

Rediscovery of *Proneura prolongata* (Zygoptera: Protoneuridae) and other new Odonata records from Colombian Amazon

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Abstract

As with most taxa present in Colombia, the study of dragonflies is still in its exploratory phase. This paper reports the results of a trip to the Amazon region in order to collect dragonflies. Seven new records for the country were found, including the rediscovery of *Proneura prolongata* Selys and an undescribed species in the genus *Calvertagrion* St. Quentin.

Resumen

Al igual que con la mayoría de taxa presentes en Colombia, el estudio de las libélulas aun se encuentra en su fase exploratoria. En este artículo se reportan los resultados de un viaje a la región amazónica con el objetivo de coleccionar Odonatos, entre las especies encontradas destacan siete nuevos registros para el país, incluyendo el redescubrimiento de *Proneura prolongata* Selys y una especie aun no descrita del género *Calvertagrion* St. Quentin.

Introduction

Based on well studied taxa such as vertebrates and vascular plants, Colombia is considered one of the megadiverse countries of the world, joining Brazil, Indonesia, Mexico and China among others (Díaz & Acero 2003, Rangel-Ch 2005). The information available for other taxonomic groups in Colombia is scarce, due to almost zero funding for national research and poorly conceived environmental laws which involve bureaucracy that presents numerous obstacles when applying for research permits (Fernández 2011).

Odonates are not an exception to this situation. Research on this group of insects by Colombian students has been scarce, with a publication in the 1930s and then starting again in the 1980s, although reports became more numerous after 2000. Recent listings of the number of odonate species from neighbouring countries indicate that progress in Colombia lags behind: Peru 481 spp. (Hoffmann 2009), Venezuela 487 spp. and Brazil 660 spp. (Pérez-Gutiérrez & Palacino-Rodríguez 2011). The species numbers indicate that much work is needed as only 338 spp. have thus far been recorded from Colombia (Bota-Sierra et al. 2010, Pérez-Gutiérrez & Montes-Fontalvo 2011, Pérez-Gutiérrez & Palacino-Rodríguez 2011, Rojas 2011).

The odonate fauna of the Amazon region is one of the most understudied in Colombia, as can be seen in the distributional maps for genera provided by Garrison et al. (2006, 2010). Here I present a species list based on a single field trip, highlighting the species that have been rediscovered and the ones that are new records for the country, with some notes on their habits and descriptions of unknown morphological characters.

Materials and Methods

Three localities (Figure 1) were visited during a field trip to the Colombian Amazon from July 19th to 23rd 2011:-

- Yahuaraca stream (4°9' S 69°57' W) at the Municipality of Leticia, crossing three ecosystems; running waters surrounded by forest, then Igapó (flooded forest) (Figure 2), and finally open lakes.
- Correo Lake (3°46' S 70°23' W) in the river Loretoyacu, with margins dominated by Igapó (Figure 3) and terra firme forest.
- Amazonas River near Loretoyacu's mouth (3°47' S 70°21' W), with margins dominated by open areas for housing and cultivation (Figure 4), both at the Municipality of Puerto Nariño.

Odonates were collected and photographed, and field notes were taken for every specimen. Specimens are deposited at the Colección de Entomología of the Universidad de Antioquia (CEUA). Illustrations were composed combining freehand and digital illustration techniques using Adobe Illustrator CS3. Map is based on a digital elevation model DEM-SRTM, with 90 resolution meters, downloaded from the CGIAR-CSI consortium for spatial information and modified with ArcGis 9.2.

Results

Thirty four Odonata specimens were collected and identified to species level, with the exception of some females and taxonomically unclear groups. Nineteen species were recorded (Table 1), including seven new records for Colombia, raising the species number for the country to 344, including four previously unrecorded genera. The collection highlights include the rare damselfly *Proneura prolongata* which had not been found again since its original description (Selys 1889), and an undescribed *Calvertagrion* species (which Dr. Ken Tennessen is working on; pers. comm.).

**Figure 1:
Sampled
Localities**

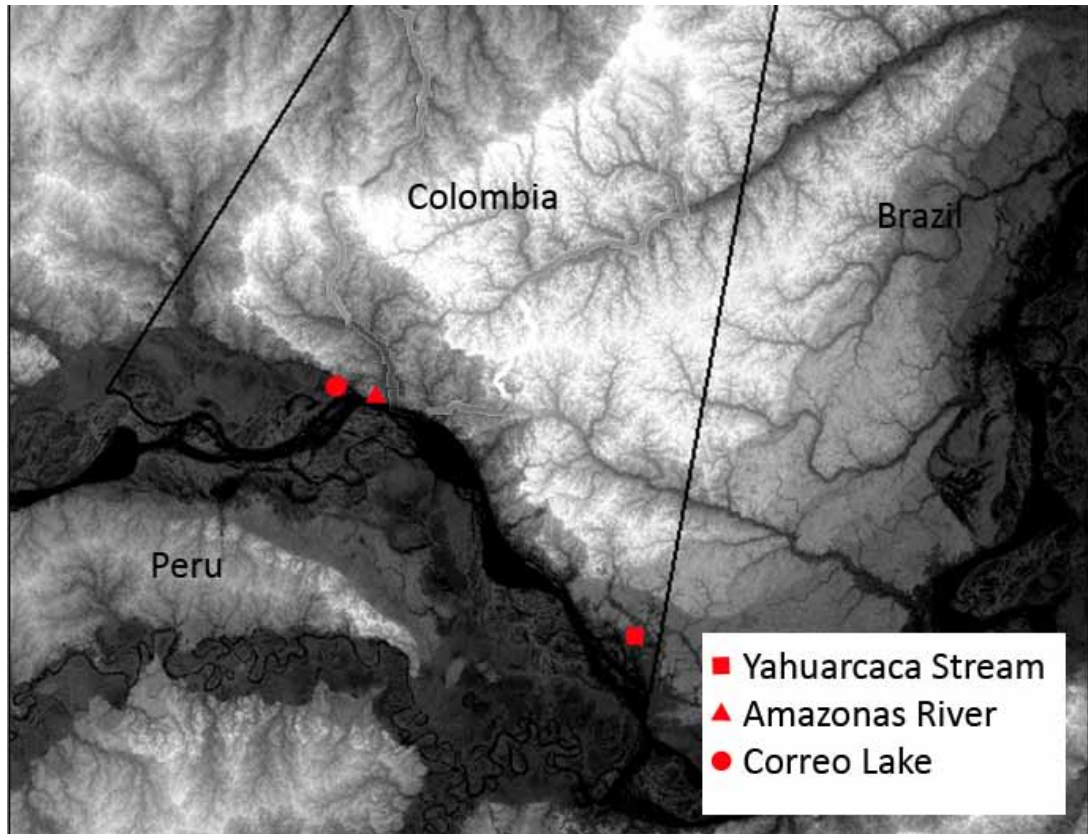


Table 1. Habitat and locality of the species collected

Locality	Family	Species	Habitat
Yahuarcaca Stream and lakes	Libellulidae	<i>Uracis fastigiata</i> (Burmeister, 1839)	Terra firme forest
		<i>Brachymesia furcata</i> (Hagen, 1861)	Lake
		<i>Erythrodiplax attenuata</i> (Kirby, 1889)	Lake
	Calopterygidae	<i>Orthemis</i> species group <i>discolor</i>	Stream
		<i>Hetaerina sanguinea</i> Selys, 1853	Stream
	Coenagrionidae	<i>Acanthagrion lancea</i> Selys, 1876 *	Lake
		<i>Aeolagrion inca</i> (Selys, 1876) °	Lake
Protoneuridae	<i>Proneura prolongata</i> Selys, 1889 °	Igapó	
Correo Lake	Libellulidae	<i>Perithemis lais</i> (Perty, 1834)	Lake
		<i>Perithemis bella</i> Kirby, 1889 *	Lake
		<i>Brachymesia herbida</i> (Gundlach, 1889)	Terra firme clearings
	Coenagrionidae	<i>Erythemis attala</i> (Selys in Sagra, 1857)	Clearings near the shore lake
		<i>Erythrodiplax unimaculata</i> (De Geer, 1773)	Terra firme streams
		<i>Orthemis</i> species group <i>discolor</i>	Terra firme clearings
		<i>Uracis imbuta</i> (Burmeister, 1839)	Terra firme clearings
		<i>Acanthagrion lancea</i> Selys, 1876 *	Lake
		<i>Acanthagrion apicale</i> Selys, 1876	Terra firme streams
		<i>Aeolagrion inca</i> (Selys, 1876)	Terra firme swamps
		<i>Ischnura capreolus</i> (Hagen, 1861)	Lake
		<i>Calvertagrion</i> sp. nov.	Terra firme streams
		<i>Metaleptobasis incus</i> Sjöstedt, 1918 °	Terra firme swamps
Protoneuridae	<i>Protoneura</i> sp.	Lake	
Amazonas River	Libellulidae	<i>Micrathyria</i> sp.	River shore
	Coenagrionidae	<i>Aeolagrion inca</i> (Selys, 1876) °	River shore
	Protoneuridae	<i>Neoneura bilinearis</i> Selys, 1860	River shore
		<i>Neoneura rufithorax</i> Selys, 1886 *	River shore

° First record of the genus from Colombia.

* First record of the species from Colombia.-



Figure 2. Igapó at Yahuarcaca Stream.



Figure 3. Edge between lake and Igapó at Correo Lake.



Figure 4. Amazonas River arm.

Acanthagrion lancea

This species is recorded from Argentina, Brazil, Ecuador, Paraguay, and Peru (Leonard 1977, Anjos-Santos et al. 2011; von Ellenrieder & Muzón 2008). At the Colombian Amazon it was very common and abundant at the macrophyte zone in the edge between the igapó and the open waters of the lakes. They were observed in copula near midday and it was also observed being preyed on by spiders (Figure 5).

Aeolagrion inca

The genus *Aeolagrion* is known to occur from Surinam and Trinidad throughout South America to the north of Argentina (Tennessee 2009, Garrison et al. 2010), and although its presence in Colombia was expected it had not been confirmed to date. *Aeolagrion inca* is recorded from Bolivia, Brazil, Ecuador, and Peru (Tennessee 2009). At the Colombian Amazon it was collected both in open places with high sun incidence (i.e. shores of the Amazonas river or of lakes without high vegetation cover), and at shaded swamps in the interior of terra firme forest. Tennessee (2009) states: “these damselflies are fairly cryptic shade-dwellers, especially females. Although



Figure 5. *Acanthagrion lancea*, male, Correo Lake.



Figure 8. *Calvertagrion* sp. nov., male, Terra Firme Stream near Correo Lake.



Figure 6. *Aeolagrion inca*, male, Yahuarcata Lake.



Figure 7. *Calvertagrion* sp. nov., female. Terra Firme Stream near Correo Lake.

the larvae and therefore the exact breeding habitat are not known ...". My observations show that males of *A. inca* also perch in open sunny areas, which expands the known microhabitat for this genus and maybe could point to their breeding places (Figure 6).

***Calvertagrion* sp. nov.**

The genus *Calvertagrion* has been recorded for the Amazon forest in Brazil, Ecuador, and Peru (Garrison et al. 2011). At present only one species has been described (Garrison & Costa 2002) but Dr. Ken Tennessen is working on a revision of the genus which would increase the number of species to five (Tennessen pers. comm.). The species collected at the Colombian Amazon seems to be one of the undescribed species (Tennessen pers. comm.). It was observed flying in forest clearings crossed by little streams (Figures 7 and 8).

Mesoleptobasis incus

The genus *Mesoleptobasis* has been recorded for the Amazon forest in Brazil, Guyana, Peru, Surinam, and Venezuela, where according to Garrison & von Ellenrieder (2009) specimens are infrequently collected, and it is therefore likely that distribution ranges are larger than those indicated by existing specimens. Its presence in Colombia was therefore expected but it had not been confirmed to date. *Mesoleptobasis incus* was recorded in the Amazon regions of Brazil and Venezuela (Garrison & von Ellenrieder 2009). At the Colombian Amazon it was observed flying in a shaded swampy zone inside the forest (Figure 9).



Figure 9. *Mesoleptobasis incus*, male, Terra Firme Swamp near Correo Lake.



Figure 10. *Neoneura rufithorax*, male, Amazonas River shore.

Neoneura rufithorax

This species has been recorded in Venezuela, Northern Brazil, and Southern Peru (Garrison 1999, De Marmels 2007). In the Colombian Amazon, I collected it on a sunny shore of the Amazonas river, where it flew near the water surface and perched on overhanging dead wood (Figure 10).

Proneura prolongata

Baron Edmond de Selys-Longchamps described this species based on a single male collected in “Le Peba” (Selys 1889). He noted that the genus differed from all other Protoneuridae by “...the prolongation of the inferior sector of the triangle to about the end of the marginal cell after which the quadrangle is beneath....” [translated from the French]; in modern terminology this is described as CuA free, one cell long (Garrison et al. 2010). Machado (1985) discussed the ambiguity of Selys’ locality “Peba, Tefé [Amazonie]” indicating that it cannot be precisely located, not even for a country, but stated that it is certainly in the upper Amazon region of Peru or Brazil. Gloyd (1977) suggested that it could correspond to Pebas, in Loreto department in Peru, and Garrison et al. (2010) considered the latter to be the most likely locality. As noted by von Ellenrieder & Garrison (2007), the holotype is lacking the last seven abdominal segments. Fortunately, Selys had composed some free-hand colour illustrations of various species from his collection which were never published (Hämäläinen 2009), including one of the holotype male of *P. prolongata* (Figure 11). Rosser W. Garrison mentioned this to Marcel Wasscher, who was able to scan several of the plates including that of *P. prolongata*.

Proneura prolongata had not been recorded since its original description. In the Colombian Amazon it was observed flying within an Igapó (Figure 2), which could explain why it is so rare in collections because accessing this habitat is very difficult; I was able to approach and collect the single male seen from a kayak (Figure 12).

The species has been listed as “data deficient” by the IUCN as further knowledge about its range, habitat preferences, and biology is needed in order to evaluate potential threats (von Ellenrieder 2009).

Von Ellenrieder & Garrison (2007) provided illustrations of head, thorax, genital ligula, second and third abdominal segments and wings of the holotype. Here I provide illustrations of the tenth abdominal segment and caudal appendages in lateral view and a brief description.

Body length is 36.0 mm and abdominal length is 30.5 mm. Paraprocts are 4 times longer than cerci, 1.33 times longer than abdominal segment 10 (Figure 13), and are conical with tips curving inwards (Figure 14). Cerci are 2.5 times higher than long, ovoid with a wide base in medio-dorsal view (Figure 15). Abdominal segments 8 – 10 including cerci and paraprocts are covered with golden setae.

Perithemis bella

This species is recorded for Brazil, Ecuador, and Peru (Ris 1930, Hoffmann 2009, Garrison pers. comm.). Brother Apolinar Maria recorded *P. bela* (with the orthographic error) in 1939 for the Magdalena Valley Region in Colombia; nevertheless the specimens on which he based the report are lost and it seems unlikely that this species reaches the Magdalena Valley. This species was not recorded in the last check list for Colombian Odonata, this being the first reliable record. In the Colombian Amazon it was observed while it was perched on a macrophyte at the edge between the Igapó and the lake (Figure 16).

Discussion

This work reflects the state of knowledge of odonatology in Colombia. The majority of the entomological museums in the country keep regional collections and these are restricted principally to the Andean zone (Cardona et al. 2010), with relatively good representation of the Caribbean and Pacific regions, but the Orinoquia and Amazon regions, which are the most inaccessible, are poorly represented. So the findings made in only three



Figure 11. Selys's unpublished color plate of *Proneura prolongata*.

days in the field for the Amazon region evidence the necessity of expeditions to the Colombian remote zones with the scope of collecting Odonata for the improvement of knowledge of Colombia's odonate fauna.

Acknowledgements

To my family for their company and help during the field trip to the Colombian Amazon, to CEUA for the technical support, to Jérôme Constant and Marcel Wasscher who scanned Selys' drawings and to Natalia von Ellenrieder and Rosser Garrison who provided them, to Camilo Flórez who helped me with the illustrations, to Cintia Moreno who helped me with the map and to Ken Tennesen, Natalia von Ellenrieder and Rosser Garrison who reviewed and enriched the manuscript.



Figure 12. *Proneura prolongata*, male.

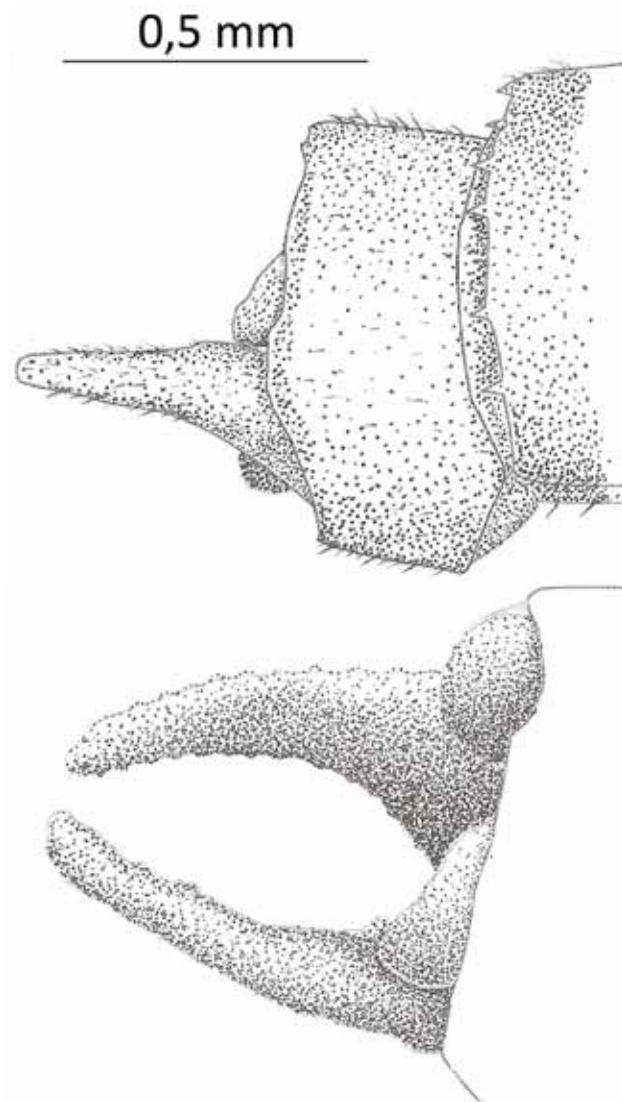


Figure 13 (left, above). Abdominal segment 10 and appendages of *Proneura prolongata* in lateral view.

Figure 14 (right above). Abdominal segment 10 and appendages of *Proneura prolongata* in posterior.

Figure 15 (left below). Caudal appendages of *Proneura prolongata* in medio-dorsal view.

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Figure 16. *Perithemis bella*, male, Correo Lake.