THE LARVAE OF *TEINOPODAGRION DECIPIENS* DE MARMELS AND *T. MERIDIONALE* DE MARMELS (ZYGOPTERA: MEGAPODAGRIONIDAE)

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The larvae of 2 spp. are described and illustrated: *T. decipiens*, based on specimens from the Bolivian Yungas, and *T. meridionale*, based on ♀specimens from the Argentine Yungas. A key to all known larvae is provided.

INTRODUCTION

Teinopodagrion De Marmels, 2001 is an endemic genus from the South American Yungas mountain cloud forest, extending from Venezuela to northwestern Argentina along the eastern slope of the Andes. It comprises 24 species, and the larvae of only two of them have been described (DE MARMELS, 1982; 2001): *T. oscillans* (Selys, 1862) and *T. venale* (Selys, 1862).

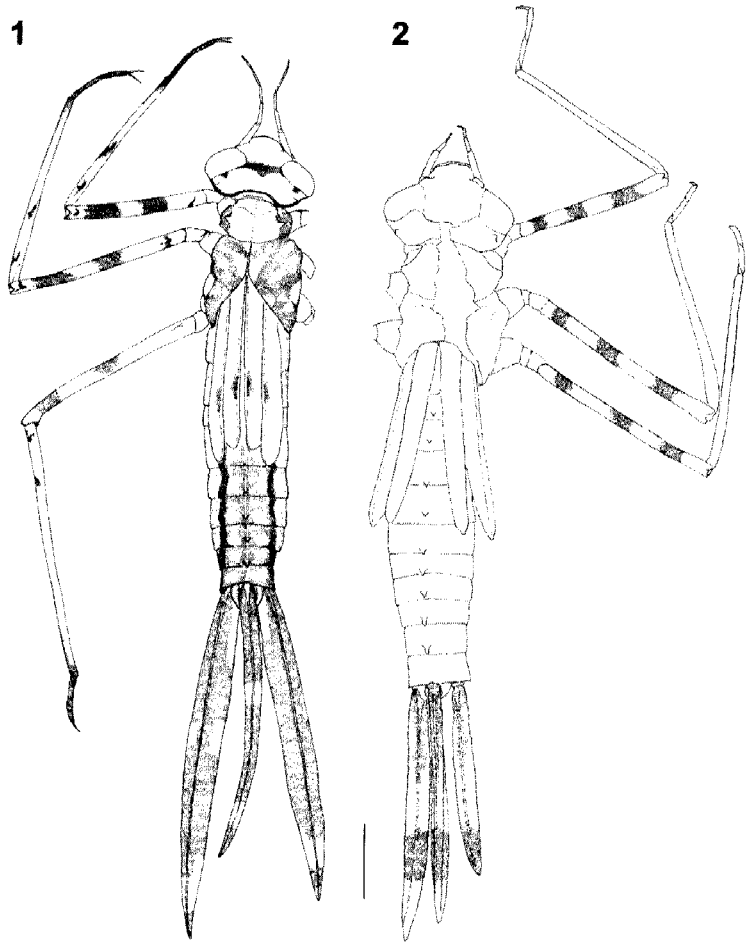
In this paper the larvae of two further species are described and illustrated: *Teinopodagrion decipiens* De Marmels, 2001 and *T. meridionale* De Marmels, 2001.

TEINOPODAGRION DECIPIENS DE MARMELS

Figures 2, 4-5, 7, 9, 11, 13, 16-17, 20-21, 23, 25-26

M a t e r i a l. – BOLIVIA: Nor Yungas province, Coroico, stream of clear waters and stony bed, larvae found amongst vegetal detritus, 1 ♀ (emerged in laboratory), 3 ♂ (last larval instar), 13-I-2000 (1930 m. a.s.l.), 16°12'40"S, 67°42'13"W, von Ellenrieder leg. – All specimens deposited in the Museo de Ciencias Naturales de Salta.

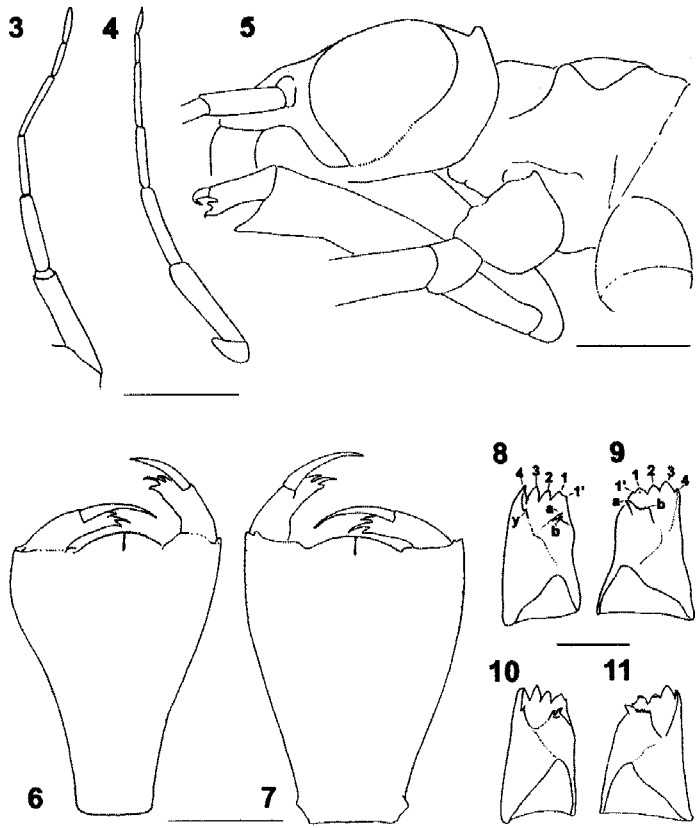
DESCRIPTION. – H e a d: trapezoidal, about 1.75 times as wide as long, with posterior margin concave, bearing a blunt tubercle on each side of occiput (Figs 2, 5). Antenna 6-segmented, with first antennomere the longest (Fig. 4). Prementum (Fig. 7) 0.63-0.76 times as wide as long, dorsal and ventral surfaces bare, except for a few lateral thin long setae; ligula convex, finely crenulated along margin. Labial palp with three teeth, the medial one longest, inner tooth blunt and outer and medial teeth triangular (Fig. 7). Articulation of pre- and postmentum midway between bases of coxa I and II. Mandibles (Figs 10-11) with following formula (sensu WATSON, 1956): L 1'1234 0 a (m^{1234}) b, R 1'1234 y a (m^{0}) b.



Figs 1-2. General aspect of last larval instar, dorsal view: (1) *Teinopodagrion meridionale* De Marmels, ♂; – (2) *T. decipiens* De Marmels, ♀. – [Scale: 2 mm]

T h o r a x. – Pronotum quadrangular, with lateral angles projected into a blunt tubercle on each side (Fig. 5). Wing pads almost reaching the end of abdominal segment 5. Legs long; femora with three dark bands; tibiae and tarsi lacking dark bands.

A b d o m e n. – Unpatterned, with dorsal hooks present on segments 1-9; those on 1-5 small, increasing in size from 6 to 9 (Fig. 13). Cerci elongated and blunt (Figs. 16-17, 20-21). Gonapophyses of male triangular and denticulate, of female reaching distal end of segment 10 and outer ones with denticulate margins (Fig. 23). Caudal lamellae with two transverse dark bands (Figs 25-26; in two males also the tips dark) and denticulate margins, about as long as 0.72-0.79 times the abdomen length; dorsal lamella foliaceous with a latero-longitudinal carina on each side, lateral lamellae triquetal.



Figs 3-11. Last larval instar, Figs 3, 6, 8, 10: *T. meridionale*; Figs 4-5, 7, 9, 11: *T. decipiens*; – (3, 4) right antenna, dorsal view; – (5), head and prothorax, lateral view; – (6, 7) prementum, dorsal view; – (8, 10) right mandible, inner view; – (9, 11) left mandible, inner view. – [Scales: Figs 3-7: 1 mm; Figs 8-11: 2 mm]

Measurements (in mm; females N = 1, males N = 3). – Total length without caudal lamellae, female: 17, males: 16.6-19. Prementum length, female: 3, males: 2.7-3.2; prementum max. width, female: 1.9, males: 2.05; Femur I, female: 4.3, males: 4.1-4.6; II, female: 5.4, males: 5.5-6; III, female: 6.9, males: 6.5-7.1. Inner wing pads, female: 5.8, males: 5.7-6.2; external wing pads, female: 5.3, males: 5.5-5.75. Abdomen length without caudal lamellae, female: 9.75, males: 9.5-12; dorsal caudal lamella, female: 6.6, males: 6-6.4; lateral caudal lamellae, female: 6.9, males: 7.5-9.3.

YOUNGER INSTARS. – One female specimen, which differs from the last instar as follows: Head with a pair of blunt tubercles on vertex between compound eyes; tubercles on abdominal segments 1-9 all prominent and upright; tibiae with two basal dark bands; caudal lamellae with dark apices.

TEINOPODAGRION MERIDIONALE DE MARMELS

Figures 1, 3, 6, 8, 10, 12, 14-15, 18-19, 22, 24

Material. – ARGENTINA: Salta province, Lesser, (1312 m.a.s.l.), 24°40'57"S, 65°28'39"W stream of clear water and stony bed, larvae found amongst masses of an aquatic macrophyte, von Ellenrieder leg., 1 ♀ (emerged in laboratory), 13-X-2005; 1 ♀ (emerged in laboratory), 12-XI-2005; 1 ♂, 3 ♀ (last larval instar), 13-X-2005; 1 ♂ (last larval instar), 23-IX-2005; 1 ♂ (last larval instar), 10-XI-2005; 1 ♂ (last larval instar), 12-XI-2005; – ARGENTINA: Salta province, Baritú National Park, stony stream affluent to Baritú River, 22°29'57"S, 64°45'29"W, (1215 m.a.s.l.), 2 ♂ (last larval instar), 19/20-VIII-2005, von Ellenrieder leg. – All specimens deposited in the Museo de Ciencias Naturales de Salta.

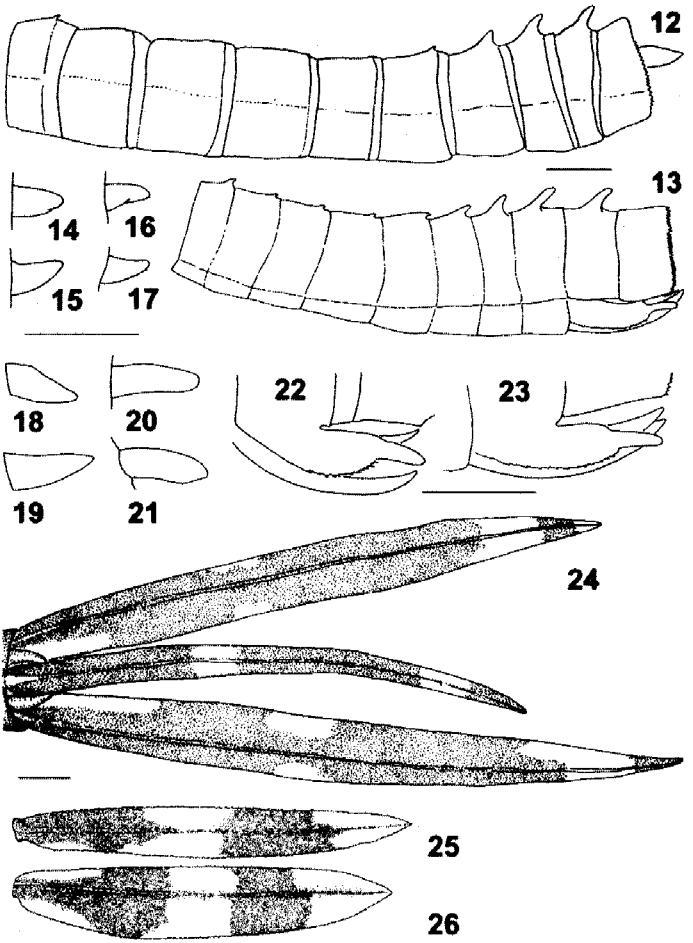
DESCRIPTION. – Head: trapezoidal, about 1.55 times as wide as long, with posterior margin concave, bearing a blunt tubercle on each side of occiput (Fig. 1). Antenna 6-segmented, with first antennomere the longest (Fig. 3). Prementum (Fig. 6) 0.68-0.79 times as wide as long, dorsal and ventral surfaces bare, except for a few lateral thin long setae; ligula convex, finely crenulated along margin. Labial palp with three teeth, the medial one longest, inner tooth blunt and outer and medial teeth pointed (Fig. 6). Articulation of pre- and postmentum midway between bases of coxa I and II. Mandibles (Figs 8-9) with following formula (sensu WATSON, 1956): L 1'1234 0 a (m^{1234}) b, R 1'1234 y a (m^{0}) b.

Thorax. – Pronotum quadrangular, with lateral angles projected into a blunt tubercle on each side (Fig. 1). Wing pads almost reaching the end of abdominal segment 5, with a dark basal and a dark medial spot (Fig. 1). Legs long; femora with three dark bands; tibiae with dark apexes and two basal dark spots; tarsi dark.

Abdomen. – With two dark latero-longitudinal stripes as in Fig. 1, with dorsal hooks present on segments 1-9; those on 2-5 minute, increasing in size from 6 to 9 (Fig. 12). Cerci tapering to end (Figs 14-15, 18-19). Gonapophyses of male triangular and denticulate, of female surpassing distal end of segment 10 and outer ones with denticulate margins (Fig. 22). Caudal lamellae dark with basal, medial and sub-apical pale bands on medial lamella, and basal, medial and sub-apical pale outer spots on lateral lamellae (Fig. 24), margins finely denticulate;

about as long as 1.04-1.64 times the abdomen length; dorsal lamella foliaceous with a latero-longitudinal carina on each side, lateral lamellae triquetal.

Measurements (in mm; females N = 4, males N = 5). – Total length without caudal lamellae, females: 12.3-15.4, males: 11-18. Prementum length, females: 2.4-2.7, males: 2.5-2.7; prementum max. width, females: 1.7-1.9, males: 1.8-1.9; Femur I, females and males: 4-4.6; II, females: 5.4-6, males: 5.4-6.1; III, females: 6.4-7.2, males: 6.2-7.2. Inner wing pads, females: 5.1-5.9, males: 5.2-6; external wing pads, females: 4.9-5.6, males: 5 -5.6. Abdomen length without caudal lamellae, females: 6.2-8.6, males: 6.5-10.8; dorsal caudal lamella: females, 7.5-9, males: 7.7-10.6; lateral caudal lamellae, females: 9.6-11, males: 9.4-11.5.



Figs 12-26. Last larval instar, Figs 12, 14-15, 18-19, 22, 24: *T. meridionale*; Figs 13, 16-17, 20-21, 23, 25-26: *T. decipiens*; – (12, 13) abdomen, lateral view; – (14, 16) female cercus, lateral view; (18, 20) male cercus, lateral view; – (15, 17) female cercus, dorsal view; (19, 21) male cercus, dorsal view; – (22, 23) ovipositor, lateral view; – (24) caudal lamella, dorsal view; – (25) dorsal caudal lamella, lateral view; – (26) medial caudal lamella, lateral view. – [Scales: 1 mm]

YOUNGER INSTARS (same localities; Lesser, 1 ♀, 9-IX-05; 4 ♂, 5 ♀, 13-X-05; 2 ♂, 1 ♀, 12-XI-05; Baritú, 12 ♂, 5 ♀, 19/20-VIII-05) differ from the last instar as follows: Head with a pair of blunt tubercles on vertex between compound eyes; tubercles on abdominal segments increasing in length caudally, 2-6 not minute.

KEY TO KNOWN LAST LARVAL INSTARS OF *TEINOPODAGRION*

1 Caudal lamellae longer than abdomen (ratio of 1.04-1.64, Fig. 1); male cercus tapering to end (Figs 18-19) 2
– Caudal lamellae shorter than abdomen (ratio of 0.72-0.79, Fig. 2); male cercus cylindrical (Figs 20-21) 3
2 (1) Tibiae unpatterned (as in Fig. 2); wing cases extending to beginning, or slightly distal to beginning, of S5; dorsal hooks on S5-9; Venezuela and Colombia ..... ***venale***
– Tibiae with two basal dark spots and dark apex (Fig. 1); wing cases extending to end of S5 (Fig. 1); dorsal hooks on S1-9, those on 2-5 minute (Fig. 12); Bolivia and Argentina ..... ***meridionale***
3 (2) Labium extending beyond coxae II; wing cases extending to end of S6; tibiae unpatterned (as in Fig. 2); abdomen with dark longitudinal marks and dorsal hooks on S5-9; Venezuela and Colombia ..... ***oscillans***
– Labium extending to between coxae I and II (Fig. 5); wing cases extending to end of S5 (Fig. 2); tibiae with one basal dark band (Fig. 2); abdomen pale and with dorsal hooks on S1-9, those on 2-5 minute (Fig. 13); Peru and Bolivia ..... ***decipiens***

DISCUSSION

Teinopodagrion decipiens extends from Peru to Santa Cruz department in Bolivia, and *T. meridionale* from Santa Cruz department in Bolivia to NW Argentina (DE MARMELS, 2001). Their larvae can be easily differentiated from each other by color pattern (abdomen and tibiae unmarked in *T. decipiens*, with dark marks in *T. meridionale*) and ratio of the caudal lamellae to the abdomen (shorter than abdomen in *T. decipiens*, longer in *T. meridionale*). The other two species from which larvae are known, *T. oscillans* and *T. venale*, occur in Venezuela and Colombia, and can be distinguished by the characters mentioned in the key.

The generic characters proposed by DE MARMELS (2001) for larvae of *Teinopodagrion* are herein confirmed, and can be complemented as follows: antennae 6-segmented; head with a pair of tubercles behind the eyes; prementum slightly constricted at basal third; labial palp with three teeth, the medial one the longest; mandibular formula L 1'1234 0 a (m^{1234}) b, R 1'1234 y a (m^{0}) b; pronotum with projecting lateral angles; abdominal segments with dorsal hooks; caudal lamellae lanceolate, the medial one foliaceous with a medio-longitudinal carina on each side, wider and shorter than the triquetal lateral lamellae.

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