

A redefinition of *Telagrion* Selys and *Aceratobasis* Kennedy stat. rev. and the description of *Schistolobos* gen. nov. for *Telagrion boliviense* Daigle (Odonata: Coenagrionidae)

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ABSTRACT

The species currently included in *Telagrion* Selys are found to belong to three different genera: *Telagrion sensu stricto*, monotypic, including only the type species *T. longum* Selys, *Schistolobos* gen. nov., also monotypic, including *Telagrion boliviense* Daigle, and *Aceratobasis* Kennedy, resurrected to include *Metaleptobasis cornicauda* Calvert (type species), *Agrion macilentum* Rambur, *Telagrion mourei* Santos and *T. nathaliae* Lencioni. Synonymic lists, diagnoses, illustrations and distribution maps for the three genera and a key for species of *Aceratobasis* are provided.

Key words: Odonata, damselfly, Coenagrionidae, *Aceratobasis*, *Telagrion*, *Schistolobos*, taxonomy, diagnoses, South America.

RESUMEN

Se halla que las especies incluídas actualmente en *Telagrion* Selys pertenecen a tres géneros distintos; *Telagrion sensu stricto*, monotípico, incluyendo solo la especie tipo *T. longum* Selys, *Schistolobos* gen. nov., también monotípico, incluyendo a *Telagrion boliviense* Daigle, y *Aceratobasis* Kennedy, revivido para incluir a *Metaleptobasis cornicauda* Calvert (especie tipo), *Agrion macilentum* Rambur, *Telagrion mourei* Santos y *T. nathaliae* Lencioni. Se proporcionan listas sinónmicas, diagnosis, ilustraciones y mapas de distribución para estos tres géneros y una clave para las especies de *Aceratobasis*.

INTRODUCTION

This paper continues previous work (von Ellenrieder 2003; De Marmels & Garrison 2005; Garrison & von Ellenrieder 2005; Garrison 2007; von Ellenrieder & Garrison 2007; De Marmels 2007; von Ellenrieder & Lozano 2008) allowing for placement of poorly-known species to definable genera within neotropical Zygoptera in order that all genera may be adequately diagnosed.

Past literature dealing with the species we treat here has often involved generic transfers reflecting a continuing inadequacy in generic diagnoses. *Telagrion* was described by Selys (1876) to include four new species: *T. longum*, *T. fulvellum*, *T. inversum* and *T. mecistogastrum*. He (1876) placed the genus among those lacking female vulvar spine in his second section (with inferior sector of triangle

arising at basal postcostal vein or slightly proximal), and diagnosed it by the presence of pale postocular spots, medial vein of normal length in both sexes, abdomen extremely long and S10 of male not forked. Kirby (1890) designated *T. longum* as type of the genus; *Telagrion inversum* was transferred to *Leptobasis* Selys and *T. mecistogastrum* to *Minagrion* Santos by Santos (1965). Several species were subsequently described under this genus, and all of them but *T. oreas* Ris, *T. quadricolor* Ris, *T. mourei* Santos, *T. nathaliae* Lencioni and *T. boliviense* Daigle were later shifted to other genera or synonymized: *Telagrion? daeckii* Calvert was transferred to *Enallagma* Charpentier by Byers (1927), *T. raineyi* Williamson to *Leptobasis* by Garrison (1986), *T. prothoracicum* Kimmins to *Leptagrion* Selys, *T. serracipoense* Santos and *T. riberoi* Santos to *Minagrion* by Santos (1965), and *T. tenax* St. Quentin was synonymized with *T. longum* by De Marmels & Garrison (2005). Several species described under other genera were transferred to *Telagrion* by Santos (1965), including *Leptobasis diceras* Selys (transferred to *Metaleptobasis* by Cumming 1954), *Agrion macilentum* and *Metaleptobasis cornicauda*. Santos (1965) also synonymized *Aceratobasis* with *Telagrion*. Kennedy (1920b) had erected *Aceratobasis* to include *Metaleptobasis cornicauda* and described it briefly as having “characters as in *Metaleptobasis* but male without thoracic horns and the superiors longer than the inferiors.” Thus until recently (Lencioni 2004, 2006; Daigle 2007) *Telagrion* was considered to comprise *T. longum*, *T. cornicauda*, *T. diceras*, *T. macilentum*, *T. oreas*, *T. quadricolor*, *T. mourei*, *T. nathaliae* and *T. boliviense*. As was mentioned by Lencioni (2006) no generic characters seem to define this group of species.

We recently examined the type of *Leptobasis diceras* and the female syntype of *T. fulvellum* deposited in IRSNB (von Ellenrieder and Garrison 2007), and concluded that the first had been correctly shifted to *Metaleptobasis* by Cumming (1954) and improperly placed in *Telagrion* by Santos (1965), and that *T. fulvellum* belongs to a new genus (Garrison and von Ellenrieder 2008). We also found that some of the poorly known species included in *Telagrion*, namely *T. oreas*, *T. quadricolor* and *T. prothoracicum*, are congeneric with *Acanthagrion acutum* Ris and *Cyanallagma thekterion* De Marmels, and are consequently describing a new genus for them elsewhere (von Ellenrieder & Garrison 2008).

Based on examination of the remaining *Telagrion* specimost likely most likely es, we reevaluate the genus and conclude that it is an artificial assemblage combining three genera; its type species, *T. longum*, and *T. boliviense* are not congeneric, nor are either of them congeneric with *T. cornicauda*, *T. macilentum*, *T. mourei* and *T. nathaliae*. The genus *Aceratobasis* briefly described by Kennedy (1920b) for *Metaleptobasis cornicauda* is therefore resurrected to include the last four species, and *Schistobos* gen. nov. is described for *T. boliviense*.

MATERIAL AND METHODS

Adults of all described species of *Telagrion sensu lato* were examined, and all original descriptions and revisions were analyzed. Additionally, several species of other coenagrionid genera were examined to establish generic boundaries. All diagnostic characters were illustrated with the aid of a camera lucida and drawings are not to scale. Measurements are in mm, and total length and abdominal length do not include appendages. Wing terminology follows Riek & Kukulova-Peck (1984) and genital ligula terminology Kennedy (1916). Abbreviations for

structures used throughout the text are as follows: FW: forewing; HW: hindwing; S1-10: abdominal segments 1 to 10. Diagnoses, synonymies and distribution ranges are provided for all species. Maps represent distribution records from collections and reliable literature records, and were created electronically from the Digital Chart of the World (1:1,000,000) using ArcView 9.1. Elevation data and longitude/latitude coordinates were culled from the Global Gazetteer website (<<http://www.fallingrain.com/world/>>).

Acronyms for collections are as follows:

DRP	— Dennis R. Paulson personal collection, Seattle, Washington, USA
FAAL	— Frederico A.A. Lencioni personal collection, São Paulo, BRAZIL
FSCA	— Florida State Collection of Arthropods, Gainesville, Florida, USA
IRSNB	— Institut Royal des Sciences Naturelles de Belgique, Brussels, BELGIUM
MCZ	— Museum of Comparative Zoology, Cambridge, Massachusetts, USA
NHMW	— Naturhistorisches Museum Wien, AUSTRIA
MNRJ	— Museu Nacional de Rio de Janeiro, Rio de Janeiro, BRAZIL
RWG	— Rosser W. Garrison personal collection, Sacramento, California, USA
UAGRM	— Universidad Autónoma 'Gabriel Raúl Moreno', Santa Cruz, BOLIVIA

RESULTS

Telagrion longum shares with all other five species remaining in *Telagrion*, *T. cornicauda*, *T. macilentum*, *T. mourei*, *T. nathaliae* and *T. boliviense*, only its relatively long abdomen (within New World Coenagrionidae shared also with *Bromeliagrion* De Marmels, *Leptagrion* and a new genus in description), presence of a ventro-basal branch in male cercus (shared with many other New World Coenagrionidae genera including *Cyanallagma* Kennedy, *Enallagma*, *Homeoura* Kennedy and *Mesamphiagrion* Kennedy) and absence of a vulvar spine in female S8 (shared with another 24 Coenagrionidae genera in the New World), and differs from them by numerous characters (Table 1).

Since *T. longum* is the type species, *Telagrion* is here redefined based on its characters: rounded frons, presence of pale postocular spots (Fig. 1a), medial portion of posterior prothoracic lobe projected caudally (Fig. 5h, k), small pretarsal supplementary tooth (forming a straight angle with claw; Fig. 3b), vein descending from quadrangle broken (Fig. 6a), presence of a well developed inner fold and unique paired medio-longitudinal ridges on inner surface of distal segment of male genital ligula (Fig. 8a-b) and male cercus with a ventro-basal branch arising from the inner surface of cercus (Fig. 10b-c). None of these characters is shared by *T. cornicauda*, *T. macilentum*, *T. mourei* and *T. nathaliae*, which are consequently excluded from *Telagrion* and for which we resurrect the available name *Aceratobasis*.

Telagrion boliviense shares with *Telagrion longum* a rounded frons, presence of pale postocular spots (Fig. 1b; can also be absent), vein descending from quadrangle broken (Fig. 6b), and a well developed inner fold in male genital ligula (Fig. 8d) but differs from it and from *Aceratobasis* by the almost linear posterior margin of head between compound eye and occipital bar (Fig. 1b), well developed pretarsal supplementary tooth (forming an acute angle with claw; Fig. 3c), metatibial spurs much longer than spaces between them (Fig. 4b), deeply cleft female pronotum, female mesostigmal plates meeting anteriorly (Fig. 5l), brown flavescent wings with shorter petiolation (CuP reaching CuPAA and not

posterior margin of wing; Fig. 6b), shorter ovipositor extending only to posterior margin of S10 and distal segment of male genital ligula lacking paired medio-longitudinal ridges and lacking outer row of strong setae (Fig. 8d-e); to accommodate this species *Schistolobos* gen. nov. is described here.

Besides having an angulate frons, lacking pale postocular spots (Fig. 1c), vestigial pretarsal supplementary tooth (forming an obtuse low prominence; Fig. 3a), and AA2 aligned with svd (Fig. 7a-b) the four species of *Aceratobasis* differ from *Telagrion* and *Schistolobos* by the presence of an outer lateral row of strong setae on the distal segment of genital ligula (a unique character for *Aceratobasis*; Fig. 8f-m), female ovipositor (Fig. 9e) slightly surpassing distal tips of cerci (considerably longer in *Telagrion* and reaching only posterior margin of S10 in *Schistolobos*), and sub-basal plates of ovipositor large, broadly rectangular (Fig. 9e) and meeting ventrally. Table 1 summarizes diagnostic differences between these three genera.

ACERATOBASIS Kennedy, 1920

Aceratobasis Kennedy, 1920b: 88 (diagnosis); Bridges 1994: III.1 (as junior synonym of *Telagrion*).

Type species.— *Metaleptobasis cornicauda* Calvert, 1909 by original designation (Kennedy 1920b).

Characterization.— Color of head, thorax and dorsum of abdomen black with green metallic reflections, pale areas yellow or pale green, male S8-10 with bluish pruinescence. Sexes dimorphic as to thoracic color pattern; pterothorax of males largely black dorsally with metallic reflections or covered with white pruinosity; females with broad dark middorsal stripe narrowed anteriorly and with pale antehumeral stripe (as in Fig. 2). Frons angulate; pale postocular spots and pale occipital bar absent; occipital lobes not protruding posteriorly but margin of head between compound eye and occipital bar markedly convex (Fig. 1c). Medial portion of posterior lobe of prothorax not projected caudally (Fig. 5a-g, j). Female mesostigmal plates separated from each other (Fig. 5j). Tibial spurs shorter than or as long as distance between them (as in Fig. 4a); pretarsal claw with vestigial supplementary tooth represented by an obtuse low prominence (Fig. 3a). Wings (Fig. 7) hyaline; CuP reaching posterior margin of wing; vein descending from quadrangle forming an unbroken line to wing margin. Abdomen relatively long, with a ratio of 5.6-6.7 to length of head plus thorax. Genital ligula distal segment (Fig. 8f-m) with a well developed terminal fold, lacking inner fold, lacking inner paired medio-longitudinal ridges, with deeply bifid to entire apex, lacking lateral patch of short thin setae, and with a unique outer row of strong setae. Postero-dorsal margin of male S10 recessed and with a 'v' or 'u' shaped incision (Fig. 11b, e-f, I, k). Male cercus (Fig. 11) approximately horizontal and rectangular with a ventro-basal digitiform or rounded spur shorter than one third of horizontal branch on inner surface of cercus, which in two species (*A. mourei* and *A. nathaliae*; Fig. 11h, l) is movable and articulate with cercus whereas in two others (*A. cornicauda* and *A. macilenta*; Fig. 11 b-c, f) is fused to the cercus; paraproct entire, with apex simple (Fig. 11). Female lacking vulvar spine on S8; postero-dorsal margin of S9 lacking denticles; sub-basal plates of ovipositor large, broadly rectangular and meeting ventrally; ovipositor slightly surpassing tip of cerci (Fig. 9e).

Table 1. Diagnostic characters of *Aceratobasis*, *Schistobos* and *Telagrion*; unique characters within Coenagrionidae highlighted in grey.

	<i>Aceratobasis</i>	<i>Schistobos</i>	<i>Telagrion</i>
Head (Fig. 1)			
Frons	angulate	rounded	rounded
Pale postocular spots	absent	present	present
Pale occipital bar	absent	present	absent
Margin of head between eye and occipital bar	convex	linear	convex
Thorax (Fig. 5)			
Posterior lobe of male pronotum	not projected	not projected	projected
Posterior lobe of female pronotum	entire & not projected	deeply cleft & not projected	entire & projected
Female mesostigmal plates	separated	meeting anteriorly	separated
Legs (Figs 3-4)			
Space between metatibial spurs	shorter or as long as spurs	much longer than spurs	shorter or as long as spurs
Pretarsal supplementary tooth	vestigial	well developed	small
Wings (Figs 6-7)			
Membrane	hyaline	flavescent brown	hyaline
vein descending from quadrangle	forming an unbroken line	broken	broken
CuP (anal crossvein) reaching	posterior margin of wing	CuPAA	posterior margin of wing
Abdomen (Fig. 9)			
Postero-dorsal margin of male S10	recessed with incision	not recessed and entire	not recessed and entire
Male paraproct	entire, apex simple	forked	entire, apex bifid
Denticles on posterior margin of female S9	absent	present	present
Female sub-basal plate of ovipositor	large, broadly rectangular	small, narrowly triangular	small, narrowly triangular
Female ovipositor extending	slightly beyond cerci	to S10 posterior margin	far beyond cerci
Distal segment of male genital ligula (Fig. 8)			
Inner fold	absent	present	present
Pair of medio-longitudinal ridges on inner surface	absent	absent	present
Lateral patch of thin hairs	absent	present	present
Outer row of strong setae	present	absent	absent

Diagnosis.— Among New World Coenagrionidae, the lateral row of strong setae on each outer lateral surface of genital ligula distal segment (Fig. 8f-m) is unique for *Aceratobasis*. Further diagnostic differences from *Schistobos* and *Telagrion* are summarized in Table 1.

Distribution.— Atlantic forest in Brazil from 0 to 610 m a.s.l. (Fig. 12a).

Aceratobasis cornicauda (Calvert, 1909)

Figs 1c, 2a, 3a, 5b, e, j, 7a, 8f-g, 9c, e, 11a-c, 12a

Metaleptobasis cornicauda Calvert, 1909: 199-200, figs. 110-111 (description of male, illustrations of S10); Cumming 1954: 24, 29, 31 (key, discussion of relationships).

Aceratobasis cornicauda Kennedy 1920b: 88 (designation as type species).

Telagrion cornicauda Santos 1965: 9 (transfer to *Telagrion*); Costa 1972: 80-81, figs. 2-4, 7-8, 10 (description of female, illustrations of pt, thorax, S10 and genital ligula);

Davies & Tobin 1984: 94 (synonymic list); Garrison 1991: 13 (synonymic list); Bridges 1994: VII.58 (synonymic list); Steinmann 1997: 357 (synonymic list); Tsuda 2000: 50 (synonymic list); Lencioni 2004: 96-97, figs. 1A1-4 (key, illustrations of male S10); Lencioni 2006: 197, figs. 131A-F (illustrations of male pronotum, S10 and genital ligula); Daigle 2007: 294 (comparison with *T. boliviense*).

Types.— Male holotype in MCZ (examined) with following data: “[illegible] N./ Bahia”, “Hagen [printed]”, “Mus. Berol. [printed]”, “Gizzard/ removed [printed]”, “Figured/ C.H.K. [in pencil]”, “TYPE...B *Metaleptobasis/ cornicauda* Calv. [written]/ PP Calvert det. 1909/ AnCarMus. VI p. [printed] 200/ Orig. Pl. VI, ff. 110, 111. [written]”. MCZ 12293

Specimens examined.— 4 males, 1 female. Brazil, Bahia State: 1 male (**holotype**) (IRSNB); 2 males, Alcobaca, I-1982, ABM Machado (RWG), 1 male, Rio das Ostras, I-1988, ABM Machado (RWG); Espirito Santo State: 1 female, Jacareípe, 11/28-II-1967, P Elias (RWG).

Diagnosis.— CuA extending to level of RP2 origin (Fig. 7a; as in *A. macilenta* and *A. nathaliae*). Posterior margin of prothorax slightly trilobate (Fig. 5b, e; as in *A. macilenta*). Genital ligula with deeply bifid apex and distal corners projected into long apical lobes (Fig. 8f-g; unique). Male cercus (Fig. 11a-c) with tip expanded in lateral view (unique); lacking sub-basal tooth (as in *A. macilenta* and *A. nathaliae*); ventro-basal spur fused to cercus and directed medially (Fig. 11c; as in *A. macilenta*), elongated and digitiform (as in *A. mourei* and *A. nathaliae*). Male and female epiproct with a dorso-medial tooth (Figs 9c, 11b-c), appearing vertically bifid in lateral view (Fig. 9e).

Biology.— Behavior, breeding habitat and larva unknown.

Distribution.— Atlantic forest at sea level in Bahia and Espirito Santo States, Brazil (Fig. 12a).

Remarks.— Costa (1972) diagnosed between females of *Telagrion cornicauda* and *T. macilenta* based on an examination of 108 females of the former and an unspecified number of females of the latter. Based on our material (one female of *A. cornicauda* and two females of *A. macilenta*) we have found that from the characters she proposed, shape of pale antehumeral stripe (Fig. 2a-b), thickness of pt margins and level of branching of RP2 overlap in these two species, and only size (HW and abdomen length) seems to be reliable.

***Aceratobasis macilenta* (Rambur, 1842) comb. nov.**

Figs 2b, 5d, g, 8h-i, 9b, 11d-f, 12a

Agrion macilentum Rambur, 1842: 259-260 (description of male, “Brésil”).

Leptobasis macilenta Selys 1877: 106-107 (6, 12-13 reprint) (redescription of male).

Metaleptobasis macilenta Cumming 1954: 24, 29, 31 (transfer to *Metaleptobasis*, key, discussion relationships); Santos 1956: 357-362, figs. 1-13 (description of female, additional notes on male, illustrations of head, thorax, abdomen, female S9-10, male S10 and male secondary genitalia).

Telagrion macilentum Santos 1965: 9 (transfer to *Telagrion*); Costa 1972: 80, figs. 1, 5-6, 11 (illustrations of pt, thorax, S10 and genital ligula); Davies & Tobin 1984: 94 (synonymic list); Garrison 1991: 13 (synonymic list); Bridges 1994: VII.141 (synonymic list); Steinmann 1997: 358 (synonymic list); Tsuda 2000: 50 (synonymic list); Lencioni 2004: 95-97, figs. 1B1-4, 2A (in key, illustrations of male S10, female S9-10); Lencioni 2006: 201, figs. 135A-H (illustrations of pronotum, male S10 and female S9-10); Daigle 2007: 294 (comparison with *T. boliviense*).

Types.— Male holotype in IRSNB (examined).

Specimens examined.— 4 males, 2 females. Brazil: 1 male (**holotype**) (IRSNB); Rio de Janeiro State: 1 male, Ilha Grande, Entre Rio, 31-III-1956 (RWG); Santa Catarina State: 2 males, 1 female, Joinville, 11-II/30-III-1981, Miers (RWG); São Paulo State: 1 female, Cipó, 1-I-1981, Alin (DRP).

Diagnosis.— CuA extending to level of RP2 origin (as in *A. cornicauda* and *A. nathaliae*). Posterior margin of prothorax slightly trilobed (Fig. 5d, g). Genital ligula with apex entire and slightly concave, and distal corners projected into short apical lobes (Fig. 8h-i; unique). Male cercus (Fig. 11d-f) with tip narrowed in lateral view (as in *A. mourei* and *A. nathaliae*); lacking medial sub-basal tooth (as in *A. cornicauda* and *A. nathaliae*); ventro-basal spur short and broadly truncate (unique) and fused to cercus (as in *A. cornicauda*; Fig. 11f). Male and female epiproct with a dorso-medial tooth (Fig. 9b), appearing vertically bifid in lateral view (as in Fig. 9e).

Biology.— Adults fly slowly and for short distances, and perch by hanging on shrubs and marginal vegetation bordering narrow clear water streams within forest (Santos 1956). Larva unknown.

Distribution.— Atlantic forest from 0 to 140 m a.s.l. in Minas Gerais, Rio de Janeiro, São Paulo and Santa Catarina States, Brazil (Fig. 12a).

***Aceratobasis mourei* (Santos, 1970) comb. nov.**

Figs 5a, 7b, 8j-k, 11g-h, 12a

Telagrion mourei Santos, 1970: 25-27, figs. 1-5, 7, 10, 11, 14 (description of male and female, illustrations of female thorax, pterostigma, male S10 and genital ligula); Davies & Tobin 1984: 94 (as *T. maurei* [sic], synonymic list); Garrison 1991: 13 (synonymic list); Bridges 1994: VII.159 (synonymic list); Steinmann 1997: 358 (as *T. maurei* [sic], synonymic list); Tsuda 2000: 50 (synonymic list); Lencioni 2004: 96-97, figs. 1D1-4 (in key, illustrations of male S10); Lencioni 2006: 202, figs. 136A-H (illustrations of thorax, pterostigma, male S10 and genital ligula); Daigle 2007: 294 (comparison with *T. boliviense*).

Types.— Male holotype, female allotype in MNRJ (Costa & Mascarenhas 1998, not examined).

Specimens examined.— 1 male. Brazil, Espírito Santo State: 1 male, Conceição da Barra, Fazenda Jose Campista, 03/08-XI-1969, P Elias (RWG).

Diagnosis.— CuA short, extending to level of subnodus or one cell proximal or distal to it (Fig. 7b; unique). Posterior margin of prothorax of male slightly sinuate (Fig. 5a). Genital ligula (Fig. 8j-k) with apex entire and slightly concave, and distal corners not projected into apical lobes (as in *A. nathaliae*); narrow, about twice as long as wide in ectal view (Fig. 8k; as in *A. cornicauda*). Male cercus (Fig. 11g-h) with tip narrowed in lateral view (as in *A. macilenta* and *A. nathaliae*); with a small digitiform medial sub-basal tooth (unique), ventro-basal spatulate spur with reflexed tip (unique), movable and directed medio-ventrally (as in *A. nathaliae*). Male and female epiproct lacking a dorso-medial tubercle (Fig. 11i), entire in lateral view.

Biology.— Behavior, breeding habitat and larva unknown.

Distribution.— Atlantic forest at sea level in Espírito Santo State, Brazil (Fig. 12a).

***Aceratobasis nathaliae* (Lencioni, 2004) comb. nov.**

Figs 5c, f, 8l-m, 9a, 11j-l, 12a

Telagrion nathaliae Lencioni, 2004: 93-97, figs. 1C1-4, 2B, D-F, 3, 4A, B (description of male and female, illustrations of pronotum male and female, male S10, female S9-10 and thorax, map, photographs of head and thorax); Lencioni 2006: 203, figs. 137A-F (illustrations from Lencioni 2004); Daigle 2007: 294 (comparison with *T. boliviense*).

Types.— Male holotype, female allotype in FAAL (not examined).

Specimens examined.— 1 male, 1 female. Brazil, São Paulo State: 1 male, 1 female (**paratypes**), Fazenda Santana do Rio Abaixo, Jacareí, 20-25-X-2001, FAA Lencioni (RWG).

Diagnosis.— CuA extending to level of RP2 origin (as in *A. cornicauda* and *A. macilenta*). Posterior margin of prothorax linear in male to slightly sinuate with four barely discernable lobes in female (Fig. 5c, f). Genital ligula (Fig. 8l-m) with apex entire and slightly concave, and distal corners not projected into apical lobes (as in *A. mourei*); about as wide as long in dorsal view (as in *A. macilenta* and *A. mourei*); lacking medial sub-basal tooth (as in *A. cornicauda* and *A. nathaliae*); ventro-basal spur elongated and digitiform (as in *A. cornicauda*), movable and directed medio-ventrally (as in *A. mourei*). Male and female epiproct lacking a dorso-medial tubercle (Fig. 9a), entire in lateral view.

Biology.— Adults found along a shaded road in secondary forest, flying softly and slowly for short distances, and hanging as soon as they landed (Lencioni 2004). Larva and breeding habitat unknown.

Distribution.— Atlantic forest at 600 m a.s.l. in São Paulo State, Brazil (Fig. 12a).

KEY TO ACERATOBASIS

This key will allow for identification of males of the four known species. We had access to a single female of three of the four known species and they are strikingly similar. Caution should be used in placing females and we acknowledge that additional specimens may necessitate alteration of the key for members of this sex.

- 1 CuA short, extending to level of subnodus or one cell proximal or distal to it (Fig. 7b); male cercus with a small digitiform medial sub-basal tooth in addition to ventro-basal spur (Fig. 11g-i) ***A. mourei***
- 1' CuA extending to level of RP2 origin (Fig. 7a); male cercus with only a ventro-basal spur (Fig. 11b-c, f, k-l) **2**
- 2 Prothorax linear in male to slightly sinuate with four barely discernable lobes in female (Fig. 5c, f); male and female epiproct lacking dorso-medial tubercle (Fig. 9a); male with ventro-basal spur articulate to cercus, digitiform and directed medioventrally (Fig. 11k-l); male genital ligula with distal corners not projected into apical lobes (Fig. 8l-m) ***A. nathaliae***
- 2' Prothorax slightly trilobate (Fig. 5b, d-e, g); male and female epiproct with a dorso-medial tubercle (Fig. 9b-c); male ventro-basal spur fused to cercus, directed medially (Fig. 11c, f); male genital ligula with distal corners projected into apical lobes (Fig. 8h-k) **3**

- 3 Larger species (male abd 42-46, HW 24-25.5; female abd 39-43, HW 25-27); male cercus expanded at tip (Fig. 11a-b), with ventro-basal spur elongated and pointed (Fig. 11c); male genital ligula with deeply bifid apex and distal corners projected into long apical lobes (Fig. 8f-g) *A. cornicauda*
- 3' Smaller species (male abd 35-41.5, HW 21-22.5; female abd 34-38, HW 23-24.5); male cercus narrowed at tip (Fig. 11d-f), with ventro-basal spur short and broadly rounded (Fig. 11f); male genital ligula with apex slightly concave and distal corners projected into short apical lobes (Fig. 8h-i) *A. macilenta*

SCHISTOLOBOS gen. nov.

Type species.— *Telagrion boliviense* Daigle, 2007 by present designation [NOTE: according to Art. 34.2 of the International Code of Zoological Nomenclature (1999), the original spelling of this species, *Telagrion boliviensis*, must be changed to *boliviense* in order to agree in gender with the generic name *Telagrion* (neuter)].

Etymology.— From the Greek *schistos* meaning ‘split’ — and *lobos*, a masculine noun meaning ‘lobe’, referring to the unique deeply cleft female prothoracic posterior lobe.

Characterization.— Color pale brown lacking metallic reflections, with some darker brown areas as posterior spots on thoracic sutures and rings on distal portions of S3-6. Frons rounded; pale postocular spots present as transversally elongated triangular cream colored pale areas and pale occipital bar present (obscured by post mortem changes in four out of the 10 specimens examined); occipital lobes not protruding posteriorly; posterior margin of head between compound eye and occipital bar almost linear (Fig. 1b). Medial portion of posterior lobe of prothorax not projected; in male broadly rounded, in female deeply cleft (Fig. 5i, l). Female mesostigmal plates meeting anteriorly (Fig. 5l). Tibial spurs much longer than distance between them (Fig. 4b); pretarsal claw with well developed supplementary tooth forming an acute angle with claw (Fig. 3c). Wings (Fig. 6b) flavescent brown; CuP reaching CuPAA, distally to origin of CuPAA for a distance from slightly longer to slightly shorter than CuP; vein descending from quadrangle broken. Abdomen relatively long, with a ratio of 4.2-4.4 to length of head plus thorax. Genital ligula distal segment (Fig. 8d-e) with well developed terminal and inner folds, lacking inner medio-longitudinal ridges, lacking outer row of strong setae, with deeply bifid apex, with a lateral patch of short thin setae. Postero-dorsal margin of male S10 entire and not recessed (Fig. 10e). Male cercus with a ventro-basal triangular branch continuous with entire ventral margin of cercus, about as long as half of horizontal branch (Fig. 10d-f); paraproct forked, with dorsal branch directed medially and shorter than posteriorly directed ventral branch (Fig. 10d-e). Female lacking vulvar spine; sub-basal plates of ovipositor small, narrowly triangular (as in Fig. 9b), not meeting ventrally; postero-dorsal margin of S9 with denticles; ovipositor extending to posterior margin of S10.

Diagnosis.— The deeply cleft posterior lobe of female pronotum and female mesostigmal plates meeting anteriorly (Fig. 5l) are unique to *Schistolobos* among New World Coenagrionidae. Further diagnostic differences from *Aceratobasis* and *Telagrion* are summarized in Table 1.

Distribution.— Amazon forest from 150 to 300 m a.s.l. between Madre de Dios Department in Peru and Santa Cruz Department in Bolivia (Fig. 12b).

Schistobolus boliviensis (Daigle, 2007) **comb. nov.**

Figs 1b, 3c, 4b, 5i, 1, 6b, 8d-e, 10d-f, 12b

Telagrion boliviense Daigle, 2007: 291-294, figs. 1-7 (description of male and female, illustrations of holotype male S10 and allotype female prothorax [NOTE: Daigle (2007) stated drawings correspond to paratypes, but they are of primary types], photographs of male head, thorax and S1-4, male S9-10 and female S8-10).

Types.— Male holotype, female allotype in UAGRM (examined).

Specimens examined.— 6 males, 5 females. Bolivia, Beni Department, Cercado Province: 1 male, 1 female (**holotype** and **allotype** respectively), forest trails 2 kms N of Loma Suárez, 12 km N Trinidad, 22-VIII-2003, J Daigle (UNAGRM); 1 male, 1 female (**paratypes**), forest 5 km N of Loma Suárez, Lago Los Lagartos, 22-VIII-2003, B Mauffray (FSCA); 1 female, forest 2 km N of Loma Suárez, 12 km N of Trinidad, 21-VIII-2003, B Mauffray (FSCA); 2 males, 1 female, forest N of Trinidad, 21-VIII-2003, FAA Lencioni (RWG).— Peru, Madre de Dios Department: 1 male, 1 female (**paratypes**), Tambopata Nature Reserve, 30 km SW of Puerto Maldonado, 26-II-1983, MP Frisbie (DRP); 1 male, Río Tambopata, Tres Chimbadas, 290 m, 26-II-1983, G Lamas (DRP).

Diagnosis.— As for genus.

Biology.— Breeds in lakes in grassland and open pastures surrounded by marginal forest; immature adults remain in forest underbrush during dry season, and return to lakes when mature at advent of rainy season (Daigle 2007). After alighting adults briefly open and close their wings once or twice as do species of *Argia* (Lencioni 2006; Daigle 2007). Larva unknown.

Distribution.— As for genus (Fig. 12b).

TELAGRION Selys, 1876

Telagrion Selys, 1876: 1234, 1235, 966-967 (124, 125, 256-257 reprint) (key, diagnosis, descriptions of *T. longum*, *T. fulvellum*, *T. inversum* and *T. mecistogastrum*); Kirby 1890: 155, designation of *Telagrion longum* Selys, 1876 as type species; Munz 1919: 62 (generic key); St. Quentin, 1960: 47-48 (diagnosis, generic key); Davies & Tobin 1984: 94 (synonymic list); Garrison 1986: 67-68 (key to neotropical genera lacking postocular spots); Bridges 1994: III.50 (synonymic list); Steinmann 1997: 357 (synonymic list; NOTE: Steinmann erroneously states that type genus of *Telagrion* is *T. longum* by "original designation", but the genus originally included four species and none designated as type); Tsuda 2000: 50 (synonymic list); Lencioni 2004: 91-97, figs. 1-4 (key and illustrations); Lencioni 2006: 21, 47, 197-203, figs. B22, 131-137 (key for Brazilian genera, diagnosis)

Metaleptobasis Santos 1957: 143-146 (in part; *M. sooretamae* Santos n. sp.).

Leptobasis St. Quentin 1960: 53-54 (in part; *L. tenax* St. Quentin n. sp.).

Type species.— *Telagrion longum* Selys, 1876 by subsequent designation by Kirby (1890).

Characterization.— Color of dorsum of head and thorax olive green-blue lacking metallic reflections, pale colors yellow and light blue, dorsum of S8-10 reddish-yellow. Frons rounded; pale postocular spots present; no pale occipital bar; occipital lobes not protruding posteriorly but margin of head between compound eye and occipital bar markedly convex (Fig. 1a). Medial portion of posterior lobe of prothorax developed into caudally projected subquadrate foliate plate

in both sexes; erect in male, more decumbent in female (Fig. 5h, k). Female mesostigmal plates separated from each other (Fig. 5k). Tibial spurs shorter than distance between them (Fig. 4a); pretarsal claw with small supplementary tooth forming a straight angle with claw (Fig. 3b). Wings hyaline; CuP reaching posterior margin of wing; vein descending from quadrangle broken (Fig. 6a). Abdomen relatively long, with a ratio of 5.1-5.3 to length of head plus thorax. Genital ligula distal segment (Fig. 8a-c) with well developed terminal and inner folds, lacking outer row of strong setae, with apex bifid, with a lateral patch of short thin setae, with a pair of unique inner medio-longitudinal ridges. Postero-dorsal margin of male S10 entire and not recessed (Fig. 10b-c). Male cercus with a ventro-basal triangular branch arising from inner surface of cercus, shorter than 1/4 of horizontal branch (Fig. 10b-c); paraproct entire, with bifid apex (Fig. 10a-c). Female lacking vulvar spine; sub-basal plates of ovipositor small, narrowly triangular (Fig. 9d) not meeting ventrally; postero-dorsal margin of S9 with denticles; ovipositor greatly surpassing tips of cerci (Fig. 9d).

Diagnosis.— Among New World Coenagrionidae the presence of a pair of inner medio-longitudinal ridges on ental surface of distal segment of male genital ligula is unique to *Telagrion* (Fig. 8a-b). Further diagnostic differences from *Aceratobasis* and *Schistolobos* are summarized in Table 1.

Distribution.— Atlantic forest from 0 to 630 m a.s.l. in Espirito Santo, Rio de Janeiro, São Paulo and Rio Grande do Sul States, Brazil (Fig. 12b).

***Telagrion longum* Selys, 1876**

Figs 1a, 3b, 4a, 5h, k, 6a, 8a-c, 9d, 10a-c, 12b

Agrion longissimum Hagen, 1861: 310 (*nomen nudum*).

Telagrion longum Selys, 1876: 970-972 (260-262 reprint) (description of male and female, synonymy with *Agrion longissimum*); Kirby 1890: 155 (designation as type species of *Telagrion*); Calvert 1903: 37 (discussion of genus and affinities with *Telagrion? daeckii* Calvert); St. Quentin 1960: 48 (key for males); Santos 1965: 9 (history, synonymy of *Metaleptobasis sooretamae*); Santos 1970: 25-27, figs. 6, 8, 9, 12-13 (illustrations of female thorax, pterostigma and male genital ligula); Davies & Tobin 1984: 94 (synonymic list); Garrison 1991: 13 (synonymic list); Bridges 1994: VII.138 (synonymic list); Steinmann 1997: 357 (synonymic list); Tsuda 2000: 50 (synonymic list); Lencioni 2004: 92, 96-97, figs. 1E1-4, 2C (key and illustrations of male S10 and female S8-10); De Marmels & Garrison 2005: 272, figs. 25-27 (synonymy of *Leptobasis tenax*, illustrations of male pronotum, cerci, genital ligula); Lencioni 2006: 200, figs. 134A-I (illustrations of pronotum, pterostigma, male S10, genital ligula and female S9-10); Daigle 2007: 294 (comparison with *T. boliviense*).

Metaleptobasis sooretamae Santos, 1957: 143-146, figs. 1-8 (description of male, illustrations of thorax, S10 and genital ligula).

Leptobasis tenax St. Quentin, 1960: 53-54, figs. 4-5 (description of male, illustrations of pronotum and S10); Santos 1965: 9 (suggested synonymy with *T. longum*); Lencioni 2004: 92 (suggested synonymy with *T. longum*).

Types.— *Telagrion longum*: 4 male, 1 female syntypes in IRSN; 1 incomplete syntype male in MNRJ (on loan from the IRSN to the late ND Dos Santos in the early 1960s; De Marmels & Garrison 2005; examined), with following label data: “Cl[ausen?]/3.” *Metaleptobasis sooretamae*: holotype in MNRJ (Costa & Mascarenhas 1998; not examined). *Leptobasis tenax*: Rio Grande do Sul State:

(Stieglmayr), 1 male in NHMW (De Marmels & Garrison 2005; examined).

Specimens examined.— 5 males and 2 females. Brazil: 1 male syntype, “Cl[ausen?]/3”; São Paulo State: 2 males, Fazenda Santana do Rio Abaixo, Jacareí, 27-XI-1999, FAA Lencioni (RWG); same but 1 male, 1 female 29-IX-2002 (RWG); Rio Grande do Sul State: 1 male (**holotype** *Leptobasis tenax*), Stieglmayer (NHMW).

Diagnosis.— As for genus.

Biology.— Behavior, breeding habitat and larva unknown.

Distribution.— As for genus (Fig. 12b).

DISCUSSION

Schistolobos fits in Kennedy's (1920a) 'Argia' series, characterized by long tibial spurs, *Telagrion* in his 'Coenagrion-Pseudagrion' series, characterized by short tibial spurs, rounded frons and female lacking vulvar spine on S8, and *Aceratobasis* in his 'Nehalennia-Telebasis' series, including genera with short tibial spurs, angulate frons and female lacking vulvar spine on S8 within the 'Chromagrion-Nehalennia-Teinobasis' subseries, characterized by male cercus with a basal spur. We believe it will be possible to resolve phylogenetic relationships among these three genera and remaining Coenagrionidae once a phylogenetic analysis including all unambiguously defined genera is undertaken.

ACKNOWLEDGMENTS

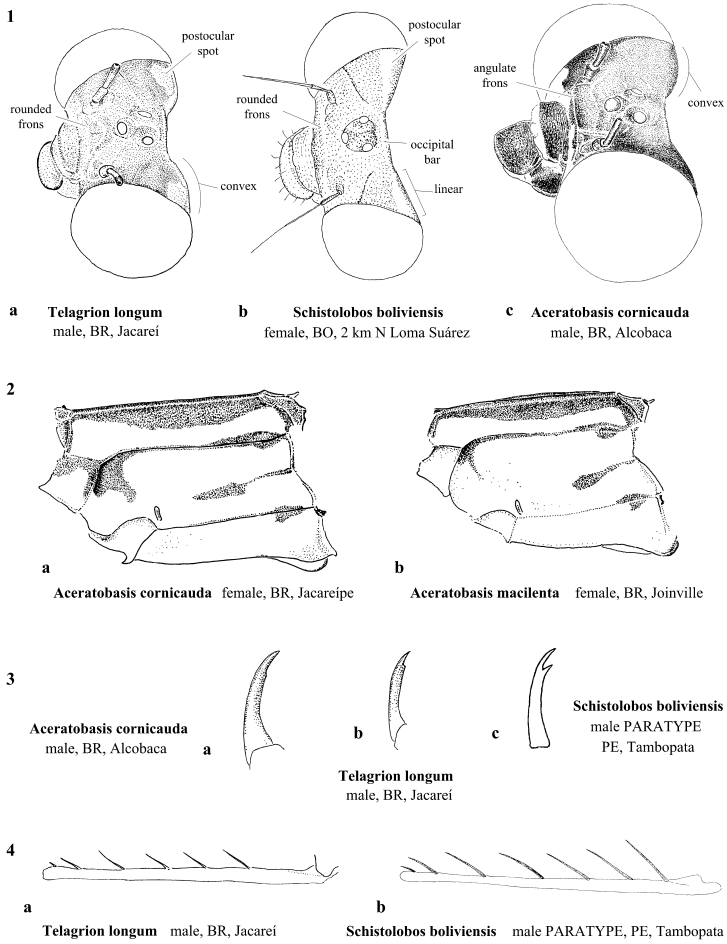
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Figs 1-4. 1, head, dorso-lateral view. 2, pterothorax, lateral view. 3, metapretarsus, lateral view. 4, metatibia, lateral view.

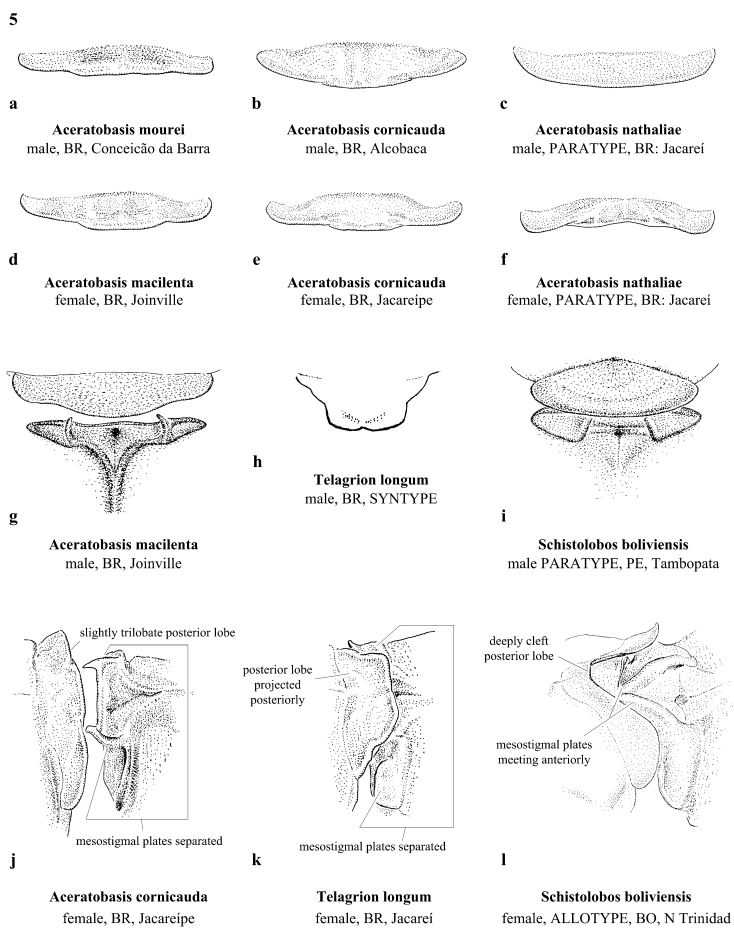


Fig. 5. Pronotum and anterior portion of mesepisterna, a-f, h, posterior lobe of pronotum, dorsal view, g, i, posterior lobe of pronotum and mesostigmal plates, dorsal view, j-l, posterior lobe of pronotum and mesostigmal plates, medio-dorsal view.

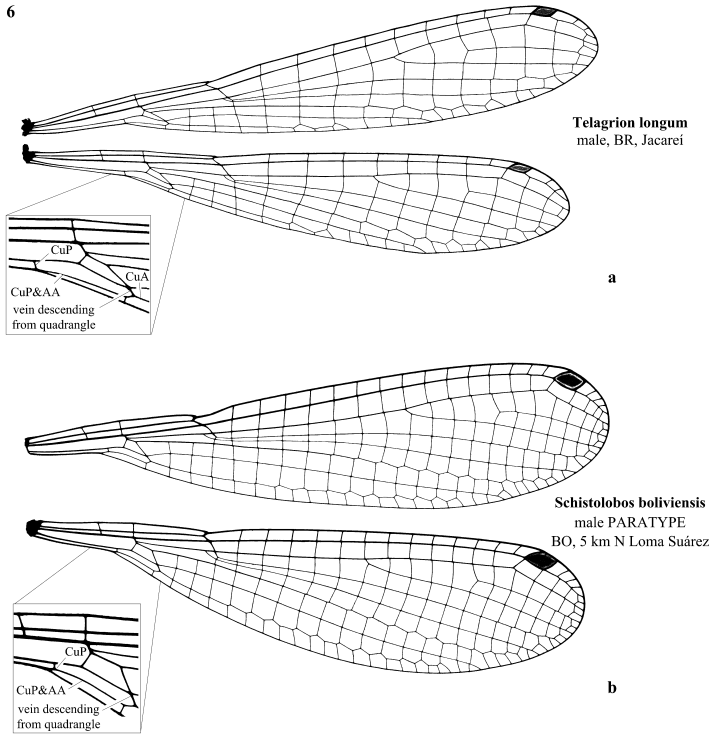


Fig. 6. Wings.

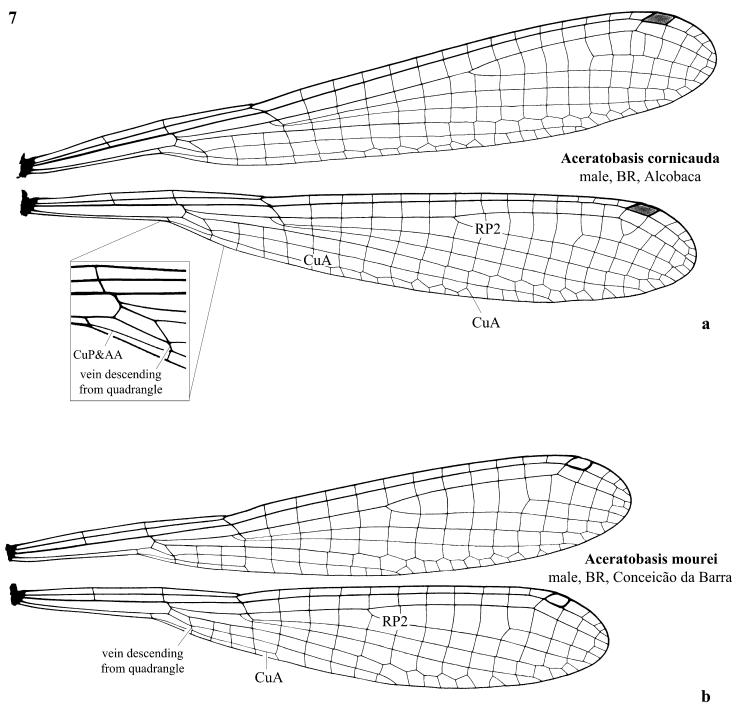


Fig. 7. Wings.

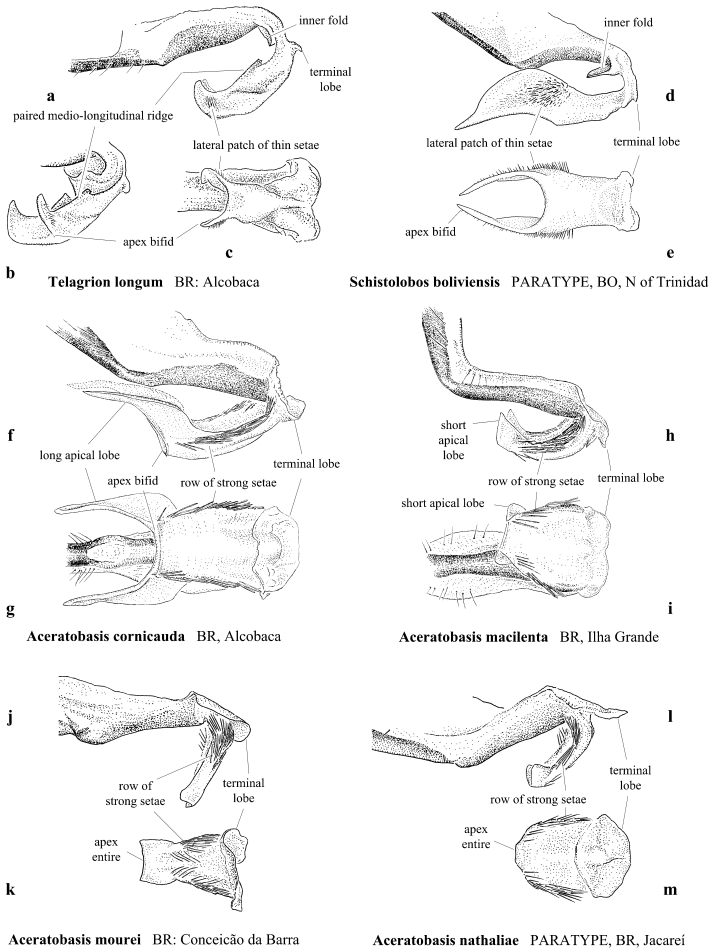
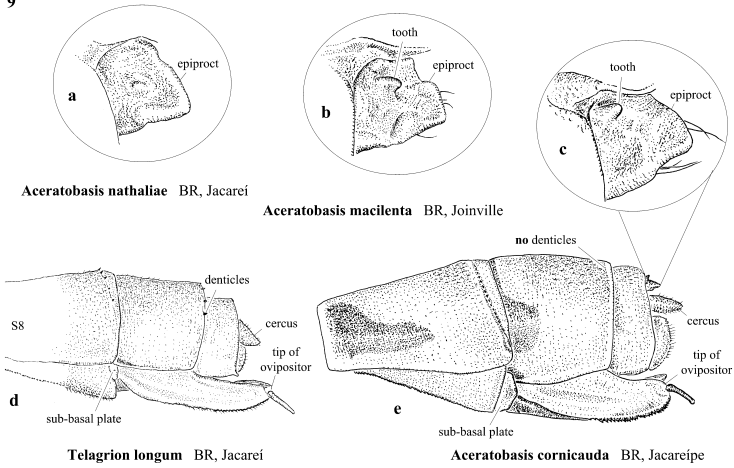


Fig. 8. Male genital ligula, a, d, f, h, j, l, lateral view, b, medio-inner view, c, e, g, I, k, m, ectal view.

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Figs 9-10. 9, female S8-10. 9, a-c, epiproct, medio-dorsal view, d-e, S8-10, lateral view, 10, male cercus, a, d, lateral view, b, e, medio-dorsal view, c, dorsal view, f, medial view.

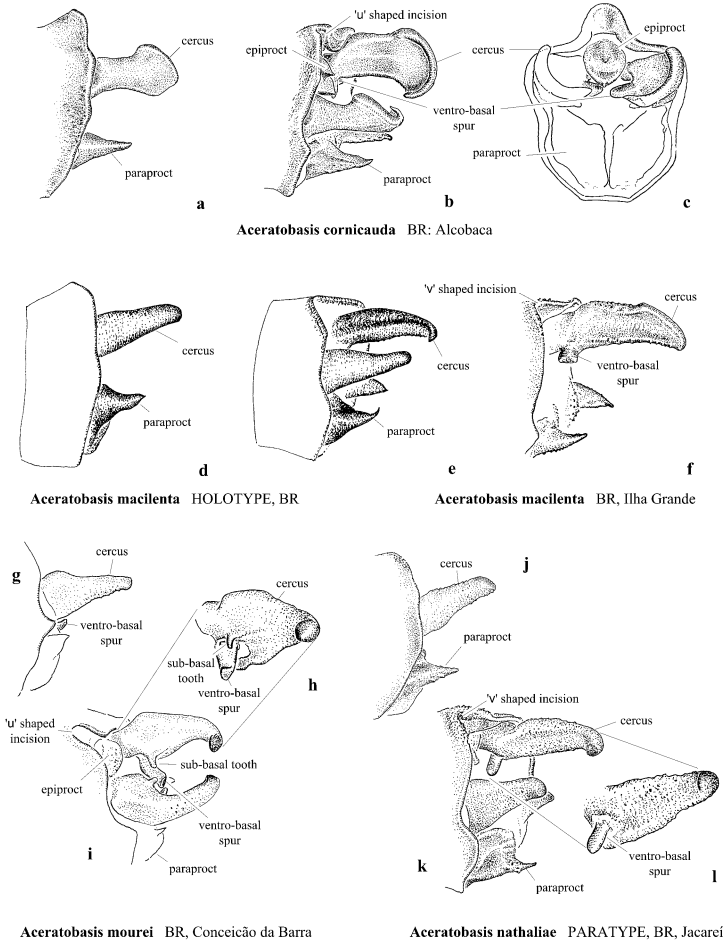


Fig. 11. Male cercus, a, d, g, h, lateral view, b, e-f, i, k, medio-dorsal view, c, posterior view, h, l, medial view.

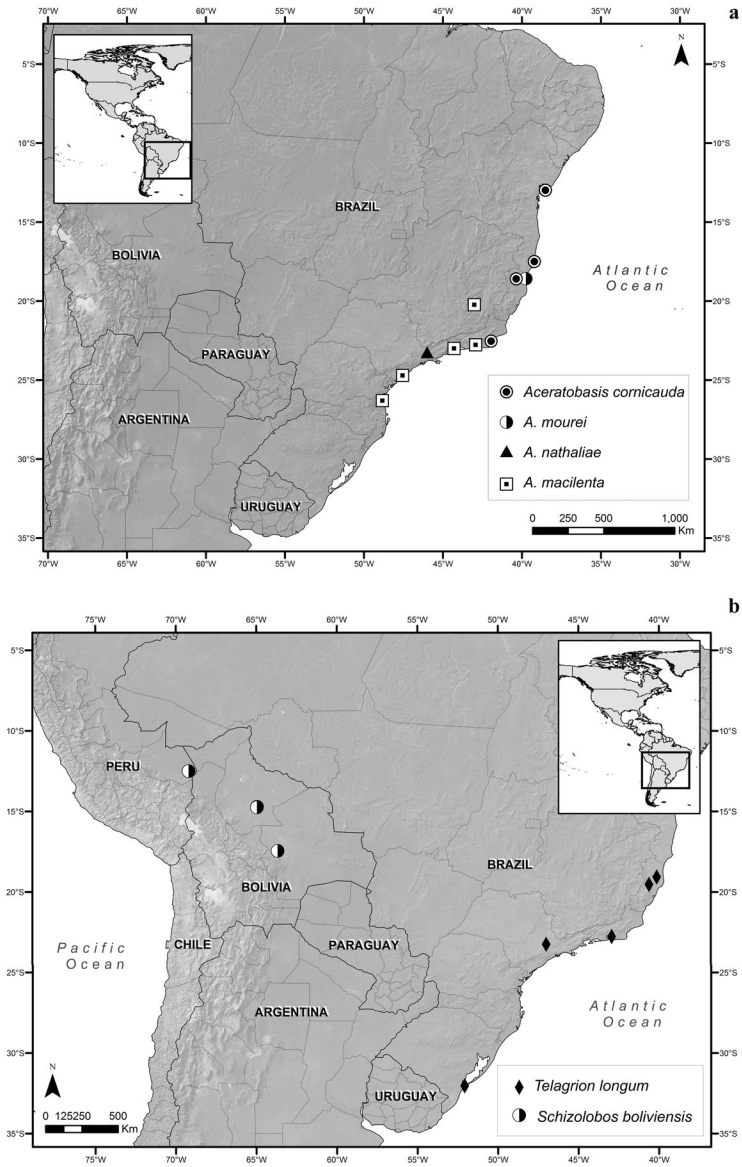


Fig. 12. Distribution maps of , a, *Aceratobasis* , b, *Schizolobos* and *Telagrion*.