

SHORT COMMUNICATIONS

**ARGIA CARLCOOKI SPEC. NOV. FROM MEXICO
(ZYGOPTERA: COENAGRIONIDAE)**

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The new sp. (holotype ♂, allotype ♀: Mexico, State of Morelos, Rio Amacuzac tributary at Tehuixtla; 20-VII-1992; deposited at FSCA, Gainesville, FL, USA) is described and compared with its closest relative, *A. immunda* (Hag.).

INTRODUCTION

There are 115 species of *Argia* listed by BRIDGES (1993). DAIGLE (1992) described *A. garrisoni* from northeast Mexico and GARRISON (1994) described *A. leonora*, *A. pima*, and *A. sabino* from the United States and Mexico. The addition of *A. carlcooki* increases the total to 119 currently recognized species in this speciose genus. The larva of the new species is unknown.

ARGIA CARLCOOKI SPEC. NOV.

Figures 1 a-e

Material. – Holotype ♂, allotype ♀ [in tandem]: MEXICO, Morelos State, Tehuixtla, Route 6, Rio Amacuzac tributary SE of Balneario Los Palma, 20-VII-1992, J.J. Daigle (JJD); – Paratypes (58 ♂, 10 ♀): same data as holotype and allotype, 21 ♂, 1 pair in tandem (JJD); 13 ♂, 1 pair in tandem, S.W. Dunkle (SWD); 5 ♂, 1 ♀, 2 pairs in tandem, K.J. Tennessen (KJT); 6 ♂, 4 pairs in tandem, W.F. Mauffray (WFM); stream 1 km S of Cocoyotla, Hwy 421, 20-VII-1992, 1 ♂, (KJT). Colima State, stream 24.2 mi. S of Colima, 21-VIII-1965, 1 ♂, D.R. Paulson (DRP); Jalisco State, spring 1.9 mi. NW of La Toma and 1.2 mi. NE of Tequila, 25-VIII-1965, 2 ♂, (DRP); Oaxaca State, stream 5.0 mi. W of Jalapa del Marquez, 22-VI-1966, 1 ♂, (DRP) and stream 14.0 mi. E of El Camaron, 26-VIII-1967, 1 pair, (DRP). – The holotype, allotype, and several paratypes are deposited in the Florida State Collection of Arthropods (FSCA) in Gainesville, Florida. The remaining paratypes are in the collections of Carl Cook, Jerrell J. Daigle, Thomas W. Donnelly, Sidney W. Dunkle, Rosser W. Garrison, William F. Mauffray, Dennis R. Paulson, Enrique Gonzalez Soriano, and Ken J. Tennessen.

E t y m o l o g y. – The species is named for Carl Cook, the founding editor of the North American journal *ARGIA*, in honor of his contributions to neotropical odonatology.

MALE (holotype). – **H e a d.** – Eyes in life blackish-blue dorsally, light blue ventrally. Vertex black, large postocular spots and occipital bar blue. Frons, anteclypeus, postclypeus, genae, maxillae, and labrum blue; labium light blue; antennae and dorsal rear of head black.

T h o r a x. – Pronotum black with a large lateral blue spot, posterior lobe nearly erect, propleuron blue; thoracic carina black, mesepisternum black dorsally, bright blue laterally. Humeral stripe forked dorsally. Lower mesinfrasternum blue, mesepimeron black dorsally and blue ventrally; metepisternum blue with a thin black metapleural sutural line, metepimeron pale blue (Fig. 1a).

Legs. – Coxae light blue, legs black with extensive pale blue areas. Tibial extensor surface light blue, armature black.

Wings. – Similar to *A. immunda*. 14 postnodal cross-veins in forewings, 13 in hindwings. Veins black with diamond-shaped brown pterostigma overlying 1 cell.

A b d o m e n. – Bright blue, segment 1 bright blue with wide dorsobasal black spot; segment 2 blue with three unequal black areas laterally. Segments 3-6 bright blue with black lateroventral area about 1/4 the segment length and black basal rings; segment 7 black with bright blue basal ring. Segment 8 bright blue, black ventrolaterally; segment 9 bright blue with an obscure black spot laterally. Segment 10 light blue dorsally, laterobasal black area saddle-shaped with ends extending upward to dorsum apically and basally.

Caudal appendages (Fig. 1c) similar to *A. immunda* (Fig. 2c) but smaller and not so robust. Pale areas of appendages washed with blue. Viewed dorsomedially, cercus weakly trifid with large toothed protuberance (Fig. 1e). Viewed dorsally, the cercus very weakly trifid and the epiproct narrow. When viewed laterally, bases of the cerci broad and the paraprocts are weakly bifid with the lower arm of the paraproct subequal to the upper arm. Bright blue tori evenly edged apically. Viewed posteriorly, the cerci trifid with the strong, black middle tooth decurved downward and inward.

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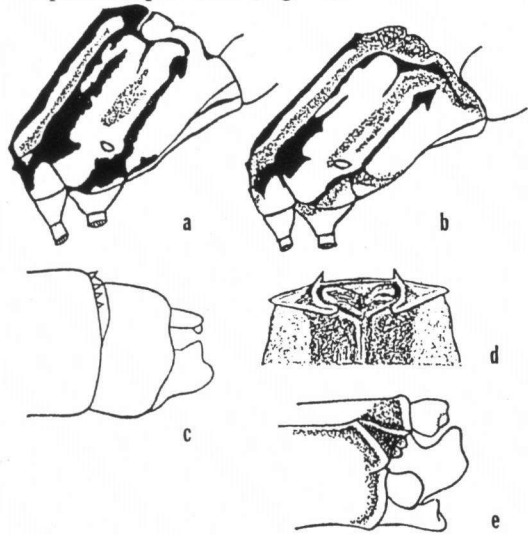


Fig. 1. *Argia carlcooki* sp.n.: (a) lateral view of male thoracic pattern; – (b) ditto, female; – (c) lateral view of male abdominal appendages; – (d) dorsal view of female mesostigmal plate; – (e) dorsomedial view of male appendages.

Smaller pale outer and inner protuberances more rounded.

M e a s u r e m e n t s (mm). – Total length including appendages 33, abdomen 26, forewing 21, and hindwing 20.

FEMALE (allotype). – **H e a d.** – Eye coloration same as male. Top of head same as holotype. Facial coloration brownish-blue.

T h o r a x. – Coloration and pattern as in holotype with some brownish undertones in the paler blue areas (Fig. 1b). Posterior medial borders of flat mesostigmal plates curved and depressed tightly against the thoracic carina (Fig. 1d). Viewed laterally, mesostigmal plates not raised above thoracic carina. Margin of mesostigmal lobes entire.

Legs. – Light brown with bluish overtones with variable black extensor and flexor stripes on femora and tibiae. Tarsi and armature black.

Wings. – As in holotype except 15/14 postnodal crossveins in forewings, 13/12 in hindwings.

A b d o m e n. – Segment 1 blue with brownish-black dorsoapical spot. Segment 2 similar to holotype but with more black dorsally and more blue lateroventrally. Segments 3-6 similar to holotype but with brownish-black markings increasing in size from segment 3 to segment 6. Segment 7 almost entirely brownish black with an obscure pale basal ring. Segment 8 bright blue with a black stripe ventrally, an irregular brownish apical ring, and a small obscure brown mid-ventral spot. Segment 9 bright blue dorsally, beige ventrally with a very thin brown lateral stripe, and a small obscure brown mid-ventral spot. Segment 10 blue. Ovipositor beige with bluish overtones.

M e a s u r e m e n t s (mm). – Total length including appendages 32.7, abdomen 26, forewing 20.5, and hindwing 20.

VARIATION AMONG PARATYPES. – Paratypes similar to holotype and allotype. The total length of ♂ ranges from 31-34, ♀ 30-32; abdomen ♂ 24-27, ♀ 23-25; forewing ♂ 19.5-21.5, ♀ 20-22; hindwing ♂ 19-20, ♀ 19-21; Postnodal crossveins in forewing of ♂ 13-15, ♀ 12-15, hindwing ♂ 11-13, ♀ 11-13.

COMPARISON WITH *ARGIA IMMUNDA*

The bright blue thoracic areas of *A. carlcooki* easily distinguish it from the corresponding light violet areas of *A. immunda* (Hag.). The color pattern resembles both *A. extranea* (Hag.) and *A. immunda*. The pale areas in segments 8, 9 and 10 are blue, not light violet. *A. carlcooki* has a black ventrolateral stripe on segment 9 whereas a shorter, light brownish black stripe exists in *A. immunda*. These distinctive postbasal dark rings found in *A. immunda* are incomplete and reduced in *A. carlcooki*. In *A. carlcooki*, the frons and the labrum are blue. In *A. immunda*, the frons and the labrum are purple. The dark leg pattern of both species is very similar.

The male appendages of *A. carlcooki* (Fig. 1c) are most similar to *A. immunda* (Fig. 2c). The body size and appendages are slightly smaller in *A. carlcooki* than in *A. immunda*. In dorsal view, the torus, torifer, and paraprocts similar to *A. immunda*.

Dorsomedially, cercus is weakly trifold (Fig. 1e), not bifid as in *A. immunda* (Fig. 2e). In posterior view, the cercus is trifold with the strong black middle tooth angled more inwards than the downwardly directed *A. immunda* middle tooth. The pale outer protuberance smaller and less robust than in *A. immunda*. When viewed laterally, the cercus base is broader, not as constricted as in *A. immunda*. The weakly bifid paraproct has the lower arm more rounded and less extended than in *A. immunda*.

Structurally, the female of *A. carlcooki* is similar to both *A. immunda* and *A. extranea*. The mesostigmal lobes, missing in *A. immunda* (Fig. 2d), are not as pronounced as in *A.*

extranea. Viewed laterally, the mesostigmal lobes rarely exceed the height of the thoracic carina, much less than the distinctly upraised lobes in *A. extranea*. No mesepisternal tubercles exist in *A. carlcooki*.

In coloration, female *A. immunda* are light brown but female *A. carlcooki* are blue or bluish-brown in the major pale areas, similar to the *A. carlcooki* males. No dichromatic (totally brown) females were observed in the described material. The humeral stripe of *A. carlcooki* is much wider (Fig. 1b) when compared to the narrow stripe in *A. immunda* (Fig. 2b). Female *A. carlcooki* show comparatively more black areas on the thorax and abdomen than female *A. immunda*. The ovipositor is black in *A. carlcooki* with a large pale basal area as opposed to the mostly pale *A. immunda* ovipositor.

CALVERT's (1902) key to *Argia*, Couplet NN on p. 72, can be modified for the males as follows:

- NN. Antennodal cells on the front wings 3.
- P. Face, antehumeral stripe, and abdominal pale areas violet; black postbasal rings present on segments 4-6 33. *immunda*
- PP. Face, antehumeral stripe, and abdominal pale areas blue; black postbasal rings incomplete on segments 4-6 33a. *carlcooki*

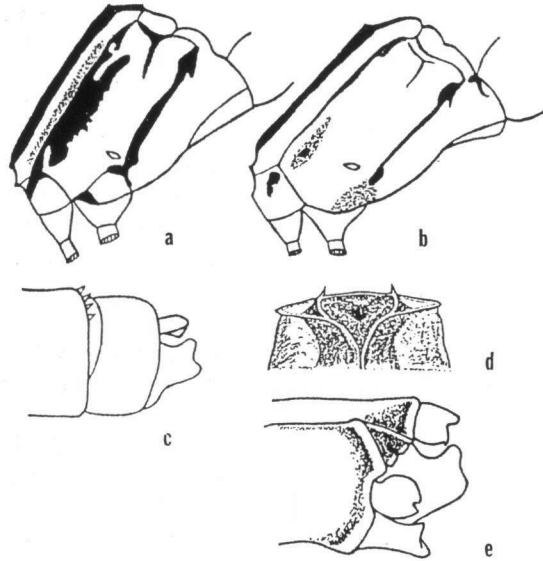


Fig. 2. *Argia immunda* (Hagen): (a) lateral view of male thoracic pattern; - (b) ditto, female; - (c) lateral view of male abdominal appendages; - (d) dorsal view of female mesostigmal plate; - (e) dorsomedial view of male appendages.

BIOLOGY

A large population of *Argia carlcooki* was found on a small spring-fed tributary just south of the Balneario Los Palma at Tehuixtla. The first-order stream meandered about 100 meters through dry scrub forest before entering the wide Rio Amacuzac in south-central Mexico. While wading the stream, the first adult males were seen about 9:30 AM in the morning and their numbers gradually increased throughout the day. Later, solitary females and mated pairs appeared about noon and began ovipositing in the aquatic macrophytes, *Ceratophyllum* and *Najas*.

Other commonly seen *Argia* species were *A. extranea*, *A. oenea* Hag. (purple form), and *A. tezpi* Calv. *Phyllogomphoides pacificus* Sel. flew up and down the stream throughout the day. *Erpetogomphus elaps* Sel. and *E. eutainia* Calv. were found perching on mesquite bushes in the nearby fields.

It appears that *A. carlcooki* is restricted to the western side of the Mexican Continental Divide and *A. immunda* to the eastern slopes. *A. carlcooki* and *A. immunda* were collected together only at the Jalapa del Marquez site in Oaxaca State by Dr D. Paulson. Further collecting in south-central Mexico should reveal more sites where these species may exist together.

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