: (1) antennae long, 3× length of head capsule; (2) head longer than broad; (3) tarsal claws with second row of denticles with as many denticles as the first row, but reduced in size (Fig. 20); (4) lingua apically with a pointed projection (Fig. 16); (5) terminal filament 0.65–0.70× length of cerci (mature nymph). In the male imago: (1) forewings with paired marginal intercalaries (Fig. 10); (2) turbinate eyes ellipsoidal, height of stalk half of eye diameter; (3) fore femur 0.70× length of tibia; tarsus subequal in length to tibia.

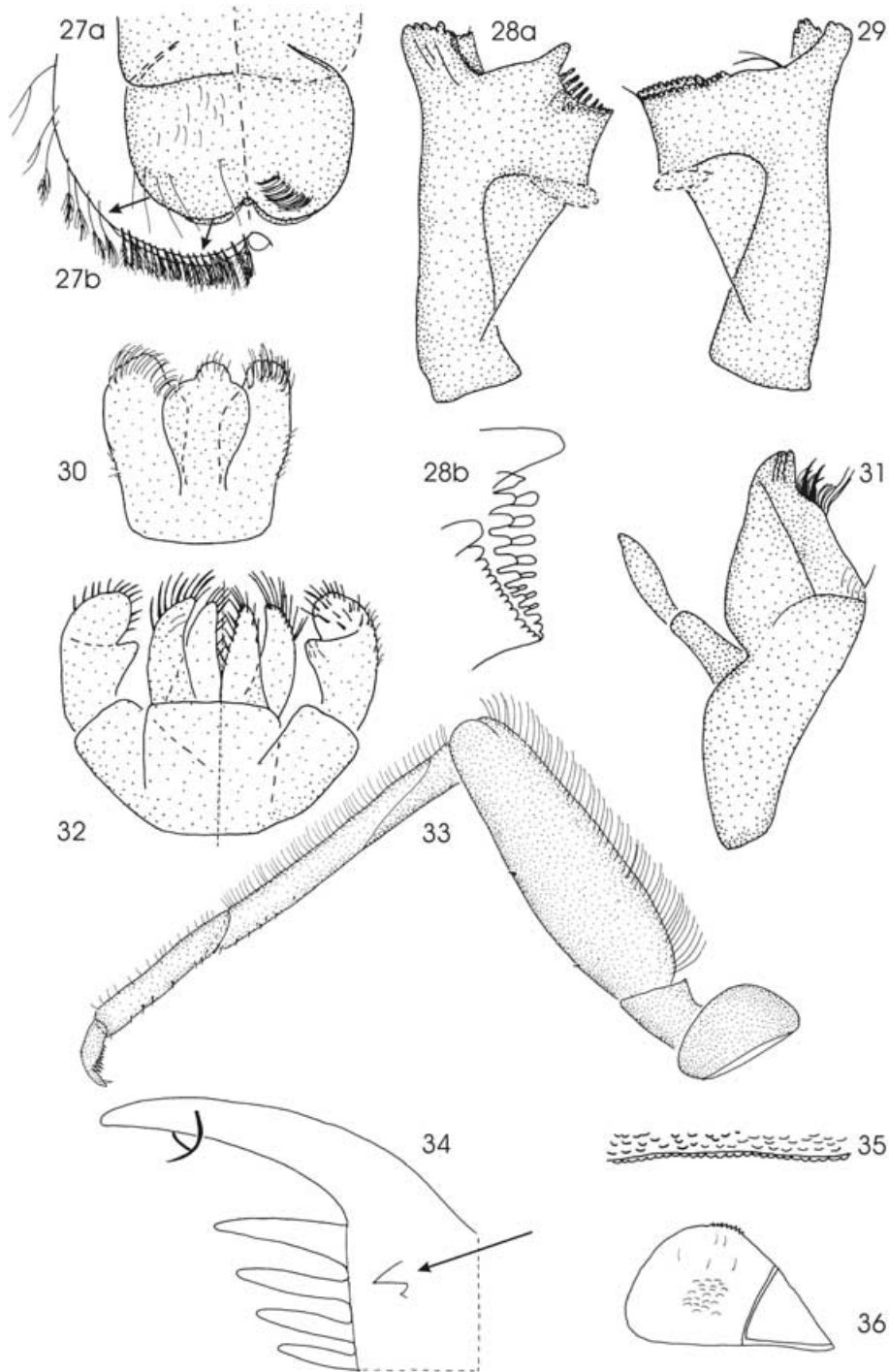
Variation. The nymphs of *A. peruvianus* have great variability in body size and colouration. The length of the terminal filament also varies with development of the nymph. Young nymphs have a terminal filament that is shorter, in proportion, than the terminal filament of mature nymphs.

Material examined. Peru: Paratype (one nymph), río Chullumpia Cutimbo, above Curacalla, SW Puna # 20, 1.VIII.1977, S. Roback & L. Berner colls. (N 4832); 30 nymphs, Puno, 160 km de Arequipa, 4300 m, 15.X.1983, Domínguez col.; 30 nymphs, Puno, río Conavire, cerca de Mañazo, 4100 m, 15.X.1983, Domínguez col. Argentina: 25 nymphs, Córdoba, río Suela, 2 km NO de Copina, 55 km de Alta Gracia, 30.IV.2000, Nieto col.; 50 nymphs, San Luis, Paso Malo, río Piedras Blancas, S 32°19'14", W 64°58'22", 1150 m, 15.XI.2001, Orce & Nieto colls.; 15 nymphs and two male imagos (reared), Tucumán, Apeadero Muñoz, S 27°00'42", W 65°41'18", 1560 m, 13.X.2000, Manzo, Orce & Nieto colls. The paratype is housed at FAMU. Other material is housed at IFML.

*Andesiops torrens* (Lugo-Ortiz & McCafferty, 1999) comb. n. (Figs. 23–36).

*Deceptiviosa torrens* (Lugo-Ortiz & McCafferty, 1999: 98).

Type species of *Deceptiviosa*.



Figs. 27–36. *Andesiops torrens*. Nymph: mouthparts (27a) labrum, left d.v., right v.v.; (27b) detail of apical setae; (28a) left mandible v.v.; (28b) detail of teeth of molar; (29) right mandible v.v.; (30) hypopharynx v.v.; (31) maxilla v.v.; (32) labium, left d.v., right v.v.; leg: (33) fore leg; (34) tarsal claws detail; (35) posterior margin of tergum IV; (36) paraproct.

Imago. Adequately characterized by Lugo-Ortiz and McCafferty (1999) with the following necessary addition with reference to the forewings: *A. torrens* with marginal intercalaries single or double (Fig. 23).

Nymph. Adequately characterized by Lugo-Ortiz and McCafferty (1999). Discussion. *A. torrens* can be distin-

guished from the other species of the genus by the following combination of characters. In the nymph, (1) head broader than long; (2) antennae short,  $1.5\times$  length of head capsule; (3) tarsal claws with only one denticle in the second row (Fig. 34); (4) terminal filament  $0.15\text{--}0.20\times$  length of cerci; (5) labium compact (Fig. 32); (6) left mandible: teeth of molar

with constrictions (Fig. 28b); (7) posterior margins of terga rounded (Fig. 35); (8) paraprocts: posterior margins with small spines (Fig. 36).

In the male imagos, (1) forewings with marginal intercalaries double or single (Fig. 23); (2) turbinate eyes tubular, height of stalk as long as eye diameter; (3) fore femur half the length of the tibia, tarsus longer than tibia.

Material examined. Chile: Paratype (one nymph), Aconcagua, río Longotoma, 17.XI.1963, G. F. Edmunds.; four nymphs and eight male imagos, Llanquihue Prov., río El Canelo, Hornohuínco, Correntoso, 22–23.XII.1972, Pescador & Peña colls. Argentina: three nymphs, Chubut, Lago Epuyen (arroyo), 30.I.1980, Domínguez col.; two nymphs, Río Negro, Nahuel Huapi, Puerto Blest, 29.I.1980, Domínguez col.; four nymphs, El Hoyo, río Epuyen, Cerro Pirque, 5.XII.1997, Molineri col.; eight nymphs, río Foyel, ruta 258 (al Bolsón), 4.XII.1997, Molineri col.; 14 nymphs, Santa Cruz, Lago Buenos Aires, 7.II.1980; five nymphs, Neuquén, cerca de las Coloradas, RN 40, 11.XII.1997, Molineri col.; six nymphs, Mendoza, 21 km del Sosneado, 2000 m, 2.I.1980, Domínguez col.; one male imago, PN Lanín, Chachín, 3 km SE de Pto. Hua-Hum, 10.XII.1997, Molineri col. The paratype is housed at FAMU. The material from Chile is housed at NMNHS. Other material is housed at IFML.

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