

**HETERAGRION COOKI SPEC. NOV. FROM ECUADOR
(ZYGOPTERA: MEGAPODAGRIONIDAE)**

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The new sp. is described from Ecuador (holotype ♂: Pichincha Province, Hotel Tinalandia, 31-I-1997; allotype ♀: Pichincha prov., Rio Palenque Biological Station, 9-X-1988; both deposited in FSCA). Males can be distinguished by the very large decumbent tooth on the cercus.

INTRODUCTION

There are currently 38 species and 1 subspecies in *Heteragrion* (DONNELLY, 1992), all neotropical. The addition of *H. cooki* sp. n. increases the total to 39. The larva is unknown.

Specimens studied were from the Florida State Collection of Arthropods (FSCA), private collections, and the International Odonata Research Institute (IORI).

HETERAGRION COOKI SP. NOV.

Figures 1-10

Material. — **Holotype** ♂: ECUADOR, Pichincha prov., small stream at Hotel Tinalandia, Hwy 30, 9 km W of Alluriquin, 31-I-1997, J.J. Daigle leg. (JJD); — **Allotype** ♀: ECUADOR, Pichincha prov., Rio Palenque Biological Station, 47 km S of Santo Domingo de los Colorados, 600 ft, 9-X-1988, S.W. Dunkle leg. (SWD). — **Paratypes** (27 ♂, 6 ♀): same data as holotype 8 ♂ (JJD); — 1 ♂, 1 ♀, E. Tapia leg.; — 9 ♂, K.J. Tennessen leg.; — 4 ♂, W.F. Mauffray leg.; — Tinalandia, 10 km E of Santo Domingo de los Colorados, 19-V-1975, 1 ♂, 2 ♀, B.A. Drummond leg. (FSCA); — same data, 1 ♀ but T.C. Emmel leg.; — Tinalandia, 12-V-1985, 1 ♂, T.C. Emmel leg. (FSCA); — Tinalandia, 5-XII-1980, 1 ♀, T. Arregui leg. (FSCA); — Tinalandia, between Machachi and Santo Domingo de los Colorados, 2/8-V-1992, 1 ♂, 1 ♀, J.B. Heppner leg. (FSCA); — Rio Palenque Biological Station, 47 km S of Santo Domingo de los Colorados, 600 ft, 9-X-1988, 3 ♂, S.W. Dunkle leg.; — El Oro prov.,

Hotel Machay 25 km SE of Pinas, 3-VII-1989, 1 ♂, R. Miller & L. Stange leg. (FSCA).

The holotype, allotype, and several paratypes are deposited in the Florida State Collection of Arthropods (FSCA) and the International Odonata Research Institute in Gainesville, Florida. The remaining paratypes are in the collections of Jerrell J. Daigle, Sidney W. Dunkle, William F. Mauffray, Ken J. Tennesen, and Ponteficia Universidad Catolica del Ecuador (PUCE), Ecuador.

E t y m o l o g y. — The species is named after Carl C o o k for his many contributions to New World odonatology.

MALE (holotype). — **H e a d.** — Eyes in life black, dull green ventrally. Face all bright yellow upwards to level of median ocellus; small brown lateral spot between base of antenna and eye. Vertex dark brown with irregular yellowish-brown areas posteriorly (Fig. 1). Antennae yellow with apex of second segment dark brown, distal segments dark brown. Ocelli clear; rear of head dull yellow.

T h o r a x. — Anterior lobe of pronotum brown. Middle lobe yellow with a diffuse brown area dorsally (Fig. 2). Brown posterior lobe completely edged with yellow, slightly erect. Propleuron dull yellow. Black middorsal thoracic carina bordered with thin yellow and brown reticulated stripes and thin yellow lateral lines. Mesepisternum dark brown dorsally, brownish yellow laterally. Brown humeral stripe incomplete apically (Fig. 3). Mesinfraepisternum dull yellow with a mid-lateral brown stripe. Mesepimeron brown dorsally, dull yellow ventrally. Metepisternum brownish yellow. Metepimeron lemon yellow with a small diffuse brown dash distally. Metinfraepisternum and venter lemon yellow.

Legs. — Yellow and brown banded with black armature. Coxae yellow with a diffuse brown central spot.

Wings. — Venation typical of genus. 15 postnodal crossveins in forewings, 14-15 in hindwings. Veins black with diamond-shaped dark brown pterostigma overlying 2 cells.

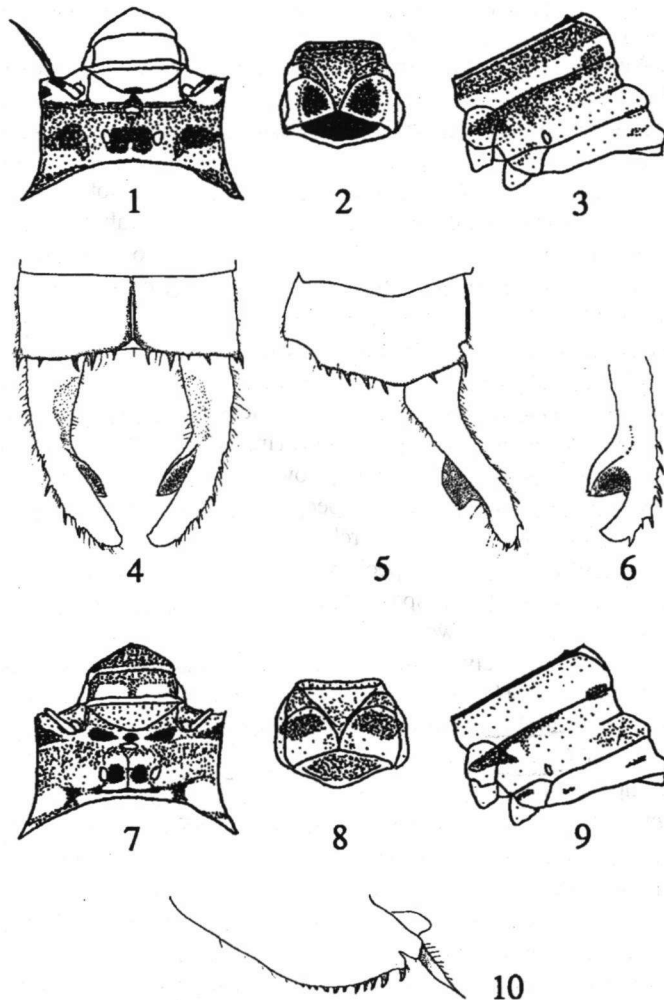
A b d o m e n. — Mostly banded yellow and brown. Segments 1 and 2 dull yellow but light brown dorsally. Segments 3-6 with both a dull yellow basal ring and a brown apical ring encompassing wider dull yellow and brown bands. Dull yellow band on segments 6 and 7 increasingly brown dorsally. Segment 8 yellow with wide basal brown area abruptly narrowing to apex. Segments 9 and 10 yellow but brown dorsally. Caudal appendages brown. Appendage structure typical of *Heteragrion*: cerci brown, rounded apically; large decumbent tooth with a dorsal transverse ridge from apex to base, tiny notch at apex of tooth (Fig. 4). In lateral view, tooth wide and broad (Fig. 5). In dorsomedial view, widths of tooth, apical cercus, and the intervening separational gap subequal (Fig. 6). Paraprocts vestigial.

M e a s u r e m e n t s (mm). — Total length including appendages 43.5, abdomen 35.5, forewing 24.5, and hindwing 24.5.

FEMALE (allotype). — **H e a d.** — Eye coloration brown dorsally, pale green ventrally. Labrum dark brown, edged with yellow. Clypeus brown with two yellow posterior spots. Frons brown with pale yellow T-spot. Genae pale brown with light black lateral mark. Top of head light brown with irregular pale areas (Fig. 7). Pale postocular bar and postocular spots present. Vertex pale with two parallel brown

spots. Rear of head pale.

T h o r a x. — Similar to holotype but pronotum and mesepisternum pale without dark brown spots or brown antehumeral stripe (Figs 8-9). Yellow areas of holotype male replaced with cream coloration in allotype.



Figs 1-10. *Heteragrion cooki* sp. n., holotype ♂ (1-6) and allotype ♀ (7-10): (1) dorsal view of head; — (2) dorsal view of pronotum; — (3) lateral view of thorax; — (4) dorsal view of caudal appendages; — (5) lateral view of caudal appendages; — (6) dorsomedial view of right cercus; — (7) dorsal view of head; — (8) dorsal view of pronotum; — (9) lateral view of thorax; — (10) lateral view of ovipositor.

Legs. — As in holotype.

Wings. — As in holotype except 16 postnodal crossveins in flavescent forewings and 13/14 in hindwings. Cream pterostigma edged with dark brown.

A b d o m e n. — Similar to holotype but pale lateral areas and dorsal dark brown areas larger. Both pale basal and middle annulations incomplete dorsally. Segment 8 with thin pale apical ring. Segment 9 pale with brown lateral spot, and brown dorsally with thin pale apical ring. Ovipositor cream, dark brown genital valve with moderately-sized dentition (Fig. 10). Styli brown with pale tips. Cerci pale brown.

M e a s u r e m e n t s (mm). — Total length including appendages 38.5, abdomen 30.5, forewing 25, and hindwing 24.5.

VARIATION AMONG PARATYPES. — Paratypes similar to holotype and allotype. The total length (mm) of the ♂ ranges from 43-44, ♀ 41-43; abdomen ♂ 35-36, ♀ 33-35; forewing ♂ 24-25, ♀ 24-25; hindwing ♂ 24-25, ♀ 26. Postnodal crossveins in forewing of ♂ ranges from 15-16, ♀ 15-16; hindwing ♂ 14-15, ♀ 13-14.

DISCUSSION

Heteragrion cooki is known only from 2 provinces in western Ecuador. It has not been taken in nearby Colombia or Peru. At Tinalandia, it was found on a small sandy mountain stream which was heavily covered with forest sub-story brush and vines. Collecting with a net was difficult because of the overhanging tangles where most of the conspicuous males were perching. Companion species were *Hetaerina fuscoguttata* Selys and a purplish species near *Argia oculata* Hagen. The recorded flight time of this rare and local species is from May to January.

H. cooki has characters between *H. alienum* Williamson from Mexico and the reddish *H. aurantiacum* Selys from southern Brazil and Argentina. It has a color pattern most similar to *H. alienum* but the decumbent tooth of the cercus in *H. alienum* is more acutely tipped in the dorsomedial view. *H. cooki* appendages resemble those of *H. aurantiacum*, although the decumbent tooth of the cercus is longer and more slenderer in *H. cooki* when viewed dorsally and laterally. *H. aurantiacum* is a reddish species, not dull brown and yellow like *H. cooki*. This dull brown and yellow color pattern separates *H. cooki* from other described species verified from Ecuador which are either completely brilliant red like *H. erythrogastrum* Selys, or have a black and yellow striped pattern as in *H. angustipenne* Selys and *H. inca* Calvert.

Much work remains to be done with this speciose genus. We have seen material representing 5 additional new species from South America. Some synonymies need to be formalized. Future collecting in South America may yield additional new species in this distinctive genus.

ACKNOWLEDGEMENTS

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REFERENCE

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