nnfe100719

Studies on Neotropical Fauna and Environment
2004, Vol. ••, No. •, pp. ••–••

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Description of the Final Stadium Larva of *Hetaerina rosea* Selys (Zygoptera: Calopterygidae)

Pablo Pessacq and Javier Muzón

Institute of Limnology 'Dr. Raul A. Ringuelet', La Plata, Argentina

Abstract

The final stadium larva of *Hetaerina rosea* is here described and illustrated for the first time based on specimens collected in Corrientes and Buenos Aires provinces, Argentina.

Resumen

Se describe e ilustra el último estadio larval de *Hetaerina rosea* sobre la base de especímenes provenientes de las provincias de Corrientes y Buenos Aires, Argentina.

Keywords: *Hetaerina*, final larval instar, Calopterygidae.

Introduction

The primarily Neotropical genus *Hetaerina* Hagen *in* Selys is composed of 37 species, six of which are presently known from Argentina (i.e., *caja dominula*, *longipes*, *mendezi*, *proxima*, *rosea* and *sanguinea*) (Muzón & von Ellenrieder, 1998). At present, the final stadium larva of 19 species and subspecies (50% of the genus) has been described (Geijskes, 1943; Santos, 1970a, 1970b, 1972; De Marmels, 1985; Novelo-Gutiérrez & Gonzalez Soriano, 1991; Zloty et al., 1993; Westfall & May, 1996; Novelo-Gutiérrez, 2000), including the supposed larva of *H. moribunda* and an unidentified species (Geijskes, 1943). No keys including all the described larvae have been given; there are only partial keys: Geijskes (1946), Zloty et al. (1993) for Costa Rica, Westfall and May (1996) for USA, Novelo-Gutiérrez and Gonzalez Soriano (1991) for Durango, Mexico and Novelo-Gutiérrez (2000) for Mexico.

Hetaerina rosea Selys has a large distribution area including Peru, southern Bolivia and Brazil, Paraguay, Uruguay and northern and central Argentina (Garrison, 1990; Muzón, 1996). As with others species of this genus, *H. rosea* is a conspicuous inhabitant of lotic environments often with abundant riparian vegetation. In Argentina it has been recorded from the provinces of Misiones, Entre Ríos, Salta, Jujuy, Tucumán, Santiago del Estero, Córdoba and Buenos Aires (Muzón & von Ellenrieder, 1998). Its southern limit of distribution comprises the northeast area of Buenos Aires province in Argentina, in the so-called 'Pampa ondulada' which is characterized by a moderately integrated drainage and endorheic interfluvial areas.

Here, we describe the final stadium larva of *Hetaerina rosea* based on reared specimens collected in the Argentinean provinces of Buenos Aires and Corrientes.

Results

Hetaerina rosea Selys (Figs. 1–10)

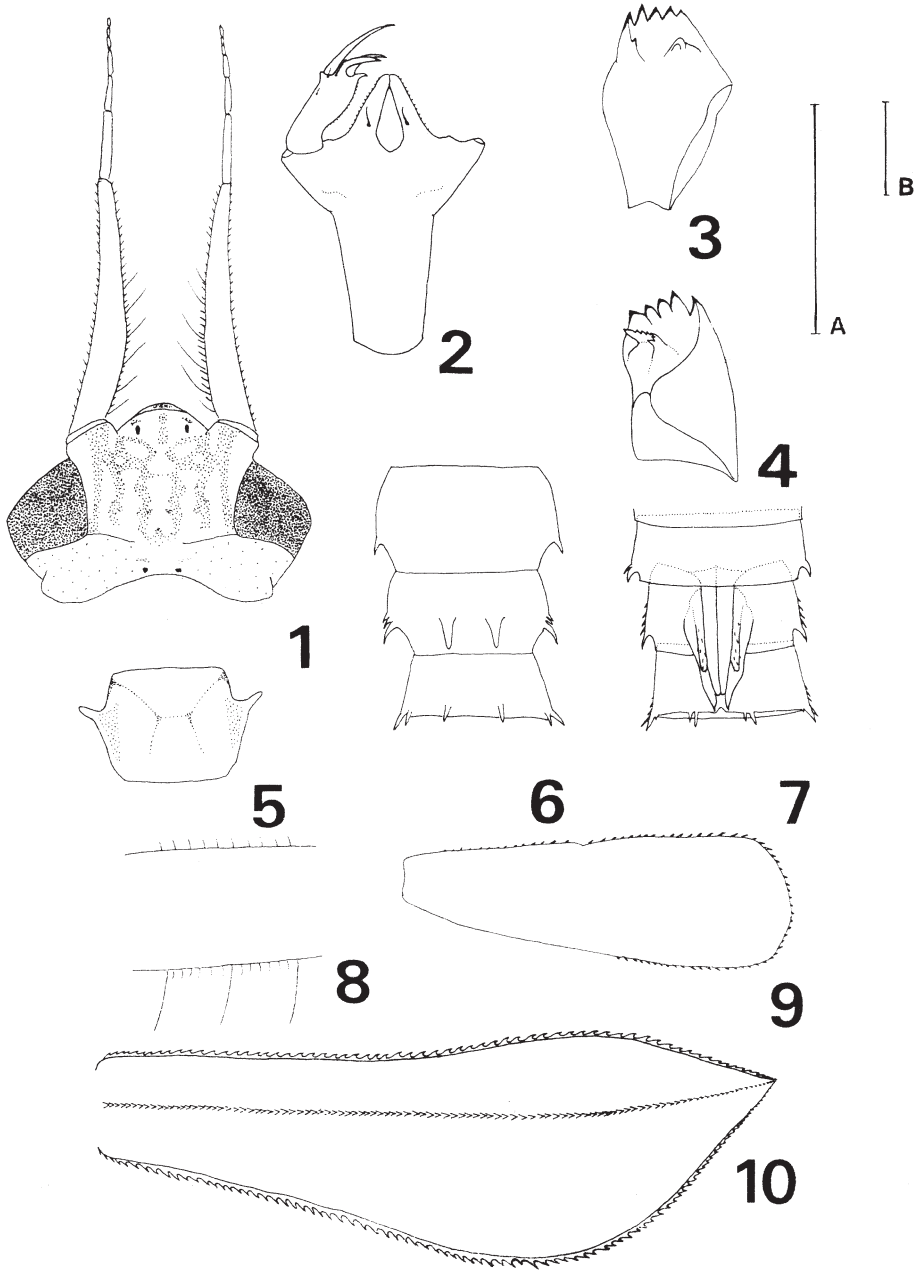
Material examined

(4 ΓΓ, 4 EE). Argentina, Buenos Aires prov., Pergamino, arroyo Maguire, 33°57′46″S, 60°16′22″W, 09-I-2002, 3 ΓΓ and 4 EE (two reared) final stadium larvae, leg. Muzón & Pessacq. Corrientes prov., Mercedes, arroyo Payubre, 29°01′41″S, 58°10′28″W, 23-II-2003, leg. Muzón & Pessacq, 1 Γ (reared). All specimens deposited in the collection of the Departamento Entomología, Museo de La Plata.

Received: 14 February 2004
Accepted: 30 June 2004

Correspondence: P. Pessacq, Instituto de Limnologia 'Dr. Raul A. Ringuelet', CC 712, 1900 La Plata, Argentina. E-mail: pessacq@ilpla.edu.ar

DOI: 10.1080/01650520400007363



Figs. 1–10. *Hetaerina rosea*, last larval instar. (1) Head, dorsal view; (2) labium, dorsal view; (3) right mandible, inner view; (4) left mandible, inner view; (5) pronotum, dorsal view; (6) male abdominal segments 8–10, ventral view; (7) female abdominal segments 8–10, ventral view; (8) femur I, dorsal view; (9) median caudal lamella, lateral view; (10) lateral caudal lamellae, lateral view. Scales A and B = 1 mm, scale A: Figs. 1, 2, 5–7, 9, 10; scale B: Figs. 3, 4, 8.

Measurements (mm, *n* = 6)

Total body length (without caudal lamella): 15.1 ± 1.3. Head: max. width: 3.27 ± 0.07, max. length: 1.96 ± 0.05. Antenna: total length: 3.9 ± 0.15, segment 1: 2.45 ± 0.09, segment 2: 0.67 ± 0.06, segment: 3 0.36 ± 0.05, segment 4: 0.2, segment 5: 0.1, segment 6: 0.1, segment 7: 0.1. Prementum: max. width: 2.16 ± 0.05, max. length: 3.37 ± 0.07. Cleft length 0.8. Movable hook: 0.8. Femur: 1: 3.33 ± 0.20, 2: 4.31 ± 0.27, 3: 5.10 ± 0.24. Tibia: 1: 4.11 ± 0.29, 2: 4.84 ± 0.37, 3: 5.59 ± 0.43. Wing pads: internal: 5.51 ± 0.23, External: 5.29 ± 0.14. Caudal lamella: lateral: 6.89 ± 0.65, medial 5.66 ± 0.25.

Description

Final stadium larva: Head: brownish, color pattern as in Figure 1, posterolateral angles with prominent and rounded protuberances. Antenna: first segment as long as 0.6 times

antenna length and as wide as 0.8 times head width; inner side with few sparse long thin setae (each seta as long as maximum width of segment or longer). Mandibles (sensu Watson, 1956) as follows (Figs. 3 and 4):

$$\frac{\text{L } 12345\ 0\ a(m^{1,2,3,4,5})b}{\text{R } 12345\ y \qquad a}$$

Molar crest in left mandible denticulate, concave in inner view. Molar crest of right mandible broad, with two rounded and scaly ornamented knobs. Prementum (Fig. 2) nearly trapezoidal, reaching second coxae; cleft shallow, less than 40% of maximum width of prementum (length/width ratio 2.4), and 20% the prementum length. One small seta at each side of the cleft; anterior margin of labial palp with three hooks, the inner one the smallest, movable hook as long as external margin of palp.

Thorax: pronotum with mid-lateral finger like prominences, slightly projecting anteriorly (Fig. 5). Wing pads reaching anterior margin of fifth abdominal segment.

Legs: posterior margin of femur with numerous thin short setae intermixed with a few longer ones, about seven times as long as the short ones. Anterior margin with thin short setae, as long as those on posterior margin and about 30% less numerous (Fig. 8).

Abdomen: with no mid-dorsal protuberances. Male (Fig. 6) segments 8–9 with one posterolateral spine, segment 9 with two or more smaller spines adjacent to posterolateral ones. Segment 10 with several spines, 2–3 posterolateral, two ventral and a mid-dorsal bifid one on the posterior margin. Female spine pattern as in male, except for minute spines on segments 8–10 (Fig. 7). Gonapophyses as in Figures 6 and 7.

Caudal lamellae variable in shape and color pattern. Lateral lamellae triquetral, widened distally, reaching maximum width at 0.6 of length (measured from base); lateral, dorsal and ventral carinae with rows of similarly sized, regularly spaced denticles; length/width ratio 3 : 1. Medial lamella slightly widened distally, dorsal margin and apical 0.40 of ventral margin denticulate, length/width ratio nearly 3 : 1.

Discussion

Hetaerina larvae have been extensively studied by Zloty et al. (1993),Westfall and May (1996) and Novelo-Gutiérrez (2000); nevertheless, and because these revisions are regional in scope (Costa Rica, USA and Mexico), exclusively South American larvae were not considered. The main morphological differences of *Hetaerina rosea* with these species are given in Table 1. We have been unable to assign the larva described as *Hetaerina* sp. by Geijskes (1943) to any described species. Based on Geijskes' statements about the low probability of assigning it to *Hetaerina mortua* or *H. laesa*, and on a shared distribution area this larva could represent the recently described *H. gallardi* (Machet, 1989).

Table 1. Morphological characteristics of the exclusively South American *Hetaerina* final instar larvae (*Hetaerina* sp. from Geijskes, 1943). Characters and states: A: posterolateral protuberances of head; 1: lacking, 2: more or less prominent and rounded, 3: prominent and distinctly pointed. B: pronotal protuberances; 1: finger-like, 2: not finger-like. C: number of premental setae; 1: one, 2: two. D: length of premental cleft; 1: >45% of premental width, 2; < or = 40% of premental width. E: rows of spines on posterior border of abdominal segments 8–9, 1: present, 2: absent. F: mid-dorsal protuberances on abdominal segments 3–10, 1: present, 2: absent. G: lateral spines on abdominal segment 8; 1: present, 2: absent.

Characters	A	B	C	D	E	F	G
H. auripennis	2	1	1	1	2?	2	1
H. brightwelli	1	2	2	1	2?	2	2
H. hebe	–	–	2	1	1	2	1
H. moribunda	3	2?	1	2	2	2	1
H. rosea	2	1	1	2	2	2	1
Hetaerina sp.	3	–	2	–	2?	1?	1

Comparing all the described mandibles, it is found that *Hetaerina dominula* (Geijskes, 1943), *H. occisa* (as *H. macropus* by Geijskes, 1946), *H. infecta* (Novelo-Gutiérrez, 2000) and *H. rosea* have an identical mandibular formula, except for the development of knobs or teeth in the right molar crest. In *H. rosea* two knobs are present, whereas in *H. dominula* there are two denticles and in *H. occisa* there is one knob and one denticle. In *H. infecta* the right molar crest is described as 'poorly developed, consisting of two small cusps', whose morphology is not clearly discernible from the figure (Novelo-Gutiérrez, 2000, Fig. 3a).

Of the recorded Argentinean *Hetaerina* species, only *H. caja*, recorded for the first time as *H. dominula* (Fraser, 1948), has been described. However, based on the great similarity of *Hetaerina caja* with *H. rosea* (Garrison, 1990), this record (a single male from Misiones province) should perhaps be attributed to *H. rosea*, thus removing *H. caja* from the Argentinean species list (Muzón & von Ellenrieder, 1998).

Acknowledgments

We thank Rosser W. Garrison and Natalia von Ellenrieder for valuable suggestions and critical reading of the manuscript. This work was partially financed by The National Geographic Society project # 7104–01.

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