

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

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A. garrisoni sp. n. (holotype ♂: Mexico, State of San Luis Potosi, Rio Huichihuayan; allotype ♀: Mexico, San Luis Potosi, Cascadas Micos; deposited at FSCA, Gainesville, FL, USA) is described and compared with its closest relative, *A. calida* (Hagen).

INTRODUCTION

DAVIES & TOBIN (1984) listed 133 species of *Argia* and indicated that much taxonomic work remains to be done within the genus. The addition of *A. garrisoni* sp. n. increases the total to 134 currently recognized species in this profuse genus. The larva is unknown.

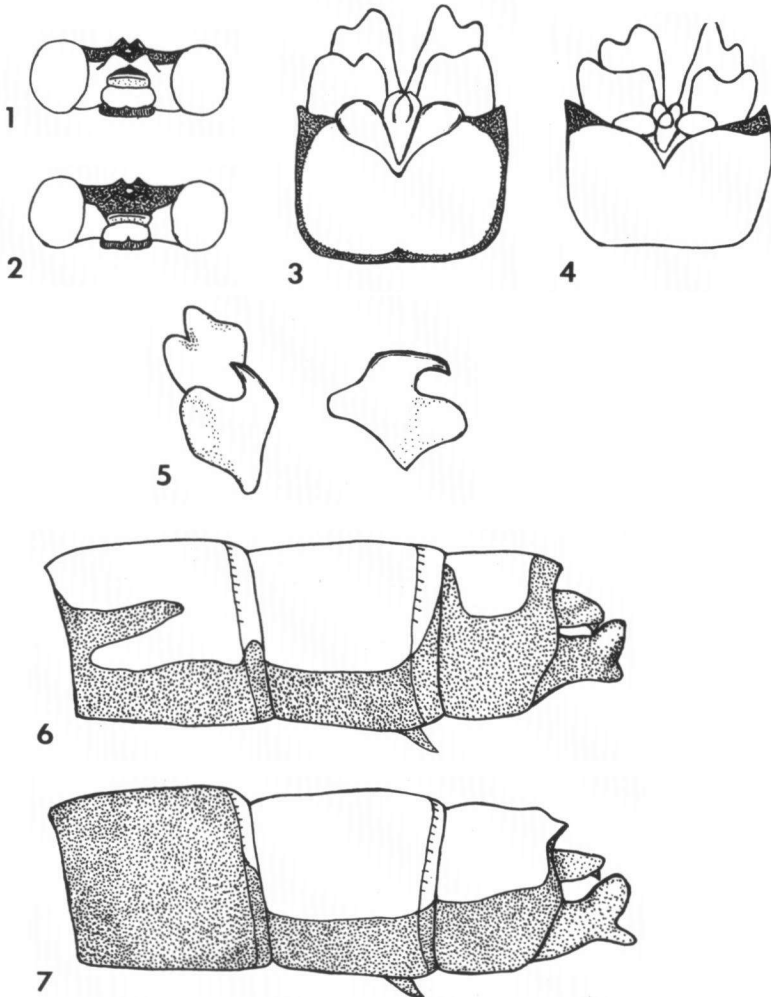
ARGIA GARRISONI SPEC. NOV.

Figures 1, 3, 5, 6, 8, 10, 12

Material. — **Holotype** ♂: Mexico, San Luis Potosi, Rio Huichihuayan headwater, W of town of Huichihuayan, off Hwy 85, 23-VI-1990, J.J. Daigle (JJD) leg.; — **Allotype** ♀: Mexico, San Luis Potosi, Cascadas Micos, NE of Ciudad Valles, off Hwy 85, 25-VI-1990, K.J. Tennessen (KJT) leg.; — **Paratypes** (37 ♂, 5 ♀): same data as holotype, 6 ♂ (JJD), 5 ♂ (KJT), 5 ♂ E. Gonzalez Soriano (EGS) leg.; — same data as allotype, 4 ♂, (JJD), 3 ♂, 2 ♀ (KJT); — San Luis Potosi, Rio Coy, off Hwy 85, S of Ciudad Valles, 24-VI-1990, 1 ♀ (KJT); — San Luis Potosi, Las Cascadas Park, Tamasopo, W of Ciudad Valles, 26-VI-1990, 1 ♀ (KJT); — Rio Corona, Tamaulipas, Hwy 101, Guemes, 22-V-1984, 1 ♂, G.W. Harp leg.; — El Salto Falls, San Luis Potosi, 12-VI-1963, 4 ♂, 1 ♀ R.E. Woodruff leg.; — same data, but 15-VI-1963, 4 ♂; — Rio Ramos, Nuevo Leon, 3 km S of Allende, 2-IX-1963, 2 ♂ T.W. Donnelly (TWD) leg.; — Horsetail Falls, Nuevo Leon, 35 km S of Monterrey, 6-IX-1962, 3 ♂ (TWD). — The holotype, allotype, and the El Salto Falls paratypes are deposited in the Florida State Collection of Arthropods (FSCA) in Gainesville, Florida. The remaining paratypes are in the collections of Jerrell J. Daigle, Thomas W. Donnelly, Sidney W. Dunkle, Rosser W. Garrison, Enrique Gonzalez Soriano, and Ken J. Tennessen.

Etymology. — The species is named for Rosser W. Garrison in honor of his contributions to Neotropical odonatology.

MALE (holotype). — Head: Eyes in life purple dorsally, yellow ventrally. Top of head black, postocular spots purple, pale streak lateral to each lateral ocellus; anterior surface of frons, anteclypeus, and postclypeus purple; genae, mandibles, and labrum pale purple, a black basal transverse line on labrum; labium light tan;



Figs. 1-7. Male structural features of *Argia garrisoni* sp. n. (Figs 1, 3, 5, 6) and *A. calida* (Hag.) (Figs 2, 4, 7): (1-2) Head, frontal view; — (3-4) Segment 10 and appendages, dorsal view; — (5) Appendages (left superior dissected), dorsolateral view; — (6-7) Abdominal segments 8-10 and appendages, lateral view.

antennae, fronto-clypeal suture and rear of head black (Fig. 1).

Thorax: — Pronotum black with a large lateral purple spot, anterior lobe pale medially, posterior lobe nearly erect, propleuron purple; mesepisternum black in medial half, purple laterally, lower mesinfraepisternum purple, mesepimeron black in anterior half and purple posteriorly; metepisternum purple with a thin black metapleural sutural line, metepimeron pale yellow with purplish overtones and a metepimeral black stripe which is slightly forked dorsally.

Legs. — Coxae light purple, legs black with tibial extensor surface light purple, armature black.

Wings. — Similar to *Argia calida* (Hagen). 14 postnodal crossveins in forewings, 13 in hindwings. Veins black, light brown pterostigma diamond-shaped, overlying $1\frac{1}{2}$ cells.

Abdomen. — Black, large purple apical ring expanded ventrally on segment 1, a large purple dorsal spot on 2; segments 3-7 with pale latero-ventral areas and light purple basal rings; basal ring on 7 dark purple; 8 purple with lower lateral areas black and a narrow black basal ring with a distinctive black mid-lateral slash. Segment 9 purple with basal black area. Segment 10 purple dorsally with a thin black basal line and black apical corners; laterally, basal black area saddle-shaped with ends extending upward to dorsum apically and posteriorly (Figs 3, 6).

Caudal appendages (Figs 3, 5, 6) very similar to *A. calida* but slightly more robust. Viewed dorsally superior appendages slightly bifid; inferior appendages bifid, extending beyond superiors about the same length as the superiors from segment 10; the lower arm of the inferior slightly longer than the upper arm, tori purplish oval knobs (Fig. 3). Viewed dorsolaterally superiors deeply bifid with broad rounded outer arm inflated dorsally. Outer edge of inner arm parallel-sided approaching blunt apex. Inner arm more than 3 times narrower and more slender than broad outer arm (Fig. 5). Viewed laterally appendages close together, tip of inner arm of the superior appendage brushes upper arm of inferior appendage (Fig. 6).

Measurements (mm). Total length including appendages 41, — abdomen 32, — forewing 24, —and hindwing 23.

FEMALE (allotype). — **Head:** Eye coloration same as male. Top of head and face same as holotype except two obscure brown spots on postclypeus.

Thorax. — Coloration as in holotype with some brownish undertones in the purple areas. Metepimeral black stripe much reduced. Posterior medial borders of mesostigmal plates raised into elevated, projecting lobes that are higher than wide. Lower inner margin of lobes entire (Fig. 12).

Legs. — Dull yellow with variable black extensor and flexor stripes on femora and tibiae. Tarsi and armature black.

Abdomen. — Similar to holotype but with larger pale lateroventral areas on segments 3-7 and a pale yellow basal stripe on ovipositor. Dorsally, segment 8

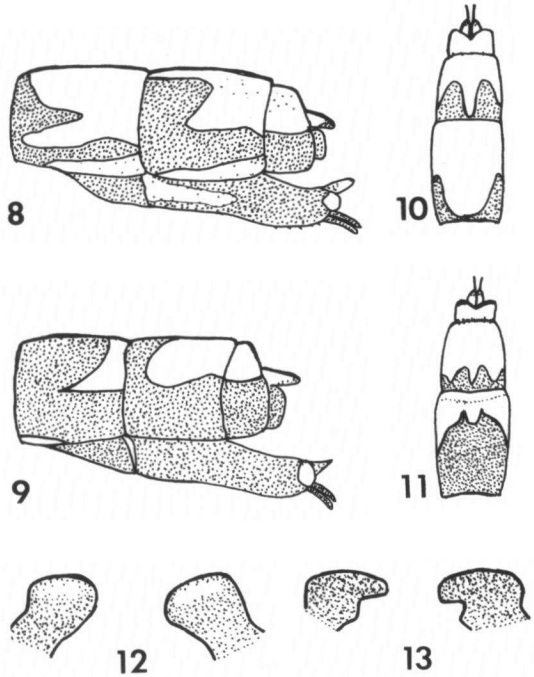
mostly purple with a wide bowl-shaped black basal area which extends ventrally (Fig. 10). Viewed laterally, this black basal area projects into a lateral peak (Fig. 8). Segment 9 with purple and black areas in equal amounts. Dorsally, the basal black area has a deep U-shaped concavity with its adjoining peaks smoothly rounded. Viewed laterally, such adjoining peaks reach halfway to segment 8, then extend laterally along segment 10 to the appendages. Top of segment 10 purple (Fig. 10).

Wings. — As in holotype except 16 postnodal crossveins in forewings, 14 in hindwings.

Measurements (mm). — Total length including appendages ♂ 38, — abdomen 30, — forewing 24, — and hindwing 23.

VARIATION AMONG PARATYPES. — Paratypes similar to holotype and allotype. The distinctive black lateral slash on segment 8 is shorter in length in some males. The immature El Salto Falls female has the mostly tan thoracic coloration brushed with some light purplish overtones.

The total length of ♂ ranges from 38-41, — ♀ 37-39; — abdomen ♂ 30-33, — ♀ 29-31; — forewing ♂ 23-25, — ♀ 24-25; — hindwing ♂ 22-24, — ♀ 22-24; — postnodal crossveins in forewing of ♂ 14-17, — ♀ 14-16, — hindwing ♂ 13-15, — ♀ 13-15.



Figs 8-13. Female structural features of *Argia garrisoni* sp. n. (Figs 8, 10, 12) and *A. calida* (Hag.) (Figs 9, 11, 13): (8-9) Abdominal segments 8-10, lateral view; — (10-11) same, dorsal view; — (12-13) Mesostigmal lobes, frontal view.

COMPARISON WITH *ARGIA CALIDA*

A. garrisoni sp. n. is most similar to *A. calida*, especially by the male appendages. The body size and appendages are slightly larger in *A. garrisoni*. The outer arm of the superior appendage is more robust dorsally than in *A. calida*. The outer edge of the inner arm is more parallel-sided towards the blunt apex than in *A. calida*. When viewed laterally, the appendages are wider apart with the tips

more noticeable in *A. calida* (Fig. 7).

The bright blue areas of *A. calida* are replaced by purple in *A. garrisoni*. The abdomen in *A. calida* is black with only segments 9 and 10 blue above (Fig. 7). Segment 8 is black in *A. calida* but purple with a distinctive black lateral slash in *A. garrisoni*. In *A. calida* the black areas on top of the head extend down to the clypeus, covering most of the frons; the rest of the face is blue (Fig. 2). In *A. garrisoni* the frons is purple, the black area does not reach the clypeus. The fronto-clypeal suture is black in *A. garrisoni*, blue in *A. calida*. The small blue dorsal dot on segment 2 in *A. calida* is replaced by a larger purple spot in *A. garrisoni*.

Structurally, the females of *A. garrisoni* and *A. calida* are very similar. The mesostigmal lobes are more elevated, higher than wide with the inner margin entire or smooth in *A. garrisoni*. The lobes are shorter, wider than high, with the lower inner margin concave or indented in *A. calida* (Fig. 13). This concavity enables the lobe to overhang the dorsal thoracic carina in *A. calida* but not in *A. garrisoni*. The lobes in *A. garrisoni* are similar to the lobes in *A. translata* Hagen. However, *A. translata* has nearby mesepisternal tubercles which do not exist in *A. garrisoni*.

Female *A. garrisoni* are purple but female *A. calida* are blue in the major pale areas, similar to the respective males. Female *A. calida* show comparatively more dorsal and lateral black on segment 9 (Figs 9, 11). The black dorsal pattern on segment 9 shows a deep concavity in *A. garrisoni*. This concavity is more V-shaped with sharper adjoining peaks in *A. calida*. The ovipositor is all black in *A. calida* but *A. garrisoni* has a large basal, pale yellow stripe.

CALVERT's key (1902) to *Argia*, Couplet E, line aa on p. 70, can be modified for the males as follows:

- aa Pale antehumeral stripe one-third as wide as dark middorsal, inferior appendages bifid.
- b Face, antehumeral stripe, and abdominal segments 9 and 10 mostly blue; segment 8 entirely black 2. *calida*
- bb Face, antehumeral stripe, segments 9 and 10 mostly purple; segment 8 purple with a lateral black slash 3. *garrisoni*

BIOLOGY

The habitat of *A. garrisoni* appears to be shallow spring-fed rivers with waterfalls in the Tamaulipan scrub forest of northeast Mexico. Records exist for the States of Nuevo Leon, San Luis Potosi and Tamaulipas. At Rio Hui-chihuayan, *A. calida* and *A. garrisoni* occurred together but in different habitats. *A. garrisoni* males perched openly on fallen tree branches in the middle of the river's sunny areas. In contrast, the secretive *A. calida* males were found away from the river in dry, shady gullies, usually perching on the ground or on tree roots. Some *A. calida* were seen in heavy, shady underbrush. *A. garrisoni* males were few in number and were widely scattered on the rivers. The females were

found in brush away from the water.

Other companion Odonata were numerous ovipositing pairs of *Argia* sp. (nr *fissa* Selys) and *A. translata* Hagen. A few cruising *Erpetogomphus constrictor* Ris and *Phyllogomphoides suasus* Selys highlighted the assemblage.

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