



Description of the final instar larva of *Homeoura lindneri* (Ris, 1928) and redescription of the larva of *H. chelifera* (Selys, 1876) (Odonata: Coenagrionidae)

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Abstract

The final instar larvae of *Homeoura lindneri* and *H. chelifera* are described and illustrated based on reared specimens from Argentina. A generic diagnosis is provided, as well as a key to the larvae of the most common genera of Coenagrionidae present in Argentina.

Key words: Aquatic Insects, damselfly, Neotropical Region

Resumen

Se describe e ilustra el último estadio larval de *Homeoura lindneri* y *H. chelifera* sobre la base de ejemplares de Argentina criados hasta su emergencia. Se provee además una diagnosis genérica y una clave para los géneros más comunes de Coenagrionidae presentes en Argentina.

Introduction

Homeoura Kennedy is a neotropical genus of five species (von Ellenrieder 2008). The final instar larvae of two of them have been described: *H. chelifera* (Selys 1876) and *H. nepos* (Selys 1876) (Needham 1904; Calvert 1948). However, these descriptions are doubtful. Both larvae were described based on incomplete specimens from Brazil, identified by association with adults (they were not reared to confirm their specific status). Bulla (1971) re-described the larva of *H. chelifera* (which did not coincide with Needham's description) as part of his PhD thesis, but this work was never formally published and the specimens he studied are lost.

In this contribution we describe the larva of *H. lindneri* and re-describe the larva of *H. chelifera* based on reared specimens from Argentina. We provide a generic diagnosis of the *Homeoura* larva and a key to the larvae of the genera of Coenagrionidae present in Argentina.

Methodology

Nomenclature used to describe mandibular formula follows Watson (1956). Abbreviations for structures used throughout the text are as follows: SI–SX: abdominal segments 1 to 10. The specimens are deposited in the Collection of the Departamento Científico Entomología, Museo de La Plata, Argentina.

Results

Genus *Homeoura* Kennedy

Larval diagnosis. Postero-lateral margins of head rounded. Mandibular formula $L\ 1+2\ 3\ 4\ 5\ y\ a\ b / R\ 1+2\ 3\ 4\ 5\ y\ a$. Prementum with 6–8 long setae total (3+3, 4+3 or 5+3). Labial palp with 3–4 setae; inner margin crenulated; distal margin with 7–9 teeth. Caudal lamellae shorter than abdomen with nodus and transverse suture; ratio of maximum length to maximum width more than 6.5.

Homeoura lindneri (Ris, 1928)

Acanthagrion lindneri Ris, 1928: 41–44, figs. 1–2 (description of male and female).

Homeoura lindneri: von Ellenrieder, 2008: 96–97 (complete synonymy).

Description of final instar larva (figs. 1–2). *Head.* Almost 2.15 times as wide as long at its widest point. Posterolateral margins rounded, with more than 20 spinules. Antennae seven-segmented; third antennomere the longest. Mandibular formula (figs. 1c–d): $L\ 1+2\ 3\ 4\ 5\ y\ a\ b\ (1<3<2<4<5) / R\ 1+2\ 3\ 4\ 5\ y\ a\ (1<3<2<4<5)$. Labium: articulation of pre- and postmentum between bases of coxae I; prementum (fig. 1a) sub-triangular, ratio of maximum length to maximum width 1.27; anterior margin convex and slightly crenulated; with 7–8 premental setae (3+3, 4+3 or 5+3), the inner ones smaller than 0.5 the length of the external ones; lateral margin with 3–5 spines; latero-distal margin with 2 or 4 spines. Labial palp (fig. 1b): outer margin with 3–4 setae; distal margin with 8–9 teeth (decreasing in size laterally); movable hook longer than half the length of outer margin.

Thorax. Wing pads reaching mid length SIV; femora without spines on flexor margin; femora I–II with short spines along the entire extensor margin; femur III with short spines restricted to distal third of extensor margin. Tibiae with short spines restricted to distal third of flexor margin (increasing in number towards tibia III); without spines along extensor margin.

Abdomen. Cylindrical. SI–VIII with spinules along lateral carina; posterior margins of SV–X with a row of spines. Cerci sub-conical, smaller than 0.5 the length of SX. Female gonapophyses (fig. 2c–d) reaching distal end of SX, outer ones with a ventral row of denticles. Lateral caudal lamellae (fig. 2a) lanceolate (almost 0.8 the length of the abdomen); ratio of maximum length to maximum width 8.31; nodus at approximately 0.58 the length of the lamella; with transverse suture (visible on ventral half of the lamella), 14–18 dorsal spines, and 27–36 ventral spines; prenodal area with a rounded dark spot near base of lamella, and scattered groups of dark branching tracheoles, most strongly colored at margins; postnodal area with three transverse black stripes (the proximal do not reach the dorsal margin). Medial caudal lamella (fig. 2b) lanceolate (almost 0.72 the length of the abdomen); ratio of maximum length to maximum width 8.27; nodus at approximately 0.56 the length of the lamella; with transverse suture, 24–26 dorsal spines and 14–16 ventral spines; color pattern similar to that of lateral caudal lamellae.

Measurements (in mm; average, range in square brackets; females N=3, unless indicated otherwise). Total length (without caudal lamella): 12.23 [12.10–12.50]. Head: maximum length (N=2): 1.30; maximum width (N=2): 2.80. Prementum: maximum length: 1.87 [1.80–1.90]; maximum width: 1.47 [1.40–1.60]; outer premental seta (N=1): 0.35. Thorax: femur I: 1.67 [1.60–1.70]; femur II: 2.33 [2.30–2.40]; femur III: 2.93 [2.80–3.00]; tibia I: 2.00 [1.80–2.20]; tibia II: 2.50 [2.40–2.60]; tibia III: 3.10 [3.00–3.20]; inner wing pads maximum length: 3.73 [3.60–3.80]; outer wing pads maximum length: 3.60 [3.40–3.70]. Abdomen: total length: 7.53 [7.20–8.00]; SIX length: 0.70; SX length: 0.50; cerci length: 0.10; female gonapophyses length: 1.03 [1.00–1.10]. Lateral caudal lamella: maximum length: 6.07 [6.00–6.20]; maximum width: 0.73 [0.70–0.80]; dorsal row of spines length: 3.03 [2.80–3.20]; ventral row of spines length: 3.57 [3.30–3.70]. Medial caudal lamella: maximum length: 6.20; maximum width (N=2): 0.75 [0.70–0.80]; dorsal row of spines length:

3.07 [2.50–3.40]; ventral row of spines length: 2.63 [1.90–3.10].

Specimens examined. *Homeoura lindneri*: Argentina, Entre Ríos Province, Diamante Department, Pre-Delta National Park, 32° 07' 57''S, 60° 40' 32''W; 23–24/XI/2006, coll. A. Garré, J. Lambruschini, F. Lozano, L. Ramos & S. Weigel Muñoz, 3 female exuviae (reared) [emerged: 28/XI/2006, 30/XI/2006, 06/XII/2006].

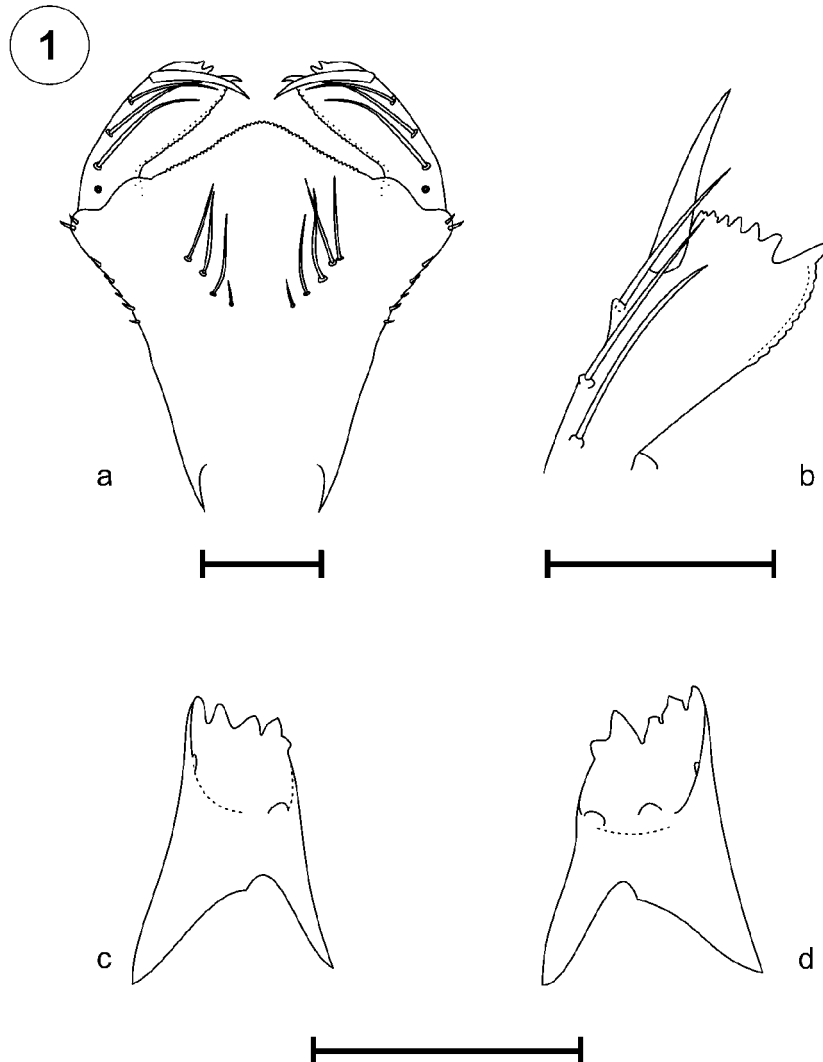


FIGURE 1. *Homeoura lindneri*. Argentina, Entre Ríos Prov., National Park Pre-Delta. (a) Prementum (dorsal view); (b) Left labial palp (inner view); (c) Right mandible (inner view); (d) Left mandible (inner view). Scales 0.5 mm.

Homeoura chelifera (Selys, 1876)

Acanthagrion? cheliferum Selys, 1876: 319–321 (description of male).

Acanthagrion cheliferum: Needham, 1904: 717 (incomplete larval description); Bulla, 1971: 159–166, figs. 175–182, 246 (redescription of adult and larva; this work was never formally published and the material used is lost).

Homeoura chelifera: von Ellenrieder, 2008: 93 (complete synonymy).

Redescription of final instar larva (figs. 3–4). *Head*. Almost 2.10 times as wide as long at the widest point. Posterolateral margins rounded, with more than 20 spinules. Antennae seven-segmented (the third antennomere is the longest). Mandibular formulae (figs. 3b–c): $L\ 1+2\ 3\ 4\ 5\ y\ a\ b$ (80%: $1<3<4<2<5$; 20%: $1<3<2<4<5$) / $R\ 1+2\ 3\ 4\ 5\ y\ a$ ($1<3<2<4<5$). Labium: articulation of pre- and postmentum between bases of

coxae I; prementum (figs. 3a) sub-triangular, ratio of maximum length to maximum width 1.29; anterior margin convex and slightly crenulated; with 6 or 8 premental setae (3+3 or 4+4), the inner ones shorter than 0.5 the length of the external ones, except in one specimen where the inner ones are longer than 0.75 the length of the external ones; lateral margin with 3–5 spines; latero-distal margin with 3–4 spines. Labial palp: outer margin with 5 setae; distal margin with 7–8 teeth (which become smaller to outer margin); movable hook longer than half the length of outer margin.

Thorax. Wing pads reaching anterior third of SIV; femora without spines on flexor margin; with short spines in two rows along the entire extensor margin. Tibiae I–III with short spines restricted to distal third of flexor margin (increasing in number towards tibia III); without spines along extensor margin.

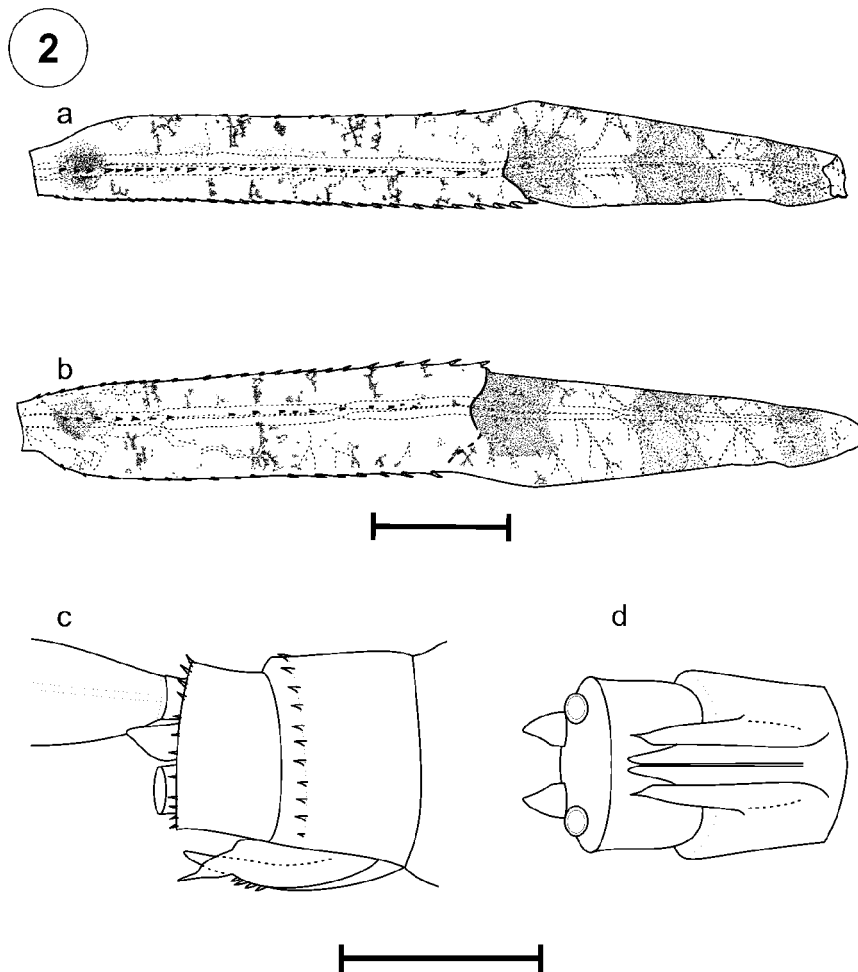


FIGURE 2. *Homeoura lindneri*. Argentina, Entre Ríos Prov., National Park Pre-Delta. (a) Lateral caudal lamella (tip curved back on itself); (b) Medial caudal lamella; (c) ♀ terminalia (lateral view); (d) ♀ terminalia (postero-ventral view). Scales 1.0 mm.

Abdomen. Cylindrical. SIV–VIII with spines along lateral carina; SV–X with a posterior ring of spines. Cerci conical, smaller than 0.5 the length of SX, except in one male exuvia (fig. 4c) in which the cerci were larger. Female gonapophyses (figs. 4a–b) not surpassing distal end of SX, outer ones with a ventral row of denticles. Male gonapophyses (figs. 4c–d) acute, not surpassing distal end of SIX. Lateral caudal lamella (fig. 3d) lanceolate (almost 0.84 the length of the abdomen); ratio of maximum length to maximum width 7.62; nodus at approximately 0.55 of lamella's length; with transverse suture, 15–18 dorsal spines, and 33–36 ventral spines; color pattern very diffuse, with scattered groups of dark branching tracheae. Medial caudal lamella lanceolate (almost 0.86 the length of the abdomen); ratio of maximum length to maximum width 6.94; nodus at approximately 0.50 the length of the lamella; with transverse suture, 25 dorsal spines and 20–26

ventral spines; color pattern similar to that of lateral caudal lamellae.

Measurements (in mm; average, range in square brackets; N=6, unless indicated otherwise). Total length (without caudal lamella) (N=4): 11.56 [11.20–11.90]. Head: maximum length (N=4): 1.38 [1.20–1.50]; maximum width: 2.90 [2.80–3.00]. Prementum: maximum length: 1.90 [1.90–2.00]; maximum width: 1.47 [1.40–1.60]; outer premental seta (N=1): 0.33. Thorax: femur I: 1.50 [1.40–1.60]; femur II: 2.05 [2.00–2.10]; femur III: 2.70; tibia I: 1.93 [1.80–2.00]; tibia II: 2.15 [2.00–2.30]; tibia III: 2.68 [2.50–2.80]; inner wing pads maximum length: 3.50 [3.40–3.60]; outer wing pads maximum length: 3.50 [3.40–3.70]. Abdomen: total length: 7.27 [6.50–7.80]; SIX length: 0.67 [0.60–0.70]; SX length: 0.48 [0.40–0.50]; cerci length: 0.20; female gonapophyses length (N=3): 1.00; male gonapophyses length (N=3): 0.50. Lateral caudal lamella: maximum length (N=2): 6.10 [6.00–6.20]; maximum width (N=2): 0.80; dorsal row of spines length (N=2): 0.80; ventral row of spines length (N=2): 3.35 [3.30–3.40]. Medial caudal lamella: maximum length (N=2): 6.25 [6.20–6.30]; maximum width (N=2): 0.90 [0.80–1.00]; dorsal row of spines length (N=2): 3.10 [3.00–3.20]; ventral row of spines length (N=2): 3.30 [2.80–3.80].

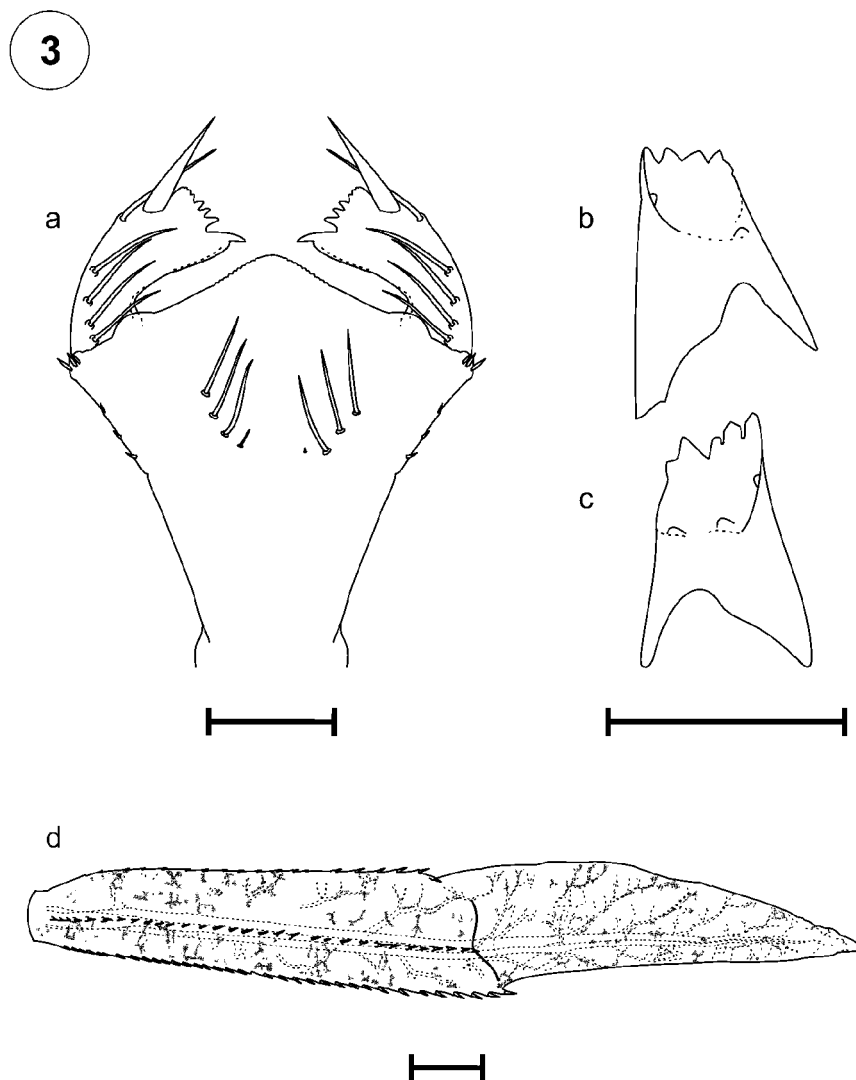


FIGURE 3. *Homeoura chelifera*. Argentina, Corrientes Prov., (a) (d) San Juan de Poriahú Ranch, (b) (c) El Dorado Ranch. (a) Prementum (dorsal view); (b) Right mandible (inner view); (c) Left mandible (inner view); (d) Lateral caudal lamella. Scales 0.5 mm.

Specimens examined. *Homeoura chelifera*: Argentina, Corrientes Province, Ituzaingo Department, San Juan de Poriahú Ranch, 27° 42' 51" S, 57° 11' 14" W; 01/X/2003, coll. J. Muzón, 1 male exuvia (reared) [emergence date not determined]; 2 males and 2 females same data but coll. S.A. Mazzucconi [emergence

data not determined except for 1 female: 15/X/2003]; Argentina, Corrientes Province, Mercedes Department, El Dorado Ranch, Corrientes River and artificial channel, 28° 44' 34" S, 58° 07' 36" W; 26/IX/2003, coll. S.A. Mazzucconi, 1 female exuvia (reared) [emergence date not determined].

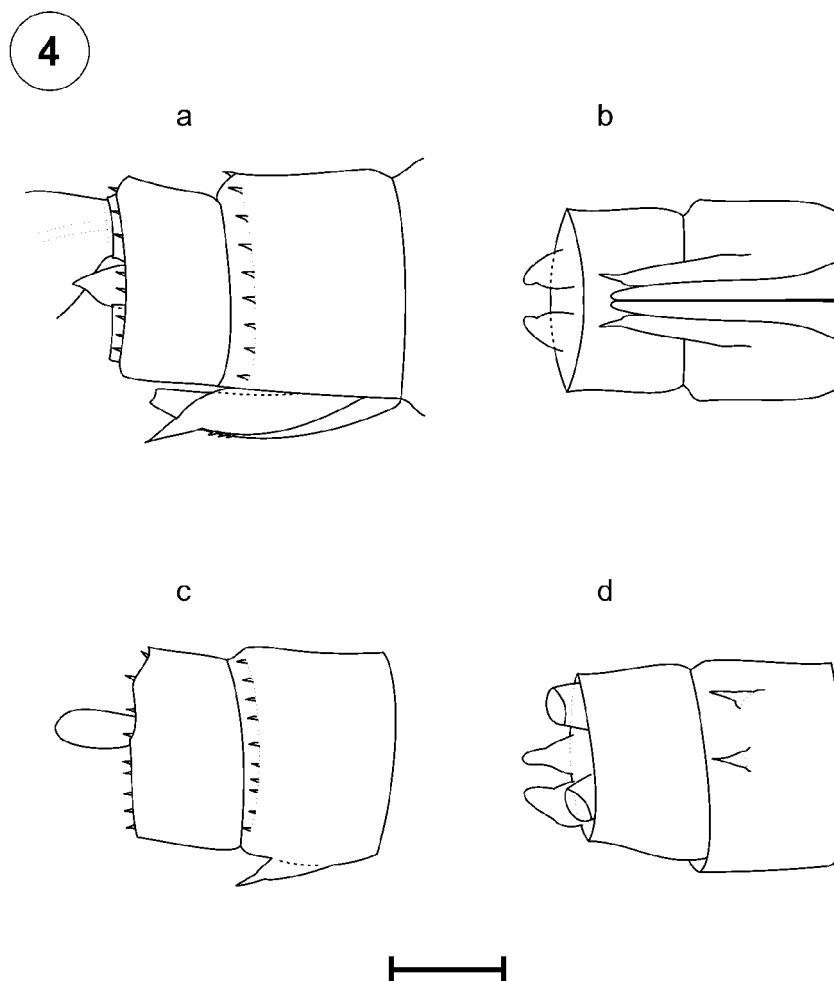


FIGURE 4. *Homeoura chelifera*. Argentina, Corrientes Prov., (a) (b) El Dorado Ranch, (c) (d) San Juan de Poriahú Ranch. (a) ♀ terminalia (lateral view); (b) ♀ terminalia (ventral view); (c) ♂ terminalia (lateral view); (d) ♂ terminalia (ventro-lateral view). Scales 0.5 mm.

Key to final instar larvae of most common genera of Coenagrionidae from Argentina

There are 15 genera known from Argentina (von Ellenrieder 2008; von Ellenrieder & Muzón 2008; Garrison 2009). In the key below we exclude three of them (*Aeolagrion*, *Antiagrion* and *Tigrigrion*) because there are no descriptions of the final instar larvae for the species recorded from Argentina.

- 1 Anterior margin of labial palp not bilobate 2
- Anterior margin of labial palp bilobate; bromeliad-dwelling larvae *Leptagrion*
- 2 Anterior margin of labial palp with teeth..... 3
- Anterior margin of labial palp without teeth *Telebasis*
- 3 Caudal lamellae shorter than abdomen..... 4
- Caudal lamellae longer than abdomen *Acanthagrion*
- 4 Total length of larvae excluding caudal lamellae more than 9 mm 5
- Total length of larvae excluding caudal lamellae less than 6 mm *Argentagrion*
- 5 Premental setae present 6
- Premental setae absent *Argia*

6	Inner margin of labial palp crenulated.....	7
-	Inner margin of labial palp not crenulated	<i>Cyanallagma</i>
7	Caudal lamellae with caudal filament.....	8
-	Caudal lamellae without caudal filament	10
8	Ratio of maximum length to maximum width of lateral caudal lamellae more than 3.3	9
-	Ratio of maximum length to maximum width of lateral caudal lamellae less than 2.6.....	<i>Protallagma</i>
9	Ventral margin of cerci slanting upward; caudal lamellae with color pattern diffuse	<i>Oxyagrion</i> (in part: <i>O. bruchi</i> , <i>O. chapadense</i> , <i>O. terminale</i>)
-	Ventral margin of cerci straight, if not then caudal lamellae with dark areas well defined	<i>Andinagrion</i>
10	Length of caudal lamellae 0.5–1.0 the length of the abdomen.....	11
-	Length of caudal lamellae less than 0.5 the length of the abdomen	<i>Ischnura</i>
11	Caudal lamellae with transverse suture	12
-	Caudal lamellae without transverse suture ... <i>Oxyagrion</i> (in part: <i>O. basale</i>)	
12	Lateral short setae along outer margin of labial palp absent	13
-	At least one lateral short seta along outer margin of labial palp present	<i>Oxyagrion</i> (in part: <i>O. hempeli</i> , <i>O. rubidum</i>)
13	2 premental setae	<i>Enallagma</i>
-	4 or more premental setae.....	<i>Homeoura</i>

Discussion

The *Homeoura* larvae we examined possess the typical features of Coenagrionidae, *i.e.* sub-triangular prementum with entire anterior margin, movable hook of labial palp without setae, antennal segment 1 shorter than the total length of remaining segments, caudal lamellae planar with nodus.

Homeoura lindneri is easily recognizable by the presence of three black spots distal to nodus on each caudal lamellae compared to diffuse color pattern in *H. chelifera*. Based on Calvert's description (1948) of the larva of *H. nepos*, the latter can be distinguished from *H. chelifera* and *H. lindneri* by the presence of 11 spines across the lateral margins of the prementum (3–5 in *H. chelifera* and *H. lindneri*); this character is likely to be highly variable, but unfortunately, the caudal lamellae of *H. nepos*, which could provide further specific characters, have not been described yet.

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