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Colombian *Anacroneuria*: Descriptions of new and old species

(Insecta, Plecoptera, Perlidae)

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35 species of the genus *Anacroneuria* Klapálek are recorded for Colombia including following 23 species described as new: *anchicaya, azul, calima, choachi, cipriano, cordillera, forcipata, guambiana, guayaquil, meta, morena, oreja, pacifica, paez, planada, portilla, quilla, regleta, rosita, socapa, tejon, undulosa, valle.* 12 species are described from the Cordillera Occidental; 9 of these are from Rio Azul in the middle Calima river basin or other streams in the Departamento Valle del Cauca. Five species are described from sites scattered along the Cordillera Oriental and six are from the Cordillera Central. Redescriptions are given for five species previously recorded from Colombia. A neotype is designated for *A. albimacula* Klapálek and a lectotype is designated for *A. pallens* Klapálek. A provisional key for males of 31 Colombian species is presented.

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Introduction

By 1927, twenty *Anacroneuria* species already had been described from Colombia (Banks 1914, Enderlein 1909a, 1909b, Klapálek 1921, 1922, Navas 1916, 1924, 1926, 1927, Pictet 1841). Unfortunately, due to ambiguity, vagueness and incompleteness, none of these studies are particularly helpful in identifying Colombian *Anacroneuria*. Study of type material led to recognition of two synonyms and to redescriptions for three Pictet (1841) and three Enderlein (1909a, 1909b) species (Zwick 1972, 1973). Subsequent research (Benedetto, unpublished, Stark, unpublished) indicate type material for six Navas (1916, 1926, 1927) and two Klapálek (1921, 1922) species are lost. Nine of these older names are given below as nomina dubia, but a neotype is proposed for *A. albimacula* Klapálek because it is the generic type species.

Since 1927, only one *Anacroneuria* species has been described from Colombia (Rojas & Baena 1993) but Stark (1995) recorded 31 species from Venezuela including 18 new to science. These reports along with those dealing with related genera (Froehlich 1984, 1988, Stark 1989, 1991, 1996, Stark & Zwick 1989) reflect a renewed interest in neotropical perlid systematics.

In this study we report the status for 12 species formerly recorded in Colombia or Venezuela and provide descriptions for 23 new species. Five unassociated females are also described under informal designations. Significantly, there is little overlap among the 35 species included herein with those currently known for Venezuela (Stark 1995), however, the overlap between Colombian and Ecuadoran

Anacroneuria is quite strong (Stark, unpublished). Holotypes and paratypes are deposited in the National Museum of Natural History, Washington (USNM), the Museo de Entomología de la Universidad del Valle, Cali (MEUV), or the Stark collection at Mississippi College, Clinton (BPS). Additional material has been examined from the Museum für Naturkunde der Humboldt Universität, Berlin (MNHB), The Museum of Comparative Zoology, Harvard University (MCZ), the National Museum of Natural History, Prague (NMP), and the University of Missouri, Columbia (UMO). The following key should permit identification of males of known Colombian *Anacroneuria*.

Provisional key to known Colombian male *Anacroneuria*

1. Wings banded in amber and dark brown ..... *bifasciata* (Pictet)
– Wings variable, but without bands ..... 2.

2. Forewing length at least 16 mm ..... 3.
– Forewing length no more than 15 mm ..... 12.

3. Hammer absent ..... 4.
– Hammer present ..... 5.

4. Aedeagal apex projecting beyond shoulder about twice as long as wide (Fig. 58); dorsal aedeagal keel weak (Fig. 60) ..... *guambiana*
– Aedeagal apex projecting beyond shoulder about as long as wide (Fig. 116); dorsal aedeagal keel absent (Fig. 118) ..... *socapa*

5. Lateral aspect of aedeagal apex hatchet shaped (Fig. 103) ..... 6.
– Lateral aspect of aedeagal apex somewhat scoop shaped (Fig. 84) ..... 7.

6. Hammer a minute circular disc (Fig. 15); ventral aspect of aedeagal apex rounded (Fig. 17) ..... *pallens* Klapálek
– Hammer thimble shaped (Fig. 101); ventral aspect of aedeagal apex notched (Fig. 102) ..... *quilla*

7. Projecting portion of aedeagal apex somewhat bulbous, or trilobed (Fig. 13) ..... 8.
– Projecting portion of aedeagal apex thin and hooked (Fig. 84) ..... 11.

8. Aedeagal apex trilobed ..... *fenestrata* (Pictet)
– Aedeagal apex simple ..... 9.

9. Dorsomesal aedeagal keel Y-shaped (Fig. 90) ..... *paez*
– Dorsomesal aedeagal keel composed of two narrow ridges (Fig. 14) ..... 10.

10. Ventral aedeagal apex truncate, hooks slender (Fig. 12) ..... *bolivari* (Banks)
– Ventral aedeagal apex rounded, hooks stout (Fig. 63) ..... *guayaquil*

11. Dorsal aedeagal keel present (Fig. 109); hammer excavated (Fig. 106) ..... *regleta*
– Dorsal aedeagal keel absent (Fig. 85); hammer thimble shaped (Fig. 82) ..... *pacifica*

12. Dark pigment covers ocelli or area immediately anterior to ocelli (Fig. 76) ..... 13.
– Ocellar region pale, or with only diffuse pigment (Fig. 51) ..... 22.

13. Aedeagal tip in ventral aspect bearing three sclerotized processes (Fig. 3) ..... 14.
– Aedeagal tip in ventral aspect bearing a single, sometimes notched process (Fig. 121) ..... 15.

14. Wings with a transparent circular window near cord; mesoapical aedeagal lobe without keel (Fig. 5) ..... *albimacula* Klapálek
– Wing membrane completely transparent; mesoapical aedeagal lobe with keel (Fig. 80) ..... *oreja*

15. Aedeagal apex deeply notched ..... *farallonensis* Rojas & Baena
– Aedeagal apex rounded or slightly emarginate (Fig. 121) ..... 16.

16. Aedeagal apex upturned in lateral aspect at an approximate right angle (Fig. 122) ..... *tejon*
– Aedeagal apex straight or only slightly upturned (Fig. 113) ..... 17.

17. Dorsal aedeagal keel arcuate or triangular (Figs 30, 114) ..... 18.
– Dorsal aedeagal keel composed of two more or less parallel ridges (Fig. 25) ..... 20.

18. Margins of aedeagus convergent from base of hooks to near tips of hooks (Fig. 114) ..... 19.
– Margins of aedeagus abruptly narrowed at midlength of hooks (Fig. 28) ..... *azul*

19. Aedeagal hooks swollen and curved inward abruptly near tips (Fig. 112) ..... *rosita*
– Aedeagal hooks slender and curved inward gradually (Fig. 38) ..... *choachi*

20. Aedeagal apex acute (Fig. 24); subapical membranous lobes absent (Fig. 23) ..... *anchicaya*
– Aedeagal apex blunt or emarginate (Fig. 73); subapical membranous lobes present (Fig. 73) .. 21.

21. Aedeagal hooks slender throughout (Fig. 73) ..... *morena*
– Aedeagal hooks wider subapically (Fig. 98) ..... *portilla*

22. Aedeagus very slender from base of hooks to apex (Fig. 10); hooks digitate (Fig. 8) ..... 23.
– Aedeagus about as wide in subapical area as basally (Fig. 126); hooks not digitate ..... 24.

23. Margins of aedeagal apex parallel (Fig. 8) ..... *angusticollis* (Enderlein)
– Aedeagal apex swollen (Fig. 53) ..... *forcipata*

24. Lateral aspect of aedeagal apex very narrow (Fig. 127) ..... *undulosa*
– Lateral aspect of aedeagal apex relatively wide (Fig. 132) ..... 25.

25. Hammer reduced to circular unpigmented spot (Fig. 47) ..... 26.
– Hammer thimble shaped (Fig. 135) ..... 27.

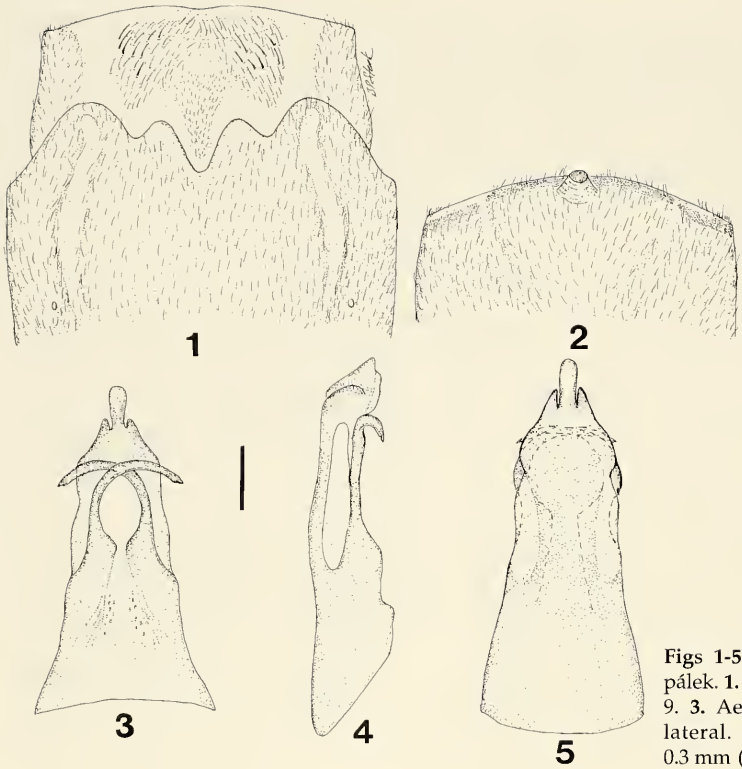
26. Dorsomesal aedeagal keel obsolete (Fig. 50) ..... *cordillera*
– Dorsomesal aedeagal keel well developed (Fig. 133) ..... *valle*

27. Aedeagal apex of three subequal lobes (Fig. 136) ..... *paleta* Stark
– Aedeagal apex not trilobed (Fig. 33) ..... 28.

28. Aedeagal apex appearing notched (Fig. 33), lateral aspect somewhat hatched shaped (Fig. 34) ... . *calima*
– Aedeagal apex blunt or rounded (Fig. 93), lateral aspect more scoop shaped (Fig. 94) ..... 29.

29. Aedeagal body with swollen lateral knobs at hook bases (Fig. 93); wing length greater than 12 mm ..... *planada*
– Aedeagal body without swollen lateral knobs (Fig. 43); wing length less than 11 mm ..... 30.

30. Pronotum with narrow irregular pigment bands, head almost entirely yellow (Fig. 41) .... *cipriano*
– Pronotum with broad, pale pigment bands, head forward of ocelli diffuse yellow brown (Fig. 66) ..... *meta*



Figs 1-5. *Anacroneuria albimacula* Klapálek. **1.** ♀ sterna 8 and 9. **2.** ♂ sternum 9. **3.** Aedeagus ventral. **4.** Aedeagus lateral. **5.** Aedeagus dorsal. Scales: 0.3 mm (**1, 2**), 0.15 mm (**3-5**).

Anacroneuria albimacula Klapálek
(Figs 1-5)

Anacroneuria albimacula Klapálek, 1921: Holotype ♂ (lost), Bogota, Colombia.

Types. Neotype: ♂ (pinned), Colombia, Antioquia, 12 km E Medellin, 6 February 1983, O. S. Flint (USNM).
Additional specimens. 1♀ (pinned), same data as neotype (USNM).

Description

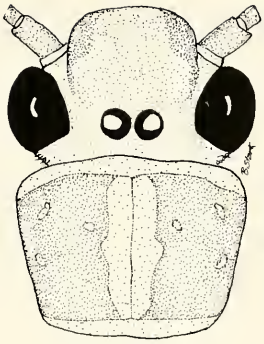
Adult habitus. Brown pigment covers ocelli and extends to anterior margins of compound eyes. Lappets brown. Pronotum with dark midlateral pigment bands; wide mesal band pale. Wing membrane and veins dark, except for pale costal margins and subapical circular area at cord.

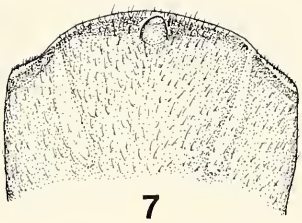
Male. Forewing length 12 mm. Hammer broad basally, narrowed to a flat, circular apex; height subequal to basal diameter (Fig. 2). Ventral and dorsal aspect of aedeagal apex trilobed; lateral lobes short and acute, apical lobe slender and finger shaped (Figs. 3-5). In lateral aspect, apical lobe oblique and lateral lobes broadly rounded (Fig. 4).

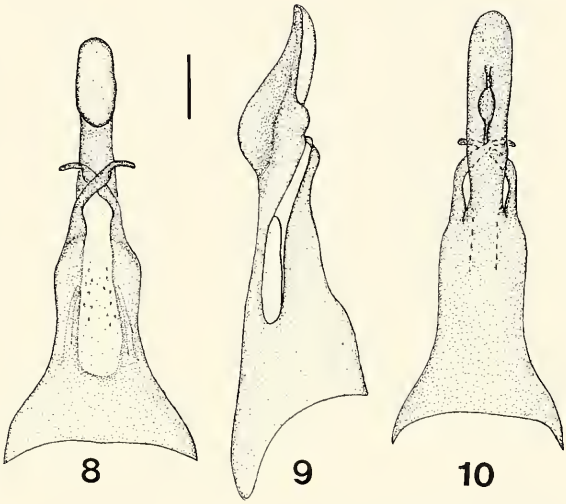
Female. Forewing length 14.5 mm. Subgenital plate with four lobes (Fig. 1). Lateral lobes separated from median lobes by shallow notch; median lobes separated by deeper V-shaped notch. Transverse sclerite of sternum nine weakly sclerotized, hardly discernable in setal patch. Setal patch trilobed; mesal lobe extends into median notch of subgenital plate; setae of mesal lobe minute, lateral setae long and coarse.

Nymph. Unknown.

Discussion. *Anacroneuria albimacula* is the genotype of *Anacroneuria* by subsequent designation of Claassen (1940). Because the holotype is lost (L. Benedetto, pers. comm.), and no figures were given by Klapálek (1921), we are designating a neotype in order to insure generic stability. The holotype was from "Bogota" in the Cordillera Oriental and the neotype from near Medellin in the Cordillera Central,







Figs 6-10. *Anacroneuria angusticollis* (Enderlein). **6.** Head and pronotum. **7.** ♂ sternum 9. **8.** Aedeagus ventral. **9.** Aedeagus lateral. **10.** Aedeagus dorsal. Scales: 0.6 mm (**6**), 0.3 mm (**7**), 0.15 mm (**8-10**).

but the specimen agrees in size and basic color pattern with Klapálek's description. Significantly, the holotype and the neotype share an apical pale pigment spot in the wings. This character occurs sporadically among *Anacroneuria* species but it is apparently uncommon among those from Colombia. *Anacroneuria schmidti*, which shares this wing pattern and the subgenital plate outline, is a much smaller species (Zwick 1973).

Anacroneuria angusticollis (Enderlein)
Figs 6-10

Neoperla angusticollis Enderlein, 1909b: Holotype ♂, Rio Magdalena, Colombia.
Anacroneuria unicolor Klapálek, 1922: Holotype ♂, Colombia. Syn. Zwick, 1973.
Anacroneuria angusticollis, Zwick 1973

Redescription

Adult habitus. Head yellow to diffuse yellow-brown, lappets brown. Pronotum dark brown with narrow mesal pale stripe. Anterior face of femora and tibiae dark brown. Wing membrane transparent, veins dark brown.

Male. Forewing length 13 mm. Hammer thimble shaped, height about equal to basal diameter (Fig. 7). Aedeagal apex long, slender and ventrally excavated (Figs. 8, 10). Dorsal keel well developed

(Figs. 9, 10). Hooks slender and apically digitate (Fig. 8).

Female. Unknown.

Nymph. Unknown.

Examined material: 1♂, ECUADOR: Napo, Tena, 23 May 1977, P. Spangler and D. Givens, 1♂ (USNM). Napo, Misahaulli, 1 January 1989, R. W. Sites (UMO).

Discussion. Zwick (1973) redescribed the holotype of this species from Rio Magdalena, Colombia, and placed *A. handlirschi* Klapálek and *A. unicolor* Klapálek as synonyms. Subsequently, Stark & Sivec (1998) removed *A. handlirschi* from synonymy. We have not found this species among our Colombian material but it is fairly common among Ecuadoran specimens we have seen. The figures were made from specimens collected in Napo Province, Ecuador.

Anacroneuria apicalis (Enderlein)

Neoperla apicalis Enderlein, 1909a: Holotype ♀, Rio Magdalena, Colombia.
Anacroneuria apicalis, Zwick 1973

Diagnosis

Adult habitus (modified from Zwick 1973). Head ocre, lappets and ocellar areas black. Lateral pronotal bands dark brown, median pale band wide. Legs banded; femoral apex and tibial base and apex black. Wings transparent, veins brown except pale costal area.

Male. Unknown.

Female (modified from Zwick 1973). Forewing length 12.5 mm. Subgenital plate with four lobes separated by shallow notches. Sternum 9 setal patch trilobed; median lobe with minute setae, lateral lobes with variable larger and coarser setae.

Nymph. Unknown.

Examined material: None.

Discussion. Presently we are unable to associate this name with any of the species represented in our material.

Anacroneuria bifasciata (Pictet)

Perla bifasciata Pictet, 1841: Holotype ♀, Colombia.
Anacroneuria bifasciata, Zwick 1972
Anacroneuria bifasciata, Stark 1995

We have no additional Colombian records of this species. Zwick (1973) reported two Colombian female specimens collected by Pehlke in 1914 but no specific locality was given.

Anacroneuria bolivari (Banks)

Figs 11-14

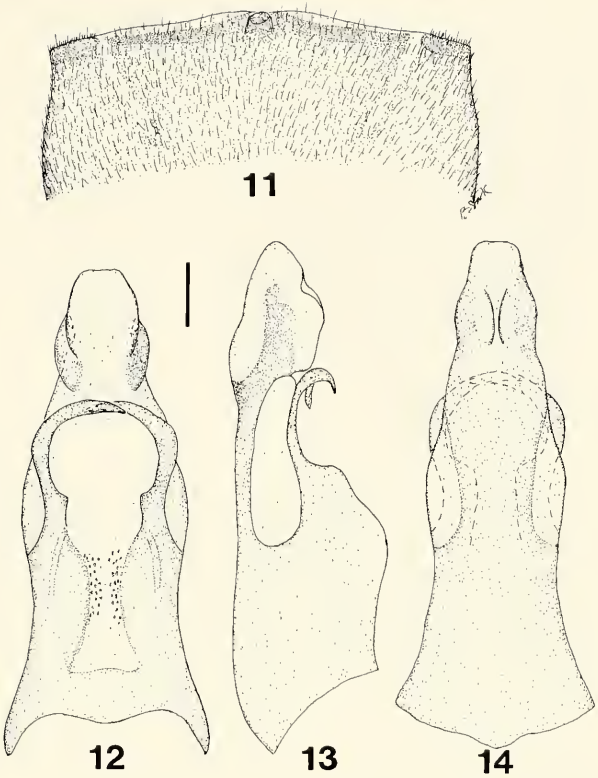
Neoperla bolivari Banks, 1914: Holotype ♀, Monte Socorro, Colombia.

Diagnosis

Adult habitus. Head yellow with darker lappets. Pale median pronotal stripe wide, narrow submarginal stripes brown. Wing membrane transparent, most veins pale brown; R vein dark brown, costal area pale.

Male (putative). Forewing length 18 mm. Hammer subcylindrical, height less than basal diameter (Fig. 11). Aedeagal apex broadly rounded with swollen subapical lateral lobes; dorsal keel low, hooks slender (Figs 12-14).

Female. Forewing length 23-25 mm. Subgenital plate bilobed; lobes broadly rounded, notch narrow. Transverse sclerite of sternum 9 narrow, sparsely hirsute near ends; setal patch triangular, median



Figs 11-14. *Anacroneuria bolivari* (Banks). **11.** ♂ sternum 9. **12.** Aedeagus ventral. **13.** Aedeagus lateral. **14.** Aedeagus dorsal. Scales: 0.3 mm (**11**), 0.15 mm (**12-14**).

setae minute, lateral setae long and coarse.

Nymph. Unknown.

Examined material: Holotype, ♀ (abdomen missing), Colombia, Monte Socorro, 3600 m, Fassl (MCZ); 1♀ (pinned), Colombia: Antioquia, Quebrada Espadera, 7 km E Medellin, 24 February 1983, O. S. Flint (USNM); 3♂♂ (pinned), Risaralda, Termales de Santa Rosa de Cabal, 29 February 1984, C. M. and O. S. Flint (USNM).

Discussion. The condition of the holotype does not permit a definitive association, but based on similarities in size, color pattern and subgenital plate shape, this assignment seems reasonable. The males are tentatively associated on the basis of coloration and size.

Anacroneuria farallonensis Rojas & Baena

Anacroneuria farallonensis Rojas & Baena, 1993: Holotype ♂, Peñas Blancas, 2000 m, Rio Cali, Valle del Cauca, Colombia.

We have no additional records of this species.

Anacroneuria fenestrata (Pictet)

Perla fenestrata Pictet, 1841: Holotype ♂, Colombia.
Anacroneuria fenestrata, Zwick 1972
Anacroneuria fenestrata, Stark 1995

We have no additional records of this species.

Anacroneuria pallens Klapálek
Figs 15-19

Anacroneuria pallens Klapálek, 1922: Lectotype ♂, here designated, Bogota, Colombia.

Diagnosis
Adult habitus (modified from Klapálek 1922). Body ochre yellow, anterior portion of head and sides of the pronotum distinctively darker, somewhat darker reddish. Legs ochre yellow except dorsal and distal edges of femora, and basal and distal areas of tibia, darker brown; apical tarsal segment darker, brownish. Wing membrane pale, glossy, veins yellow brown.

Male. Forewing length 18-19 mm. Hammer a small, circular, slightly raised disc (Fig. 15). Ventral aedeagal apex broadly rounded, terminating in an oval, longitudinally cleft platform. Hooks large, scythe shaped (Fig. 17). Dorsal and lateral aspect of aedeagal apex strongly keeled; keel forming a long, sinuate X-pattern (Figs 18-19).

Female (putative). Forewing length 22-25 mm. Subgenital plate bilobed; lobes obliquely truncate; notch shallow, U-shaped (Fig. 16).

Nymph. Unknown.

Examined material: ♂ Lectotype (pinned), Bogota, Colombia, 31 October 1888, Lindig (NMP); 1♀ (paralectotype), Bogota, Colombia, 2 November 1888, Lindig (NMP).

Discussion. The type series of *A. pallens* may have included additional specimens but of the two syntypes known to have survived, we select the male as lectotype. The abdomen is in a microvial labelled "#84", on the specimen pin. The damaged syntype female subgenital plate and terminal segments are in a microvial labelled "#85", on the specimen pin. Both specimens are in the National Museum of Natural History, Prague.

Anacroneuria pehlkei (Enderlein)

Neoperla pehlkei Enderlein, 1909a: Holotype ♀, Natagaima, Colombia.
Anacroneuria pehlkei, Zwick 1973

Diagnosis
Adult habitus (modified from Zwick 1973). Body yellow but outer margins of head dark. Pronotum yellow with wide submarginal bands and very narrow pale margins. Legs black except for sharply pale banded femoral base.

Male. Unknown.

Female (modified from Zwick 1973). Forewing length 11 mm. Subgenital plate four lobed; lobes subequal but median notch deeper than lateral notches. Setal patch of sternum 9 trilobed; mesal patch with minute setae, lateral patches with larger, coarser setae.

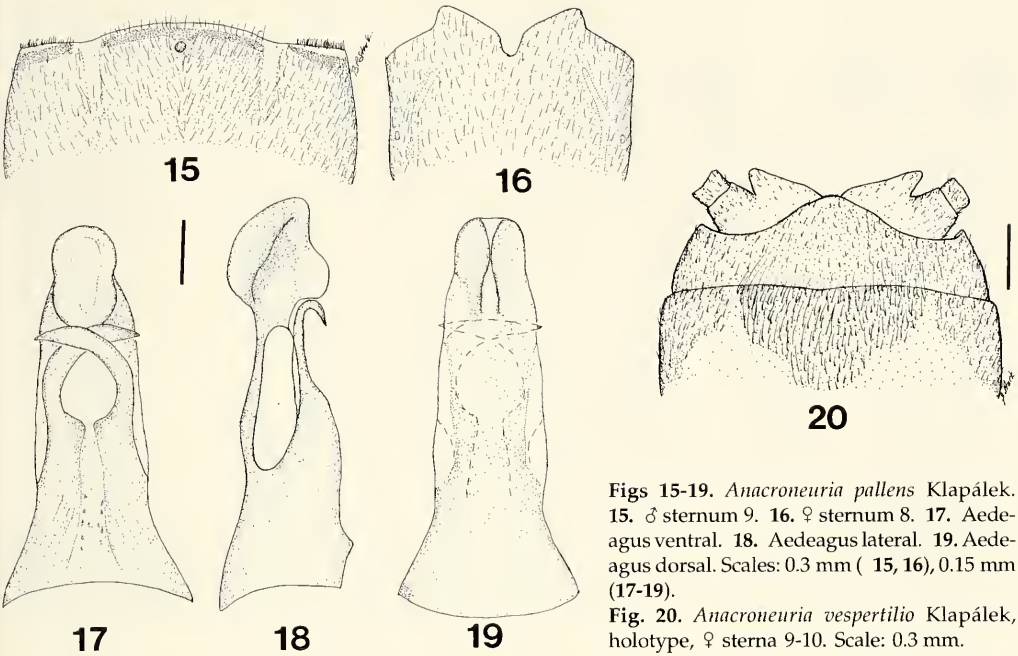
Nymph. Unknown.

Examined material: None.

Discussion. The type locality, in a valley between the Cordillera Central and Cordillera Oriental in the Departmento del Tolima, is in the general region where a few of our specimens were collected. We cannot presently associate this name with any of the species we have seen.

Anacroneuria schmidti (Enderlein)

Neoperla schmidti Enderlein, 1909a: Holotype ♀, Balzapamba, Ecuador.
Anacroneuria variegata Klapálek, 1921: Lectotype ♀, Bogota, Colombia, syn. Zwick, 1973.
Anacroneuria schmidti, Zwick 1973



Figs 15-19. *Anacroneuria pallens* Klapálek. **15.** ♂ sternum 9. **16.** ♀ sternum 8. **17.** Aedeagus ventral. **18.** Aedeagus lateral. **19.** Aedeagus dorsal. Scales: 0.3 mm (**15, 16**), 0.15 mm (**17-19**).
Fig. 20. *Anacroneuria vespertilio* Klapálek, holotype, ♀ sterna 9-10. Scale: 0.3 mm.

Diagnosis
Adult habitus (modified from Zwick 1973). Head yellow, pronotum yellow except for narrow brown submarginal stripes. Wing membrane pale, veins brown except for pale costal area (C, Sc, R) and an apical clear window spot.

Male. Unknown.

Female (modified from Zwick 1973). Forewing length 9.5-10.5. Subgenital plate four lobed; lobes rounded and separated by shallow notches; median notch V-shaped and deeper than lateral notches. Sternum 9 setal patch trilobed; median lobe with minute setae, lateral lobes with variable larger and coarser setae.

Nymph. Unknown.

Examined material: None.

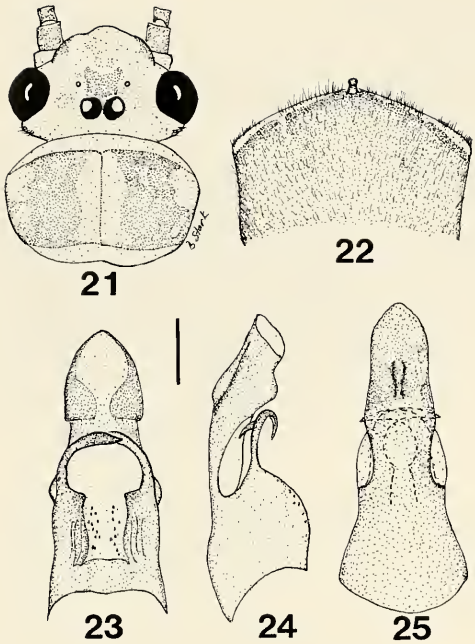
Discussion. We are presently unable to associate this name with any of the species in our material. The species is similar in color pattern and subgenital plate shape and setation to *A. albimacula*, but is significantly smaller.

Anacroneuria vespertilio Klapálek
Fig. 20

Anacroneuria vespertilio Klapálek, 1921: Holotype ♀, Bogota,Colombia.

Diagnosis
Adult habitus (modified from Klapálek 1921). Dorsum of body Van Dyke brown, darker on the pro- and mesonotum. M-line and calluses of the frons paler, transceeding to ochre yellow. Antennae and palpi sepia brown, legs slightly paler, but a narrow black band at the femoral apex. Wings brown with dark brown veins.

Male. Unknown.



Figs 21-25. *Anacroneuria anchicaya*, spec. nov. **21.** Head and pronotum. **22.** ♂ sternum 9. **23.** Aedeagus ventral. **24.** Aedeagus lateral. **25.** Aedeagus dorsal. Scales: 0.6 mm (**21**), 0.3 mm (**22**), 0.15 mm (**23-25**).

Female. Forewing length about 30 mm. Subgenital plate destroyed. Setal patch of sternum 9 broadly triangular, clothed throughout with red brown setae (Fig. 20).

Nymph. Unknown.

Examined material: ♀ Holotype, Colombia, Bogota, Lindig (MNHB).

Discussion. One of us (BPS) studied fragments of the holotype while it was on loan to P. Zwick. The subgenital plate had been destroyed, or lost, and only part of segments nine and ten were intact for our study. These segments are in a microvial and presumably are now with any other fragments of the specimen in the Museum für Naturkunde der Humboldt Universität, Berlin. The large size and prominent red-brown setal patch on the female sternum 9 may permit this name to be associated with other specimens in the future.

Anacroneuria anchicaya Baena & Zúñiga, spec. nov.

Figs 21-25

Types. Holotype: ♂, Colombia, Valle del Cauca, Alto Anchicayá, 700 m, 12 May 1994, A. M. Rojas, A. Ramos (MEUV). – Paratype: ♂, Colombia, Valle del Cauca, Rio Desbaratado, 1100 m, 10 June 1992, A. M. Rojas, M. Baena (BPS).

Description

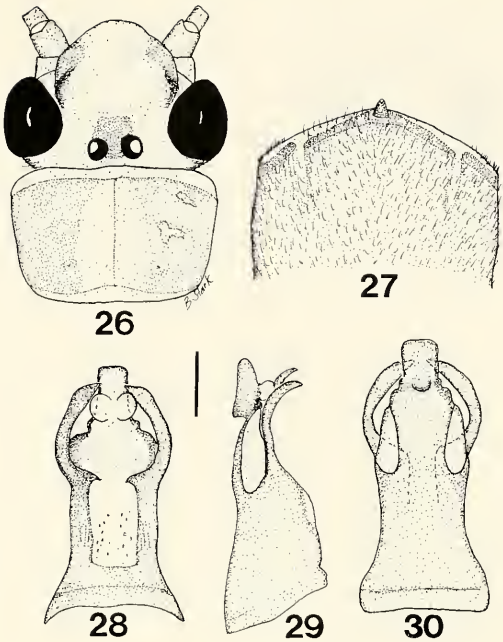
Adult habitus. Head yellow with dark spot over ocellar region; lappets dark brown; blotch forward of M-line pale brown. Pronotum with dark brown midlateral stripes, pale on anterolateral margins; median stripe pale (Fig. 21). Wing membrane pale brown, veins brown.

Male. Forewing length 9 mm. Hammer subcylindrical, height slightly greater than basal diameter (Fig. 22). Aedeagal apex simple; ventral aspect broadly triangular, wider than neck area beyond hooks (Fig. 23). Dorsal aspect with a broad low keel (Fig. 25). Hooks slender.

Female. Unknown.

Nymph. Unknown.

Etymology. The species name refers to the locality from which the holotype was collected and is used as a noun in apposition.



Figs 26-30. *Anacroneuria azul*, spec. nov. **26.** Head and pronotum. **27.** ♂ sternum 9. **28.** Aedeagus ventral. **29.** Aedeagus lateral. **30.** Aedeagus dorsal. Scales: 0.6 mm (**26**), 0.3 mm (**27**), 0.15 mm (**28-30**).

Anacroneuria azul Rojas & Baena, spec. nov.
Figs 26-30

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, Cuenca media Rio Calima, 550 m, 10 August 1994, A. M. Rojas, M. Baena (MEUV). – Paratypes: all from Colombia: 1♂, Cauca, Vereda Alegria, 1100 m, Trampa de luz 10 April 1993, A. Ramos (MEUV); 1♂, Cauca, Santander de Quilichao, Hosp. Pared., 1000 m, 13 March 1993, F. Riascos (MEUV); 2♂♂, Valle del Cauca, type locality, 21 February 1994, A. M. Rojas, M. Baena, A. Ramos (USNM); 1♂, same location, 20 February 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV); 2♂, same location, 11 August 1994, A. M. Rojas, M. Baena, R. Aldana (BPS); 1♂, same location, 15 February 1992, A. M. Rojas, R. Aldana (MEUV).

Description

Adult habitus. Head yellow brown with dark ocellar area and lappets. Mid pronotal area yellow, bordered by broad dark brown bands (Fig. 26). Wing membrane transparent, veins brown. Femora yellow with dark brown band in distal half; tibiae with basal and apical dark bands.

Male. Forewing length 11 mm. Hammer somewhat conical (Fig. 27). Aedeagal apex truncate with a pair of membranous ventral lobes and a small transverse, arcuate keel (Figs 28, 30). Lateral margins parallel, lateral aspect somewhat foot shaped (Fig. 29). Scythe shaped hooks almost reach aedeagal tip (Fig. 28).

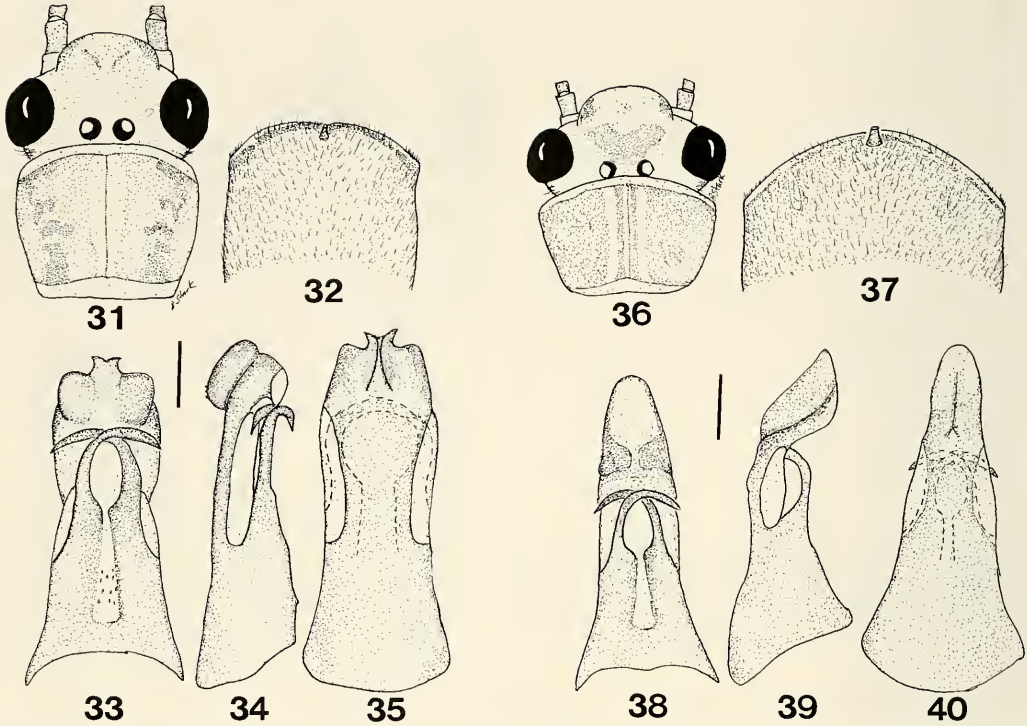
Female. Unknown.

Nymph. Unknown.

Etymology. The species name refers to the river basin from which the holotype was collected and is used as a noun in apposition.

Anacroneuria calima Baena & Rojas, spec. nov.
Figs 31-35

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, 550 m, Cuenca media Rio Calima, 11 August 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV). – Paratypes: 3♂♂,same data; 1♂, Valle del Cauca, type locality, 21 February 1994, A. M. Rojas, M. Baena, R. Aldana (BPS); 1♂, same location, 6 July 1994, A. M. Rojas, A. Ramos (USNM).



Figs 31-35. *Anacroneuria calima*, spec. nov. **31.** Head and pronotum. **32.** ♂ sternum 9. **33.** Aedeagus ventral. **34.** Aedeagus lateral. **35.** Aedeagus dorsal. Scales: 0.6 mm (**31**), 0.3 mm (**32**), 0.15 mm (**33-35**).
Figs 36-40. *Anacroneuria choachi*, spec. nov. **36.** Head and pronotum. **37.** ♂ sternum 9. **38.** Aedeagus ventral. **39.** Aedeagus lateral. **40.** Aedeagus dorsal. Scales: 0.6 mm (**36**), 0.3 mm (**37**), 0.15 mm (**38-40**).

Description
Adult habitus. Head brown with dark lappets and a pair of small divergent bars near the anterior margin; ocellar region pale. Pronotum with irregular midlateral dark bands (Fig. 31). Wing membrane and veins brown. Femora dark brown along dorsal surface and at distal end, tibiae dark brown.

Male. Forewing length 10.5 mm. Hammer somewhat conical (Fig. 32). Aedeagal apex notched with a rounded pair of subapical lobes (Fig. 33). Dorsal aspect with a long median keel (Fig. 35); dorsolateral aspect hatchet shaped (Fig. 34). Hooks slender.

Female. Unknown.

Nymph. Unknown.

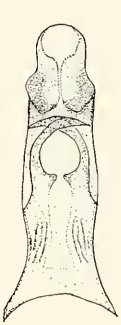
Etymology. The species name refers to the Rio Calima basin in which the holotype was collected and is used as a noun in apposition.

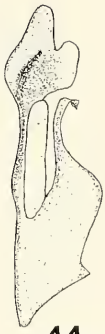
Anacroneuria choachi Stark & Zúñiga, spec. nov.
Figs 36-40

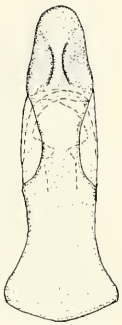
Types. Holotype: ♂ (pinned), Colombia, Cundinamarca, Choachi, 17 May 1944, F. R. Fosberg (USNM).

Description
Adult habitus. Head forward of ocelli and along anterior margin pale brown, lappets brown. Median pronotal stripe diffuse brown, bordered by narrow pale stripes and broad dark lateral stripes (Fig. 36). Wing membrane transparent, veins brown.

Male. Forewing length 11 mm. Hammer thimble shaped, height subequal to basal diameter







Figs 41-45. *Anacroneuria cipriano*, spec. nov. **41.** Head and pronotum. **42.** ♂ sternum 9. **43.** Aedeagus ventral. **44.** Aedeagus lateral. **45.** Aedeagus dorsal. Scales: 0.6 mm (**41**), 0.3 mm (**42**), 0.15 mm (**43-45**).

(Fig. 37). Aedeagal apex simple, scoop shaped and gradually narrowed beyond hooks. Dorsomesal keel sharp, Y-shaped, hooks slender (Figs 38-40).

Female. Unknown.

Nymph. Unknown.

Etymology. The species name is based on the location where the holotype was collected and is used as a noun in apposition.

Anacroneuria cipriano Zúñiga & Rojas, spec. nov.

Figs 41-45

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, Cuenca media Rio Calima, 550 m, 21 February 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV). – Paratype: 1♂, Colombia, Valle del Cauca, Escalerate, Cuenca Rio San Cipriano, 150 m, 15 February 1992, A. M. Rojas, M. del C. Zúñiga (BPS).

Description

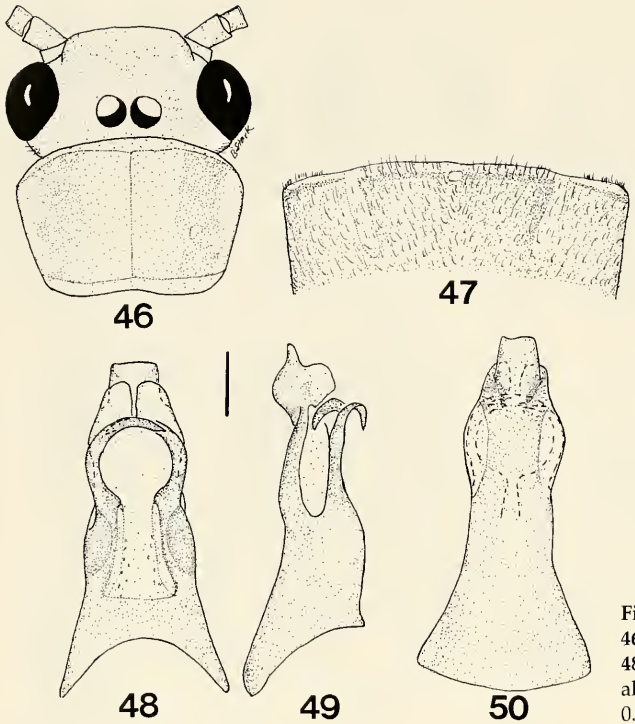
Adult habitus. Head yellow brown with dark lappets. Pronotum with irregular midlateral dark pigment and broad mesal pale stripe (Fig. 41). Wing membrane transparent, veins brown except pale costal area.

Male. Forewing length 8 mm. Hammer cylindrical, height twice as great as basal diameter (Fig. 42). Ventral aedeagal apex scoop shaped with subapical shoulders slightly sclerotized (Fig. 43). Dorsal aspect with a low mesal keel (Fig. 45). Hooks slender.

Female. Unknown.

Nymph. Unknown.

Etymology. The species name is based on the river basin in which the paratype was found and is used as a noun in apposition.



Figs 46-50. *Anacroneuria cordillera*, spec. nov. **46.** Head and pronotum. **47.** ♂ sternum 9. **48.** Aedeagus ventral. **49.** Aedeagus lateral. **50.** Aedeagus dorsal. Scales: 0.6 mm (**46**), 0.3 mm (**47**), 0.15 mm (**48-50**).

Anacroneuria cordillera Rojas & Zúñiga, spec. nov.

Figs 46-50

Types. Holotype: ♂, Colombia, Valle del Cauca, Villa Carmelo, Cuenca alta, Rio Meléndez, 1800 m, Trampa de luz, 15 October 1991, A. M. Rojas, M. del C. Zúñiga, C. Serrato (MEUV).

Description

Adult habitus. Head pale with diffuse brown over area forward of ocelli and extending to M-line; lappets pale. Median pronotal stripe pale, irregular midlateral stripes brown (Fig. 46). Wing membrane transparent, veins pale.

Male. Forewing length 14 mm. Hammer reduced to a small depigmented zone (Fig. 47). Aedeagal apex simple, scoop shaped. Ventral membranous lobes well developed, dorsomesal keel absent, hooks slender (Figs 48-50).

Female. Unknown.

Nymph. Unknown.

Etymology. The species name is based on the Cordillera Occidental and is used as a noun in apposition.

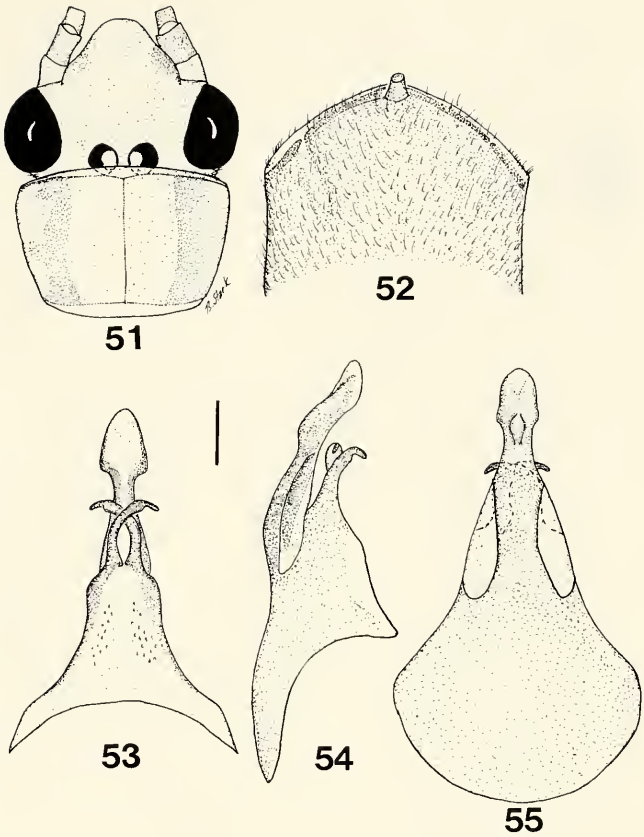
Anacroneuria forcipata Rojas & Baena, spec. nov.

Figs 51-55

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, 550 m, Cuenca media Rio Calima, 21 February 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV).

Description

Adult habitus. Head yellow brown except for darker lappets. Pronotum banded midlaterally with dark pigment (Fig. 51). Wing membrane transparent, veins brown.



Figs 51-55. *Anacroneuria forcipata*, spec. nov. **51.** Head and pronotum. **52.** ♂ sternum 9. **53.** Aedeagus ventral. **54.** Aedeagus lateral. **55.** Aedeagus dorsal. Scales: 0.6 mm (**51**), 0.3 mm (**52**), 0.15 mm (**53-55**).

Male. Forewing length 12 mm. Hammer thimble shaped, apex flat (Fig. 52). Aedeagus scoop shaped, broad basally and slender in the apical half; apex slightly enlarged (Fig. 53). Hooks short with wide finger shaped apices (Fig. 53). Ventrolateral aspect sinuate (Fig. 54); dorsal aspect with a low mesal keel (Fig. 55).

Female. Unknown.

Nymph. Unknown.

Etymology. The species name refers to the forceps shaped aedeagal hooks.

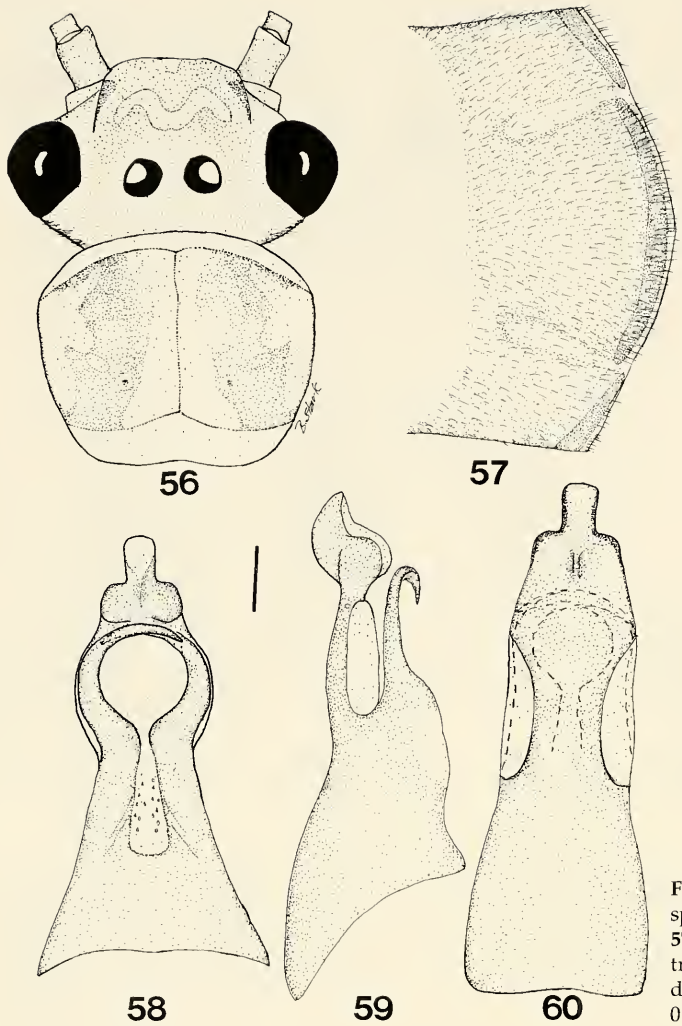
Anacroneuria guambiana Zúñiga & Stark, spec. nov.

Figs 56-60

Types. Holotype: ♂, Colombia, Cauca, Piendamó, Cuenca media Rio Piendamó, 1400 m, 23 November 1993, Y. Ballesteros, J. Loaiza (MEUV). – Paratypes (all from Colombia): 1♂, Cauca, Mondomo, 1100 m, 10 April, A. Ramos (USNM); 1♂, Cauca, Silvia, Cuenca alta Rio Piendamó, 2680 m, Trampa de luz, 15 September 1993, Y. Ballesteros, J. Loaiza (MEUV); 1♂, Cauca, Piendamó, Cuenca media Rio Piendamó, 1400 m, Trampa de luz, 25 October 1993, Y. Ballesteros, J. Loaiza (BPS); 1♂, Cauca, La Campana, Cuenca alta Rio Piendamó, 2900 m, Trampa de luz, 9 November 1993, Y. Ballesteros, J. Loaiza (MEUV); 1♂, Cauca, El Núcleo, Cuenca alta Rio Piendamó, 2700 m, Trampa de luz, 24 October 1993, Y. Ballesteros, J. Loaiza (MEUV).

Description

Adult habitus. Head pattern pale brown around M-line, lappets brown. Midlateral pronotal bands pale brown, mesal and anteolateral areas pale (Fig. 56). Wing membrane transparent, veins brown.



Figs 56-60. *Anacroneuria guambiana*, spec. nov. **56.** Head and pronotum. **57.** ♂ sternum 9. **58.** Aedeagus ventral. **59.** Aedeagus lateral. **60.** Aedeagus dorsal. Scales: 0.6 mm (**56**), 0.3 mm (**57**), 0.15 mm (**58-60**).

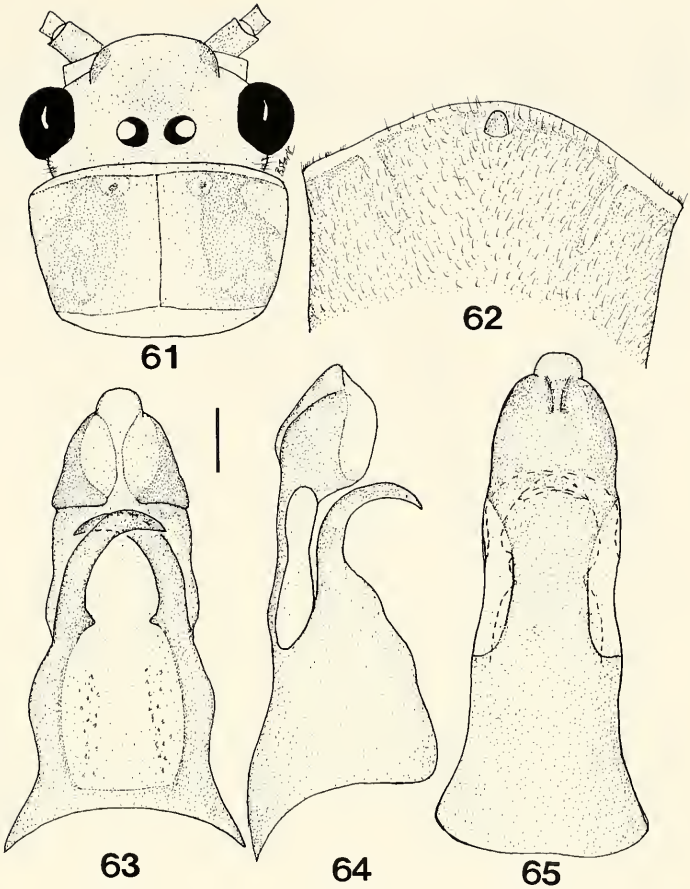
Male. Forewing length 22 mm. Hammer absent (Fig. 57). Aedeagal apex simple, truncate in ventral aspect with low rounded shoulders (Fig. 58). Dorsal keel obscure, hooks slender (Figs 58-60).
Female. Unknown.

Nymph. Unknown.

Etymology. The name, used as a noun in apposition, refers to the distribution of this species in the region inhabited by the Guambiana people.

Anacroneuria guayaquil Zúñiga & Rojas, spec. nov.
Figs 61-65

Types. Holotype: ♂, Colombia, Quindio, Reserva Guayaquil, Cuenca alta, Rio Quindio, 3070 m, 29 April 1992, M. del C. Zúñiga, A. M. Rojas (MEUV).



Figs 61-65. *Anacroneuria guayaquil*, spec. nov. **61.** Head and pronotum. **62.** ♂ sternum 9. **63.** Aedeagus ventral. **64.** Aedeagus lateral. **65.** Aedeagus dorsal. Scales: 0.6 mm (**6 1**), 0.3 mm (**62**), 0.15 mm (**63-65**).

Description

Adult habitus. Head yellow brown with diffuse brown spot anterior to ocelli; lappets brown. Pronotum with brown lateral stripes and scattered pale rugosities; median stripe pale (Fig. 61). Wing membrane transparent, veins brown.

Male. Forewing length 19 mm. Hammer nipple shaped, height subequal to basal diameter (Fig. 62). Ventral aedeagal apex broadly triangular, sclerotized laterally and membranous mesally. Dorsomesal keel short, with widely spaced ridges (Figs 63-65).

Female. Unknown.

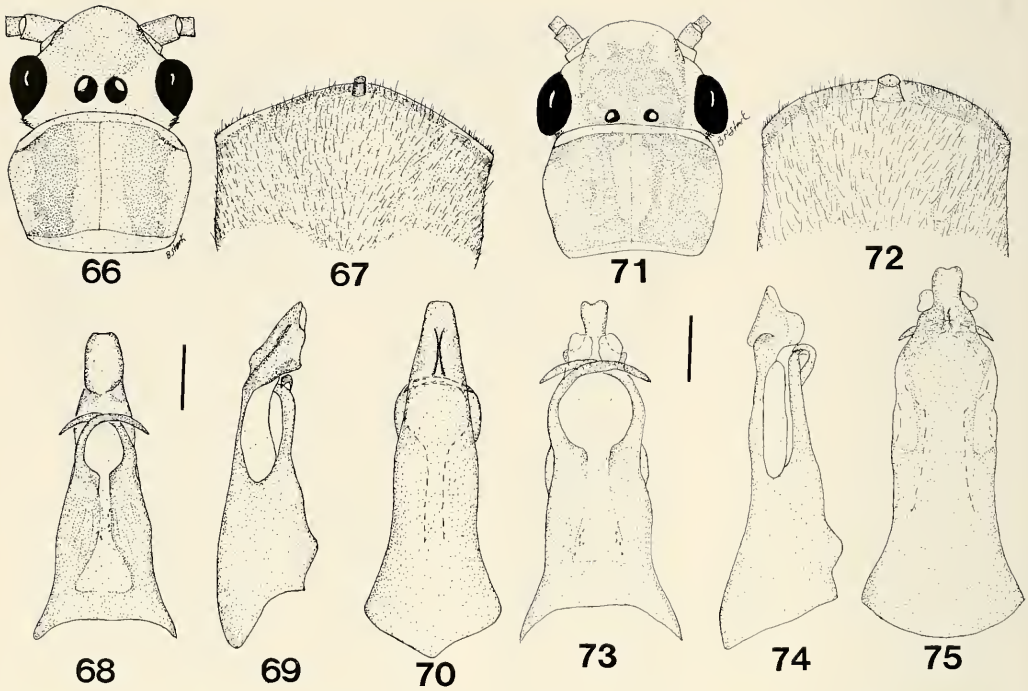
Nymph. Unknown.

Etymology. The species name, based on the type locality in the Reserva Guayaquil, is used as a noun in apposition.

Anacroneuria meta Stark & Zúñiga, spec. nov.

Figs 66-70, 140

Types. Holotype: ♂, Colombia, Meta, Quebrada Blanca, 3 km W Restrepo, 11 February 1983, O. S. Flint (USNM). – Paratype: 1♀, same data (USBN).



Figs 66-70. *Anacroneuria meta*, spec. nov. **66.** Head and pronotum. **67.** ♂ sternum 9. **68.** Aedeagus ventral. **69.** Aedeagus lateral. **70.** Aedeagus dorsal. Scales: 0.6 mm (**66**), 0.3 mm (**67**), 0.15 mm (**68-70**).
Figs 71-75. *Anacroneuria morena*, spec. nov. **71.** Head and pronotum. **72.** ♂ sternum 9. **73.** Aedeagus ventral. **74.** Aedeagus lateral. **75.** Aedeagus dorsal. Scales: 0.6 mm (**7 1**), 0.3 mm (**72**), 0.15 mm (**73-75**).

Description
Adult habitus. Head covered with diffuse brown pigment forward of ocelli; M-line indistinct; lappets brown. Midlateral pronotal stripes brown, margins and mesal stripe pale (Fig. 66).

Male. Forewing length 10 mm. Hammer subcylindrical, height greater than basal diameter (Fig. 67). Aedeagal apex simple; ventral aspect an oval platform, dorsal keel well developed, hooks slender (Figs 68-70).

Female. Forewing length 14 mm. Subgenital plate bilobed; lobes broadly rounded, notch shallow and wide. Transverse sclerite of sternum 9 narrow, setal patch triangular and without enlarged setae (Fig. 140).

Egg. Collar button like. Chorion smooth. Length 0.31 mm, diameter 0.18 mm. Outline typical for the genus.

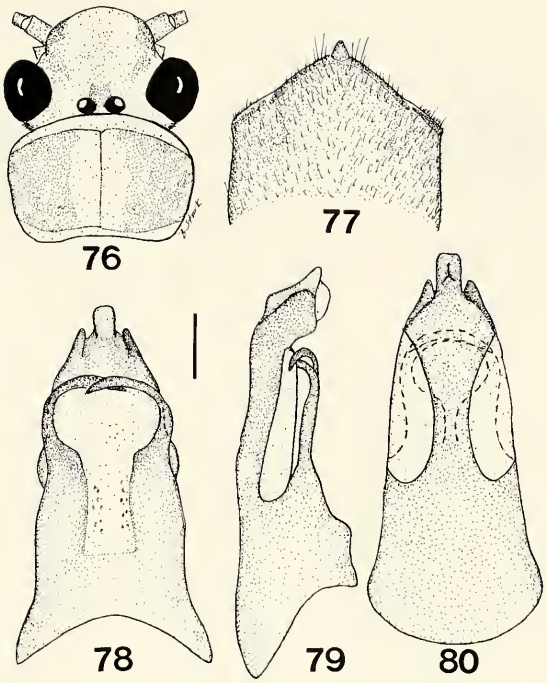
Nymph. Unknown.

Etymology. The species name, based on the Colombian Department where it was collected, is used as a noun in apposition.

Anacroneuria morena Stark & Zúñiga, spec. nov.
Figs 71-75

Types. Holotype: ♂ (pinned), Colombia, Cundinamarca, Zipaquira-Pacho, 6 March 1965, J. A. Ramos (USNM).

Description
Adult habitus. Dark brown pigment covers much of head and pronotum. A pair of pale oval spots occur lateral to ocelli and three occur medially on frons. Anterior margin of head pale. Median, pale



Figs 76-80. *Anacroneuria oreja*, spec. nov. **76.** Head and pronotum. **77.** ♂ sternum 9. **78.** Aedeagus ventral. **79.** Aedeagus lateral. **80.** Aedeagus dorsal. Scales: 0.6 mm (**76**), 0.3 mm (**77**), 0.15 mm (**78-80**).

pronotal stripe narrow (Fig. 71). Wing membrane and veins dark brown, costa pale.

Male. Forewing length 11 mm. Hammer subcylindrical, height about equal to basal diameter (Fig. 72). Aedeagal apex narrow and emarginate; subapical area with a pair of ventral membranous masses arising from sclerotized lateral knobs (Fig. 73). Hooks slender. Dorsum with a low, median, subapical keel (Fig. 75).

Female. Unknown.

Nymph. Unknown.

Etymology. The name refers to the dark habitus of this species.

Anacroneuria oreja Zúñiga & Stark, spec. nov.

Figs 76-80

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, Cuenca media Rio Calima, 550 m, 21 February 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV).

Description

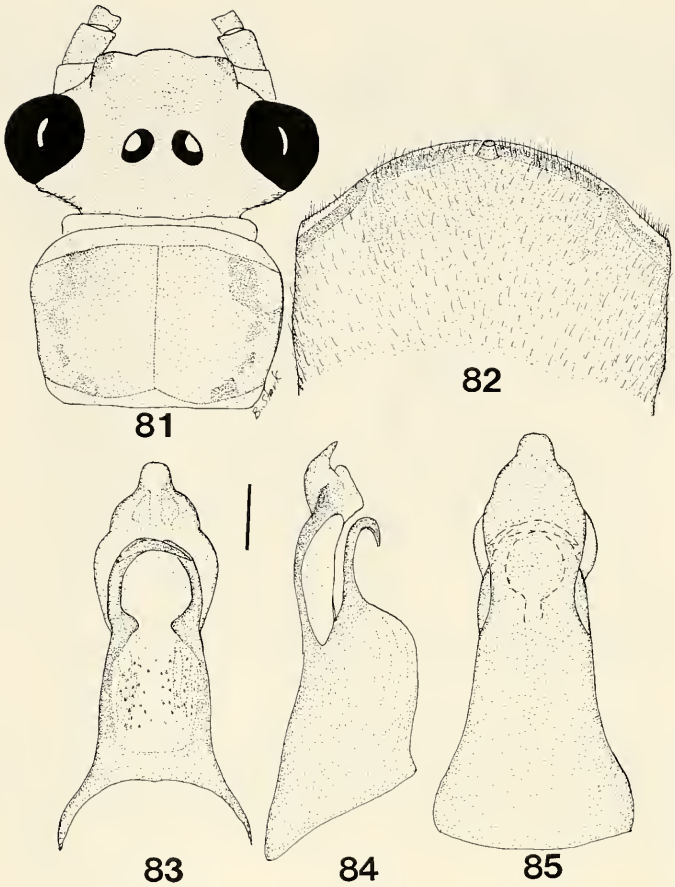
Adult habitus. Head yellow brown. Lappets and ocellar area dark brown. Pronotum with irregular dark stripes (Fig. 76). Wing membrane transparent, veins brown.

Male. Forewing length 10 mm. Hammer somewhat conical (Fig. 77). Ventral aspect of aedeagus trilobed; lateral lobes somewhat ear shaped, median lobe truncate (Figs 78-79). Dorsal aspect with a small Y-shaped keel (Fig. 80). Hooks slender.

Female. Unknown.

Nymph. Unknown.

Etymology. Oreja, Spanish for ear, refers to the ear shaped lateral lobes on the aedeagal tip.



Figs 81-85. *Anacroneuria pacifica*, spec. nov. **81.** Head and pronotum. **82.** ♂ sternum 9. **83.** Aedeagus ventral. **84.** Aedeagus lateral. **85.** Aedeagus dorsal. Scales: 0.6 mm (**81**), 0.3 mm (**82**), 0.15 mm (**83-85**).

***Anacroneuria pacifica* Rojas & Baena, spec. nov.**
Figs 81-85

Types. Holotype: ♂, Colombia, Valle del Cauca, Alto Anchicayá, 700 m, 12 May 1994, A. M. Rojas, A. Ramos (MEUV). – Paratypes (all from Colombia): 1♂, same data as ho0lotype (MEUV); 1♂, Valle del Cauca, Rio Azul, Cuenca media Rio Calima, 550 m, 12 August 1994, A. M. Rojas, M. Baena, R. Aldana (USNM); 1♂, same location, 21 November 1994, R. Aldana (BPS).

Description

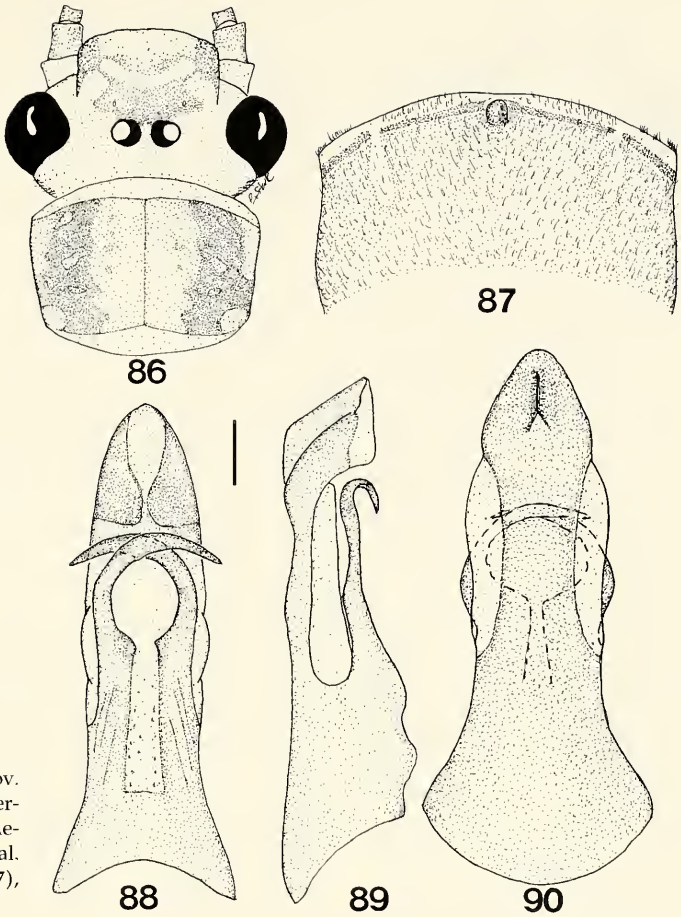
Adult habitus. Head yellow with pale M-line forward of ocelli; lappets brown. Pronotum with irregular brown bands laterally, median stripe pale (Fig. 81). Wing membrane transparent, veins pale except dark brown M and Cu veins.

Male. Forewing length 17-18 mm. Hammer height subequal to apical diameter (Fig. 82). Aedeagal apex simple, with a pair of small midventral lobes (Fig. 83). Dorsal keel absent, hooks slender (Figs 83-85).

Female. Unknown.

Nymph. Unknown.

Etymology. The name, used as a noun in apposition, refers to the distribution of the species in the Costa Pacifica region of Colombia.



Figs 86-90. *Anacroneuria paez*, spec. nov. **86.** Head and pronotum. **87.** ♂ sternum 9. **88.** Aedeagus ventral. **89.** Aedeagus lateral. **90.** Aedeagus dorsal. Scales: 0.6 mm (**86**), 0.3 mm (**87**), 0.15 mm (**88-90**).

***Anacroneuria paez* Zúñiga & Stark, spec. nov.**
Figs 86-90

Types. Holotype: ♂, Colombia, Cauca, Caldono, Cuenca media Rio Ovejas, 1430 m, Trampa de luz, 15 September 1993, Y. Ballesteros, J. Loaiza (MEUV). – Paratypes: 1♂, Colombia, Cauca, Pescador, Cuenca media Rio Ovejas, 1430 m, Trampa de luz, 15 September 1993, Y. Ballesteros, J. Loaiza (BPS).

Description

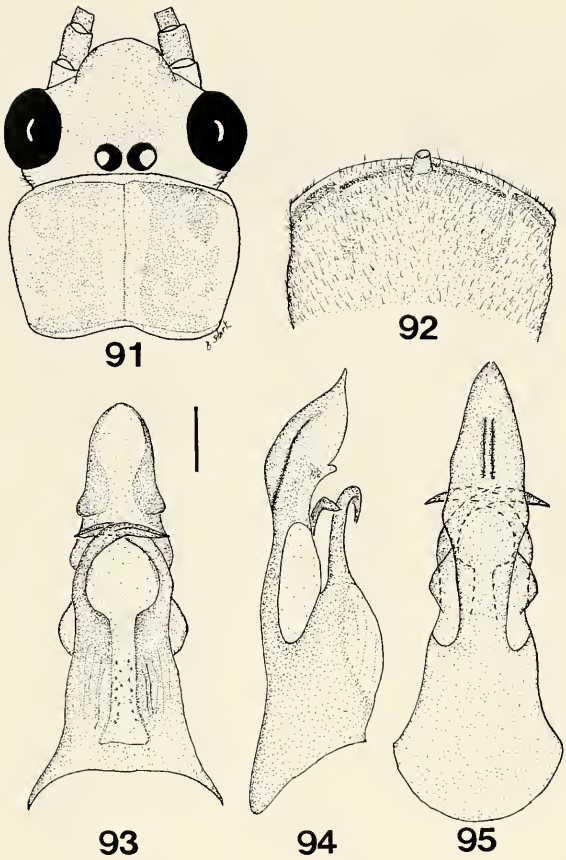
Adult habitus. Diffuse brown area extends from ocelli to M-line, lappets brown. Median pronotal band pale, irregular lateral bands brown, anterolateral margins pale (Fig. 86). Wing membrane transparent, veins brown.

Male. Forewing length 19 mm. Hammer nipple shaped, height subequal to basal diameter (Fig. 87). Aedeagal apex simple, scoop shaped, gradually narrowed to tip; ventral membranous lobes absent, dorsomesal keel prominent, hooks slender (Figs 88-90).

Female. Unknown.

Nymph. Unknown.

Etymology. Paez honors the indigenous peoples of Colombia and is used as a noun in apposition.



Figs 91-95. *Anacroneuria planada*, spec. nov. **91.** Head and pronotum. **92.** ♂ sternum 9. **93.** Aedeagus ventral. **94.** Aedeagus lateral. **95.** Aedeagus dorsal. Scales: 0.6 mm (**91**), 0.3 mm (**92**), 0.15 mm (**93-95**).

Anacroneuria planada Baena & Rojas, spec. nov.

Figs 91-95

Types. Holotype: ♂, Colombia, Nariño, Reserva Natural La Planada, 1400 m, April 1994, F. Escobar (MEUV). – Paratypes: 1♂, Colombia: Valle del Cauca, Alto Anchicayá, 700 m, 12 May 1994, A. M. Rojas, A. Ramos, (BPS); 1♂, type locality, April 1994, F. Escobar (USNM).

Description

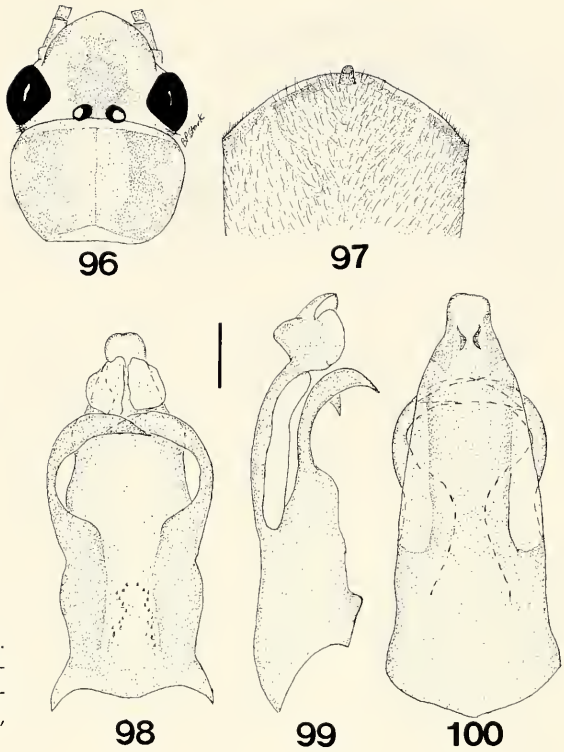
Adult habitus. Head yellow, lappets pale brown. Pronotum yellow with broad pale brown lateral stripes (Fig. 91). Wing membrane transparent, veins pale.

Male. Forewing length 13.5 mm. Hammer cylindrical, height subequal to basal diameter (Fig. 92). Apex broadly triangular (Fig. 93). Lateral aspect with a long low keel, dorsal aspect with a low mesal keel (Figs 94-95). Basal section bearing a pair of low membranous knobs lateral to hooks (Fig. 93). Hooks slender.

Female. Unknown.

Nymph. Unknown.

Etymology. Planada refers to the type locality and is used as a noun in apposition.



Figs 96-100. *Anacroneuria portilla*, spec. nov. **96.** Head and pronotum. **97.** ♂ sternum 9. **98.** Aedeagus ventral. **99.** Aedeagus lateral. **100.** Aedeagus dorsal. Scales: 0.6 mm (**96**), 0.3 mm (**97**), 0.15 mm (**98-100**).

Anacroneuria portilla Stark & Rojas, spec. nov.
Figs 96-100

Types. Holotype: ♂, and Colombia, Cauca, 18 km N Popayan, 1800 m, 26 January 1959, J. F. Clarke (USNM). – Paratype: 1♂, same data (USNM).

Description

Adult habitus. Mesal part of head, forward of ocelli, covered by large brown patch, interrupted by five circular pale areas. Pronotal bands dark laterally, pale in mesal third (Fig. 96). Wing membrane brown, veins darker.

Male. Forewing length 11 mm. Hammer subcylindrical, height greater than basal diameter (Fig. 97). Aedeagal apex broadly rounded and scoop shaped; ventral subapical lobes large and membranous; dorsal keel formed by a pair of small ear shaped flaps separated by a narrow gap. Hooks enlarged in apical half (Figs 98-100).

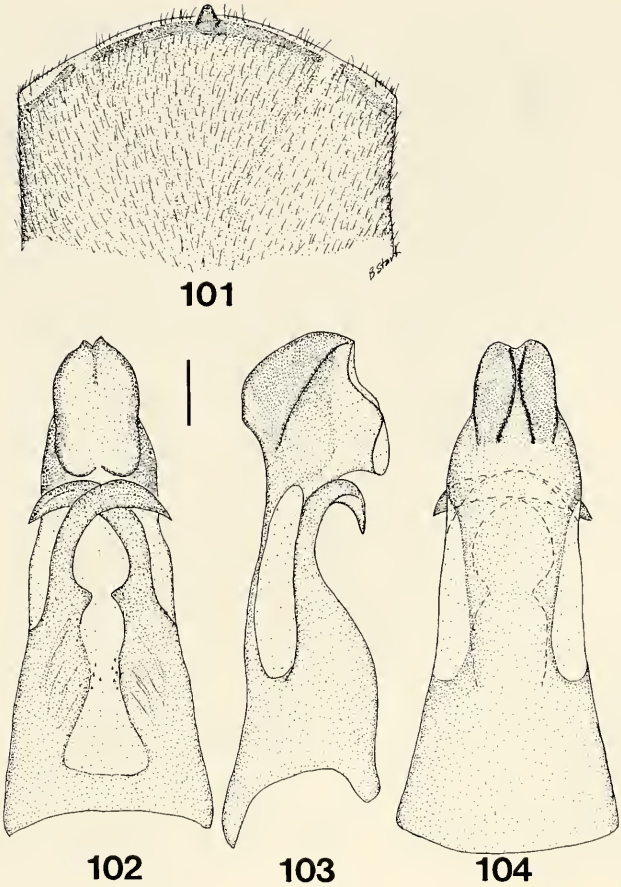
Female. Unknown.

Nymph. Unknown.

Etymology. Portilla, Spanish for "gap", refers to the space between the processes of the dorsal keel.

Anacroneuria quilla Stark & Zúñiga, spec. nov.
Figs 101-104, 149

Types. Holotype: ♂, Colombia, Risaralda, Termales de Santa Rosa de Cabal, 29 February 1984, O. S. Flint (USNM). – Paratypes (all from Colombia): 3♀♀, Valle del Cauca, Pance, 1700 m, Cuenca alta Rio Pance, 17 June 1996, J. M. Diaz, A. J. Cardoso Zúñiga (MEUV); 1♂, Valle del Cauca, Hato Viejo, Cuenca alta Rio Pance, 2180 m,



Figs 101-104. *Anacroneuria quilla*, spec. nov. **101.** ♂ sternum 9. **102.** Aedeagus ventral. **103.** Aedeagus lateral. **104.** Aedeagus dorsal. Scales: 0.3 mm (**101**), 0.15 mm (**102-104**).

11 March 1992, A. M. Rojas, M. del C. Zúñiga (MEUV); 1♂, 1♀, Valle del Cauca, Peñas Blancas, 2000 m, Cuenca alta Rio Cali, 27 June 1996, J. M. Diaz, A. J. Cardoso Zúñiga (MEUV).

Description

Adult habitus. Head yellow, lappets brown. Pronotum dark laterally with wide median yellow stripe. Wing membrane transparent, veins brown.

Male. Forewing length 16-18 mm. Hammer thimble shaped (Fig. 101). Aedeagal apex massive, hatchet shaped in lateral aspect (Fig. 103). Ventral aspect a large apically notched plateau (Fig. 102). Dorsal keel prominent (Fig. 104); hooks wide and scythe shaped.

Female. Forewing length 18 mm. Subgenital plate with four subequal lobes. Transverse sclerite of sternum nine absent; posterior margin of sternum nine notched. Median sclerite T-shaped, lateral setae prominent, median setae minute (Fig. 149).

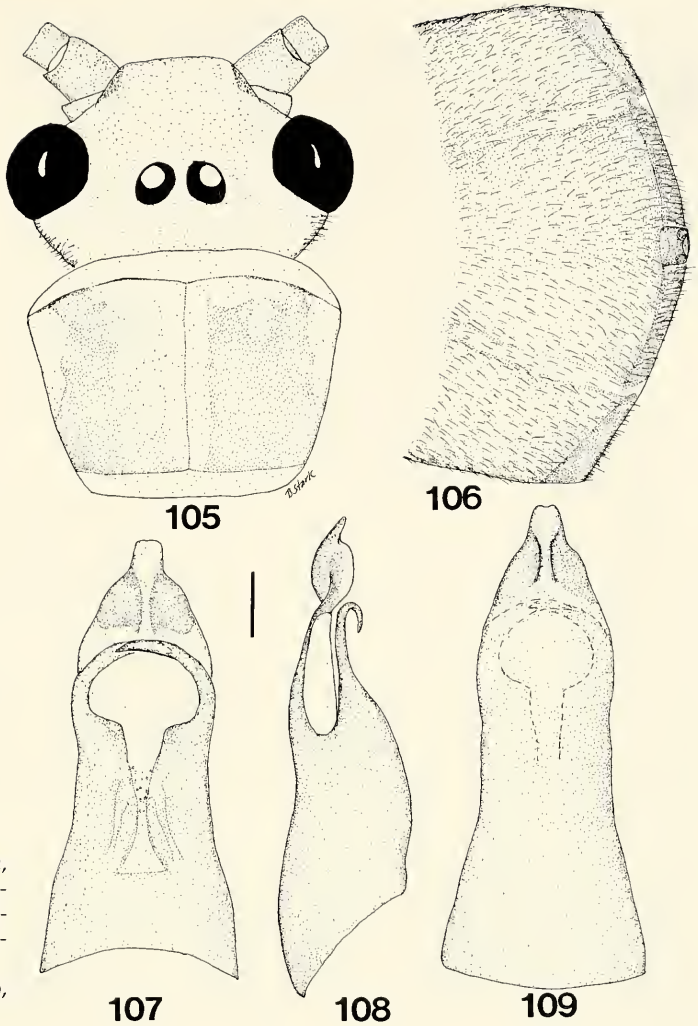
Nymph. Unknown.

Etymology. The species name refers to the strong dorsal keel on the aedeagal apex.

Anacroneuria regleta Stark & Rojas, spec. nov.

Figs 105-109

Types. Holotype: ♂, Colombia, Meta, Quebrada Blanca, 3 km W Restrepo, 11 February 1983, O. S. Flint (USNM).



Figs 105-109. *Anacroneuria regleta*, spec. nov. **105.** Head and pronotum. **106.** ♂ sternum 9. **107.** Aedeagus ventral. **108.** Aedeagus lateral. **109.** Aedeagus dorsal. Scales: 0.6 mm (**105**), 0.3 mm (**106**), 0.15 mm (**107- 109**).

Description

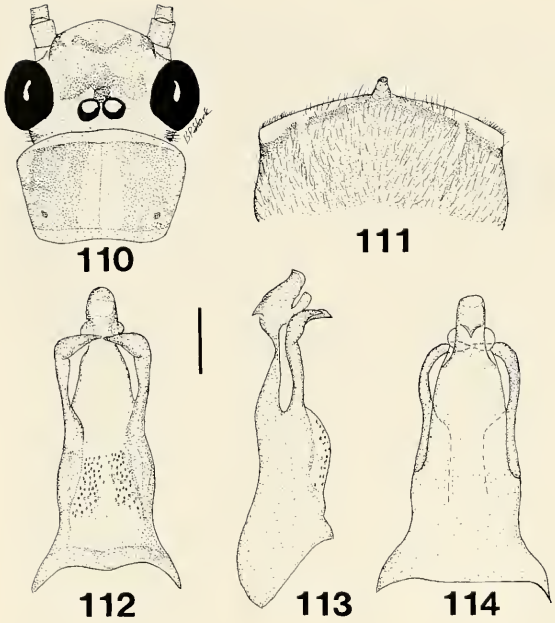
Adult habitus. Head pale yellow brown, lappets brown. Pronotum pale brown except for pale narrow mesal stripe and anterolateral margins (Fig. 105). Wing membrane transparent, veins brown.

Male. Forewing length 19 mm. Hammer excavated to form a saddle shaped apex; height less than basal diameter (Fig. 106). Aedeagal apex simple, truncate in ventral aspect with low rounded shoulders (Fig. 107). Lateral aspect strongly sinuate (Fig. 108); low dorsal keel formed by widely spaced ridges (Fig. 109). Hooks slender.

Female. Unknown.

Nymph. Unknown.

Etymology. The species name refers to the narrow corridor area within the dorsal keel.



Figs 110-114. *Anacroneuria rosita*, spec. nov. **110.** Head and pronotum. **111.** ♂ sternum 9. **112.** Aedeagus ventral. **113.** Aedeagus lateral. **114.** Aedeagus dorsal. Scales: 0.6 mm (**110**), 0.3 mm (**111**), 0.15 mm (**112-114**).

Anacroneuria rosita Stark & Rojas, spec. nov.

Figs 110-114

Types. Holotype: ♂, Colombia, Caquetá, Morelia, Rio Bodoquero, 430 m, 19-20 January 1969, Duckworth and Dietz (USNM).

Description

Adult habitus. Pale brown band between eyes arises from darker stalk extending forward from ocelli. Lappets brown, almost connected by a narrow V-shaped band. Pronotum mostly brown; median pale band narrow (Fig. 110). Wing membrane transparent, veins pale brown except for unpigmented costal margin.

Male. Forewing length 10 mm. Hammer almost conical, height greater than basal diameter (Fig. 111). Aedeagal apex slender, broadly rounded, bearing a ventral pair of membranous lobes and a wedge shaped middorsal process. Hooks turned inward abruptly and inflated in apical third (Figs 112-114).

Female. Unknown.

Nymph. Unknown.

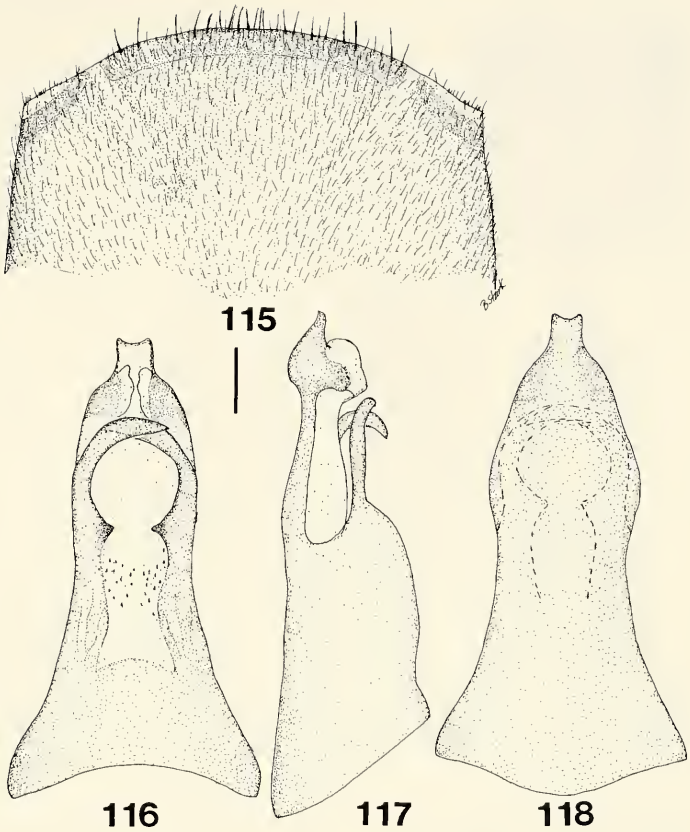
Etymology. Rosita, or small rose, refers to the small size and delicate beauty of this species.

Discussion. The lateral and dorsal aspects of the aedeagus of *A. rosita* are suggestive of *A. atrinota* Jewett, a Peruvian species, however the section of the aedeagal apex which projects beyond the hooks is much shorter in *A. rosita*, and the peculiar hooks are also distinctive.

Anacroneuria socapa Stark & Zúñiga, spec. nov.

Figs 115-118

Types. Holotype: ♂ (pinned), Colombia, Risaralda, Termales de Santa Rosa de Cabal, 29 February 1984 (USNM). Paratypes: 1♂ (pinned), same data as holotype (USNM); 1♂, Colombia, Antioquia, Piedras Blancas, 10 km E Medellin, 2 March 1984, O. S. Flint (USNM).



Figs 115-118. *Anacroneuria socapa*, spec. nov. **115.** ♂ sternum 9. **116.** Aedeagus ventral. **117.** Aedeagus lateral. **118.** Aedeagus dorsal. Scales: 0.3 mm (**115**), 0.15 mm (**116-118**).

Description

Adult habitus. Head yellow except for pair of dark spots forward of ocelli; lappets brown. Pronotum dark laterally, narrow mesal stripe pale. Wing membrane transparent, veins brown.

Male. Forewing length 21-22 mm. Hammer absent (Fig. 115). Aedeagal apex simple, slightly excavated in ventral aspect; area distal to shoulders about as long as wide (Fig. 116). Dorsal keel absent, hooks scythe shaped (Figs 116-118).

Female. Unknown.

Nymph. Unknown.

Etymology. Socapa refers to the secretive behavior of adult stoneflies.

Anacroneuria tejon Baena & Stark, spec. nov.

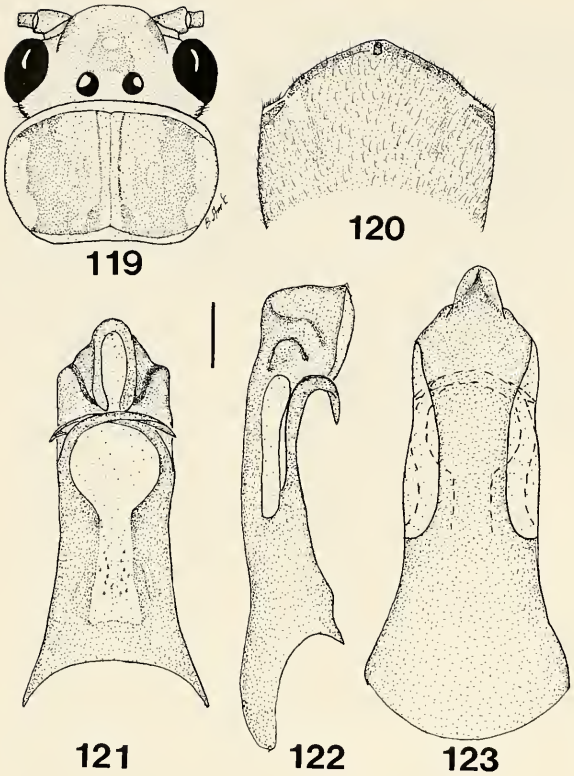
Figs 119-123

Types. Holotype: ♂, Colombia, Nariño, Reserva Natural La Planada, 1400 m, April 1994, F. Escobar (MEUV). – Paratype: 1♂, Colombia, Valle del Cauca, Pance, Cuenca alta Rio Pance, 1700 m, 17 June 1996, J. M. Diaz, A. J. Cardoso Zúñiga (MEUV).

Description

Adult habitus. Head pale with obscure brown area forward of ocelli; lappets dark brown. Pronotum with dark midlateral stripes and a pale median stripe (Fig. 119). Wing membrane transparent, veins pale brown.

Male. Forewing length 13 mm. Hammer a short cylinder as wide as long (Fig. 120). Aedeagal apex



Figs 119-123. *Anacroneuria tejon*, spec. nov. **119.** Head and pronotum. **120.** ♂ sternum 9. **121.** Aedeagus ventral. **122.** Aedeagus lateral. **123.** Aedeagus dorsal. Scales: 0.6 mm (**119**), 0.3 mm (**120**), 0.15 mm (**121-123**).

in lateral aspect sharply upturned and bearing ear shaped lobes and a sinuate keel (Fig. 122); dorsal aspect with sharp narrow, almost vertical keel (Fig. 123). Hooks long and slender (Fig. 121).

Female. Unknown.

Nymph. Unknown.

Etymology. The species name, used as a noun in apposition, refers to the Rio Tejon basin where the holotype was collected.

Anacroneuria undulosa Stark & Rojas, spec. nov.

Figs 124-128

Types. Holotype: ♂, Colombia, Chocó, km 130, 86 km E Quibdó, 17 February 1983, O. S. Flint (USNM). – Paratype: 1♀, Colombia, Chocó, 52 km E Quibdó, 20 February 1983, O. S. Flint (USNM).

Description

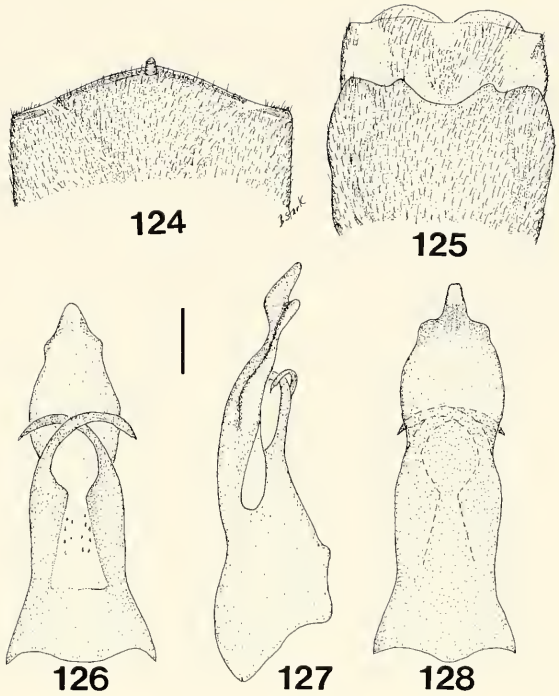
Adult habitus. Head and pronotum pale, pattern indistinct. Wing membrane transparent, veins pale.

Male. Forewing length 8 mm. Hammer subcylindrical, height about equal to basal diameter (Fig. 124). Aedeagal apex weakly trilobed, lateral lobes scarcely developed. Hooks slender, dorsal keel obscure; dorsolateral profile distinctly sinuate (Figs 126-128).

Female. Forewing length 10 mm. Subgenital plate weakly four lobed. Lateral lobes separated from narrow median lobes by indistinct notches; median lobes separated by wide U-shaped notch. Transverse sclerite of sternum 9 absent; setal patch M-shaped, without enlarged setae. A pair of membranous knobs extend into intersegmental membrane of sternum 9 (Fig. 125).

Nymph. Unknown.

Etymology. The species name is based on the undulant appearance of the aedeagus in lateral profile.



Figs 124-128. *Anacroneuria undulosa*, spec. nov. **124.** ♂ sternum 9. **125.** ♀ sterna 8-9. **126.** Aedeagus ventral. **127.** Aedeagus lateral. **128.** Aedeagus dorsal. Scales: 0.3 mm (**124**, **125**), 0.15 mm (**126-128**).

Anacroneuria valle Zúñiga & Baena, spec. nov.

Figs 129-133

Types. Holotype: ♂, Colombia, Valle del Cauca, Rio Azul, Cuenca media Rio Calima, 550 m, 20 February 1994, A. M. Rojas, M. Baena, R. Aldana (MEUV).

Description

Adult habitus. Head and pronotum mostly yellow. Lappets and midlateral stripes on the pronotum pale brown (Fig. 129). Wing membrane transparent, veins yellow brown.

Male. Forewing length 10 mm. Hammer absent but a small circular depigmented spot located at hammer site (Fig. 130). Aedeagal apex simple and shallowly notched (Fig. 131). Dorsal keel low, hooks slender (Figs 131-133).

Female. Unknown.

Nymph. Unknown.

Etymology. The species name, used as a noun in apposition, is based on the Colombian Department where it was collected.

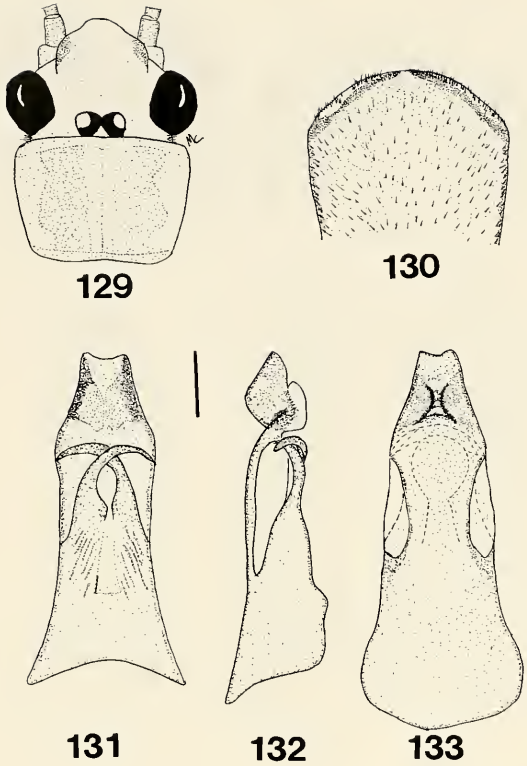
Anacroneuria paleta Stark

Figs 134-139

Anacroneuria paleta Stark, 1995: Holotype ♂, 4 km S Santo Domingo, Merida, Venezuela.

Diagnosis

Adult habitus. Head covered with diffuse brown pigment except for pale M-line and small oval spots near ocelli. Lappets brown. Brown pronotal lateral stripes irregular; pale mesal stripe narrow (Fig. 134). Wing membrane transparent, veins brown except for pale costal area.



Figs 129-133. *Anacroneuria valle*, spec. nov. **129.** Head and pronotum. **130.** ♂ sternum 9. **131.** Aedeagus ventral. **132.** Aedeagus lateral. **133.** Aedeagus dorsal. Scales: 0.6 mm (**129**), 0.3 mm (**130**), 0.15 mm (**131-132**).

Male. Forewing length 14 mm. Hammer cylindrical, height about equal to basal diameter (Fig. 135). Aedeagal apex trilobed; dorsal lobe scoop shaped, ventral lobes partially sclerotized along outer margins. Dorsal keel weak, hooks slender (Figs 136-138).

Female. Forewing length 20 mm. Subgenital plate bilobed; lobes obliquely truncate, notch narrow, V-shaped. Transverse sclerite of sternum 9 pale, setal patch triangular and without enlarged setae (Fig. 139).

Nymph. Unknown.

Examined material: Colombia: Dept. Santander, San Joaquin, 31 August 1965, W. D. Duckworth, 2♂♂, 2♀♀ (USNM).

Discussion. This series of Colombian specimens, previously determined by S. G. Jewett as *A. ohausiana* (Enderlein), is not closely related to that species (Zwick 1973). The males have a longer and less elevated dorsal aedeagal keel and the aedeagal apex is more broadly rounded than in the holotype of *A. paleta* (Stark 1995); the importance of these variations can be evaluated when a larger sample is available. The female was previously unknown.

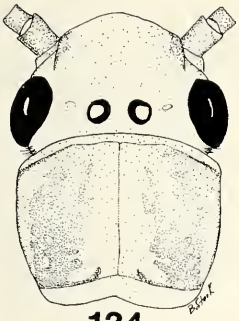
Unassociated females

Anacroneuria CO-1

Figs 141-142

Diagnosis

Adult habitus. Head dark brown over most of area between compound eyes. A pair of pale spots anterolateral to ocelli; anterior third of frons yellow, lappets brown. Pronotum with wide dark lateral bands; median stripe and anterolateral margins pale (Fig. 141). Wing membrane brown, veins brown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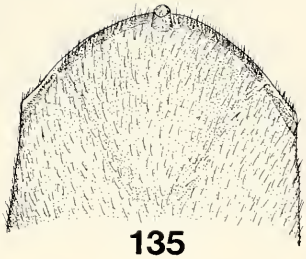
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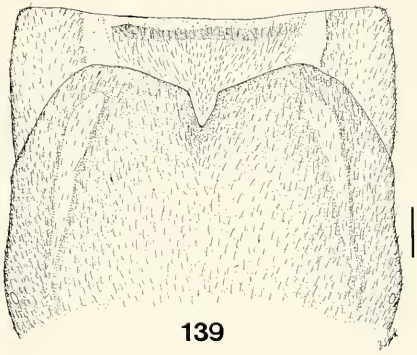
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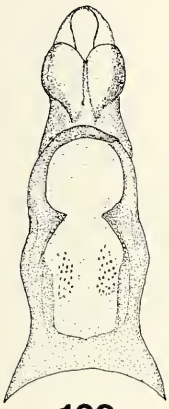
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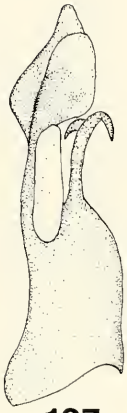
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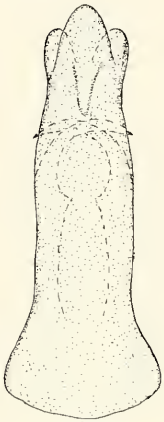
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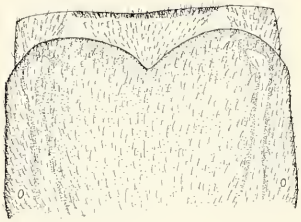
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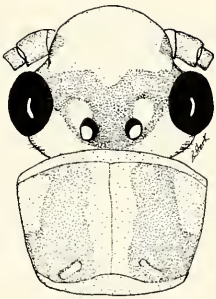
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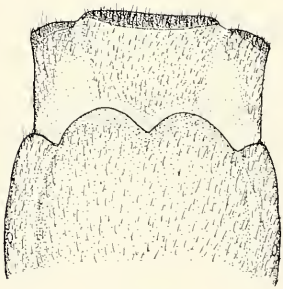
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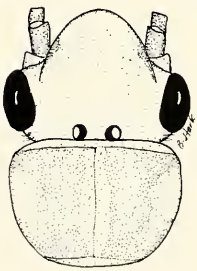
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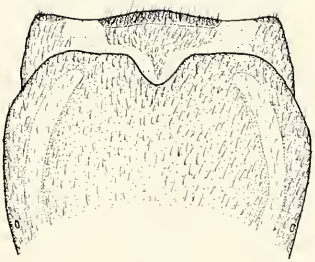
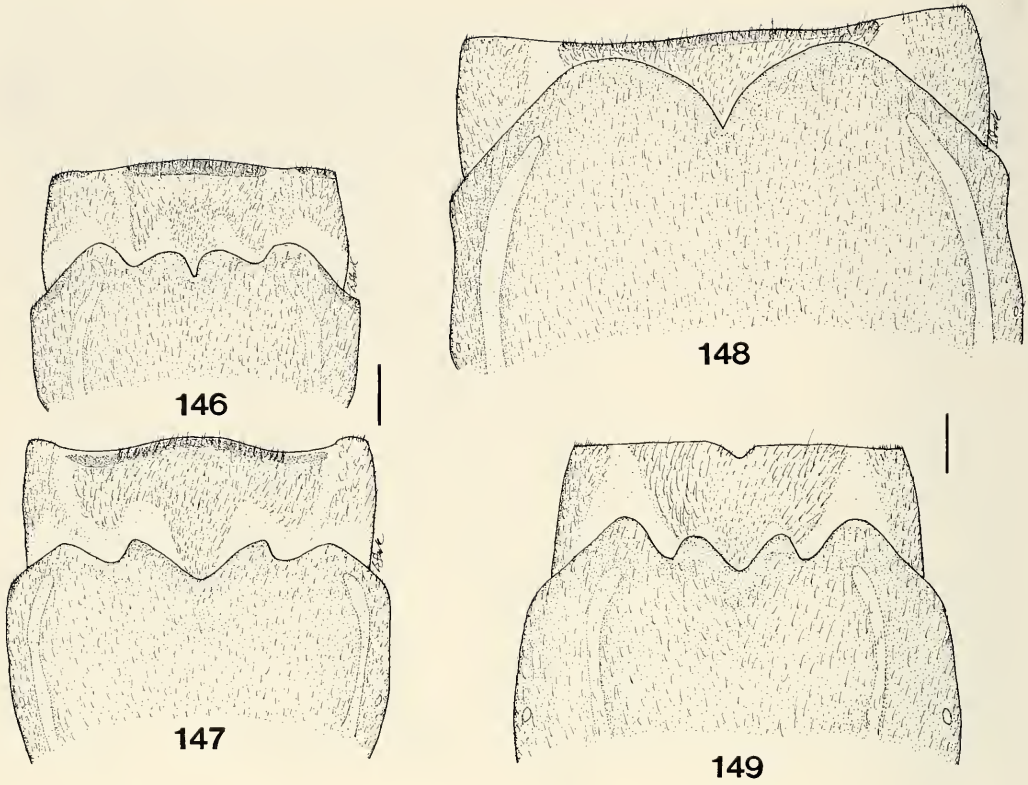

145

Figs 134-138. *Anacroneuria paleta* Stark. **134.** Head and pronotum. **135.** ♂ sternum 9. **136.** Aedeagus ventral. **137.** Aedeagus lateral. **138.** Aedeagus dorsal. Scales: 0.6 mm (**134**), 0.3 mm (**135**), 0.15 mm (**136-138**).
Figs 139-140. *Anacroneuria*, ♀ sterna 8-9. **139.** *A. sobra*. **140.** *A. meta*. Scale: 0.3 mm.
Figs 141-145. *Anacroneuria*, unassociated ♀♀. **141.** *Anacroneuria* CO-1, head and pronotum. **142.** *A.* CO-1, sterna 8-9. **143.** *A.* CO-2, head and pronotum. **144.** *A.* CO-2, egg. **145.** *A.* CO-2, sterna 8-9. Scales: 0.6 mm (**141, 143**), 0.3 mm (**142, 145**), 0.15 mm (**144**).



Figs 146-147. *Anacroneuria*, ♀ sterna 8-9. **146.** *A.* CO-3. **147.** *A.* CO-4. Scale: 0.3 mm.
Figs 148-149. *Anacroneuria*, ♀ sterna 8-9. **148.** *Anacroneuria* CO-5. **149.** *A. quilla*. Scale: 0.3 mm.

except for pale costal area.

Female. Forewing length 12 mm. Subgenital plate bilobed; lobes rounded, separated by a shallow V-shaped notch. Posterior margin of sternum nine with transverse sclerite; median field weakly sclerotized and covered by a sparse setal patch (Fig. 142).

Examined material: 1♀, Colombia: Amazonas, Leticia, 9 September 1969, D. H. Messersmith (USNM).

Anacroneuria CO-2
Figs 143-145

Diagnosis

Adult habitus. Head yellow, lappets brown. Median pale pronotal stripe narrow, dark lateral stripes broad; pale areas along midlateral margins (Fig. 143). Wing membrane transparent, veins brown.

Female. Forewing length 10 mm. Subgenital plate bilobed; lobes broad, margins truncate; notch moderately deep. Posterior margin of sternum nine with transverse sclerite; median field T-shaped, covered by a sparse setal patch (Fig. 145).

Egg. Length 0.34 mm, width 0.17 mm. Spindle shaped with collar small and button like (Fig. 144). Chorion smooth.

Examined material: 1♀, Colombia: Cundinamarca, Rio Sumapaz, 5 January 1959, G. E. Melgar, J. F. G. Clarke (USNM).

Anacroneuria CO-3
Fig. 146

Diagnosis
Adult habitus. Head mostly yellow; lappets and ocellar area pale brown. Median pale pronotal stripe wide, dark lateral stripes narrow. Wing membrane transparent, veins brown; costal area pale.

Female. Forewing length 13 mm. Subgenital plate 4-lobed. Lateral lobes longer, but subequal in width to median lobes. Posterior margin of sternum nine with transverse sclerite; median field T-shaped and sparsely setose (Fig. 146).

Examined material: 1♀, Colombia: Antioquia, Quebrada Hondo, 1450 M, 12 km SW Fredonia, 22 February 1983, O. S. Flint (USNM).

Anacroneuria CO-4
Fig. 147

Diagnosis
Adult habitus. Head yellow, lappets pale brown. Pronotum mostly yellow; diffuse anterolateral and posterolateral brown blotches form irregular stripes. Wing membrane transparent, veins pale.

Female. Forewing length 16-17 mm. Subgenital plate 4-lobed. Mesal lobes divergent, acute; lateral lobes low, rounded. Posterior margin of sternum nine with a long sinuate transverse sclerite; mesal field covered with T-shaped sparsely setose area (Fig. 147).

Examined material: 1♀, Colombia: Antioquia, Finca, Fernandes Sopetran, 14 February 1983, O. S. Flint (USNM); 1♀, Antioquia, KM 50, Rio Aurra, San Jeronimo, 14 February 1983, O. S. Flint (USNM).

Anacroneuria CO-5
Fig. 148

Diagnosis
Adult habitus. Head yellow, lappets pale brown. Pale mesal pronotal stripe wide, submarginal dark lateral stripes narrow. Wing membrane transparent, most veins pale, Cu brown.

Female. Forewing length 24-26 mm. Subgenital plate broadly bilobed, notch acute. Posterior margin of sternum nine with a narrow transverse sclerite; median field sparsely setose (Fig. 148).

Egg. Length 0.34 mm, width 0.18 mm. Spindle shaped with small button like collar. Chorion smooth.

Examined material: 6♀♀, Colombia: Risaralda, Termales de Santa Rosa de Cabal, 29 February 1984, C. M. and O. S. Flint (USNM).

Nomina dubia

Type specimens for the following species are missing and presumed lost, or they are badly damaged. Because no figures are given and the existing descriptions are not diagnostic, we are unable to apply these names to *Anacroneuria* populations.

Anacroneuria appollinaris (Navas, 1924). Type locality: Villavicencio, Colombia. Benedetto (pers. comm.) has studied the presumptive type specimen but we have no additional data.

Anacroneuria dimidiata (Navas, 1916). Type locality: Colombia. Considered nomen dubium by Illies (1966).

Anacroneuria flavilatera Klapálek, 1922. Type locality: Bogota, Colombia. Considered a valid species by Illies (1966).

Anacroneuria morio (Pictet, 1841). Type locality: Colombia. According to Zwick (1972) the holotype is seriously damaged and the aedeagus is lost. Despite this, Zwick suggests the distinctive size and dark coloration may permit recognition.

Anacroneuria ocellata (Navas, 1926). Type locality: Cali, Colombia. Considered nomen dubium by Illies (1966).

Anacroneuria plagiata (Navas, 1926). Type locality: Agnatal, Colombia. Considered nomen dubium by Illies (1966).

Anacroneuria ramealis (Navas, 1927). Type locality: Colombia. Considered nomen dubium by Illies (1966).

Anacroneuria tincta (Navas, 1916). Type locality: Colombia. Considered nomen dubium by Illies (1966).

Anacroneuria viduata (Navas, 1916). Type locality: Colombia. Considered nomen dubium by Illies (1966).

Acknowledgments

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