

***Dolonagrion* nov. gen.
for *Telagrion fulvellum* from South America
(Odonata: Coenagrionidae)**

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ABSTRACT

Based on examination of the syntype female of *Telagrion fulvellum* which we designate as lectotype, and its comparison with additional male and female specimens from Peru, this species is assigned to a new genus, *Dolonagrion*, and both sexes are redescribed, diagnosed, and illustrated.

RESUMEN

Sobre la base del examen del sintipo hembra de *Telagrion fulvellum*, el cual designamos como lectotipo, y su comparación con ejemplares adicionales machos y hembras de Perú, esta especie es asignada a un nuevo género, *Dolonagrion*, y ambos sexos son redescritos, diagnosticados e ilustrados.

INTRODUCTION

Generic recognition of neotropical components within Coenagrionidae is difficult due to vague and often inadequate descriptions and lack of illustrations. The identities of several poorly-known taxa, mostly described by Selys (1876, 1877), have recently been analyzed (De Marmels & Garrison 2005; De Marmels 2007; von Ellenrieder & Garrison 2007, 2008; von Ellenrieder 2008; von Ellenrieder & Lozano 2008). Here we address the identity of *Telagrion fulvellum* Selys, 1876.

Selys (1876) described *T. fulvellum* based on a male from 'Peba' (Upper Amazon) and a female from Pará, Brazil. We studied and illustrated the syntype female deposited in the Institut Royal des Sciences Naturelles de Belgique, and based on its examination and comparison with the type species of this genus, *T. longum* Selys, 1876, we concluded that *T. fulvellum* did not belong in *Telagrion* Selys, 1876 but most likely represented a species of *Chrysobasis* Rácenis, 1959. In a previous paper we left its status as unsolved pending examination of the male (von Ellenrieder & Garrison 2007).

Among unidentified specimens from Peru kindly sent to us by colleagues we found five females conspecific with the syntype female of *T. fulvellum*, accompanied by four males from the same localities. Examination of the male characters and comparison with the two described species of *Chrysobasis* revealed that *T. fulvellum* is not congeneric with them as we had initially thought, but belongs in a new genus, sharing some characters also with *Leptobasis* Selys, 1877, *Mesoleptobasis* Sjöstedt, 1918, and *Phoenicagrion* von Ellenrieder, 2008. However, it differs from all of them by its unique combination of characters.

MATERIAL AND METHODS

Nomenclature for wing venation follows Riek & Kukalová-Peck (1984) and for genital ligula Kennedy (1916). Measurements are given in millimeters; total length and abdomen length exclude cerci, and ovipositor length excludes styli. Diagnostic characters were illustrated with the aid of camera lucidae coupled to Wild M-8 and Nikon SMZ1500 microscopes and are not to scale. Wings were scanned from specimens. Acronyms for collections used in the text are:

- DRP — Dennis R. Paulson collection, Seattle, Washington, USA
 HNHM — Hungarian Natural History Museum, Hungary
 IRSNB — Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium
 RWG — Rosser W. Garrison collection, Sacramento, California, USA

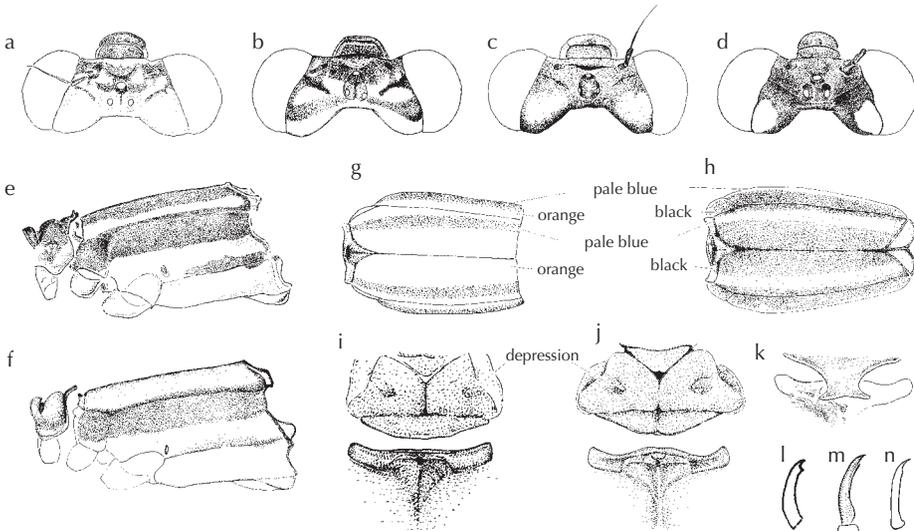


Figure 1: Morphological details of *Dolonagrion fulvellum* — (a-d) head, dorsal view; (e, f) thorax, lateral view; (g, h) pterothorax, dorsal view; (i-k) prothorax and mesostigmal plates, dorsal view; (l-n) pretarsus. — Depicted specimens: (a) immature female, Tambopata, Peru; (b, g, i, l) female, lectotype, Pará, Brazil; (c, f, h, j, n) mature female, Tambopata, Peru; (d, e, k, m) male, Explorama Lodge, Peru.

Dolonagrion gen. nov.

Type species

Telagrion fulvellum Selys, 1876, by present designation.

Etymology

From the Greek *dólôn* meaning ‘dagger’ – and *agrion*, neuter form of *agrius* meaning ‘wild’, which in damselflies is now used as an indicator that a genus belongs to the Coenagrionidae (Fliedner 2006) – referring to the characteristic long and robust ovipositor, shaped as a dagger.

Generic characterization

Small coenagrionids, total length 28-31 mm. Frons in profile rounded; always with pale postocular spots and sometimes (lectotype, paralectotype, and one teneral male) with a pale stripe along posterior margin of head dorsum or the entire posterior half of dorsum pale (teneral females); most posterior point of head at postocular lobes (Figs 1a-d). Medial portion of posterior lobe of male pronotum caudally projected into a bifid process with strongly concave lateral margins and slightly concave posterior margin (Fig. 1k), of female broadly semicircular and slightly trilobate (Figs 1i, j). Mesostigmal plates in both sexes broadly rectangular, with outer-anterior and medio-posterior margins slightly raised (Figs 1i-k). Wings petiolated to level of CuP or proximal for a distance less than length of CuP (Figs 2a, b); CuP reaching CuP&AA and not posterior margin of wing; CuA extending for 3-7 cells posterior to vein descending from subnodus; vein descending from subnodus forming a straight line to wing margin; 3 cells between quadrangle and vein descending from subnodus in Fw; condition of two cells observed only in right Fw of lectotype (Fig. 2a) is most likely an anomaly; RP2 in Fw beginning slightly before to slightly beyond Px 4 and in Hw at Px4 to midway between Px3-4; pt costal side considerably longer than posterior side (Figs 2a-c). Spurs on distal half of metafemur not longer than width of femur; metatibial spurs shorter than intervening spaces; supplementary tooth of pretarsal claw (Figs 1l-n) small and forming a right angle with claw or represented by a small notch. Male genital ligula with well developed inner and terminal folds, apex deeply bifid, and one pair of lateral lobes with sclerotized denticules on apices (Figs 3a, b). Male cercus (Figs 3f-h) dark, in lateral view slightly shorter than S10, approximately rectangular, entire and decumbent, with a transverse membranous depression in dorsal surface; male paraproct entire, in lateral view subequal to cercus. Female S8 lacking vulvar spine; female cercus shorter than S10; tergum of S10 with a very short dorso-posterior cleft (Fig. 2h). Ovipositor robust and long, with a single row of teeth along ventral margin of outer valves, and tip (excluding stylus) extending far beyond tip of cerci, for a distance subequal to length of S10 (Figs 2f-i); sub-basal plate large, attenuate ventrally (Fig. 2i). Larva unknown.

Diagnosis

Dark male cercus with a contrasting pale dorsal transverse membranous depression (Figs 3g, h) is unique for *Dolonagrion*, as is its genital ligula with combination of deeply cleft apex and one pair of lateral lobes with sclerotized denticules on apices

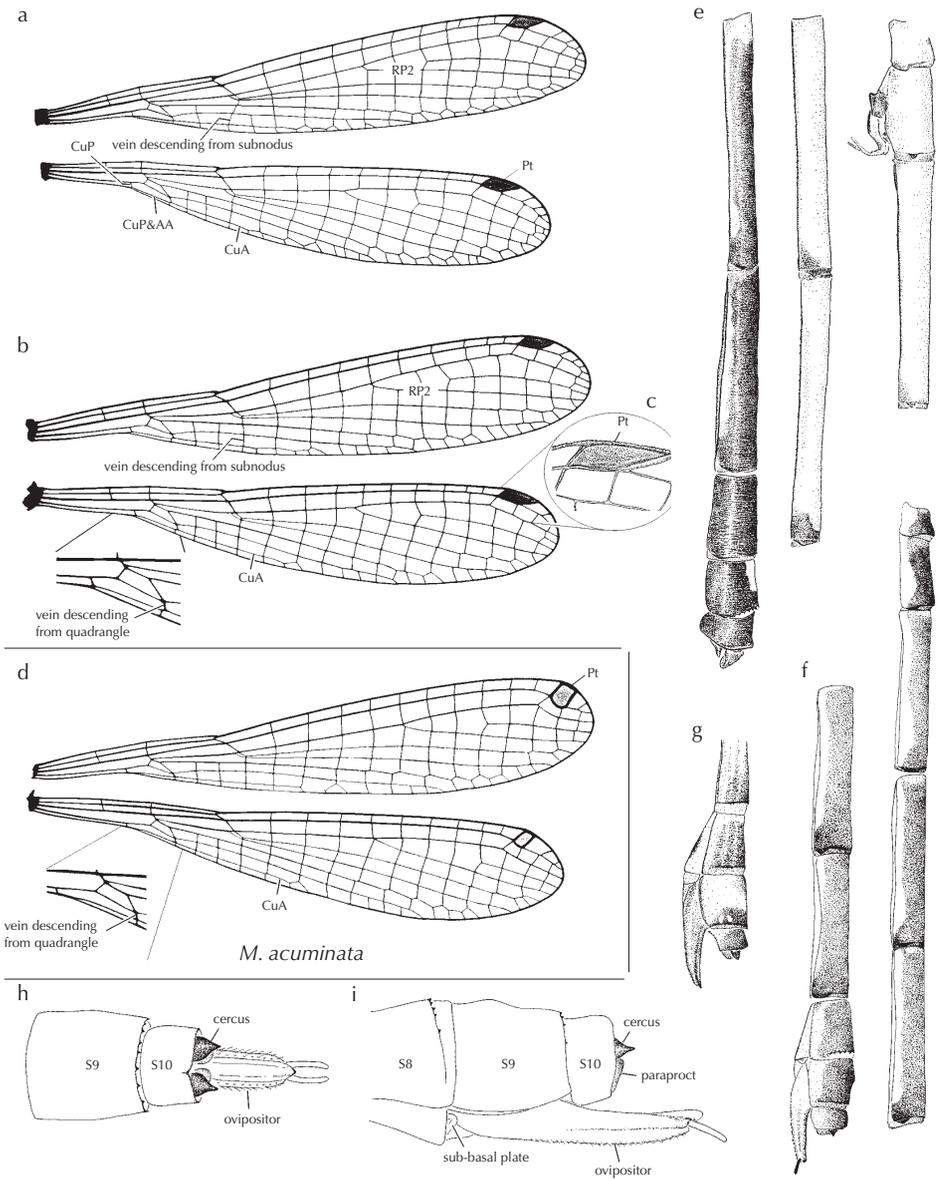


Figure 2: Morphological details of *Dolonagrion fulvellum* (a-c, e-i) and, for comparison, *Mesoleptobasis acuminata* (d) — (a-d) wings; (e-g) abdomen, lateral view; (h, i) S8-10 of female, dorsal and lateral view. — Depicted specimens: (a, g) female, lectotype, Pará, Brazil; (b) male, Tambopata, Peru; (c, e) male, Explorama Lodge, Peru; (d) male, Iquitos, Peru, in coll. RWG; (f, h, i) mature female, Tambopata, Peru.

(Figs 3a, b). The ovipositor, which extends beyond the tip of the cerci for a distance longer than S10 in *Dolonagrion* (Figs 2f-i), is longer than in any other New World coenagrionid with the only exception of *Inpabasis* Santos, 1961. However, the strongly angulate frons in *Inpabasis* easily distinguishes this genus from *Dolonagrion*. Pterostigma with costal side much longer than posterior side and pronounced acute angled distal corner (Figs 2a-c), especially evident in male Hw (Figs 2b, c), is shared in some degree only with *Amphiagrion* Selys, 1876, *Apanisagrion* Kennedy, 1920, and *Coenagrion* Kirby, 1890.

Remarks

Within New World Coenagrionidae, *Dolonagrion* shares with *Chrysobasis*, *Leptobasis*, *Mesoleptobasis*, and *Telagrion* the combination of a rounded frons, supplementary pretarsal tooth reduced in some degree, a relatively short CuA vein extending for 5-7 cells or less beyond vein descending from subnodus, and a relatively long ovipositor surpassing tip of cerci. *Dolonagrion* differs from all of them by shape of pterostigma, acutely obliquely rectangular, longer than high, and usually surmounting one cell (Figs 2a-c) versus rhomboidal and usually surmounting half a cell; *Mesoleptobasis acuminata* Santos, 1961, is an exception with pterostigma modified (Fig. 2d). It differs further from *Chrysobasis* and some species of *Leptobasis* by the presence of lateral lobes in genital ligula with sclerotized denticles on apices (Figs 3a, b) versus no lateral lobes and a pair of sclerotized spiniform processes (Figs 3c-e). Additional differences from *Mesoleptobasis* are given by vein descending from quadrangle not forming a straight line to wing margin (Figs 2a, b) and paraprocts subequal to cerci (Figs 3f, h), versus vein descending from quadrangle forming a straight line to wing margin (Fig. 2d) and paraprocts about five times longer than cerci (Figs 3i, j). Further differences from *Telagrion*, the genus in which *D. fulvellum* was originally placed, are found in its male cercus entire and decumbent (Figs 3f, h) which is horizontal with a ventro-basal branch in *Telagrion* (von Ellenrieder & Garrison 2008: figs 10a-c), and its genital ligula (Figs 3a, b) lacking the paired medio-longitudinal carinae on inner surface and patches of latero-external thin setae characteristic of *Telagrion* (von Ellenrieder & Garrison 2008: figs 8a-c).

The membranous depression on male cercus approximates that observed in *Anisagrion* Selys, 1876 and *Mesoleptobasis acuminata*, but the depression occupies the entire dorsal surface of cercus in *Anisagrion* (De Marmels & Garrison 2005: fig. 3a), and is oriented longitudinally in *M. acuminata* (Fig. 3j). Lateral lobes with sclerotized denticles on apices are also found in the genital ligula of *Phoenicagrion*, but in the latter the apex of ligula is entire and there are two pairs of lateral lobes (von Ellenrieder 2008: figs 6a-d).

Distribution

Amazon forest, from Pará State in Brazil to Loreto and Madre de Dios departments in Peru (Fig. 4).

Dolonagrion fulvellum (Selys, 1876) comb. nov.
(Figs 1; 2a-c, e-i; 3a, b, f-h; 4)

Telagrion fulvellum Selys, 1876: 967-969 [257-259 reprint] (description of male and female); — Santos (1965: 9; comments on generic placement); — Davies & Tobin (1984: 94; synonymic list); — Bridges (1994: VII-94; synonymic list); — Steinmann (1997: 357; synonymic list); — Tsuda (2000: 50; synonymic list); — Lencioni (2004: 91, 92, 96; mention); — Lencioni (2006: 199, 327, figs 133a-c, F40; illustrations of female prothorax, mesostigmal plates, S8-10 and wings, photograph of female lectotype); — Daigle (2007: 294; mention); — von Ellenrieder & Garrison (2007: 28, figs 13c-g; illustrations of female head, thorax, pretarsus, and S8-10).

Types

1 ♂, 1 ♀, syntypes. The existence of the male syntype, deposited in the Budapest Museum according to Selys' description, needs to be confirmed. A considerable part of the HNHM collection was lost in a fire in 1956, and neither of the two males deposited there since 1876 under the label of *T. fulvellum* bears a type label (G. Sziráki pers. comm.). However, after examining Selys' collection in the IRSNB (von Ellenrieder & Garrison 2007) we know that Selys' types were rarely accompanied by type labels, and we believe that one of the two males in Budapest could represent the male described by Selys. Since we were unable to examine these two males we could not compare them with Selys' description and the status of the male syntype remains doubtful. Although Steinmann (1997: 357) states: "Type male: Selys's Collection," this cannot be considered a lectotype designation, and Lencioni's (2006: 199) reference to the female in IRSNB as "ht [holotype]" is also in error. In order to clarify application of the name, we designate the syntype female from Pará, Brazil, in IRSNB (examined) with following labels: "[fulvellum] / [Bates] / [83] / [83. Agrion fulvellum / B.] / [dessiné par / Santos - 2.x.64]" as lectotype.

Specimens examined

Total 4 ♂, 6 ♀. — Brazil, Pará state: 1 ♀, lectotype (juvenile), Pará, vicinity of palm marsh, leg. H.W. Bates (IRSNB). Peru, Loreto Department: 1 ♂, 1 ♀ (mature), Explorama Lodge, 80 km NE Iquitos on Amazon River at junction with Yanamono River, 02/03 vii 1991, S.W. Dunkle leg. (RWG); Madre de Dios department: 1 ♂ (mature), Tambopata Nature Reserve, 30 km SW Puerto Maldonado, 14 ii 1982, G. Lamas (DRP); 1 ♀ (juvenile), same data but "trecha de bosque," F. Estremadoyro leg. (DRP); 1 ♀ (mature), same data but 18 ii 1982, D.L. Pearson leg. (DRP); 1 ♂ (teneral), same data but main trail, swamp forest, 26 ii 1983, M.P. Frisbie leg. (DRP); 1 ♀ (juvenile), same data but swamp forest, 05 iii 1983, M.P. Frisbie leg. (DRP); 1 ♂, 1 ♀ (♀ teneral), Boca, Río La Torre, 300 m, 01 iii 1983, G. Lamas leg. (DRP).

Redescription of male

Head: In life eyes black and yellowish green (S. Dunkle pers. comm.); labium ivory; base of mandibles and genae pale orange (teneral) to blue; rear of head blue except for black surrounding occipital foramen; blue postocular spots confluent with pale

area on rear of head; labrum, anteclypeus, postclypeus, and remainder of head black (Fig. 1d).

Thorax: Prothorax pale orange (teneral) to blue postero-laterally; remainder black. Pterothorax blue becoming paler laterally, in life yellow green (S. Dunkle pers. comm.), with broad mid-dorsal stripe, medial portion of mesostigmal plate, broad humeral stripe, and narrow stripe along upper half to entire metapleural suture black (Fig. 1e). Legs pale except for dark brown femora, base and distal tip of tibiae; tarsi, pretarsi, and spurs black. Wings hyaline, pterostigma black becoming yellow at apical 0.2 in Hw (Figs 2b, c); 8-9 Px in Fw, 7-9 in Px in Hw.

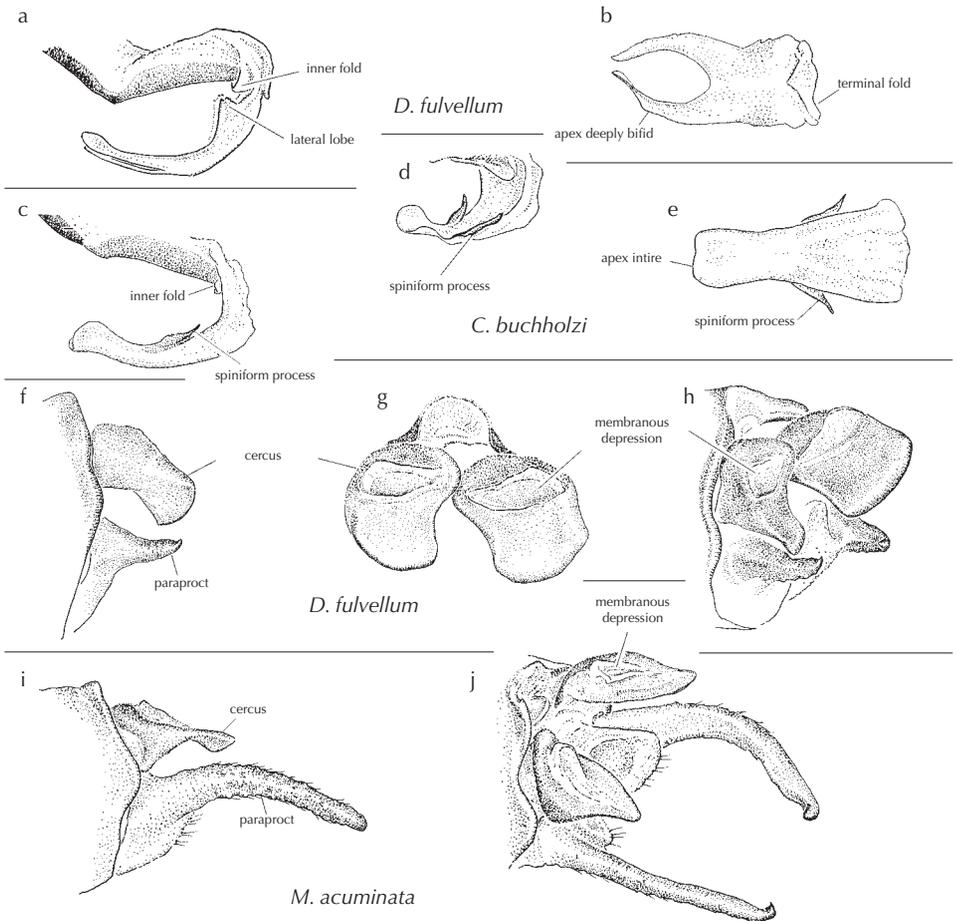


Figure 3: Details of male abdomen of *Dolonagrion fulvellum* (a, b, f-h) and, for comparison, *Chrysobasis buchholzi* (c-e) and *Mesoleptobasis acuminata* (d, e) — (a-e) genital ligula: lateral view (a, c); ectal view (b, e); medio-ental view (d); (f-j) male cercus: lateral view (f, j); posterior view (g); medio-dorsal view (h, j). — Depicted specimens: (a, b, f-h) Explorama Lodge, Peru; (c-e) Puerto Colombia, Colombia, in coll. RWG; (i, j) Iquitos, Peru, in coll. RWG.

Abdomen: S1 orange with anterior half black dorsally; S2-5 orange with black postero-lateral spots; S6 black except for dark orange at anterior 0.1 becoming pale ochre ventrally; S7 black becoming pale ochre ventrally; S8 black or with blue dorsal spot at anterior 0.5 half becoming pale ochre ventrally; S9 black with blue dorsal spot at anterior 0.6; S10, intersegmental membranes and appendages entirely black (Fig. 2e).

Dimensions: Total length 29-31; abdomen length 24-25; Fw length 14.2-14.9; Hw length 13.3-14.1.

Redescription of female

Head: With complete pale bar along posterior margin of head dorsum (Fig. 1b) and pale areas orange in lectotype female; in two juvenile and one teneral female from Peru, entire posterior area of head orange except for black lines along anterior portion of epicranial sutures (Fig. 1a); mature females from Peru as in male but base of mandibles and genae darker, postocular area of head with pruinosity obscuring color pattern (Fig. 1c); rear of head entirely pale.

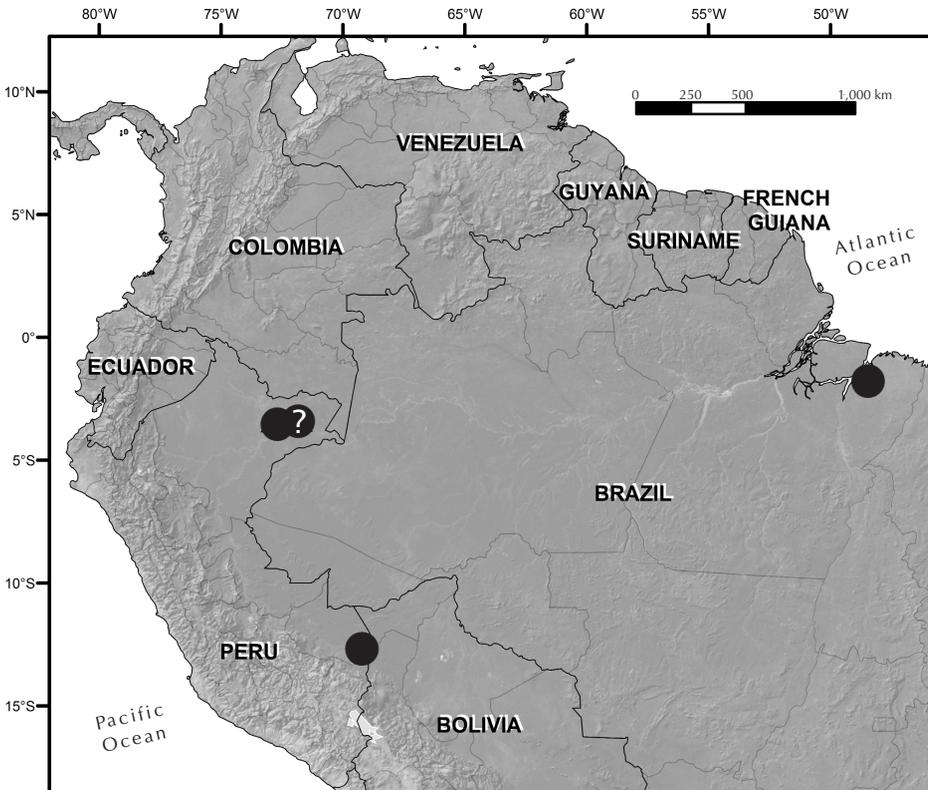


Figure 4: Distribution of *Dolonagrion fulvellum* (●). Question mark refers to uncertain locality from Selys, 'Peba'.

Thorax: Medial lobe of pronotum with a pair of latero-dorsal oval depressions (Figs 1i, j). Prothorax and pterothorax color pattern as in male in females from Peru (Figs 1f, h) but with pale areas darker blue and with pruinosity, especially along sides of prothorax and dorsum of pterothorax, obscuring color pattern; humeral stripe brown in one specimen; metapleural stripe brown or vestigial. In lectotype female prothorax and pterothorax pale orange (described by Selys 1876: 968 [258 reprint] as yellow and reddish yellow respectively), with grey (probably pale blue in life) narrow antehumeral stripe (Fig. 1g) and broad stripe along ventral portion of mesepimeron (as in Fig. 1f). Legs as in male except basal 0.6 of metafemur paler brown. One female from Madre de Dios with entire thorax orange, two others with obscure brown humeral stripe. Wings as in male but pterostigma brown (teneral and juvenile) to entirely black (Fig. 2a); 7-10 Px in Fw, 8-10 Px in Hw.

Abdomen: Orange in lectotype female except for black intersegmental membranes and black along distal sixth of S7 (along almost entire length of S7 in teneral and juvenile females from Peru), distal half of S8 (distal 0.8 in teneral and juveniles from Madre de Dios), distal third of S9, and entire S10. In mature females from Peru dorsum entirely dark brown to black except for basal pruinescent pale blue rings on S1-5; sides yellow or pale blue becoming ochre ventrally (Figs 2f, g). Appendages black; dorsal and ventral margin of ovipositor black, remainder yellow (Figs 2h, i).

Dimensions: Total length 26-30; abdomen length 20-24; Fw length 16.0-16.7; Hw length 14.6-15.7; ovipositor length 2.2-2.3, extending beyond S10 for distance of 0.75-0.9.

DISCUSSION

Machado (1985: 214) discussed the ambiguity of Selys' locality "Peba, Teffé [Amazon]" indicating that it can not 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: 143) suggested it could correspond to Pebas, in Loreto department in Peru, which we consider likely since it would be encompassed within the known distribution range of this species (Fig. 4: ?). The locality of the lectotype female, for which Selys (1876) stated "Para, a female in the vicinity of a palm marsh, by Bates" is also unclear. Papavero (1973: 256) states "On the following day and night [27 May 1848] he [Bates] sailed with a light wind, aided by the tide; up the Pará River (Baía de Marajó...), passing by Vigia..., and on the morning of the 28th arrived at Belém...The Capital of the then Province of Grão Pará (which included the Province of São José do Rio Negro, now the State of Amazonas), was called Santa Maria do Grão Belém do Pará, and was commonly abbreviated to 'Pará'. It is thus cited in many of Bates's [sic] labels and entomological writings of the time." We have therefore placed it on the map (Fig. 4) at Belém along the Amazon River, along where Bates probably collected, but the precise locality is unknown.

Selys' (1876) description of the male corresponds with the three males we examined except for some discrepancies in color pattern (greater extension of pale areas on abdomen) which could be due to his male being juvenile. The color pattern of the one juvenile and two teneral females from Madre de Dios matches closely that of the lectotype female, and we believe that all Peruvian specimens examined are conspecific with the lectotype. We believe color differences between the lectotype female

from Pará and the two mature females from Peru are due to age related color changes, with a paler, mostly orange, immature color morph (lectotype female and immature females from Peru) and a darker, with well defined black and pale blue areas, mature color morph (mature females from Peru), as has been observed for several other species of Coenagrionidae, i.e. *Acanthagrion fluviatile* (De Marmels, 1984) (De Marmels 1990), *Chrysobasis* and *Calvertagrion* spp. (D. Paulson pers. comm.), *Leptobasis vacillans* Hagen, 1877 (Calvert 1902), and *Mesoleptobasis cantralli* Santos, 1961 (Santos 1961).

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