Odonatologica 30(3): 345-350 *September 1, 2001*

CYANALLAGMA ANGELAE SPEC. NOV. AND A KEY TO THE NON-ANDEAN SPECIES OF *CYANALLAGMA* (ZYGOPTERA: COENAGRIONIDAE)

F.A.A. LENCIONI
Rua dos Ferroviários 55, Jardim Mesquita, BR-12300-000 Jacareí, S.P., Brazil
e-mail: odonata@iconet.com.br

Received September 8, 2000 / Revised and Accepted January 22, 2001

The new sp. is described from 15 ♂ and 3 ♀ collected in Salesópolis-São Paulo State (23°35'52"S, 45°43'41"W; alt. 1074 m) 14-III and 3-IV-1999. Keys and illustrations to the non-Andean species of *Cyanallagma* are given.

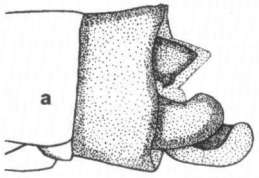
INTRODUCTION

The exclusively South American genus *Cyanallagma* Kennedy contains 13 species of which nine (*C. acutum* Ris, *C. demarmelsi* Cruz, *C. gaianii* De Marmels, *C. laterale* (Selys), *C. ovigerum* (Calvert), *C. risi* De Marmels, *C. tamaense* De Marmels, *C. tepuianum* De Marmels, and *C. thelkterion* De Marmels) occur in the mountainous regions of Venezuela, Colombia, Ecuador, Peru, and Bolivia. DE MARMELS (1997) provided the latest information on these species (except for *C. acutum*). A smaller group comprised of *C. bonariense* (Ris), *C. interruptum* (Selys), *C. nigrinuchale* (Selys), and *C. trimaculatum* (Selys) occur in southern Brazil, Argentina and Chile. The well-known *C. interruptum* is most austral zygopteran of the new world with records extending as far south as 50° south latitude (MUZON, 1995).

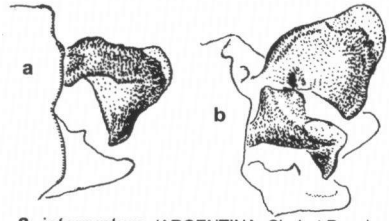
During a trip to Salesópolis, São Paulo (SP) State on 14 March and 3 April 1999, my father and I collected 15 males and 3 females of a *Cyanallagma* which I was unable to identify. I compared these specimens with congeneric specimens of *Cyanallagma* in my collection and using literature. Initially, I believed they represented the poorly known *C. trimaculatum* even though the paraprocts were smaller than the illustration by SANTOS (1965). At my request, Dr Dennis Paulson sent me copies of the original descriptions of *Acanthagrion trimaculatum*, *A.*

nigrinuchale and *A. interruptum*. From these descriptions I concluded that the illustration by Santos was partially correct, and that the specimens I collected in Salesópolis represented a new species.

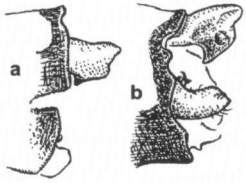
In April, 2000 I visited the Selys Longchamps collection in Brussels where I examined type material of *Cyanallagma interruptum*, *C. nigrinuchale* and *C. trimaculatum*. With photos of the only one intact male of *C. trimaculatum*, provided me by Mr Jérôme Constant, I include an illustration of the appendages of this poorly known species.



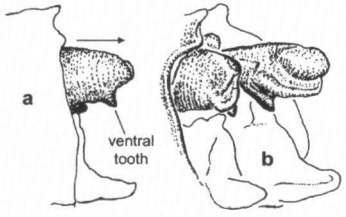
1 *trimaculatum* (Syntype)



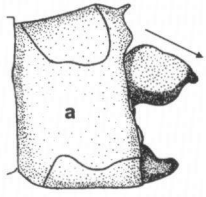
2 *interruptum* (ARGENTINA: Chubut Prov.)



3 *nigrinuchale* (Brazil: Minas Gerais, Lagoa dos Cordois)



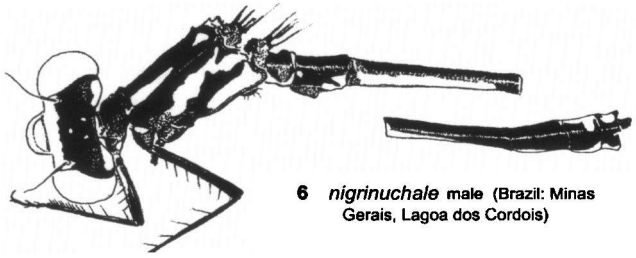
4 *bonariense* (ARGENTINA: Buenos Aires Prov.)



Figs 1-5 = male caudal appendages
a = lateral
b = mediodorsal

NOTE:
Illustrations not to scale

5 *angelae* (Brazil: São Paulo State, Salesópolis)



6 *nigrinuchale* male (Brazil: Minas Gerais, Lagoa dos Cordois)

CYANALLAGMA ANGELAE SP. NOV.

Figures: 5 (appendages), 7 (head), 8 (thorax), 9 (abdomen), 10 (female abdominal segments 8-10) 14 (female prothorax)

Material. – **Holotype** ♂: Brazil: State of São Paulo, Salesópolis (23°35'52"S, 45°43'41"W; alt. 1074 m), 3-IV-1999, F.A.A. Lencioni leg.; – **Allotype** ♀: same data as holotype; – **Paratypes**: same locality as holotype, 12 ♂, 2 ♀, 14-III-1999, F.A.A. Lencioni & F. Lencioni leg.; 2 ♂, 3-IV-1999, F.A.A. Lencioni leg. – All specimens are deposited in the author's collection.

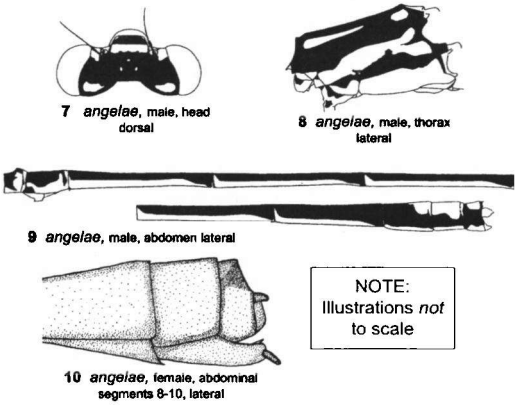
Etymology. – This species is named for my wife Angela S. L. Rodrigues, for her continuous support and encouragement during my research.

MALE (**Holotype**). – Head black, following areas blue: labrum, anteclypeus, genae, frons (reaching the base of antennae), two small spots in each side of the distal border of postclypeus and postocular spots; epicranium and postclypeus black (Fig. 7).

Thorax. – Pterothorax with mesepisternum black with sky blue antehumeral stripe interrupted medially thus forming an inverted exclamation point, broad black stripes along humeral second lateral and interpleural sutures, remaining parts of mes- and metepimeron sky blue; metepimeron pale yellow.

Wings. – Entirely hyaline, venation black; pterostigma black, covering 0.8 of cell in all wings; postnodals in FW 11, in HW 9; R_2 in FW originating just before 5th postnodal and just before 4th in HW.

Abdomen. – Segments III--VII black dorsally and light yellow ventrally; segment VIII laterally and in proximal half of dorsum black, ventrally light yellow, and in distal half of dorsum blue; segment IX as VIII, but entirely blue on dorsum; segment X as VIII, except for medial 0.75 of dorsum blue (Fig. 9).



7 *angelae*, male, head dorsal

8 *angelae*, male, thorax lateral

9 *angelae*, male, abdomen lateral

10 *angelae*, female, abdominal segments 8-10, lateral

Measurements (mm). – Total body length (with appendages) 27.5; – abdomen 23; – forewing 16; – hindwing 15.

FEMALE (**Allotype**). – Very similar to male with the following differences: general coloration paler than in male and antehumeral stripe not interrupted.

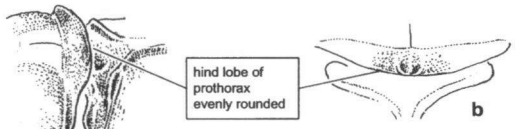
Wings. – Entirely hyaline; pterostigma light brown covering 0.75 of cell in all wings. Postnodals in FW 11, in HW 9; R_2 in FW originating just before 5th postnodal, at 4th in HW.

Abdomen. – Abdominal segments as in male, except 8-10 as in Figure 10.

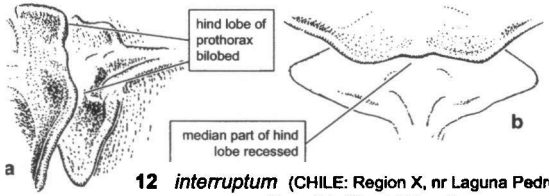
Measurements (mm). – Total body length (with appendages) 28; – Abdomen 23; – forewing 16; – hindwing 15.

VARIATION. – The series of 14 males shows little variability in color, postnodals FW 9 (10,7%), 10 (50%), 11 (35,7%) and 12 (3,6%); in HW 8 (28,5%), 9 (53,6%) and 10 (17,9%).

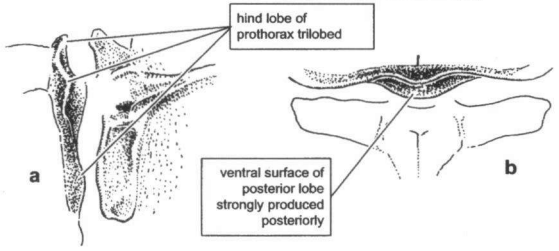
REMARKS. – The type locality is a small flooded area fed by a small stream. A dirt road going from Salesópolis to Caraguatatuba crosses the flooded area and a patch of the Atlantic forest. This area, in spite of being protected, has undergone intense deforestation. On 14-III-1999, the temperature was approximately 19°C and cloudy. We collected here for only a few moments before it rained. The 36 specimens of Zygoptera we collected included: 4 ♂ *Homeoura cheliferum* (Selys), 1 ♂ *Heteragrion beschkii* Hagen *in* Selys, 3 ♂ and 3 ♀ *Ischnura capreolus* (Hagen), 2 ♂ *Oxyagrion microstigma* Selys, 3 ♂ *O. terminale* Selys, 1 ♂ *Telebasis carmesina* Calvert, 2 ♂ *Acanthagrion lancea* Selys, 1 ♂ *A. gracile* (Rambur), 2 ♀ *Telebasis* sp. and 12 ♂ and 2 ♀ *Cyanallagma angelae*. I found the weather conditions similar when I returned to the type locality on 3-IV-1999 and collected 1 ♂ *O. microstigma*, 1 ♂ *O. haematinum* Selys and, 3 ♂ and 1 ♀ *C. angelae*.



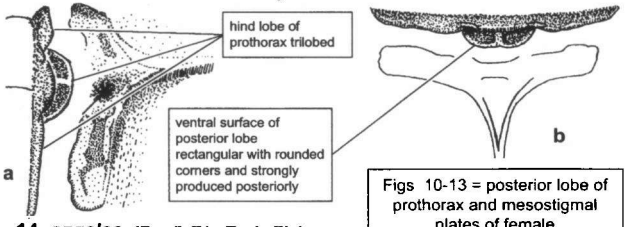
11 *nigrinuchale* (ARGENTINA: Misiones, Parque Nac. Iguazu)



12 *interruptum* (CHILE: Region X, nr Laguna Pedro, S of turnoff to Mina El Toqui)



13 *bonariense* (ARGENTINA: Buenos Aires Prov., Sierra de la Ventana at Arroyo del Loro)



14 *angelae* (Brazil: São Paulo State, Salesópolis)

Figs 10-13 = posterior lobe of prothorax and mesostigmal plates of female
a = dorsolateral
b = dorsal

KEY TO ADULT MALES OF THE NON-ANDEAN *CYANALLAGMA*

1 Paraproct in lateral view longer than cerci, tip of paraproct in lateral view rounded (Fig. 1a), HW 17-19 mm, Santa Cruz and Teresopolis (Rio de Janeiro State), Brazil ..... ***trimaculatum***
– Paraproct subequal to or shorter than cerci, tip of paraproct bluntly pointed (Figs 2-5) 2
2 Cercus in lateral view with a broadly triangular decumbent tooth (Fig. 2a), HW 16-17 mm, Patagonian areas of Argentina and Chile ..... ***interruptum***
– Cercus with decumbent tooth reduced (Fig. 3a, 4a, 5a) 3
3 Smaller species (HW 11.5-13 mm), cercus approximately twice the length of paraproct (Fig. 3a), attenuate tip of cercus directed posterodorsally (Fig. 3a), body pattern as in Fig. 6; São Paulo and Minas Gerais, Brazil; Misiones Prov., Argentina ..... ***nigrinuchale***
– Larger species (HW 15-17 mm), cercus and paraproct subequal (Figs 4a, 5a), tip of cercus directed posteriorly (Fig. 4a) or ventroposteriorly (Fig. 5a) 4
4 Tip of cercus rounded, directed posteriorly (Fig. 4a, arrow); small ventral tooth at approximately 0.50 of cercus, visible in lateral view (Fig. 4a), Buenos Aires lowlands of Argentina, Uruguay ..... ***bonariense***
– Tip of cercus acuminate, directed posteroventrally (Fig. 5a arrow); ventral tooth basal, hardly visible in lateral view (Fig. 5a), São Paulo State, Brazil ..... ***angelae***

KEY TO ADULT FEMALES OF THE NON-ANDEAN *CYANALLAGMA* (EXCLUDING *C. TRIMACULATUM*)

1 Smaller species (HW 13 mm), posterior lobe of prothorax evenly rounded in dorsal view (Fig. 11), ventral surface of posterior lobe not visible ..... ***nigrinuchale***
– Larger species (HW 15 mm or more), posterior lobe of prothorax bi- (Fig. 12) or trilobed (Figs 13, 14) in dorsal view, ventral surface of posterior lobe not visible (Fig. 12) or visible (Figs 13, 14) 2
2 Posterior lobe of prothorax bilobate, the medial portion recessed (Fig. 12), ventral surface of posterior lobe not visible ..... ***interruptum***
– Posterior lobe trilobate, the medial portion produced posteriorly (Figs 13, 14), ventral surface of posterior lobe visible in dorsal view 3
3 Posteriorly directed medial lobe of prothorax small, not surpassing lateral lobes; ventral surface of posterior lobe rounded and strongly produced posteriorly (Fig. 12); larger species (HW 18.5-19.5 mm) ..... ***bonariense***
– Posteriorly directed medial lobe large, not surpassing lateral lobes; ventral surface of posterior rectangular with rounded corners and strongly produced posteriorly (Fig. 14); smaller species (HW 15 mm) ..... ***angelae***

ACKNOWLEDGEMENTS

Dr ROSSER W. GARISSON provided me with comparative material, literature and illustrations and Dr DENNIS PAULSON sent me valuable data on the distribution of *Cyanallagma nigrinuchale* and literature. Dr JANIRA M. COSTA facilitated my access at the collection of the Museu Nacional, Rio de Janeiro and provided me with comparative material and literature. Prof. FREDERICO LENCIONI, my father, assisted me with fieldwork, Mr BEDROS ORCHANIAN provided English suggestions on the manuscript, and Mr JÉRÔME CONSTANT and the Entomological staff of the IRSNB helped me with the specimens of the Selys Longchamps's collection. Dr JAVIER MUZÓN provided records and specimens of *C. nigrinuchale* from Argentina. Figures 1, 5, 7-10 and 14 were executed by F.A.A. Lencioni; all others provided by R. Garrison. To all of these persons, I extend my sincere thanks and appreciation.

REFERENCES

BULLA, L.A., 1972. Revision de los especies Argentinas del genero Cyanallagma Kennedy (Odonata: Coenagriidae). *Revta Soc. ent. argent.* 34(1/2): 95-105.

DE MARMELS, J., 1989. Notes on Acanthagrion acutum Ris, Enallagma occultum Ris and E. ovigerum Calvert (Zygoptera: Coenagrionidae). *Odonatologica* 18(3): 245-252.

DE MARMELS, J., 1997. New and little-known species of Cyanallagma Kennedy, 1920 from Andes and from Pantepui (Zygoptera: Coenagrionidae).*Odonatologica* 26(2): 135-157.

LEONARD, J.W., 1977. A revisionary study of the genus Acanthagrion (Odonata: Zygoptera). *Misc. Publ. Mus. Zool., Univ. Mich.* 153: 1-173.

MUZÓN, J., 1995. Los Odonata de la Patagonia Argentina. *Revta Soc. ent. argent.* 54(1/4): 1-14.

SANTOS, N.D., 1965. Contribuição ao conhecimento da fauna do Estado da Guanabara. LIV – "Acanthagrion taxaensis" sp.n. (Odonata: Coenagriidae). *Atas Soc. Biol. Rio de J.* 9(1): 60-63.

SELYS LONGCHAMPS, E., 1876. Synopsis des agrionines, 5 me. légion: Agrion (suite). Le genre Agrion. *Bull. Acad. Belg.* (II) 41: 247-322.