

***Epipleoneura angeloi* (Odonata: Protoneuridae), a new species from the central region of Brazil**

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Abstract

Epipleoneura angeloi sp. nov., is described and illustrated based on males from Mato Grosso and Goiás states, central region of Brazil.

Key words: Odonata, Protoneuridae, *Epipleoneura* sp. nov.

Resumo

Uma nova espécie, *Epipleoneura angeloi*, é descrita e ilustrada com base em exemplares machos provenientes dos estados de Mato Grosso e Goiás, região central do Brasil.

Introduction

Epipleoneura Williamson, 1915 is a protoneurid genus composed of 25 species, of which 15 occur in Brazil (Machado, 2005). Here we describe an additional Brazilian species from Mato Grosso and Goiás States. Based on cercus epiproct and genital ligula morphology, this species is closely related to *E. williamsoni* Santos.

Methodology

Illustrations were made with the aid of a camera lucida attached to a stereoscopic microscope Zeiss Stemi SV 6. Terminology for wing venation follows Riek & Kukalová-Peck (1984). Fw = fore wing, Hw = hind wing; pt = pterostigma; Ax = antenodal crossvein; Px = postnodal crossvein[s]; S = abdominal segment[s]. Measurements are in millimeters; abdominal and total lengths exclude cerci.

All the specimens are deposited in the “Museu Nacional de Rio de Janeiro” (Brazil, Rio de Janeiro), with the exception of one paratype from Chapada dos Guimarães, riacho da Represinha, deposited in the “Museo de La Plata” (Argentina, Buenos Aires, La Plata).

***Epipleoneura angeloi* sp. nov.**

Figures 1a–c, 2a–b, 3a–b, 4.

Etymology. This species is named after Angelo B. M. Machado, Universidade federal de Minas Gerais (UFMG), in recognition of his extensive contribution to the knowledge of Neotropical Odonata.

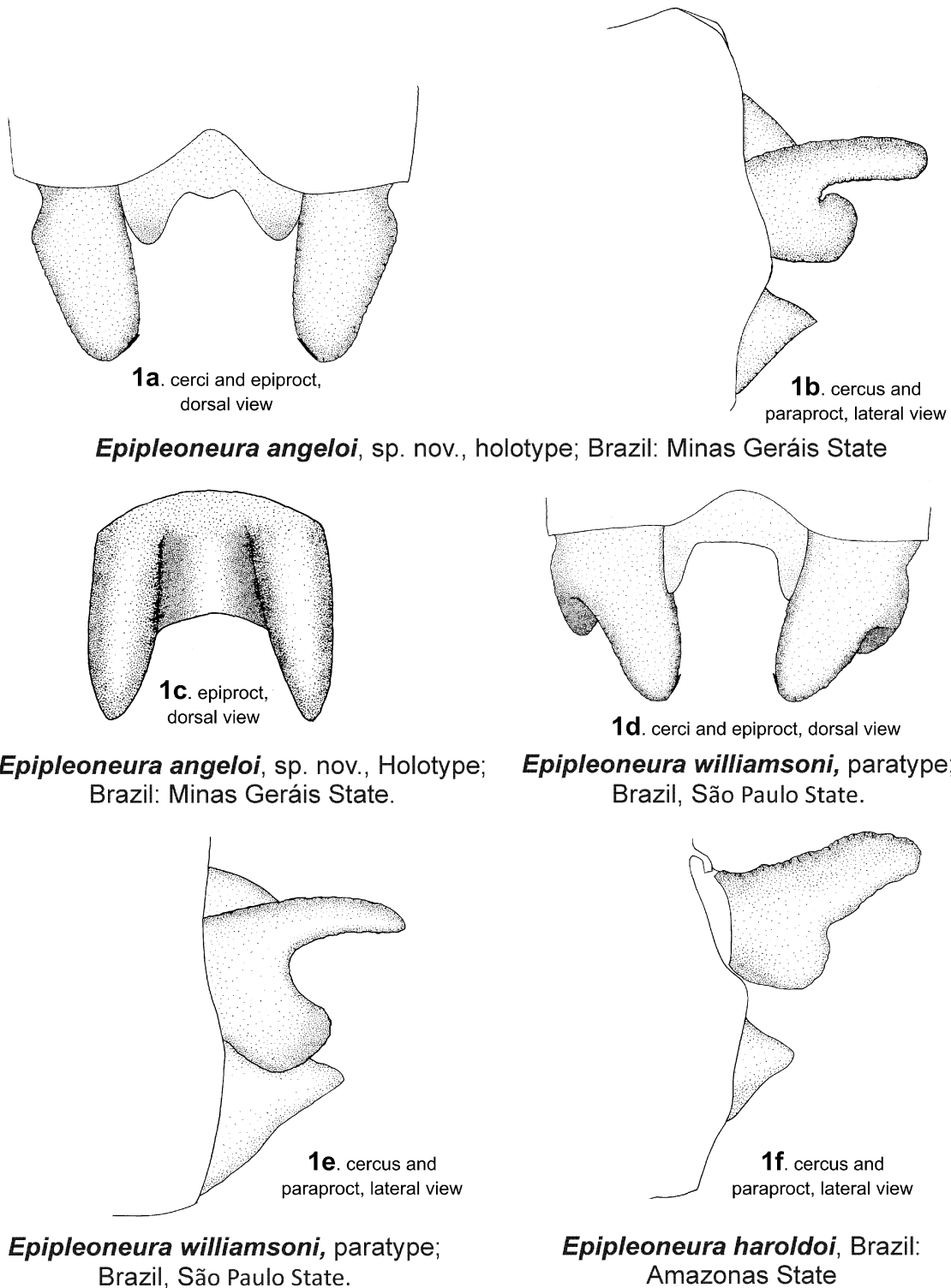
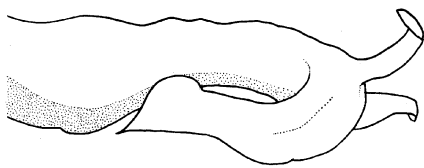
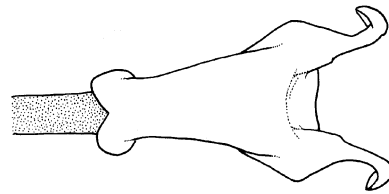


FIGURE 1. *Epipleoneura angeloi* sp. nov. holotype, *E. williamsoni* paratype, São Paulo State, and *E. haroldoi* Brazil, Manaus (redrawn from Von Ellenrieder & Garrison, 2008) males.

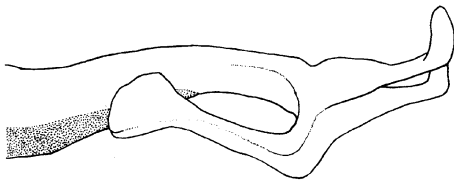


2a. genital ligula, lateral view

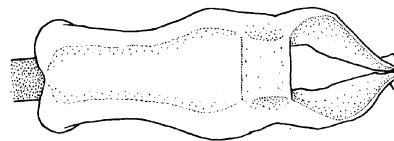


2b. genital ligula, ectal view

Epipleoneura angeloi, sp. nov., paratype; Brazil: Mato Grosso State

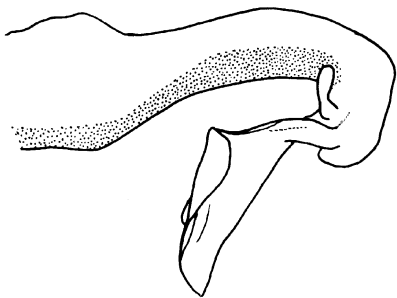


2c. genital ligula, lateral view

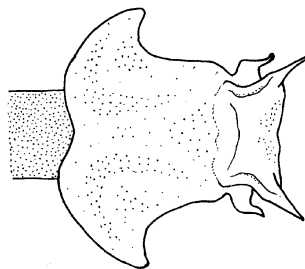


2d. genital ligula, ectal view

Epipleoneura williamsoni, paratype; Brazil: São Paulo State



2e. genital ligula, lateral view



2f. genital ligula, ectal view

Epipleoneura haroldoi, Brazil: Amazonas State

FIGURE 2. *Epipleoneura angeloi* sp. nov. paratype, Mato Grosso State, *E. williamsoni* paratype, São Paulo State, and *E. haroldoi* Brazil, Amazonas State (redrawn from Von Ellenrieder & Garrison, 2008) males.

Specimens examined. Holotype ♂: Brazil, Mato Grosso State: Chapada dos Guimarães, riacho da represinha, about 15°27'11"S, 55°44'19"W, leg. Santos, N.D. & Carvalho, J.U. (Col 16), 28.x.1983 (originally labeled "*Epipleoneura* ♂"). **Paratypes:** 10 ♂♂, same data as holotype (all originally labeled as "*Epipleoneura* ♂"); 3 ♂♂, same data as previous but: Rio Coxipozinho, about 15°27'S, 55°44'W; 1 ♂, Buriti, Chapada dos Guimarães, about 15°24'54"S, 55°48'27"W, leg. Santos, N.D. & Machado, J.P., 13.iv.1963 (originally labeled as "*Epipleoneura williamsoni*?"); 2 ♂♂, Goiás State: Riacho Jataí, 17°52'51"S, 51°42'50"W, leg. Santos, N.D. Netto, L.F.R. & Dacio, C.V.N. 12.x.1982 (originally labeled as "*Epipleoneura williamsoni*").

Additional material. 1 ♀, same data as holotype but: Rio Coxipozinho.

Male holotype. Head. Dorsally metallic green; antennifer with a dorsal carina and with distal half brown, basal half yellow; frons angulate; antefrons yellow with lateral and dorsal margins brown; postclypeus dark brown, anteclypeus yellow; labrum light brown dorsally, yellow ventrally; dorsal half of genae brown, ventral half yellow; rear of head black ventrally, with two narrow yellow stripes bordering eyes; labrum and maxilla yellow.

Thorax. Prothorax dorsally metallic green, sides light brown, becoming yellow ventrally. Mesepisternum metallic green, mesepimeron brown with metallic green reflections, metepisternum brown with anterior yellow areas, metepimeron yellow; pterothoracic venter, coxae and trochanters light yellow; remainder of legs light brown. Wings hyaline, venation black; MP ending 0.5 cell distally from the vein descending from subnodus; IR2 and RP3 separated by a short crossvein one cell posterior to their origin; divergence of RP-RA (arculus) at Ax 2, in right Hw slightly distal to Ax 2; IR1 beginning at Px 6, in left Fw beginning at Px 7; RP2 beginning at Px 4 in Fw and proximal to Px 3 in Hw; pt pale brown, about 2/3 length of underlying cell; 10 Px in right Fw, 9 in left Fw wing, 8 in Hw.

Abdomen. S1–6 dorsally dark brown, ventrally dark yellow, S3–7 with a distal dark brown ring, S7 with a more extended dark brown pattern. S8–10 reddish brown. Cercus (Figs. 1a, 1b) brown, with a dorsal and a ventral branch. The former longer, horizontally flat, with a small black spine close to apex on its inner margin, partially covered by hair-like setae. Ventral branch rounded in lateral view, internally concave, spoon-like. Epiproct (Fig. 1c) well developed, with two elongated lateral lobes, middle section moderately elevated longitudinally.

Paraproct conical, short, not surpassing level of ventral branch apex. Genital ligula (Fig. 2a–b) lacking internal fold, with a pair of latero-posterior pedunculate processes, apex of S3 with a shallow cleft and two small, rounded lateral lobes.

Dimensions. Total length 30.0; abdomen length 24.6; Fw: 15.9; Hw: 15.1.

Paratypes. Same as holotype except as follows: Divergence of RP-RA (arculus) distal in most specimens. Venation - Px: Fw 10 (55%), 11 (45%); Hw 8 (40%), 9 (50%), 10 (10%). RP2: at Px 4 in Fw; at Px 3 or proximal to it in Hw. IR1: at Px 6 (10%), 7 (70%) or 8 (20%) in Fw; at Px 6 (60%) or 7 (40%) in Hw.

Dimensions. (n=10): abdomen length 24.9 – 27.32 [mean 25.43; SD 0.7]; Fw 15.7 – 17.2 [mean 16.3; SD 0.45]; Hw 14.6 – 16.3 [mean 15.4; SD 0.53].

Female. Head. Same as in male, but yellow on anterior side of head replaced by blue, and black pattern of genae and on rear of head less extensive.

Thorax. Prothorax: Coloration same as male, posterior lobe (Fig. 3a–b) erect, with a wide rounded medial lobe visible in dorsal view and two rounded lateral lobes visible in lateral view. Pterothorax: mesepisternum metallic green, remainder of thorax light yellow, with an elongated light brown area with metallic green reflections on most of mesepimeron, except for narrow light yellow stripe on dorsal and ventral margins of mesepimeron. Legs light yellow. Wings hyaline, venation black; MP ending 0.5 cell distally from the vein descending from subnodus; IR2 and RP3 separated by a short crossvein one cell posterior to their origin; divergence of RP-RA (arculus) distal to Ax 2, in right Fw almost at Ax 2; IR1 beginning at Px 6; RP2 beginning at Px 3 in left Fw, at Px 4 in right Fw, at Px 3 in Hw; pt pale brown, about 3/4 length of underlying cell, as long as underlying cell in right Fw; 9 Px in left Fw, 10 in right Fw, 9 in left Hw and 8 in right Hw.

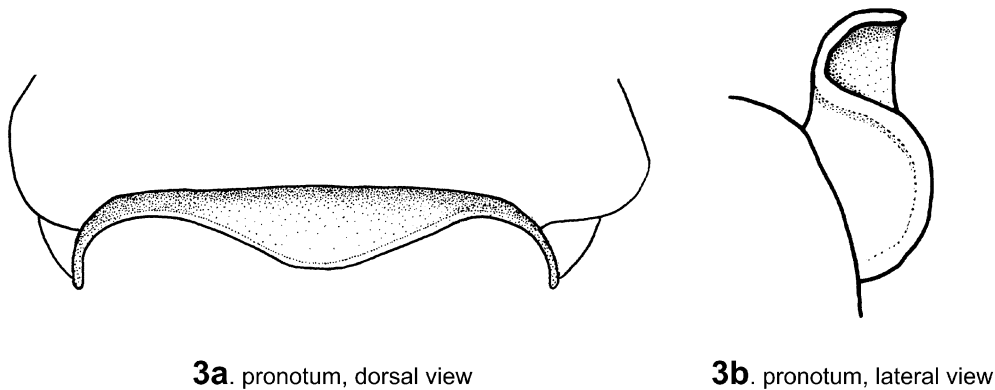
Abdomen. S1–7 dorsal half brown, ventral half light yellow; S2–7 basally each with a light yellow ring and a distal brown ring; S8–9 dorsal 2/3 brown, ventral 1/3 light yellow; S10 brown. Ovipositor apex slightly surpassing S10 distal margin.

Dimensions. Total length 30.0; abdomen length 23.0; Fw 17; Hw 16.1.

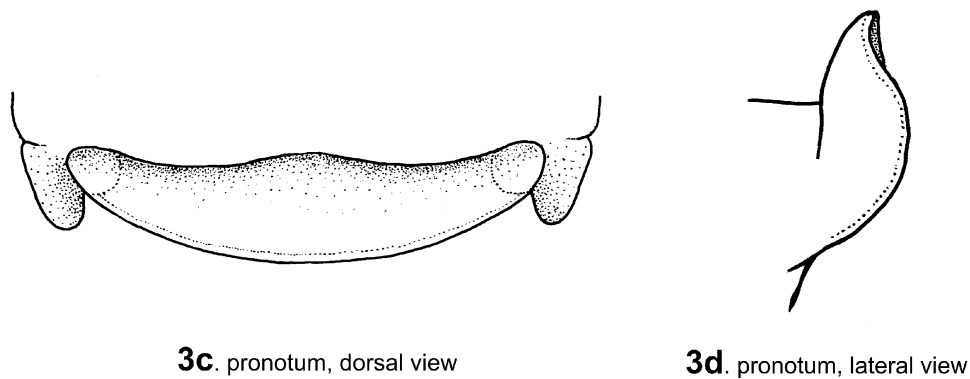
Remarks. The female described above was found in the same envelope as the paratypes from Coxiposinho River, together with a female of *Epipleoneura metallica* Rácenis, 1955, and it does not agree with the female of any species of *Epipleoneura* female currently known. The posterior margin of pronotum (Fig. 3a–b) is erect as in *E. williamsoni* (Fig. 3c–d), the closest species to *E. angeloi*. Since we have identified this female as *E. angeloi* by association, we have excluded it from the type series.

Diagnosis. See under discussion.

Distribution (Fig. 4): Brazil, Mato Grosso (Chapada dos Guimarães) and Goiás (Jataí River) States.



Epipleoneura angeloi, sp. nov.; Brazil: Mato Grosso State



Epipleoneura williamsoni, allotype; Brazil: São Paulo State

FIGURE 3. *Epipleoneura angeloi* female, *E. williamsoni*, allotype female, Brazil, São Paulo State, Ribeirão de São Vicente (redrawn from Santos, 1957).

Epipleoneura williamsoni Santos, 1957

Figures 1d–e, 2c–d, 3c–d, 4.

Material studied: **Holotype** ♂: Brazil: São Paulo State, Pirassununga, São Vicente River county, border with Passa Quatro county, about 21°59'45"S 47°25'37"W, leg. Santos N.D. & Machado J.P., 15 xii 1948. Five **paratype** ♂♂ and **allotype** ♀, same data as holotype. 1 ♂ Tocantins State, Araguatins, about 5°39'3"S, 48°7'26"W, ix–xi 1963; 6 ♂♂, 1 ♀ J. Hidas. Mato Grosso, Diamantino, Paraguay River headwaters, Sete Lagoas Ranch, about 14°24'10"S 56°25'37"W, leg. Costa J.M. & Souza L.O.I., 10 iii 2002.

Diagnosis. See under discussion.

Distribution (Fig. 4): Brazil: São Paulo (Pirassununga), Tocantins (Araguatins), Mato Grosso (Diamantino) and Bahia (Rio das Pedras, 12° 07' 07.2" S & 45° 48' 41.1" W, 710 m, 23 i 2004, leg. Patricia S. F. Perruquetti & Rui C. Peruquetti, information provided by F.A.A. Lencioni) States. Paraguay (San Pedro, Arroyo Aguaray-mi, N of Lima, 23° 54' S, 56° 20' W, 132 m, 1 xii 1973, leg. O.S. Flint, Jr., information provided by R.W. Garrison).



FIGURE 4. Distribution of *Epipleoneura angeloi* sp. nov. (triangles) and *Epipleoneura williamsoni* (stars).

Discussion

The male of *Epipleoneura angeloi* is very similar in appendage and genital ligula morphology to *E. williamsoni*; both species possess a long cercus dorsal branch, parallel to main body axis accompanied by a well developed rounded ventral branch in lateral view; an epiproct with two elongated lateral lobes and genital ligula with two apical rounded lobes. Both species differ only by the size and degree of divergence of the ventral branch of the cercus when viewed laterally and by the relative length of paraproct. In *E. angeloi* (Fig. 1a), the ventral branch is small, rounded, is separated by a narrow excavation from the upper branch and it is almost parallel to it. The paraproct apex does not surpass the level of the ventral branch apex and extends just beyond the basal third of the dorsal cercal branch. In *E. williamsoni* (Fig. 1e), the ventral branch is more robust, is separated by a wide (approximately 45°) excavation from the upper branch. The paraproct apex surpasses the level of the ventral branch apex and the basal half of the dorsal branch. Additionally, the distal segment of the genital ligula of *E. williamsoni* (Figs. 2c–d) has a broader apex and a narrower base in comparison to that of *E. angeloi* (Figs. 2a–b). The apical lobes are also more pronounced in *E. angeloi* compared to *E. williamsoni*.

The posterior lobe of prothorax in the presumed female of *E. angeloi* (Figs. 3a–b) is erect as in *E. williamsoni* (Figs. 3c–d), but differs by the development of a more pronounced and narrow medial lobe.

In lateral view, the cercus of *E. angeloi* (Fig. 1b) looks similar to that of *E. haroldoi* Santos, 1964 (Fig. 1f) but differs by the curved apex in medial view, by the oblique flattened dorsal branch, and shape of the ventral branch. In addition, the apex of distal segment of genital ligula in *E. haroldoi* (Figs. 2e–f) possesses a pair small posteriorly directed angulate lobes, accompanied by a pair of small distally directed pedunculate process.

Acknowledgements

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This is the contribution number 68 of the LIESA.

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