



RECORDS OF MESOAMERICAN ANACRONEURIA (PLECOPTERA: PERLIDAE), WITH DESCRIPTIONS OF FOUR NEW SPECIES

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ABSTRACT

Three new species, *Anacroneuria guanacaste*, *A. morsei* and *A. tempisquito* are described based on Costa Rican specimens and an additional new species, *A. totumas* is described from Panamanian specimens. *Anacroneuria azul* Rojas & Baena and *A. marca* Stark are reported from Panama for the first time, and the presence of *A. lineata* (Navás) in Panama, is confirmed. Six additional new provincial records are presented for Costa Rica and one each for Guatemala and Panama.

Keywords: Plecoptera, Perlidae, *Anacroneuria*, Mesoamerica, new species, new records

INTRODUCTION

A minimum of 40, currently accepted species of *Anacroneuria* have been reported for the Mesoamerican nations which lie between Mexico and Colombia (Fenoglio & Morisi 2000; Fenoglio 2007; Harper 1992; Jewett 1958; Needham & Broughton 1927; Stark 1998; Stark & Kondratieff 2004), yet much of this region remains unstudied and the fauna may be significantly more diverse than current data suggests. The only moderately comprehensive studies (Costa Rica, Stark 1998 and Mexico, Stark & Kondratieff 2004) produced 25 and 30 *Anacroneuria* species respectively, with only eight species common to the two areas. In the Costa Rican study many specimens came from a single location on Rio Tempisquito, Estación Biológica Maritza in Guanacaste Province, a site which produced adults of 13 *Anacroneuria* species over the course of four years (1987-1990) of light trapping (Stark 1998). In this study, two additional new species are recognized from this site.

The current study is based on samples provided by R.W. Baumann and the Monte L. Bean Life Science Museum, Brigham Young University, and

miscellaneous specimens from various sources, not included in an earlier study of the Costa Rican and Panamanian fauna (Stark 1998). These samples include one, previously unrecognized species from Panama, three from Costa Rica, the first Panamanian records of *Anacroneuria azul* Rojas & Baena, 1999 (Stark et al. 1999) and *A. marca* Stark, 1998, six new provincial records from Heredia and Cartago Province, Costa Rica and one each from Baja Verapaz Province, Guatemala, and Chiriqui Province, Panama. Table 1 presents a current list of the *Anacroneuria* species known for the Mesoamerican region, together with their respective distributions.

MATERIALS AND METHODS

Specimens were prepared for study following the procedures outlined by Stark (2013). Selected structures were drawn using Wild M5A and Olympus SZH10 stereomicroscopes equipped with drawing tubes. Holotypes are deposited in the United States National Museum of Natural History through the courtesy of the Monte L. Bean Life Science Museum and the Stroud Water Research Center. Other specimens are deposited in the

Table 1. Distributions of *Anacroneuria* species known from localities south of Mexico and north of Colombia (BE = Belize, CO = Colombia, CR = Costa Rica, EC = Ecuador, GA = Guatemala, HO = Honduras, MX = Mexico, NI = Nicaragua, PA = Panama, US = United States).

Species	Authors	Date	Distribution
<i>A. acutipennis</i>	Klapálek	1923	CR, GA, PA
<i>A. alejuela</i>	Stark	1998	CR
<i>A. annulicauda</i>	(Pictet)	1841	GA, HO, MX
<i>A. annulipalpis</i>	Klapálek	1922	CR, PA
<i>A. azul</i>	Rojas & Baena, in Stark et al.	1999	CO, EC, PA
<i>A. benedettoi</i>	Stark	1998	CR, HO, PA
<i>A. blanda</i>	Needham & Broughton	1927	CO, CR, PA
<i>A. coronata</i>	Needham & Broughton	1927	HO, MX
<i>A. costana</i>	(Navás)	1924	CR, MX
<i>A. curiosa</i>	Stark	1998	CO, CR, NI
<i>A. divisa</i>	(Navás)	1924	CR, NI
<i>A. exquisita</i>	Stark	1998	CR
<i>A. flavolineata</i>	Jewett	1958	GA, MX
<i>A. flavominuta</i>	Jewett	1958	GA, HO, MX
<i>A. guanacaste</i>	sp. n.	2014	CR
<i>A. hacha</i>	Stark	1998	CR
<i>A. harperi</i>	Stark	1998	CO, PA
<i>A. holzenthali</i>	Stark	1998	CR, HO, NI
<i>A. lineata</i>	(Navás)	1924	BE, CR, GA, HO, MX, NI, PA
<i>A. litura</i>	(Pictet)	1841	BE, HO, MX, NI, US
<i>A. magnirufa</i>	Jewett	1958	CR, HO, PA
<i>A. marca</i>	Stark	1998	CR, PA
<i>A. marginata</i>	Stark	1998	CR
<i>A. maritza</i>	Stark	1998	CR
<i>A. morsei</i>	sp. n.	2014	CR
<i>A. naomi</i>	Needham & Broughton	1927	GA, MX
<i>A. pallida</i>	Jewett	1958	GA, MX
<i>A. perplexa</i>	Stark	1998	BE, CR, GA, HO, MX
<i>A. planicollis</i>	Klapálek	1923	BE, CR, GA, MX, NI, PA
<i>A. plutonis</i>	Banks	1914	CR
<i>A. quadriloba</i>	Jewett	1958	GA, MX
<i>A. senahu</i>	Stark & Kondratieff	2004	GA
<i>A. shepardi</i>	Stark & Kondratieff	2004	BE, HO, MX
<i>A. starki</i>	Fenoglio & Morisi	2000	HO, NI
<i>A. talamanca</i>	Stark	1998	CR, NI, PA
<i>A. tempisquito</i>	sp. n.	2014	CR
<i>A. totumas</i>	sp. n.	2014	CR, PA
<i>A. tornada</i>	Stark	1998	CR
<i>A. uatsi</i>	Stark	1998	CR, HO
<i>A. varilla</i>	Stark	1998	CR, PA
<i>A. ventana</i>	Stark	1998	CR
<i>A. wellsii</i>	Stark & Kondratieff	2004	GA, HO
<i>A. zaculeu</i>	Stark & Kondratieff	2004	GA
<i>A. zapata</i>	Stark	1998	CR
<i>A. zarpa</i>	Stark	1998	PA

following collections as indicated in the text.

- BPSC Bill P. Stark Collection, Mississippi College, Clinton, Mississippi, U.S.A.
FSCA Florida Collection of Arthropods, Gainesville, Florida, U.S.A.
BYUC Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah, U.S.A.
USNM United States National Museum of Natural History, Washington, D.C., U.S.A.

RESULTS AND DISCUSSION

Anacroneuria annulipalpis Klapálek

Anacroneuria annulipalpis Klapálek 1922:91. Lectotype ♀ (National Museum, Prague), Chiriqui, Panama, designation Stark (1998:557)

Material examined. Panama, Chiriqui, Totumas Cloud Forest, lodge, 08° 53.060' N, 82° 41.068' W, 1920 m, 19-25 June 2011, E. Fuller, 11♂, 4♀ (BYUC).
Comments. This species was previously reported from several Costa Rican provinces and from Chiriqui Province, Panama (Stark 1998).

Anacroneuria azul Rojas & Baena

Anacroneuria azul Rojas & Baena 1999:23, in Stark et al. 1999. Holotype ♂ (Museo de Entomología de la Universidad del Valle, Cali), Rio Azul, Valle del Cauca, Colombia

Material examined. Panama, Darién, Rio Tuira, Bocos de Cupe, 18 February 1985, J. Louton, 1♂ (USNM). Darién, Rio Tuira between El Real and Rio Pucuro, 16 February 1985, J. Louton, 3♂, 3♀ (USNM).
Comments. The specimens listed above were described by Harper (1992) as "*Anacroneuria* sp. A". Subsequently, I determined them as *A. azul*, but these determinations were never published. The records are noteworthy as one of only four *Anacroneuria* species known from sites in Colombia (Stark et al. 1999; Zúñiga & Stark 2002; Zúñiga et al. 2006; Zúñiga et al. 2007) and also from Mesoamerican sites.

Anacroneuria benedettoi Stark

Anacroneuria benedettoi Stark 1998:557. Holotype ♂ (USNM), Rio Los Ahogados, 11.3 km ENE Quebrada Grande, Guanacaste, Costa Rica

Material examined. Costa Rica, Heredia, 9 km NE Vara Blanca, 10° 14' N, 84° 06' W, 1450-1550 m, 15 March 2005, S.M. Clark, D.R. Clark, 1♂ (BYUC).

Comments. This species is recorded from Honduras, Panama and five Costa Rican provinces (Alajuela, Guanacaste, Limón, Puntarenas and San Jose). This is the first report from Heredia Province.

Anacroneuria blanda Needham & Broughton

Anacroneuria blanda Needham & Broughton 1927:117. Holotype ♀ (Cornell University), Barro Colorado Island, Panama

Material examined. Panama, Chiriqui, Totumas Cloud Forest, lodge, 08° 53.060' N, 82° 41.068' W, 1920 m, 19-25 June 2011, E. Fuller, 2♂ (MLBM).

Comments. This species is known from scattered sites in Costa Rica, Colombia and Panama (Stark 1998). This is apparently the first record from Chiriqui Province.

Anacroneuria exquisita Stark

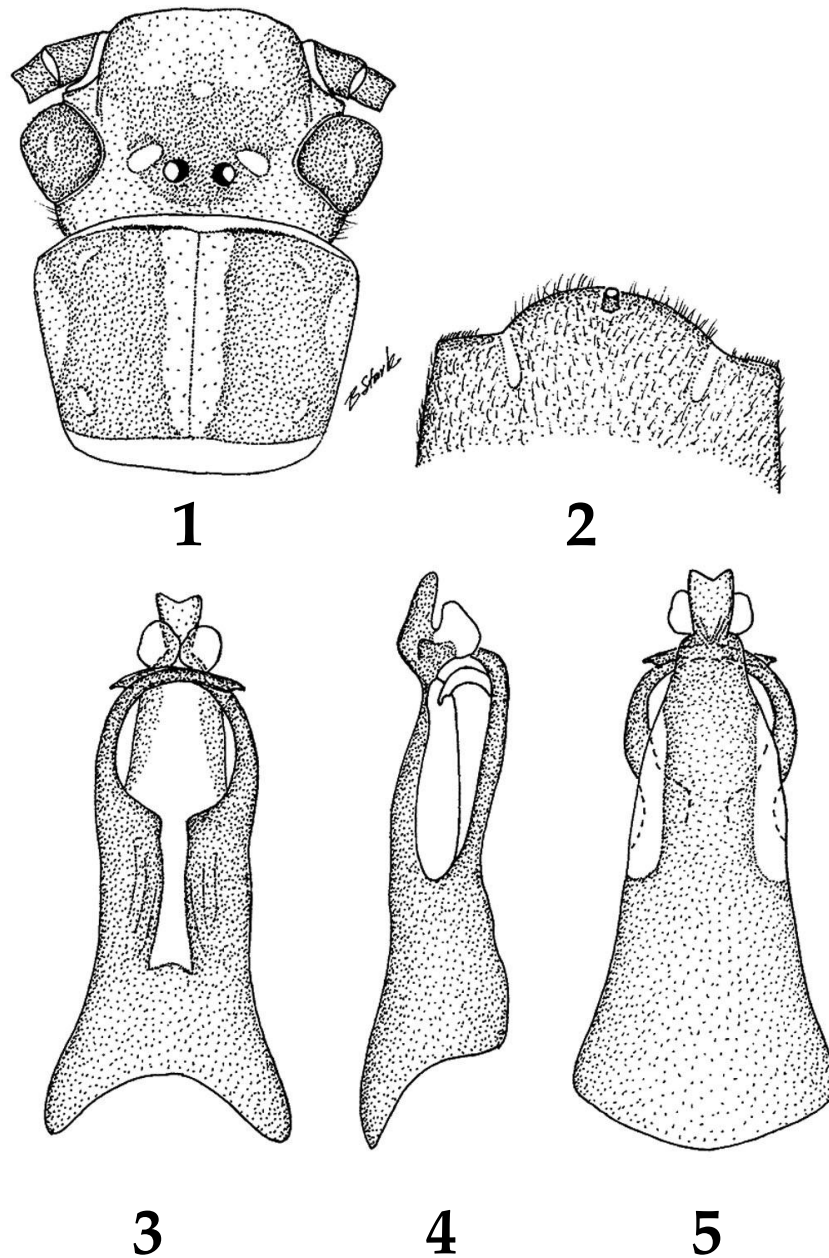
Anacroneuria exquisita Stark 1998:566. Holotype ♂ (USNM), Rio Zurqui, Parque Nacional Braulio Carrillo, San Jose, Costa Rica

Material examined. Costa Rica, Heredia, 9 km NE Vara Blanca, 10° 14' N, 84° 06' W, 1450-1550 m, 15 March 2005, S.M. Clark, D.R. Clark, 1♂ (BYUC).

Comments. This species was previously known from the holotype and four male paratypes, all from the type locality.

Anacroneuria guanacaste sp. n. (Figs. 1-5)

Material examined. Holotype ♂, Costa Rica, Guanacaste Province, Estación Biológica Maritza, Rio Tempisquito, 17 March 1989, light trap (USNM).



Figs. 1-5. *Anacroneuria guanacaste* sp.n. male. 1. Head and pronotum. 2. Sternum 9 with hammer. 3. Aedeagus, ventral. 4. Aedeagus, lateral. 5. Aedeagus, dorsal.

Adult habitus. General color brown, patterned with pale brown. Head dark brown pigment extending from behind ocelli in a broad patch covering central frons; lappets and antennae dark brown, pale callosities lateral to ocelli distinct (Fig. 1). Median

pronotal band yellow, most of disc brown. Wing membrane pale amber, veins brown. Hind femora with pale proximal band covering basal 2/3, apical third dark brown. Tibiae banded, pale in median field, dark brown at both ends.

Male. Forewing length 12 mm. Hammer thimble shaped, height slightly greater than apical diameter (Fig. 2). Aedeagal apex simple, notched on apical margin; ventral membranous lobes conspicuous (Fig. 3). In lateral aspect, apex is somewhat foot-shaped, but with a slightly bulging process at ankle (Fig. 4). Dorsal keel consists of an obscure series of low chevron-like lines (Fig. 5), but median line absent. Hooks slender.

Female. Unknown.

Larva. Unknown.

Etymology. The species name, based on Guanacaste Province, is used as a noun in apposition.

Diagnosis. In the Stark (1998) key this species runs to couplet 18 where an impasse occurs due to the intermediate forewing length. If the impasse is resolved by choosing the greater length (13 mm), no resolution is gained, although a determination of *A. marca* or *A. ventana* Stark, 1998 can be forced; if the smaller length (10 mm) is chosen a determination of *A. varilla* Stark, 1998 is made. In some respects, *A. guanacaste* is intermediate between these species with a slender, thimble-shaped hammer like that of *A. marca*, and with an aedeagal apex more similar to that of *A. varilla*. The new species is distinguished from both by the apical notch in the aedeagal tip (Fig. 3), and by the chevron-like dorsal keel (Fig. 5). The species is probably a near relative of *A. flavominuta* Jewett, 1958 and other Mexican species (Stark & Kondratieff 2004).

Anacroneuria holzenthali Stark

Anacroneuria holzenthali Stark 1998:568. Holotype ♂ (USNM), Quebrada Zapilote, Parque Nacional Rincon de la Vieja, Guanacaste, Costa Rica

Material examined. Costa Rica, Cartago, near Tuis, 3000', 16-22 June 1993, S. Keller, 1♂ (BYUC).

Comments. This species has been reported from Honduras, Nicaragua and from Alajuela, Guanacaste and Heredia provinces in Costa Rica (Stark 1998; Stark & Kondratieff 2004). This is the first record from Cartago.

Anacroneuria lineata (Navás)

Neoperla lineata Navás 1924:73. Holotype ♂ (Museum

National d'Histoire Naturelle, Paris), Costa Rica

Anacroneuria sulana Needham & Broughton 1927:112.

Holotype ♀ (Cornell University Insect Collection), Río Santa Ana, British Honduras [Belize], synonymy Stark & Kondratieff, 2004:26

Anacroneuria lineata: Stark, 1998:572. Redescription

Anacroneuria lineata: Stark & Kondratieff, 2004:26.

Female description

Material examined. Panama, Chiriqui Province, Rovira. Elvira Farm, 2200', 11 July 1964, A. Broce, 1♂ (FSCA). Veraguas, Alto de Piedra, 08° 30.9' N, 81° 07.0' W, 16-18 June 2011, E. Fuller, 1♂ (BYUC).

Comments. Several Costa Rican provincial records of this species are given in Stark (1998) and additional records are given for Belize, Guatemala, Honduras and Mexico in Stark & Kondratieff (2004). Jewett (1958) lists a male and two female specimens from "El Volcan, Chiriqui, Panama" among the specimens he determined as *A. sulana*, a synonym of *A. lineata* (Stark & Kondratieff 2004). These records may be valid, however, to my knowledge they have not been examined since the 1950's. The specimens listed above indicate the species is a valid member of the Panamanian fauna. The specimen from Veraguas has a thimble-shaped hammer rather than nipple shaped and has other subtle features which suggest it may represent a species distinct from *A. lineata*.

Anacroneuria magnirufa Jewett

Anacroneuria magnirufa Jewett 1958:162. Holotype ♀ (American Museum of Natural History), El Volcan, Chiriqui, Panama

Anacroneuria magnirufa: Stark, 1998:572. Redescription

Material examined. Costa Rica, Heredia, 9 km NE Vara Blancas, 10° 14' N, 84° 06' W, 1450-1550 m, 20 March 2005, S.M. Clark, D.R. Clark, 1♂ (BYUC). Same site, 14 March 2005, S.M. Clark, D.R. Clark, 1♂ (BYUC).

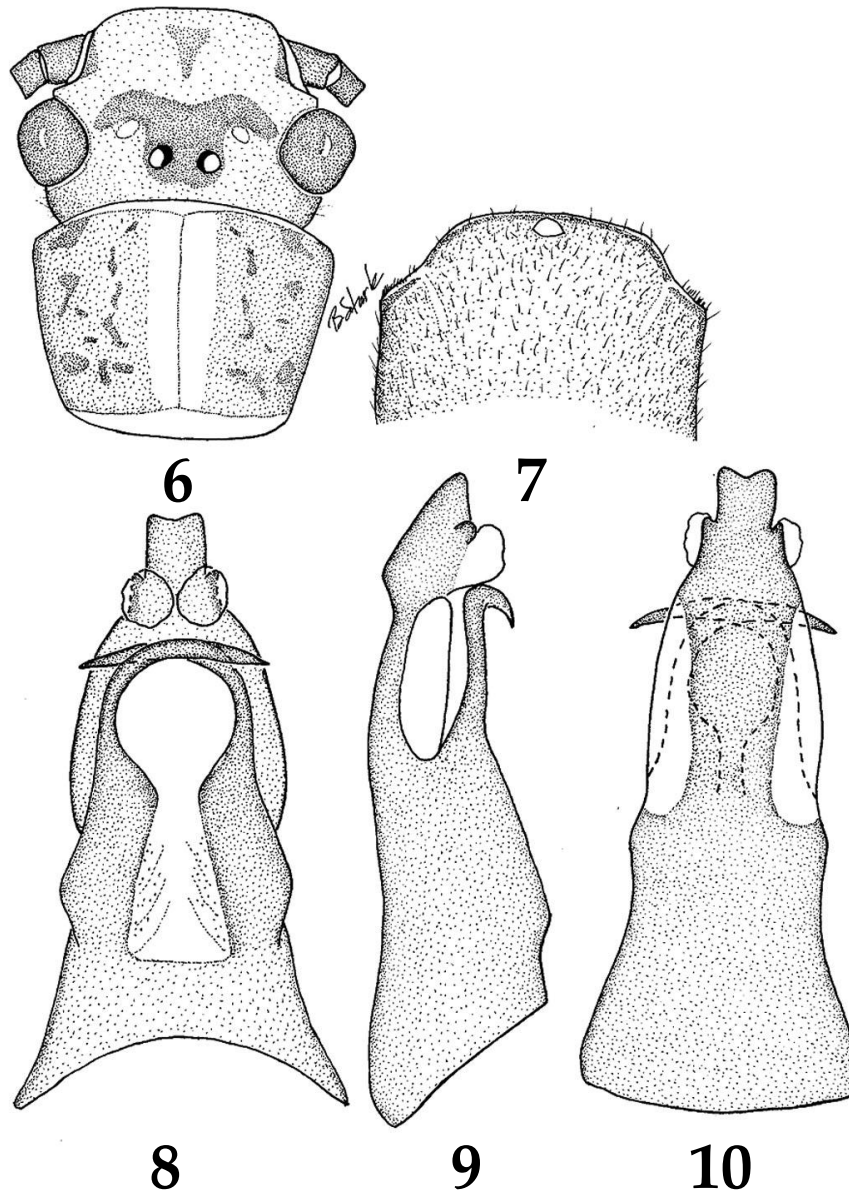
Comments. This species was previously reported from Honduras, Panama and from three Costa Rican provinces (Alajuela, Guanacaste, Puntarenas) (Jewett 1958; Stark 1998). These are the first specimens recorded from Heredia Province.

Anacroneuria marca Stark

Anacroneuria marca Stark 1998:575. Holotype ♂ (USNM), Rio Peje, Heredia, Parque Nacional Braulio Carillo, Costa Rica

24-30 July 1993, W.J. Hanson, 3♂ (BYUC). Panama, Chiriqui, Totumas Cloud Forest, lodge, 08° 53.060' N, 82° 41.068' W, 1920 m, 10-25 June 2011, E. Fuller, 5♀ (BYUC). Chiriqui Province, Rio Caldera, Boquete, 1100 m, 18 June 1973, 1♂ (USNM).

Material examined. Costa Rica, Heredia, Chilamate,



Figs. 6-10. *Anacroneuria morsei* sp.n. male. 6. Head and pronotum. 7. Sternum 9 with hammer. 8. Aedeagus, ventral. 9. Aedeagus, lateral. 10. Aedeagus, dorsal.

Comments. This species was previously reported from several Costa Rican provinces, including Heredia (Stark 1998). These are the first specimens recorded from Panama.

Anacroneuria maritza Stark

Anacroneuria maritza Stark 1998:578. Holotype ♂ (USNM), Rio Tempisquito, Estacion Maritza, Guanacaste, Costa Rica

Material examined. **Costa Rica**, Guanacaste, 3 km SE Rio Naranjo, 19-22 February 1993, F.D. Parker, 1♂ (BYUC). Same location, 21-30 April 1992, F.D. Parker, 1♂ (MLBM). Same location, 18-28 April 1993, F.D. Parker, 3♂ (BYUC). Same location, 15-30 April 1992, F.D. Parker, 1♂ (BYUC). Same location, 3-6 May 1993, F.D. Parker, 1♂ (BYUC). Same location, 12-14 May 1993, F.D. Parker, 2♂ (BYUC). Same location, 19 May 1993, F.D. Parker, 1♂ (BYUC). Same location, 24-26 May 1993, 2♂ (BYUC). Same location, 27 May 1992, F.D. Parker, 1♂ (BYUC). Same location, 28-31 May 1993, F.D. Parker, 2♂ (BYUC). Same location, 1-10 June 1992, F.D. Parker, 2♂ (BYUC). Same location, 11-20 June 1992, F.D. Parker, 1♂ (BYUC). Same location, 14-16 June 1993, F.D. Parker, 4♂ (BYUC). Same location, 18-23 June 1993, F.D. Parker, 5♂ (BYUC). Same location, 23-27 June 1993, F.D. Parker, 1♂ (BYUC). Same location, 21-30 June 1992, F.D. Parker, 3♂ (BYUC). Same location, 17-19 July 1993, F.D. Parker, 1♂ (BYUC). Same location, 21-31 July 1992, F.D. Parker, 1♂ (BYUC). Same location, 8-12 August 1993, F.D. Parker, 1♂ (BYUC). Same location 1-9 October 1992, F.D. Parker, 1♂ (BYUC).

Comments. This species was previously known from three sites in Guanacaste Province, Estacion Maritza, Monteverde and Rio Los Ahogados. The new records add another site, also in Guanacaste Province, from which this species is known to occur.

Anacroneuria morsei sp.n. (Figs. 6-10)

Material examined. Holotype ♂ (pinned), **Costa Rica**, Alajuela, Rio La Paz, Rt. 9, 7.6 km N Vara Blanca, 10.208° N, 84.166° W, 1340 m, 13 February 1986, J. Morse (USNM). Paratype: **Costa Rica**, Guanacaste, Rio Negro, Parque Nacional Rincón de

la Vieja, 10.765° N, 85.313° W, 810 m, 3 March 1986, R. Holzenthal, Fasth, 1♂ (pinned) (USNM).

Adult habitus. General color yellow patterned with brown pigment. Head with dark pigment covering ocelli and extending forward and laterad of callosities; occiput dark behind eyes, lappets and an anteromedian triangular area of frons dark brown. Median pronotal band yellow, lateral areas of disc brown with darker rugosities (Fig. 6).

Male. Forewing length 20 mm. Hammer a low mound (Fig. 7). Aedeagal apex weakly trilobed; large mesal lobe truncate or notched at tip, lateral lobes small and covered by conspicuous ventral membranous lobes (Figs. 8-9); hooks slender, dorsal keel absent (Fig. 10)

Female. Unknown.

Larva. Unknown.

Etymology. The patronym honors Dr. John Morse, a distinguished trichopterist, colleague, friend, and collector of the holotype specimen.

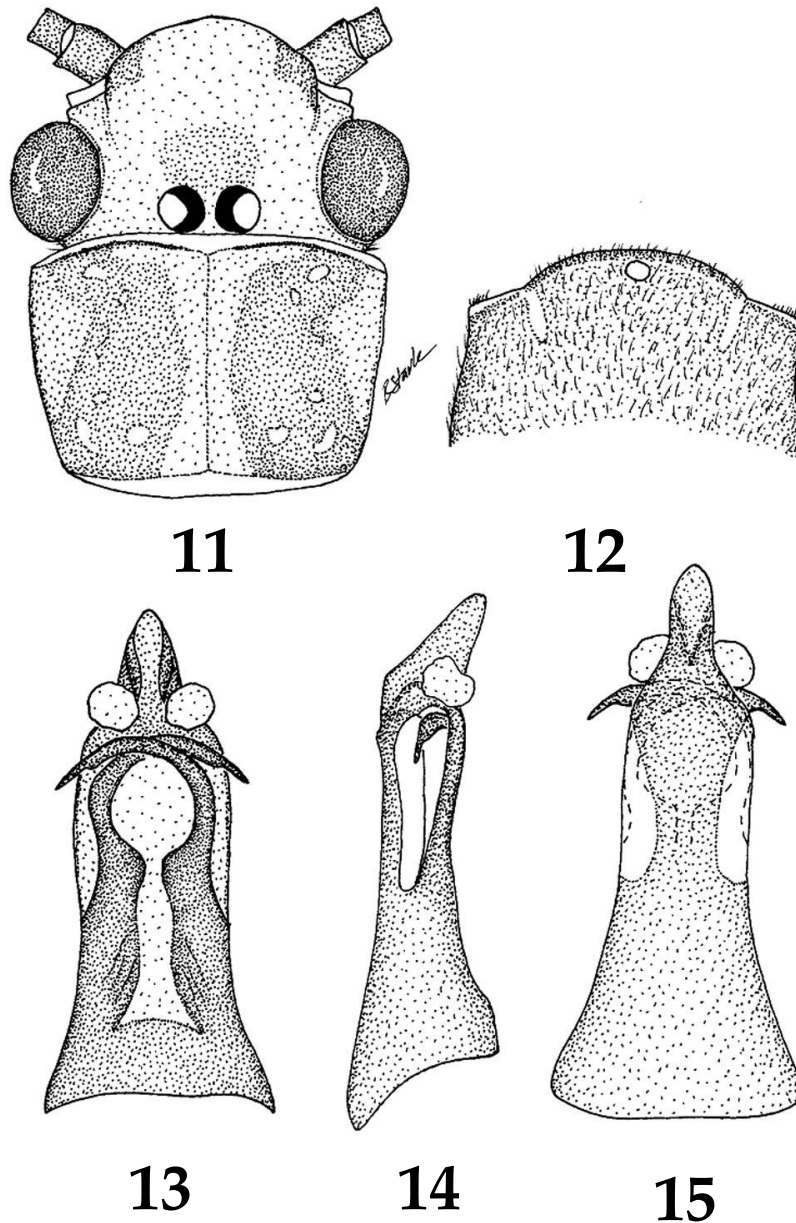
Diagnosis. The aedeagus of this species is generally similar to that of *A. brailovskyi* Stark & Kondratieff, 2004 a species known from Mexico (Stark & Kondratieff 2004), however in that species the aedeagal apex is expanded near the tip, the lateral lobes are less distinct and the apical section is not angled ventrad in lateral aspect as in the new species (Fig. 9). The aedeagus of a Costa Rican species, *A. exquisita* is also similar (Stark 1998) and the new species keys to couplet 11 in Stark (1998) which includes *A. exquisita* as one of the choices. However, the median lobe of the aedeagal apex is not notched and is more slender than in *A. morsei*. The new species is also distinct from *A. brailovskyi* and *A. exquisita* in head and pronotal pigment patterns (compare Fig. 6 with Fig. 41 in Stark 1998 and Fig. 29 in Stark & Kondratieff 2004).

Anacroneuria planicollis Klapálek

Anacroneuria planicollis Klapálek 1923:22. Lectotype ♂ (National Museum, Prague), Sierra du Naya, Mexico, designation Stark, 1998:582

Anacroneuria planicollis: Stark, 1998:582, redescription and synonymy

Material examined. **Costa Rica**, Heredia, 9 km NE Vara Blanca, 10° 14' N, 84° 06' W, 1450-1550 m, 14



Figs. 11-15. *Anacroneuria tempisquito* sp.n. male. 11. Head and pronotum. 12. Sternum 9 with hammer. 13. Aedeagus, ventral. 14. Aedeagus, lateral. 15. Aedeagus, dorsal.

March 2005, S.M. Clark, D.R. Clark, 1♂ (BYUC).

Heredia Province in Costa Rica.

Comments. This species is widely distributed from Mexico to Panama (Stark 1998; Stark & Kondratieff 2004) but has not previously been reported from

Anacroneuria tempisquito sp. n.
(Figs. 11-15)

Material examined. Holotype ♂, **Costa Rica**, Guanacaste Province, Estación Biológica Maritza, Rio Tempisque, 21 May 1990, light trap (USNM).

Adult habitus. Head yellow except for diffuse brown area forward of ocelli and dark brown lappets and antennae (Fig. 11). Pronotum with pale mesal band; dark lateral bands cover most of disc. Wing membrane transparent with pale amber tint; veins darker except for pale costa. Femora pale except for narrow black apical band; tibiae dark in proximal fourth and with a small distal dark spot.

Male. Forewing length 10 mm. Hammer reduced to a small, transparent, hairless disc (Fig. 12). Aedeagal apex pointed in ventral aspect and bearing a prominent pair of ventral, membranous lobes (Fig. 13); apex angled sharply ventrad in lateral aspect (Fig. 14), and bearing an obscure V-shaped dorsal keel composed of divergent, broken lines (Fig. 15). Hooks slender with long acute tips.

Female. Unknown.

Larva. Unknown.

Etymology. The species name, based on Rio Tempisque, is used as a noun in apposition.

Diagnosis. This species does not appear to be closely related to others known from Mesoamerica, but is more similar to the Ecuadorian species, *A. cajas* Zúñiga & Vimos, 2006 (Zúñiga et al. 2006) and the Colombian species *A. otun* Stark & Zúñiga, 2007 (Zúñiga et al. 2007). The new species is distinguished from both on the basis of pigment pattern, the prominent ventral membranous lobes, the dorsal keel, and the obscure hammer. In Stark (1998) the new species will key to couplet 9 where a choice of *A. varilla* could be forced, despite conspicuous differences in aedeagal structure.

Anacroneuria totumas sp. n.
(Figs. 16-20)

Material examined. Holotype ♂, **Panama**, Chiriqui, Totumas Cloud Forest, lodge, 08° 53.060' N, 82° 41.068' W, 1920 m, 19-25 June 2011, E. Fuller (USNM). Paratypes: **Costa Rica**: Puntarenas, Rio Bellavista, ca. 1.5 km NW Las Alturas, 1400 m, 10-11 August 1990, R. Holzenthal, R. Blahnik, F. Munoz, 1♂ (BPSC). San Jose, tributary Quebrada Caraiges, 3.6 km SW La Legua, 1650 m, R. Holzenthal, K. Kjer, F. Quesada, 2♂ (BPSC).

Adult habitus. General color brown patterned with yellow-brown. Head with dark lappets, antennae and a dark band extends from behind ocelli forward to M-line; dark band expanded laterally along M-line, and interrupted by a pale interocellar spot (Fig. 16). Pronotum dark over most of disc, but with a slender pale median band. Wings pale brown, veins brown except for C and apical half of SC. Femora pale in proximal half and dark brown in distal half; fore and mid tibiae brown, hind tibiae with pale transverse median band.

Male. Forewing length 20 mm. Hammer a low, mound-like structure (Fig. 17). Aedeagal apex simple (Figs. 18-19); ventroapical aspect with a large pair of membranous lobes overlying darkly sclerotized lateral margins (Fig. 18); dorsal keel absent, lateral margins slightly convergent to truncate apex (Fig. 20). Hooks slender.

Female. Unknown.

Larva. Unknown.

Etymology. The species name, based on the type locality at the Mount Totumas Cloud Forest, is used as a noun in apposition.

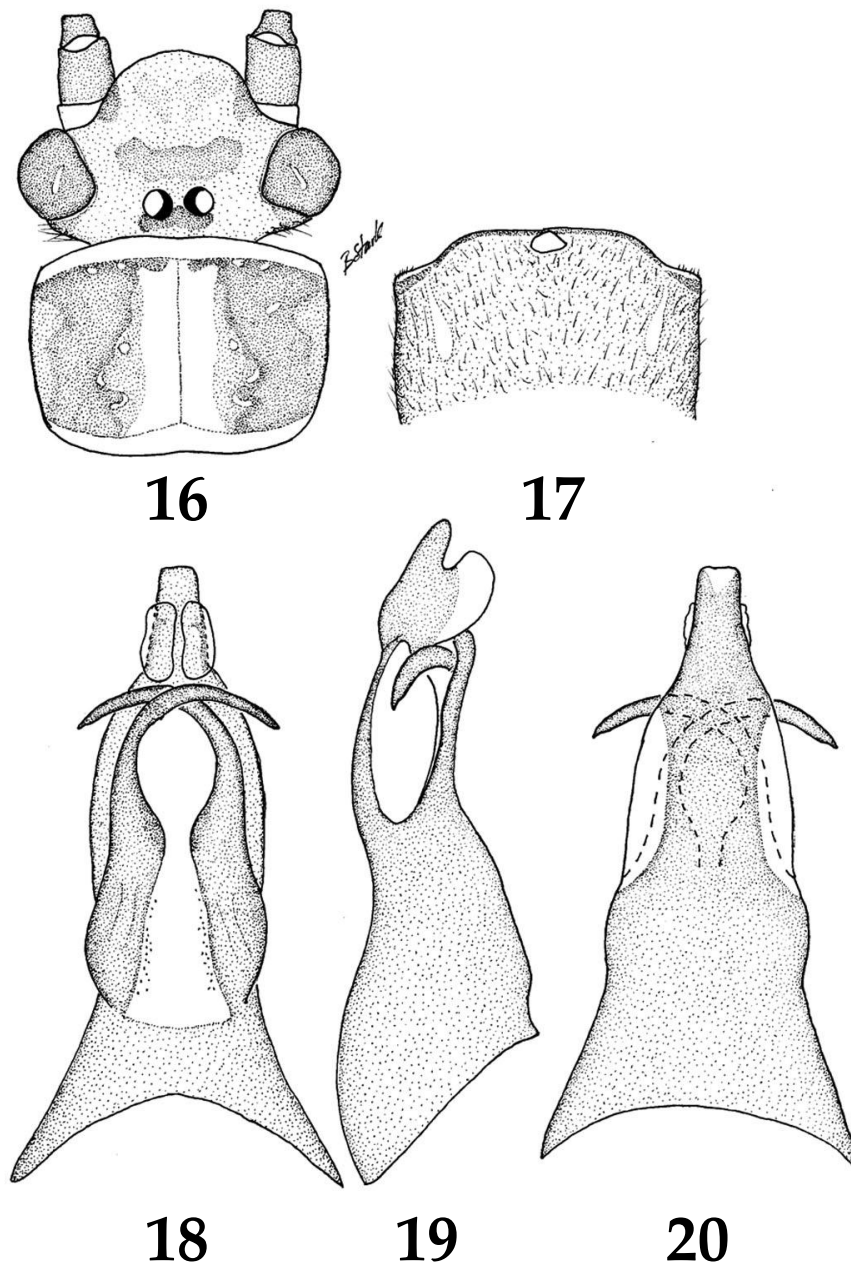
Diagnosis. This species keys to couplet 11 in Stark (1998) where *A. acutipennis* Klapálek, 1923 and *A. equisita*, a pair of species with trilobed aedeagal apices are the options. Because the new species has a simple aedeagal apex without lateral lobes, neither of these choices are viable. The aedeagal apex of the new species is generally similar to that of *A. varilla*, a much smaller species (male FWL = 9-10 mm) known from Costa Rica and Panama (Stark 1998).

Anacroneuria ventana Stark

Anacroneuria ventana Stark 1998:597. Holotype ♂ (USNM), Rio Peje, 1 km SE San Vicente, Alajuela, Costa Rica

Material examined. **Costa Rica**, Heredia, 9 km NE Vara Blanca, 10° 14' N, 84° 06' W, 1450-1550 m, 20 March 2005, S.M. Clark, D.R. Clark, 2♂ (BYUC).

Comments. This species was previously known from the holotype and two paratypes, collected in the Costa Rican provinces of Alajuela, Cartago and San Jose (Stark 1998). These are the first specimens from Heredia Province.



Figs. 16-20. *Anacroneuria totumas* sp.n. male. 16. Head and pronotum. 17. Sternum 9 with hammer. 18. Aedeagus, ventral. 19. Aedeagus, lateral. 20. Aedeagus, dorsal.

***Anacroneuria wellsi* Stark & Kondratieff**

Anacroneuria wellsi Stark & Kondratieff 2004:56.
Holotype ♂ (USNM), 4 miles W San Cristobal, Alta Verapaz, Guatemala

Material examined. Guatemala: Baja Verapaz, 5 km S Purulha, cloud forest, 15° 12.95' N, 90° 13.15' W, 1680 m, 14-16 October 2011, E. Fuller, 2♂ (BYUC).

Comments. This species was previously known from a pair of Guatemalan specimens from Alto Verapaz,

and a single male from Honduras.

ACKNOWLEDGMENTS

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