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Danielle Anjos-Santos<sup>a</sup> & Pablo Pessacq<sup>a</sup>

<sup>a</sup> Laboratorio de Investigaciones en Sistemática y Ecología Animal (LIESA), Sarmiento 849, 9200, Esquel, Chubut, Argentina

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## *Peristicta guarellae* sp. nov. from Brazil (Odonata: Protoneuridae)

Danielle Anjos-Santos\* and Pablo Pessacq

Laboratorio de Investigaciones en Sistemática y Ecología Animal (LIESA), Sarmiento 849,  
9200, Esquel, Chubut, Argentina

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*Peristicta guarellae* sp. nov. (holotype: Brazil, Paraná State, Exc. 399/col. 3, stream in km 50 of Curitiba-Ponta Grossa route [BR 376], about 25°20'08" S, 49°51'15" W, 21 November 1971, N. D. Santos leg., deposited in the Collection of "Museu Nacional, Universidade Federal do Rio de Janeiro", Rio de Janeiro, Brazil) is described and illustrated. An identification key for males of *Peristicta* (excluding *P. lizeria* Navás), comparisons and comments on other species of the genus are presented.

*Peristicta guarellae* sp. nov. (holótipo: Brasil, Paraná, Exc. 399/col. 3, riacho no km 50 da Rodovia Curitiba-Ponta Grossa (BR 376), aproximadamente 25°20'08" S, 49°51'15" W, 21 de novembro de 1971, N. D. Santos leg., depositado na Coleção do Museu Nacional, Universidade Federal do Rio de Janeiro, Brasil) é descrita e ilustrada. Uma chave de identificação para os machos de *Peristicta* (excluindo *P. lizeria* Navás), comparações e comentários sobre as outras espécies do gênero são apresentados.

<http://zoobank.org/urn:lsid:zoobank.org:pub:CDDF3BF7-C305-4696-A8F5-50741AD8D1B6>

**Keywords:** Odonata; Zygoptera; Protoneuridae; *Peristicta* sp. nov.; Brazil; Atlantic Forest

### Introduction

*Peristicta* Hagen in Selys (1860) was formerly composed of seven species distributed in the southeastern Neotropical region, i.e. in northeastern Argentina, southern Brazil, Paraguay and Uruguay (Pessacq, 2007; Pessacq & Costa, 2007). The taxonomy of the genus is well resolved for males, but only the female of *P. gauchae* Santos, 1968 and the female and larva of *P. forceps* Hagen in Selys, 1860 are known with certainty (Pessacq, 2007; Santos, 1968). The identity of the female and larva of *Peristicta aeneoviridis* Calvert, 1909 described by Ris (1913) and Santos (1972) respectively remained doubtful (Pessacq, 2007). Additionally, the identity of *P. lizeria* Navás, 1920 is also dubious; it was described based on one male from Buenos Aires Province, Argentina, and its type material could not be located; no specimens of *Peristicta* have been collected in Buenos Aires Province yet, but specimens of *P. aeneoviridis* and *P. forceps* have been recorded in Entre Rios Province, the Paraná river delta and Uruguay, very close to Buenos Aires Province, which could make *P. lizeria* a probable junior synonym of either of them.

\*Corresponding author. Email: [danielleanjos2@yahoo.com.br](mailto:danielleanjos2@yahoo.com.br)

## Methodology

Specimens were preserved dry in paper envelopes. Genital ligulae were extruded with the aid of forceps before being macerated in 10% KOH solution. Illustrations were made with the aid of a camera lucida attached to a stereoscopic microscope Leica MZ6. Scanning electron microscope (SEM) photographs were taken with Jeol-JSM-6360 LV SEM (JEOL Ltd., Tokyo) in the “Museo de Ciencias Naturales de La Plata”, La Plata, Buenos Aires, Argentina (MLP).

Terminology for wing venation follows Riek & Kukalová-Peck (1984), and for genital ligula follows Kennedy (1916). Abbreviations are as follows: Ax = antenodal crossvein; Fw = forewing; Hw = hind wing; Px = postnodal crossveins; pt = pterostigma; S1–10 = abdominal segments 1 to 10. Measurements are given in millimeters.

All the specimens are deposited in the Collection of “Museu Nacional, Universidade Federal do Rio de Janeiro”, Rio de Janeiro, Brazil (MNRJ).

### *Peristicta guarellae* sp. nov. (Figures 1, 2)

*Peristicta aeneoviridis* Calvert 1909. Santos 1972: 143–144, figs 1–6 (larval description, illustrations of habitus, antenna, abdomen, prementum, premental palp and caudal lamellae).

### Etymology

This species is named after Nely Guarella, a beloved friend of ours.

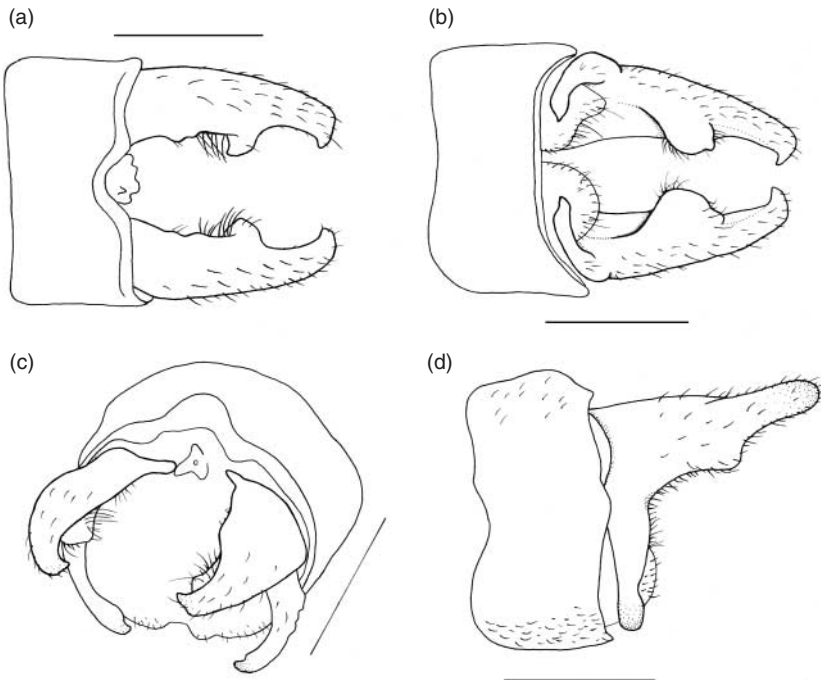


Figure 1. *Peristicta guarellae* sp. nov. holotype, male, Paraná State, Brazil: (a) cerci, dorsal view; (b) cerci, ventral view; (c) cerci, dorsoposterior view; (d) cercus, lateral view.

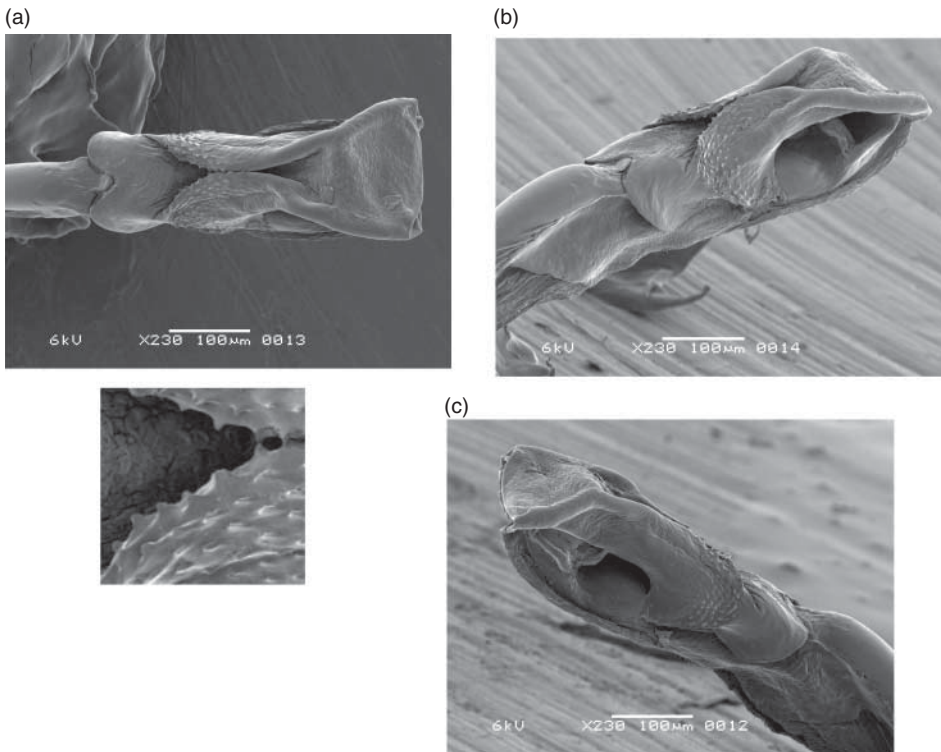


Figure 2. *Peristicta guarellae* sp. nov. holotype, male, Paraná State, Brazil. (a) Genital ligula, ectal view and detail of scale-like ornamentation; (b) genital ligula, ectolateral view; (c) genital ligula, ectolateral view.

### *Specimens examined*

*Holotype male.* Brazil, Paraná State, Exc. 399/col. 3, stream at km 50 of Curitiba-Ponta Grossa route (BR 376) (about 25°20'08" S, 49°51'15" W), 21 November 1971, N. D. Santos leg. *Paratypes.* Five males, same data as holotype. Four males, same State, but Exc. 399/col. 7, Vila Velha, 24 February 1971, N. D. Santos leg; two males, Rio de Janeiro, Col. 14, Parque Nacional da Serra da Bocaina, Rio Mambucaba, km 27.5, 24 November 1979, N.D.Santos, L.F. Neto leg. The material from Paraná State was originally labeled as *P. aeneoviridis* and from Rio de Janeiro labeled as *Peristicta*.

### *Description of holotype*

*Head.* Dorsum black with metallic greenish yellow reflections; anteclypeus with a pale yellowish spot on each side of median line; labium with an anterior yellowish stripe, gena inferiorly pale greenish, this color extending ventrally as a stripe bordering the eyes.

*Thorax.* Prothorax: predominantly black with greenish reflections; anterior lobe with a brown line on anterior margin. Pterothorax: black dorsally with dark metallic green reflections; mesepimeron and mesepisternum black with metallic greenish red reflections; metepimeron and mesepisternum dark brown, with pale ventral areas, venter yellowish. Femur black with a proximal pale yellowish spot, remainder of leg dark brown; tarsal claw light brown. Wings hyaline, pt slightly smaller than underlying cell; CuP&AA' one cell long; MP extending for 1.5 cell

beyond crossvein descending from subnodus in Fw and right Hw and 2 cells in left Hw; RP<sub>2</sub> beginning in Px3; IR<sub>1</sub> beginning in Px6; Ax1 and Ax3 spaces of subequal length, Ax2 the shortest (Fw = 2:1.2:2.2; Hw = 2:1.2:2); arculus distal to Ax2; IR<sub>2</sub> arising at vein descending from subnodus; number of Px: 11 in Fw, 9 in Hw.

*Abdomen.* S1-5 dark brown; S6-10 black; S4-7 with proximal pale lateral spots. Cerci black, with dorsal and ventral branches (Figure 1). Dorsal branch forcipate, slightly directed dorsally; longer than S10, with a well-developed blunt tooth directed ventrally at half of its length. Ventral branch arising from base of dorsal branch, much thinner than latter and curved medially following contour of S10, with a small tooth on its apex. Paraprocts reduced.

Genital ligula (Figure 2) with an inner fold proximal to flexure; segment 3 in ectal view covered with patches of spine-like micro-ornamentations and with a pair of dorsolateral folds that delimit a medial groove; lateral lobes triangular, small; apex bilobed; shaft spines present.

*Dimensions* (mm). Total length 31; abdomen length 25.8; Fw: 17; Hw: 15.8.

#### *Description of paratypes*

Same as holotype except for: one specimen from Paraná, Vila Velha with mesepimeron and mesepisternum black without green reflections; one specimen with same data as holotype with CuPAA' shorter than one cell in Fw; some specimens with proximal half of the cerci brown. Venation: MP extending 1.5 (59%), 1.75 (12%), 2.5 cells (23%) or 2.25 (6%) cells from crossvein descending from subnodus in Fw and 1.5 (16%), 1.25 (12%), 1.75 (5%); 2 (21%), 2.5 (48%), 2.25 (5%) in Hw; RP<sub>2</sub> beginning in Px4 in Fw and in Px3 in Hw; IR<sub>1</sub> in Fw beginning in Px6 (5%) or Px7 (95%), in Hw beginning Px5 (81%) or Px6 (19%); antenodal spaces in Fw from 1.8:1.2:2.2 to 2:1.4:2.2, in Hw from 2:1.2:2 to 2:1.4:2.2.

*Dimensions* (mm). Abdomen total length 29.2–31.4 [*n* = 8; mean 30.2; SD 0.88]; Fw 16–17 [*n* = 9; mean 16.3; SD 0.58]; Hw 15–16.2 [*n* = 9; mean 15.3; SD 0.5].

#### *Diagnosis*

Genital ligula segment 3 with small triangular lateral lobes, apex bilobed, dorsum with a pair of dorsolateral folds that delimit a medial groove.

#### *Distribution*

Brazil, Paraná (Ponta Grossa municipality) and Rio de Janeiro States (Parque Nacional da Serra da Bocaina). Both localities lie within the Atlantic Forest region.

#### *Remarks*

During 2009, in a visit to the MNRJ, the junior author found a male specimen conspecific with the ones herein described. It was labeled as *P. aeneoviridis*, and there was a reference number to a larval exuvia indicating that the specimen had emerged in the laboratory. Collection data agreed with the specimen used by Santos (1972) in his description of the larva of *P. aeneoviridis*. Later that same year, the senior author found a larval exuviae preserved in alcohol labeled as *P. aeneoviridis*, which had the same reference number found on the adult male. Also in 2009 Professor A. B. M. Machado, aware of our studies with *Peristicta*, kindly sent us several specimens of a probable new species, which were conspecific with the one we are describing here. All the specimens mentioned

before, and additional material from Serra da Bocaina (São Paulo States) were kept in the same box and remained in the “Laboratório de Insetos Aquáticos” (MNRJ), separated from the main collection, for further study. Unfortunately, when the junior author returned to the MNRJ in 2010, the material had been lost, but new specimens of *P. guarellae* were found mixed with specimens identified as *P. aeneoviridis*.

The electron microscope images of *P. guarellae* presented here were taken from specimens from Serra da Bocaina. To facilitate the identification of species and use of the key, we include SEM images of *P. aeneoviridis*, *P. forceps*, *P. janiceae* Pessacq & Costa, 2007, *P. jalmosi* Pessacq & Costa, 2007, and *P. muzoni* Pessacq & Costa, 2007. Images of an average specimen of *P. muzoni* are presented, since those published in Pessacq and Costa (2007) were taken from a specimen with unusually short lobes in the segment 3 of genital ligula.

In the Paraná State there is more than one place named Vila Velha, but Santos (1972) mentioned material collected between Curitiba and Ponta Grossa cities and it is probable that the material cited here was collected in the “Parque Estadual de Vila Velha” which is located in Ponta Grossa City. The “Parque Nacional da Serra da Bocaina” is located between the States of Rio de Janeiro and São Paulo. Here, we follow the labels of type material, and we only considered the species as recorded in Rio de Janeiro State, but it is possible that this species occurs in both States.

## Discussion

With the exception of *Peristicta gauchae* Santos, 1968, all the remaining species possess virtually identical cercus morphology and coloration. The genital ligula is the only structure allowing for

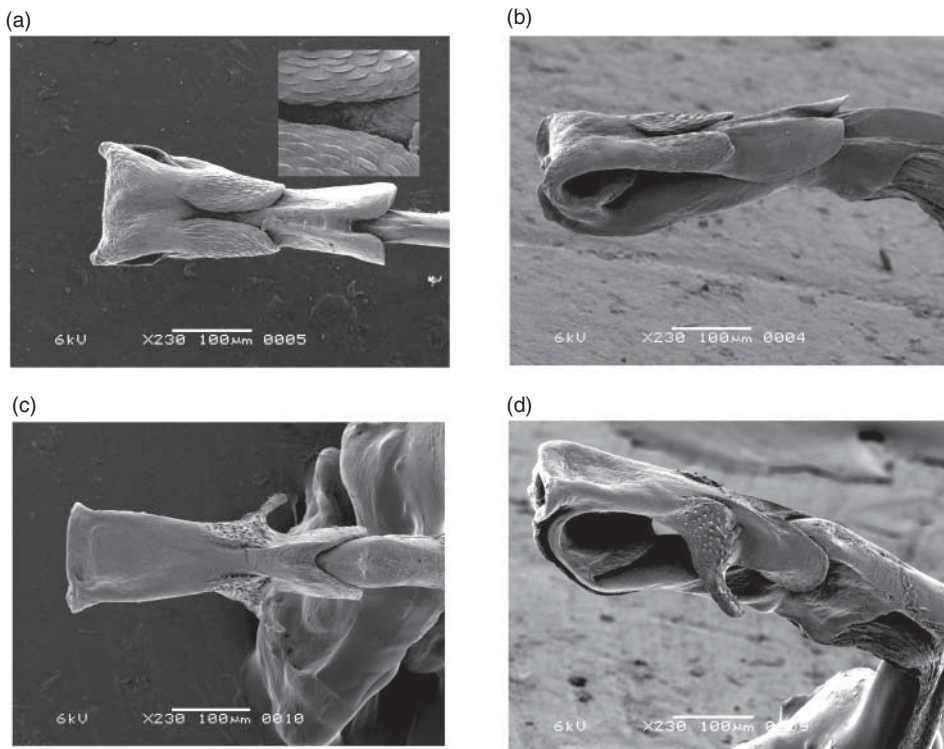


Figure 3. (a, b) *Peristicta jalmosi*, Lagoa Sancta, Minas Gerais State, Brazil: (a) genital ligula, ectal view and detail of scale-like ornamentation; (b) genital ligula, lateral view. (c, d) *P. muzoni*, Serra da Bodoquena, Mato Grosso do Sul State, Brazil: (c) genital ligula, ectal view. (d) genital ligula, lateral view.

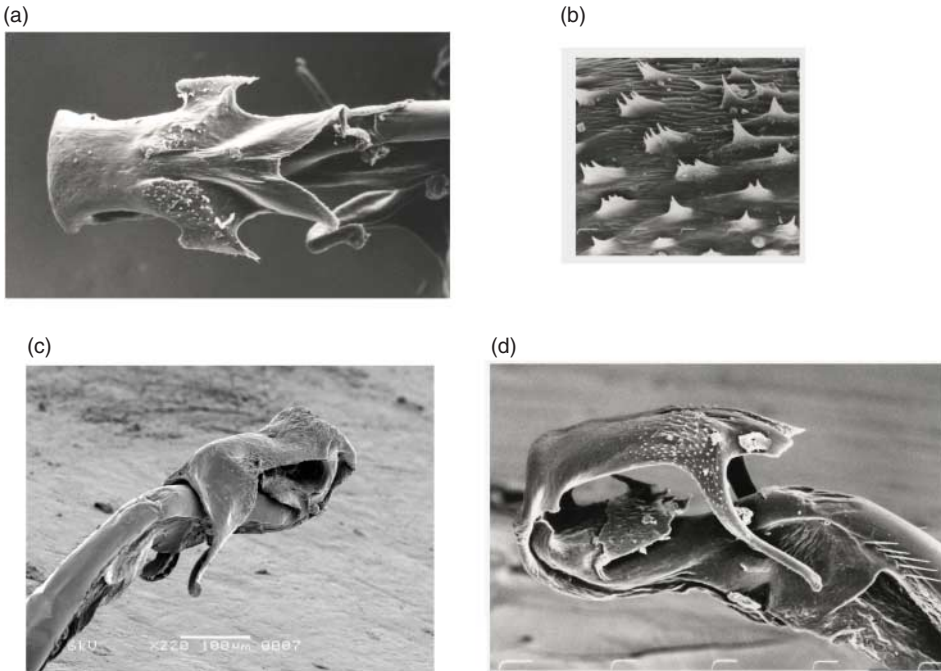


Figure 4. (a, b) *Peristicta aeneoviridis*, Misiones Province, Argentina: (a) genital ligula, ectal view; (b) detail of genital ligula ornamentation. (c) *P. janiceae*, Serra do Cipó, Minas Gerais State, Brazil, genital ligula, anterolateral view. (d) *P. forceps*, Corrientes Province, Argentina, genital ligula, lateral view.

separation of species. Segment 3 in most species has two lateral lobes (absent in *P. jalmosi* Pessacq & Costa, 2007) of different shapes and sizes (Figures 2b, c, 3c, d, 4a, c, d) and it usually possess a bilobed apex (truncated in *P. gauchae* and *P. janiceae* Pessacq & Costa, 2007). The surface of segment 3 is covered with patches of micro-ornamentation, which varies in extent and shape, from simple, bifid and trifid spines in most species to scale-like spines in *P. jalmosi*. The micro-ornamentation is only visible under SEM photographs. A pair of dorsolateral folds that delimit a medial groove is also present in segment 3 in *P. jalmosi* and *P. guarellae*. These folds are insinuated in *P. aeneoviridis*, *P. forceps* and *P. muzoni*, and are usually hard to distinguish with stereoscopic microscope. Unfortunately, detailed information of the genital ligula of *P. gauchae* is not available; the material of this species deposited at MNRJ belongs to the type series and is very fragile and damaged, extraction of genital ligula for SEM photographs would probably cause severe damage.

*Peristicta guarellae* seems to be closely related to *P. jalmosi*, and can be separated from it by the presence of two triangular lateral lobes (Figure 2b, c), spine-shaped micro-ornamentation and a wider and shallower cleft between apical lobes of segment 3 of genital ligula. *P. jalmosi* lacks lateral lobes (Figure 3b), the micro-ornamentation is scale-like (Figure 3a) and the apical cleft in segment III of genital ligula is narrower and deeper (Figure 3a).

**Key to species of males of Peristicta**

*Peristicta lizeria* is not included. This key is modified from Pessacq and Costa (2007).

- 1 Cerci shorter or slightly longer than S10, inner tooth of cercus dorsal branch almost apical (figures 1, 2 and 4 in Santos, 1968; figures 2488, 2489 in Garrison, von Ellenrieder, & Louton, 2010).....*Peristicta gauchae*

- 1' Cerci distinctly longer than S10, inner tooth of cercus dorsal branch never almost apical . . . 2
- 2 Segment 3 of genital ligula with apex truncated (Figure 4c); tooth of cercus medial, barely visible in lateral view . . . . . *P. janiceae*
- 2' Segment 3 of genital ligula with apex bilobed (Figures 2, 3, 4a, d); tooth of cercus ventral, clearly visible in lateral view . . . . . 3
- 3 Segment 3 of genital ligula lacking lateral lobes (Figure 3a, b) or with these poorly developed (Figure 2b, c) . . . . . 4
- 3' Segment 3 of genital ligula with well-developed lateral lobes (Figures 3c, d, 4a, c, d) . . . . . 5
- 4 Lateral lobes of genital ligula absent; shaft of ligula lacking spines (Figure 3a, b) . . . *P. jalmosi*
- 4' Lateral lobes of genital ligula present, short and triangular (Figure 2b, c); shaft of ligula with spines . . . . . *P. guarellae* sp. nov.
- 5 Lateral lobes of genital ligula surpassing level of apical lobes (Figure 4d) . . . . . *P. forceps*
- 5' Lateral lobes of genital ligula not surpassing level of apical lobes (Figures 3d, 4a) . . . . . 6
- 6 Lateral lobes of genital ligula wider at apex than at base, ear-like (Figure 4a) . *P. aeneoviridis*
- 6' Lateral lobes of genital ligula tapering to apex, long and narrow, directed forward (Figure 3d) . . . . . *P. muzoni*

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This is contribution number 95 of the LIESA.

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