

**PROGOMPHUS MARCELAE SPEC. NOV.
FROM WESTERN MEXICO
(ANISOPTERA: GOMPHIDAE)**

R. NOVELO-GUTIÉRREZ

Departamento de Entomología, Instituto de Ecología, A.C. Apartado Postal 63
MX-91070 Xalapa, Veracruz, Mexico
rodolfo.novelo@inecol.edu.mx

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The new sp. is described, illustrated and its affinities are pointed out. Holotype ♂: Mexico, Pinolapa, State of Michoacán, alt. 616 m asl, 19°00.524N; 103°01.456W, 7-XI-2005; deposited in IEXA, Xalapa. It appears closely related to the *pygmaeus-delicatus* group of *Progomphus*, from which it can be distinguished by the shape of the anterior hamuli and epiproct lobes. The ♀ and larva are unknown.

INTRODUCTION

With 67 currently described species, *Progomphus* is the most speciose genus of the New World Gomphidae, although only two species were described in the past 15 years from Mexico, viz. *P. belyshevi* BELLE, 1991 and *P. amarillus* TENNESSEN, 1992. While conducting a brief odonate biodiversity survey in the State of Michoacan, Mexico, I came across a small species of a new *Progomphus*, bringing the number of the currently known species to 68 (BELLE, 1991, 1994; TENNESSEN, 1992; DAIGLE, 1996), of which 10 are now known from Mexico (GONZÁLEZ-SORIANO & NOVELO-GUTIÉRREZ, 1996). The new species is similar to *P. pygmaeus* Selys and *P. delicatus* Belle.

PROGOMPHUS MARCELAE SP. NOV.

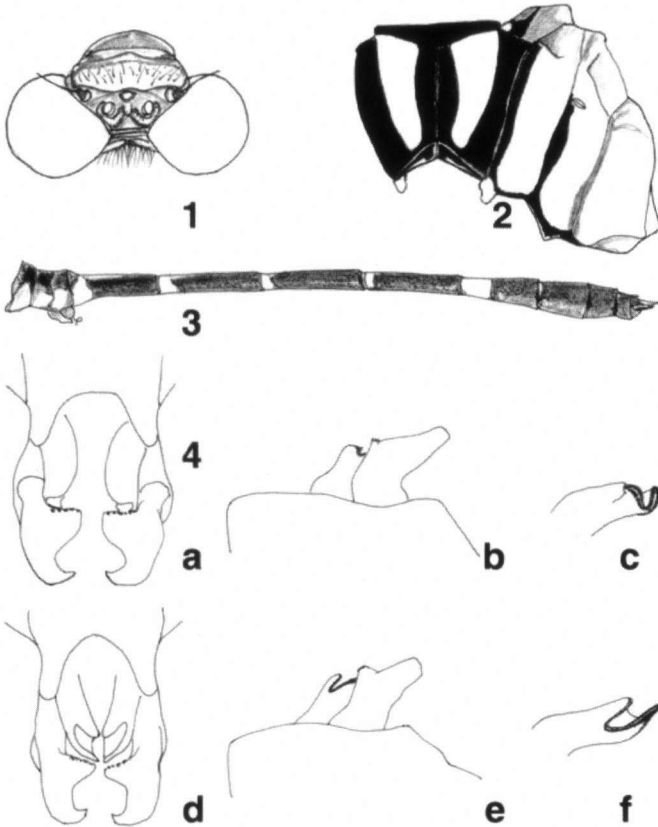
Figures 1-3, 4a-c, 5-6

Material. — **Holotype** ♂: MEXICO: State of Michoacan, Municipality of Tepalcatepec, Pinolapa, Río Pinolapa (616 m asl; 19°00.524N; 103°01.456W), 7-XI-2005, R. Novelo & J.A. Gómez leg.; deposited in Colección Entomológica del Instituto de Ecología, A.C, Xalapa (IEXA). **Paratypes**

(11 ♂) same data; one paratype to be deposited in IBUNAM, (México, D.F.), one paratype in R.W. Garrison's personal collection (Sacramento), and one paratype in IORI (Gainesville), remainder at IEXA.

E t y m o l o g y. — This species is dedicated to my wife *M a r c e l a* for her continuous support and patience.

MALE (holotype). — **H e a d.** — Labium creamy pale; eye color in life blue-green; antennae brown, black basally. Labrum pale green on distal half and borders, light brown on basal half; anteclypeus creamy, postclypeus brown except grayish at sides; antefrons brown on ventral half, pale green above, postfrons pale green; vertex brown, postocellar ridge concave in the middle; a deep furrow between vertex and occiput; occiput brown (Fig. 1), with a shallow concavity at



Figs 1-4. Details of the morphology of *Progomphus marcelae* sp. n. (Figs 1-4a-c) and *P. pygmaeus* Selys from Ecuador, Napo prov. (Fig. 4d-f): (1) head, dorsal view; — (2) pterothorax, colour pattern; — (3) abdomen, left lateral view; — (4) hamuli: (a, d) anterior and posterior hamuli, ventral view, (b, e) same, lateral view, (c, f) right anterior hamulus, anterolateral view.

each side of midline and a small, mound-like tubercle at middle, posterior border black, widely concave, beset with long brown hairs; rear of head light brown with a yellow spot adjacent to posterior margin of compound eye.

T h o r a x. — Anterior and middle lobes of prothorax light brown, pale green at sides of middle lobe, posterior lobe black. Pterothorax (Fig. 2): mesepisterna brown with green stripes; middorsal carina brown, antealar crest dark brown; pale antehumeral stripe wide, widest anteriorly and connected to mesothoracic collar, gradually narrowing to upper end which almost reaches the antealar crest, its internal margin is concave; second pale antehumeral lacking; first, second and third pale lateral stripes complete, wide, the first and second stripes of the same width throughout, connecting each other inferiorly, the third stripe very wide, occupying all the metepimeron; a narrow, spindle-shaped brown stripe on interpleural (obsolete) suture, running from antealar sinus to metaspiracle; a mere brown line on metapleural suture; mesokatepisternum light brown, metakatepisternum creamy; sternum pale green.

Wings with a light yellow tint, not brown at externe base; anterior edge of costa yellow. Venation: Fore wings (FW) with 5 1/2 paranal cells, area posterior to Cu2 one cell wide for the first 3 cells then increasing to 2 cells for a distance of 3 cells, then decreasing to one cell; first and fifth antenodals thickened in all wings; antenodal crossveins on FW 11/11, on HW 9/9; postnodal crossveins on FW 7/7, on HW 7/7; basal subcostal crossvein present in all wings; triangles and subtriangles 2-celled in all wings; pterostigma yellowish-brown (more light ventrally), surmounting 3 cells in left wings, 4 cells in right wings.

Legs: coxae gray; trochanters, internal surfaces of femora, and basal fourth of hind femora creamy colored; external surfaces of femora, apical 0.75 of hind femora, tibiae and tarsal claws reddish-brown; tarsi black; hind tibia 0.70 the length of hind femur; hind tarsi 0.66 the length of hind tibia.

A b d o m e n (Fig. 3). — Segments 1-7 brown, with greenish-yellow markings as follows: median and lower sides of segments 1 and 2 including auricles, a dorsomedial stripe along segment 2, a transverse, wide, basal ring on 3-6, connecting to middorsal stripe tapering posteriorly (on 6 is a mere fine line); a large, transverse, yellow band on 7, occupying basal 0.40 of total length of that segment, extending posteriorly as a fine middorsal line; segment 7 also with a lateroventral yellow spot at half-length. Segment 8 dark brown dorsally, light brown laterally, with a subbasal, lateroventral, irregular pale spot, segments 9-10 dark brown. Abdominal segment 1 lacking a midventral tubercle; anterior hamuli (Figs 4a-c) with a transverse, subapical emargination; posterior hamuli (Figs 4a, b) stout, with 4-5 black, low basoventral tubercles, light brown except for grayish basoventral border, hook dark brown externally.

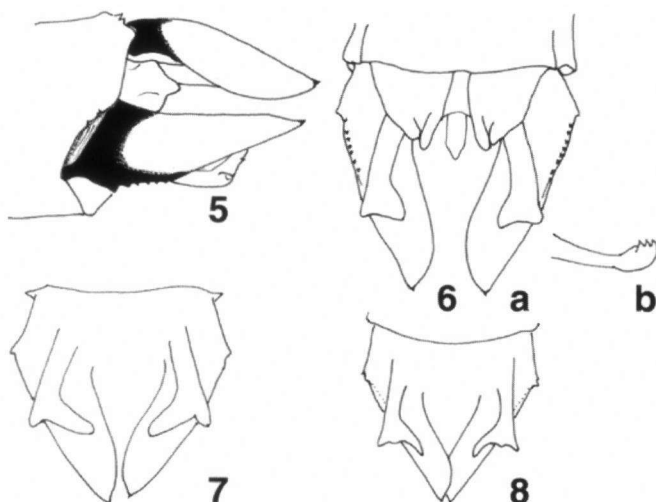
Cerci (Fig. 5) dark brown on basal 0.20, remainder pale yellow; basolateral tooth stout, short, 0.08 mm long, set off from 8 (left cercus) or 9 (right cercus) smaller teeth on ventral carina by a very shallow but wide concavity; spines at

tip of cerci black. In ventral view, lobes of epiproct straight, parallel-sided on basal 0.66, then abruptly widened at apical 0.34, forming a large, stout, internal branch and a smaller external branch (Fig. 6); epiproct reaching basal 0.68 the length of cerci. Paraprocts, in dorsal view, with an apical, conical tubercle bearing a tuft of short, reddish, stiff setae.

Measurements (mm). — Total length (incl. cerci) 35.0, abdomen 26.0, hind wing 19.5, pterostigma of fore wing 2.7, fore tibia 2.2, hind femur 3.7, cerci 1.1 (measured dorsally along the internal margin).

FEMALE. — Unknown.

VARIATION IN PARATYPE SERIES. — Some individuals show a more extensive pale colour on head (e.g., on labrum, postclypeus and postocellar tubercles). Two specimens have the upper end of antehumeral pale stripes slightly extended to external side. Five individuals have the brown stripe on interpleural (obsolete) suture running from antealar sinus to metakatepisternum. In one specimen the hind femora are almost entirely pale excepting for an apical-external brown stripe, and the lateroventral part of abdominal segment 8 present a large spot on basal and apical thirds, the central third is light brown. Wing venation: two individuals have 5 paranal cells in left wings, other two have 7 paranal cells; two specimens with the area posterior to Cu2 one cell wide throughout; the nodal formula is highly variable, the most frequent is (rank in parentheses): antenodal crossveins in FW 12/12 (11-14), in HW 9/9 (9-12); postnodal crossveins in FW 7/8 (7-9), in HW 8/8



Figs 5-8. Male caudal appendages (all setae omitted) of *Progomphus marcelae* sp. n. (Figs 5-6), *P. pygmaeus* Selys from Ecuador, Napo prov. (Fig. 7) and *P. delicatus* Belle, redrawn from BELLE, 1973 (Fig. 8): (5) cerci, dorsolateral view; — (6) caudal appendages: (a) ventral view, (b) internal branch of right epiproctal lobe, laterointernal view; — (7-8) epiproctal lobes, ventral view (basal part of epiproct omitted).

(6-9); two individuals have the subtriangles of HW one-celled, other three have the triangles of one fore wing one-celled.

M e a s u r e m e n t s (mm). — Total length (incl. cerci) 33.8-35.8; abdomen 25.0-26.9; hind wing 18.8-19.8; pterostigma 2.5-2.8; fore tibia 2.2-2.4; hind femur 3.7-4.0. Cerci 1.1 (this last measurement was the only 100% constant).

REMARKS. — *Progomphus marcelae* males were captured at a shallow rocky stream, around 1400 h on a sunny day. They were perching on small rocks where the water flow is rapid. No aggressive interactions were observed and three or four individuals were seen perching on the same rock at the same time. The stream runs into a wide, small canyon. Apparently the flying season is restricted to the late autumn; no individuals were seen during occasional collectings from 1998 to 2004, nor during systematic collectings from February 2005 to January 2006, excepting November 2005.

DISCUSSION

Progomphus marcelae belongs to the *pygmaeus-delicatus* group by stature, thoracic colour pattern, and by wing venation. By the width and shape of the antehumeral pale stripes, and the extent of pale colour on sides of thorax (cf. WILIAMSON, 1920, pl. 1, fig. 2) it resembles closely *P. pygmaeus* rather than *P. delicatus*. In *P. delicatus* the antehumeral stripes are more wedge-shaped, and metepimera are mostly obscure (cf. BELLE, 1973, fig. 130). *P. marcelae* can be easily differentiated from *P. pygmaeus* by the shape of the accessory genitalia: the apical excision of anterior hamulus is transverse and short in *P. marcelae* (Figs 4a-c), while in *P. pygmaeus* it is longitudinal and deeper (Figs 4d-f). The basal internal margin of the posterior hamulus is larger in *P. marcelae* (Fig. 4a). Likewise, of the three species, *P. marcelae* exhibits more reduced epiproctal lobes (Fig. 6a), whose apicointernal branches are clearly more developed in *P. delicatus* (Fig. 8) and *P. pygmaeus* (Fig. 7). Differences mentioned by BELLE (1973) for *P. delicatus* and *P. pygmaeus* males apply also to *P. delicatus* and *P. marcelae* males.

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