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THE FEMALE OF *HETERAGRION AZULUM* DUNKLE FROM MEXICO (ZYGOPTERA: MEGAPODAGRIONIDAE)

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It is described from 3 specimens (Los Tuxtlas Biol. Res. Stn, Veracruz, 16/17-VII--1992; allotype deposited at FSCA, Gainesville, FL, USA), and differs from all other Central American *Heteragrion* spp. by the blue-gray coloration of the thorax, and from sympatric spp. by the straight lines of denticles on the ovipositor.

INTRODUCTION

During a meeting of odonatologists at the Los Tuxtlas Biological Research Station in July 1992, 2 ♂ and 4 ♀ of *Heteragrion azulum* Dunkle were collected. In spite of considerable odonate collecting at the station in previous years, and an intensive search of the whole area in 1992, these damselflies were found only in a small area directly behind the dormitories. *H. azulum* was previously known only from the holotype male taken approximately 20 km to the SE of the station (DUNKLE, 1989).

DESCRIPTION

Material. – (3 ♀): MEXICO: Veracruz State, Estacion de Biologia Los Tuxtlas, 33 km N Catemaco, elev. 150 m, 1 ♀, 17-VII-1992, W.F. Mauffray leg., designated **allotype** and deposited at FSCA, Gainesville, FL, USA; – 1 ♀, same data, J.J. Daigle leg., JJD coll; – 1 ♀, same data but 16-VII-1992, S.W. Dunkle leg., SWD coll. – All preserved by acetone treatment and stored in clear plastic envelopes.

FEMALE **allotype.** – Labrum without a transverse carina, clypeus right-angled in profile with a rounded corner, frons right-angled with sharp corner. Labrum

and clypeus black, frons and antennae brown, base of mandibles and genae brownish white, vertex and occiput black shading to dull pale yellow on rear of head and with a brown bar extending from each lateral ocellus to compound eye, labium whitish yellow with distal segment of palp dark brown. Compound eyes in life black above, dull yellow-green below.

Prothorax pale yellow, anterior lobe with wide black anterior edge, posterior lobe also black except for lateral corners. Posterior lobe evenly arcuate, its edge black and not upcurled, but slightly depressed at its median posterior edge. Synthorax yellow-gray (blue-gray in life) with wide black mid-dorsal stripe extending over antealar sinuses, a wide black antehumeral stripe, and a wide black stripe just posterior to humeral suture. Antehumeral stripe slightly wider and darker than humeral stripe, these stripes connected posteriorly, humeral stripe extends across meskatepisternum, antehumeral stripe closer to mid-dorsal stripe than to humeral stripe. Faint, narrow, smudged black stripe on metepisternum. Legs with coxae pale yellow, femora brownish yellow with obscure wide brown distal rings, remainder of legs including claws and armature brown. Wings with venation and pterostigmata brown, two postquadrangular cells in all wings.

Pale areas of abdomen pale yellow at base becoming deeper yellow posteriorly especially on sides of segments 8-10. Segment 1 pale yellow; 2 dark brown dorsally with pale, narrow, mid-dorsal, half-length line; 3-6 dark brown dorsally, forming a wide brown ring near the base and a narrower distal ring on each segment; 7-8 dark brown dorsally, brown narrowing distally on 8; 9-10 dark brown dorsally, brown of 9 forming a basal V which points basally and a distal spot. Cerci pointed, brown, paler in basal half, longer than segment 10. Ovipositor sheaths dull yellow, extending to posterior margin of segment 10, styli brown, only 1 straight row of ventral denticles on each sheath. Sternites 2-8 with black mid-ventral carinae.

Measurements (in mm). – Total length including cerci 39; – abdomen 32; – hindwings 24.

VARIATION. – The other two females, perhaps slightly younger, show a diffuse brown connection between the pale vertex bars and rear of the head, and paler legs. In the SWD female the black of the vertex extends over much of the frons, and the dorsal brown V on abdominal segment 9 is cut almost to its base. In the JJD female that V is divided into 2 narrow streaks. Measurements 39-40, 31-33, 25-26 mm.

DISCUSSION

Female *H. azulum*, like the male, fit into WILLIAMSON's (1919) Group 3, along with other Central American *Heteragrion*. However, female *azulum* do not key well to any species in that paper.

Two other *Heteragrion* species occur with *H. azulum* at Los Tuxtlas, *H. albifrons* Ris and *H. alienum* Williamson. After studying 5 ♀ *albifrons* and 25 ♀

alienum taken at Los Tuxtlas, plus 6 ♀ from Belize and 1 ♀ from Honduras of *alienum*, I noted the differences mentioned below. Structurally, these species can be distinguished by a ventral view of their ovipositors. In *azulum* the denticles are in straight lines which converge posteriorly, in the other species the lines of denticles are convex laterally before converging posteriorly. In *azulum* and *albifrons* the denticles gradually increase in size posteriorly, in *alienum* the most posterior 5-6 denticles are enlarged and widely spaced. In *albifrons* and *alienum* accessory rows of minute denticles are usually present medial to each main row, more prominently so in *alienum*. The posterior lobe of the prothorax in *azulum* has a black flat edge, in the other species the edge is pale and upturned.

Females of *H. albifrons* and *H. alienum* appear browner and more obscurely marked than *H. azulum*. The former two species have a brown labrum, brown vertex (posterior to level of median ocellus), yellow-brown thorax, obscure brown antehumeral and humeral stripes, and browner abdomen. Abdominal segment 9 is yellow laterally in *azulum*, brown with a large yellow lateral spot in *alienum*, and all brown in *albifrons*. In *albifrons* and *alienum* the antealar sinuses are brown. In *albifrons* the area within the anterior fork of the mid-dorsal thoracic carina is brown, as is the anterior lobe of the prothorax.

A fourth species of *Heteragrion*, *H. tricellulare* Calvert (plus a closely related undescribed form), is known from Mexico but not from the vicinity of Los Tuxtlas. According to WILLIAMSON (1919), female *tricellulare* have 3 post-quadrangular cells in the forewings, the abdomen is 40 mm or more long, and the posterior lobe of the prothorax is somewhat pointed and all black. Female *tricellulare* also have abdominal segments 9-10 orange.

In the small area where *H. azulum* was collected at Los Tuxtlas, *H. alienum* was common and *H. albifrons* was scarce. Only *alienum* males were perched along the 2 m wide forest stream bordering the area, while *albifrons* is mostly found on smaller headwater streams. Females of all *Heteragrion* I have observed perch on bare twig tips in forest understory with wings spread, where they are quite inconspicuous. At the *azulum* site, there were few suitable perches between the understory and the canopy, and those in the canopy were hidden even from binocular viewing. Thus I could not ascertain if the seeming rarity of *azulum* is due to their perching in the canopy, perhaps to descend during rain. At this site, a steep, cliff-like bank several m high bordered the stream, so perhaps *azulum* breeds in seepages on such banks. Other Odonata at this site included a few *Palaemnema desiderata* Selys and *Paraphlebia quinta* Calvert, the latter a seep-breeding species.

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