

A New Parelbella from Mexico (Hesperiidae: Pyrginae: Pyrrhopygini)

Authors: Mielke, Olaf H. H., Austin, George T., and Warren, Andrew D.

Source: Florida Entomologist, 91(1) : 30-35

Published By: Florida Entomological Society

URL: [https://doi.org/10.1653/0015-4040\(2008\)091\[0030:ANPFMH\]2.0.CO;2](https://doi.org/10.1653/0015-4040(2008)091[0030:ANPFMH]2.0.CO;2)

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

A NEW *PARELBELLA* FROM MEXICO (HESPERIIDAE: PYRGINAE: PYRRHOPYGINI)

OLAF H. H. MIELKE¹, GEORGE T. AUSTIN² AND ANDREW D. WARREN^{2,3}

¹Departamento de Zoologia, Universidade Federal do Paraná, Caixa Postal 19020,
81531-980 Curitiba, Paraná, Brazil

²McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History,
University of Florida, P.O. Box 112710, Gainesville, FL 32611

³Museo de Zoología, Facultad de Ciencias, Departamento de Biología Evolutiva,
Universidad Nacional Autónoma de México, Apdo. Postal 70-399, México, D.F. 04510, México

ABSTRACT

A new species of *Parelbella* is named and described. It is known from the states of Veracruz and Oaxaca, México, and may be endemic to the southern Sierra Madre Oriental.

Key Words: HesperIIDae, Mexico, *Parelbella*, Pyrginae

RESUMEN

Se describe una especie nueva de *Parelbella*. Se conoce de los estados de Veracruz y Oaxaca, México, y posiblemente es endémico a la parte austral de la Sierra Madre Oriental.

Translation provided by the authors.

Parelbella (Hesperiidae: Pyrginae: Pyrrhopygini) was proposed by Mielke (1995) for a group of 4 Neotropical species occurring from northern Argentina and eastern Paraguay northward into southern Mexico. A single species, *Parelbella macleannani* (Godman & Salvin, 1893), has been known from the northern extreme of this distribution, ranging southward into northern South America. An undescribed species potentially sympatric with *P. macleannani*, discovered in the collection of Allyn Museum of Entomology, now housed at the McGuire Center for Lepidoptera and Biodiversity, is described herein.

Parelbella nigra Mielke, Austin & A. Warren, **sp. n.**
(Figs. 1A, B, a, b; 2A, C)

Description. Male—FW length = 25.6 mm (holotype), 25.0 mm (paratype). Forewing pointed apically, termen nearly straight, anal margin slightly concave just basad of middle; black; 3 aligned opaque white macules angled from midcosta toward just basad of tornus, broadest macule in discal cell, rectangular, extending distad just beyond origin of CuA₁; narrower macule in CuA₁-CuA₂, hourglass-shaped, entirely basad of origin of CuA₁, outlined distad with single row of pale blue scales; still narrower and pointed caudad macule in anterior half of CuA₂-2A, outlined distad and posterior half proximad with single row of pale blue scales; small pale blue macule at base of discal cell; pale blue postbasal band

across wing from anal margin to anterior discal cell continued in costal cell by a few pale blue scales; a few pale blue scales just caudad of CuA₂, about one-third distance from base to termen; narrowly triangular pale blue macule extending along vein 2A from about mid-CuA₂-2A to beyond end of white macule; another parallel pale blue macule in anal cell extending distad of that in CuA₂-2A to submargin; irregular and less distinct submarginal patches of pale blue scales in M₃-CuA₁, CuA₁-CuA₂, and CuA₂-2A; a few pale blue submarginal scales in mid-M₂-M₃; fringe black with a few pale scales in CuA₂-2A.

Hindwing termen slightly undulate to a short projection at end of vein 2A; mostly black, but browner along costa and with gray-brown scaling along anal margin; pale blue submarginal band divided by black veins, narrowing somewhat from Rs to 2A, curving slightly caudad; similar, more or less parallel medial band, about equally broad throughout, anteriormost and posteriormost portion with scales like those of submarginal band, mid-portion (between veins M₁ and CuA₂) of bluish white hair-like scales; vague pale blue macule in Sc+R₁-Rs between submarginal and medial bands; postbasal curved band of bluish white hair-like scales from anterior discal cell to beyond 2A; fringe white with black at tips of veins, a few black scales intermixed between veins, mostly black posterior to vein 2A.

Ventral forewing duller than dorsum, distinctly brown caudad of CuA₂; white macules of dorsum repeated with additional narrow white macules in

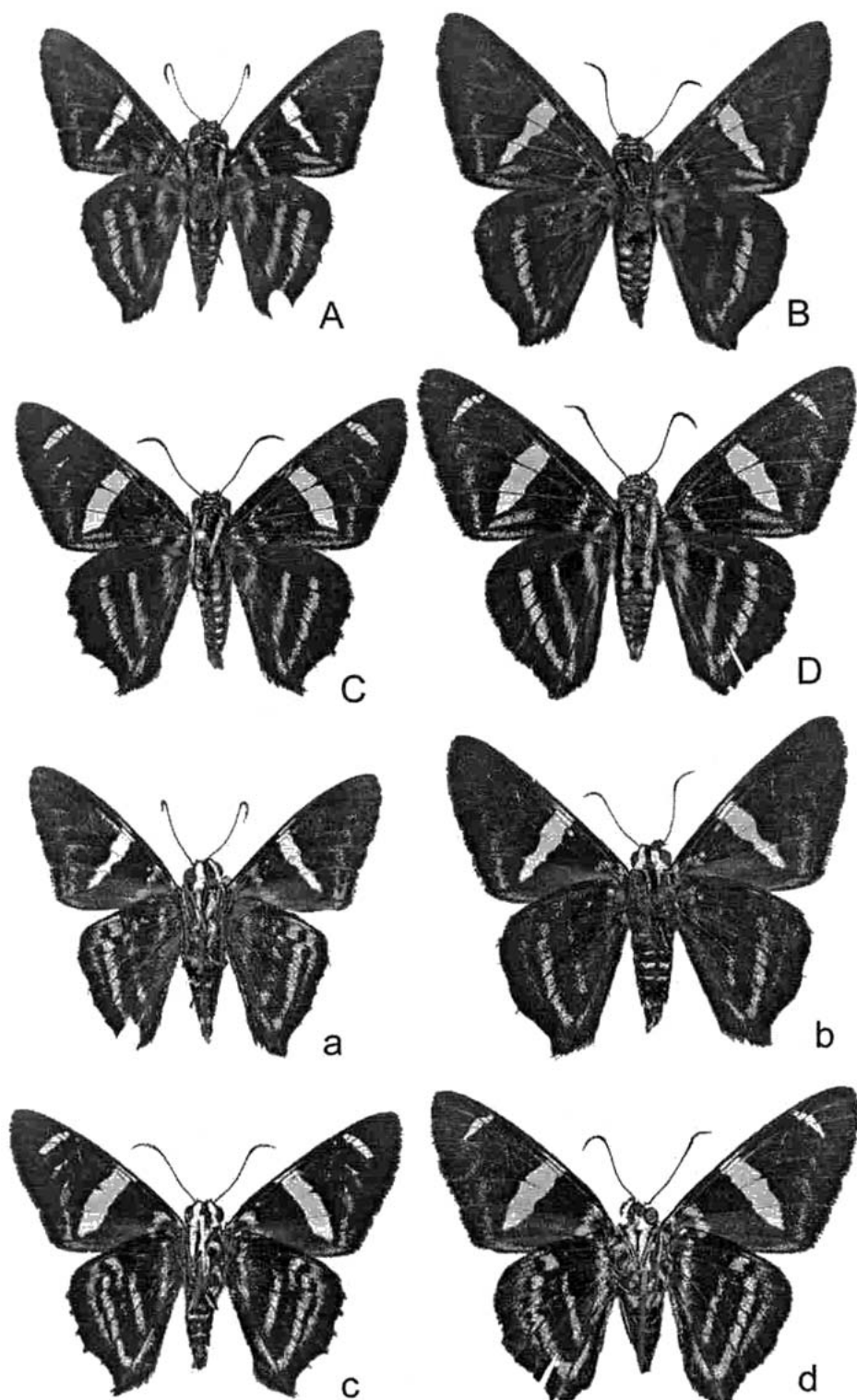


Fig. 1. *Parelbella* from Mexico: A (dorsal), a (ventral)—*Parelbella nigra* holotype male, MEXICO: Oaxaca; Totontepec, Jul 1950; B (dorsal), b (ventral)—*Parelbella nigra* allotype female, MEXICO: Oaxaca; Totontepec, Jul 1950; C (dorsal), c (ventral)—*Parelbella macleannani* female, MEXICO: Oaxaca; Rio Sarbia, Aug 1958; D (dorsal), d (ventral)—*Parelbella macleannani*, female, MEXICO: Oaxaca; Chimalapa, Sep 1956.

R_1 - R_2 extending just distad of distal end of macule in discal cell and in Sc - R_1 from mid-macule in R_1 - R_2 to well distad of distal end of that macule roughly aligned with white macule in discal cell; pale blue macule at base of costa; postbasal band faint, most prominent in discal cell; thin line of pale blue scales at distal end of discal cell; submarginal pale blue macules somewhat more prominent than on dorsum, that in CuA_2 -2A doubled; pale blue macule in anal cell as on dorsum.

Ventral hindwing duller black than on dorsum; submarginal pale blue band similar to that on dorsum paralleled distad by much narrower pale blue line from Rs to just caudad of M_2 , more or less joined cephalad by rectangular pale blue macule in Sc + R_1 - Rs ; another similar but broader macule in Sc + R_1 - Rs just proximad of submarginal band with a narrow blue line overlapping both in costal cell; medial band less well-defined than on dorsum consisting of individual and well-separated macules; postbasal band also vague, most prominent cephalad.

Head black, dorsum with narrow transverse lines, white medio-caudad of palpi, white between antennae, white dorsad of mid-eyes, pale blue behind antennae, broader white to pale blue cephalad on collar extending behind eyes and very broadly beneath eyes onto ventro-lateral portion of palpi, caudal portion of collar black; eyes dark gray; palpi black dorsad, third segment black, short, stout, porrect; antennae black with sparse whitish scales ventrad on club, apiculus dull red-brown of 20 (holotype) and 21 (paratype) segments. Thorax black, dorsum with narrow transverse pale blue line cephalad, dorso-lateral pale blue lines on tegulae narrowing caudad (central portion of dorsal and lateral thorax rubbed, may have pair of narrow central blue lines as does female and other congeners), venter with pair of medial white lines narrowing caudad, legs black with narrow white laterally, broadest on femur. Abdomen slightly greased (may have been brighter), black dorsally and laterally with narrow pale blue transverse lines at segments laterally (leaving broad black dorsal ridge), these narrowing ventrad and caudad; ventral abdomen dark gray with transverse white to pale blue at segments narrowing posteriorly; terminal tuft dark gray, highlighted with pale ochre scales caudad from distal end of segment 7 to distal tip.

Genitalia (Fig. 2A). Uncus undivided, robust, strongly decurved with hook at caudal end; tegumen hood-like with pair of lateral processes from caudal end slightly divergent, slightly decurved, toothed along central edge; vincular arc [we use this descriptive term for the combined and often curved ventral appendix of the tegumen and dorsal appendix of the saccus (e.g., see Pierce 1914) termed the vinculum by many authors (see also Torre-Bueno 1937)] thin, slightly sinuate; saccus long, thin, oriented nearly vertically; valva with

costa-ampulla broadly humped narrowing caudad to harpe, harpe with prominent more-or-less triangular dorsal process strongly toothed on cephalad edge, less so on caudal edge, this process exceeded by caudal lobe shorter than dorsal lobe, prominently toothed on dorsal edge; aedeagus robust, about three-quarters length of valva, proximal part of aedeagus slightly curved ventrad.

Female—FW length = 29.6 mm (allotype), 29.1, 30.1 mm (paratypes). Forewing broader than on male, pointed apically but more rounded than on male, termen slightly curved, anal margin nearly straight, black; 3 aligned translucent macules lightly scaled with white angled from mid-costa toward just basad of tornus, broadest macule in discal cell, trapezoidal (narrowest cephalad) extending distad just beyond origin of CuA_1 ; narrower macule (nearly of equal width on paratype) in CuA_1 - CuA_2 , hourglass-shaped, entirely basad of origin of CuA_1 (extending slightly distad on paratype), outlined distad with single row of pale blue scales; still narrower and pointed caudad macule in anterior half of CuA_2 -2A outlined distad with single row of pale blue scales; cells Sc - R_1 and R_1 - R_2 with narrow pale blue lines cephalad of white band; small pale blue macule at base of discal cell; pale blue postbasal band across wing from anal margin to anterior discal cell (vague on paratype); narrowly triangular pale blue macule extending along vein 2A from about mid- CuA_2 -2A to beyond end of white macule; another parallel pale blue macule in anal cell extending distad of that in CuA_2 -2A to submargin; irregular and less distinct submarginal patches of pale blue scales in M_2 - CuA_1 , CuA_1 - CuA_2 , and CuA_2 -2A; a few pale blue submarginal scales in mid- M_2 - M_3 ; fringe black.

Hindwing more convex and broader than on male, termen slightly undulate to a short projection at end of vein 2A; mostly black, but slightly browner along costa and anal margin; pale blue submarginal band divided by black veins, narrowing somewhat from Rs to 2A, curving slightly caudad, broader pale blue macule posterior to vein 2A; similar, more-or-less parallel medial band, about equally broad throughout, anteriormost portion of scales like those of submarginal band, posterior portion not well-defined, of blue scales and bluish white hair-like scales; postbasal curved band of bluish white hair-like scales from anterior discal cell to beyond 2A; fringe white with black at tips of veins, a few black scales intermixed in cell Sc + R_1 - Rs , mostly black posterior to vein 2A.

Ventral forewing duller than dorsum, distinctly brown caudad of CuA_2 ; white macules of dorsum repeated, additional narrow blue-white macules in R_1 - R_2 extending just distad of distal end of macule in discal cell and in Sc - R_1 extending well distad of distal end of that macule; pale blue macule at base of costa; postbasal band faint, most prominent in discal cell (especially on

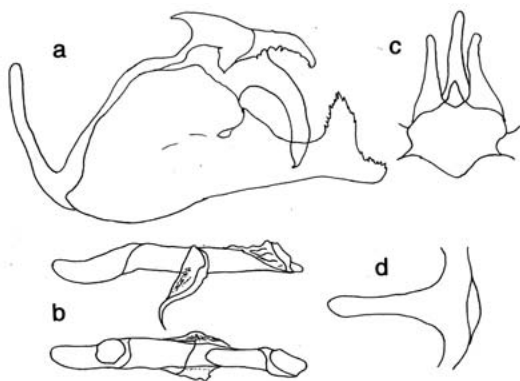


Figure 2A

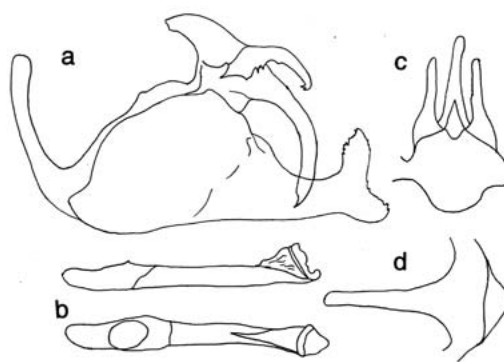


Figure 2B

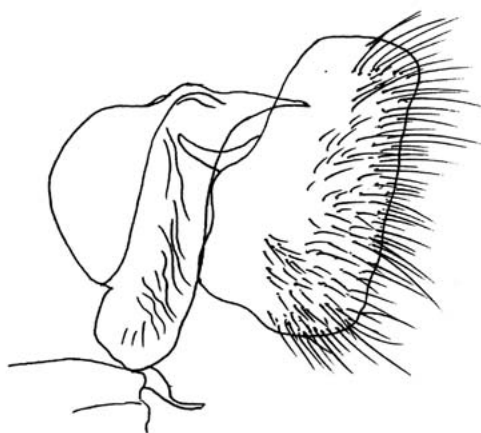


Figure 2C



Figure 2D

Fig. 2. Genitalia of *Parelbella* from Mexico. A. *Parelbella nigra* holotype, GTA #13765, data as in Fig. 1: (a) lateral view of tegumen, uncus, saccus, and valva; (b) lateral (above) and dorsal (below) views of aedeagus; (c) dorsal view of tegumen and uncus; (d) ventral view of saccus; B. *Parelbella macleannani* male, GTA #13767, MEXICO: Oaxaca; Chimalapa, Jul 1953 (same views as 2A); C. *Parelbella nigra* allotype, GTA #13768, data as in Fig. 1 (lateral view of caudal structures); D. *Parelbella macleannani* female, GTA #13766, MEXICO: Oaxaca; Rio Sarbia, Aug 1958 (same view as 2C).

paratype); thin line of pale blue scales at distal end of discal cell; submarginal pale blue macules similar to those on dorsum, that in CuA_2-2A doubled (not on paratype); pale blue macule in anal cell as on dorsum.

Ventral hindwing duller black than on dorsum; submarginal pale blue band similar to that on dorsum paralleled distad by much narrower pale blue line from R_s to CuA_2 , vague rectangular pale blue macule in $Sc+R_1-R_s$ between the two; similar macule (more prominent on paratype) in $Sc+R_1-R_s$ just proximad of submarginal band with a vague narrow blue line overlapping both in costal cell; medial band less well-defined than on dorsum, prominent only in CuA_2-2A and only a few pale

blue scales cephalad (better defined on paratype); postbasal band vague throughout (better defined on paratype).

Head same as male, but all lines pale blue except that behind and beneath eye remaining white, antennal nudum with 20, 21, and 22 segments. Thorax same as male, but dorsal markings deeper blue (perhaps an artifact of greasing of male's abdomen), pair of medial longitudinal pale blue lines in addition to the broader ones more laterally. Abdomen same as male, except segmental lines on venter pale blue.

Genitalia (Fig. 2C). Sterigma in lateral view with curved caudal edge extended to prominent point caudad from dorsal edge, cephalad edge bul-

bous, papillae anales robust, more-or-less quadrate but being somewhat broader ventrally, caudal edge straight.

Types. Holotype male with the following labels: white with black lines enclosing data, printed and handwritten - / T. Escalante / Totontepec / Oax / vii-50 /; white printed - / A. C. Allyn / Acc. 1973-48 /; white, printed - / MGCL/FLMNH / Specimen no. / 40755 /; white, printed and handwritten - / Genitalic Vial / GTA-13765 /; red, printed - / HOLOTYPE / *Parelbella nigra* / Mielke, Austin & A. Warren /. Allotype female with the following labels: white with black lines enclosing data, printed and handwritten - / T. Escalante / Totontepec / Oax. / vii-50 /; white printed - / A. C. Allyn / Acc. 1973-48 /; white, printed - / MGCL/FLMNH / Specimen no. / 40756 / white, printed and handwritten - / Genitalic Vial / GTA-13768 /; red, printed - / ALLOTYPE / *Parelbella nigra* / Mielke, Austin & A. Warren /. Paratype female with the following labels: white with black lines enclosing data, printed and handwritten - / T. Escalante / Presidio / Ver / vii-54 /; white printed - / A. C. Allyn / Acc. 1973-48 /; white, printed - / MGCL/FLMNH / Specimen no. / 40757 /; blue, printed - / PARATYPE / *Parelbella nigra* / Mielke, Austin & A. Warren /. The types above are deposited at the McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, Florida. Two additional paratypes, at the Instituto de Biología, UNAM (IBUNAM), Mexico City, are from MEXICO: Oaxaca, Puerto Eligio, V-1978, Adolfo Ibarra (male) and MEXICO: Oaxaca; Chiltepec, VIII-68, Díaz Fránces (female). The primary types and examples of *P. macleannani* from Mexico are illustrated in color on the McGuire Center's website < <http://www.flmnh.ufl.edu/mcguire/> >.

Type Locality. MEXICO: Oaxaca; Municipio Totontepec Villa de Morelos, Totontepec. The holotype and allotype of *P. nigra* are labeled as from Totontepec, Oaxaca, situated at about 2000 m in the southeastern part of the Sierra de Juárez (Sierra Mixe). Native habitats at this elevation should include moist montane cloud forest. Chiltepec (Mpio. San José Chiltepec) and Puerto Eligio (Mpio. Santiago Comaltepec) also are situated in the Sierra de Juárez at 100 and 650 m, respectively). The fauna of Papilionoidea of this region has recently been studied (e.g., Luis et al. 1991) and several taxa are known to be endemic to the region (e.g., *Papilio esperanza* Beutelspacher, 1975, Papilionidae; *Paramacera chinanteca* L. D. Miller, 1972, Nymphalidae). A female paratype of *P. nigra* is labeled as from Presidio, Veracruz. Presidio was a ranch near Totutla (Mpio. Totutla) frequented by various Mexican naturalists, from which collections were made at nearby localities including Orizaba, Córdoba and Fortín de las Flores, on the eastern slope of the Sierra Madre Oriental at approximately 1000-2500 m. The

ranch is now apparently known as Finca Hilde El Mirador (J. Brock, pers. comm. 2007). In general, habitats in this region have been altered drastically since the specimen of *P. nigra* was collected in 1954, but included moist montane cloud forest and semi-deciduous tropical forest at lower elevations.

Etymology. The species is named after its very dark aspect due to the absence of white macules in the apical portion of the forewing as occur on other species of the genus.

DIAGNOSIS AND DISCUSSION

Parelbella nigra is immediately distinguished from its most similar congener, *P. macleannani* (Fig. 1), by the absence of white subapical macules on its forewing. In addition, *P. macleannani* usually has 1 or 2 white submarginal macules in M_1 - M_2 and/or M_2 - M_3 that are also absent on *P. nigra*. Additional characters of the wings, color, and pattern are abundantly different between the 2 taxa. The male of *P. nigra* has a triangular forewing that is less truncated apically than on *P. macleannani* and the hindwing is proportionally longer. Female forewings of *P. nigra* are more rounded than those of *P. macleannani* and the hindwings are less rounded. The white macules of the medial band on the forewing are aligned or even slightly curved distad on *P. nigra*, while these tend to be curved inward on *P. macleannani*. The blue on *P. nigra* is less intense than that of *P. macleannani* on which it is more extensive, with the submarginal macules even extending to the subapex on the forewing. The submarginal band on the hindwing of *P. nigra* is curved caudad on the male and curved throughout on females, whereas these are much straighter on *P. macleannani*. On the ventral hindwing, the blue markings are again less extensive on *P. nigra* on which the medial and postbasal bands are poorly developed and lack elements present on *P. macleannani*. Finally, the terminal scales on the abdomen of *P. nigra* are pale ochre in contrast to whitish on *P. macleannani*.

Genitalia of *P. nigra* have the overall gestalt for the genus (Mielke 1995). The uncus appears more robust than on other congeners. The processes of the tegumen are likewise more robust and exhibit both a distinctly toothed ventral edge and a divergent aspect not seen on other *Parelbella*. The harpe has the caudal lobe shorter than the dorsal process as noted for *Parelbella polyzona* (Latreille [1824]) and *Parelbella peruana* Mielke, 1995 (Mielke 1995). The dorsal process is prominently toothed on its cephalad edge as also illustrated for those two taxa (Mielke 1995). The aedeagus appears more robust than those of other *Parelbella*. The pointed dorsal edge of the female's sterigma of *P. nigra* is not seen on other *Parelbella* on which this is blunt and has a dorsad orientation. Quadrate papillae anales were illustrated only for *P. macleannani* (Mielke 1995).

In comparison with the sympatric *P. maclean-nani*, the genitalia of both sexes of *P. nigra* are distinctly different as illustrated (Fig. 2). It should be noted that the genitalia of putative *P. maclean-nani* from Mexico (Fig. 2B, D) differ in several respects from those illustrated for the species by Mielke (1995). It may be that *P. maclean-nani* as now constituted includes more than 1 species. This is further reinforced by the differences in markings between the specimens illustrated here and those illustrated by Mielke (1995) from Panama and Ecuador.

While *P. maclean-nani* and *P. nigra* have not been recorded at the same localities, they are potentially sympatric with both occurring in the states of Veracruz and Oaxaca in southern Mexico. The available specimens suggest that *P. nigra* might be endemic to Mexico, particularly to the southern Sierra Madre Oriental (which includes the Sierra de Juárez) of Veracruz and Oaxaca, in extremely humid regions. A specimen seen by Bell (1942) in the Academy of Natural Sciences in Philadelphia and described as having the subapical macules absent and a narrower blue pattern may well have been *P. nigra* and merits re-examination. In Mexico, *Parelbella maclean-nani* is known from Dos Amates and Catemaco in Veracruz, and San Miguel (Chimalapa) and Rio Sarbia in Oaxaca (Mielke 1995, this study). It also has been reported at Sayaxché, El Petén, Guatemala, and then southward from Nicaragua to Colombia and Ecuador (Mielke 1995; Burns & Janzen 2001).

ACKNOWLEDGMENTS

We thank Andrei Sourakov for assembling Fig. 1 and Christine Eliazar for preparing Fig. 2. Lee D. Miller, Jacqueline Y. Miller, and Jorge Llorente reviewed versions of the manuscript and made valuable suggestions. We also thank Jim P. Brock for information and Adolf Ibarra for facilitating access to the IBUNAM collection. Funding for A. D. Warren during completion of this study was provided by DGAPA-UNAM.

REFERENCES CITED

- BELL, E. L. 1942. New records and new species of Hesperidae from Mexico (Lepidoptera: Hesperidae). *An. Esc. Nac. Cienc. Biol.* 2: 455-468.
- BURNS, J. M., AND D. H. JANZEN. 2001. Biodiversity of pyrrhopygine skipper butterflies (Hesperidae) in the Area de Conservación Guanacaste, Costa Rica. *J. Lepid. Soc.* 55: 15-43.
- LUIS, A. M., I. F. VARGAS, AND J. E. LLORENTE. 1991. Lepidopterofauna de Oaxaca I: Distribución y fenología de los Papilionoidea de la Sierra de Juárez. *Publicaciones Especiales del Museo de Zoología* 3: iii, 1-119.
- MIELKE, O. H. H. 1995. Revisão de *Elbella* Evans e gêneros afins (Lepidoptera, Hesperidae, Pyrrhopyginae). *Revta Brasileira Zool.* 11: 395-586.
- PIERCE, F. N. 1914. The Genitalia of the Group Geometridae of the Lepidoptera of the British Islands. An Account of the Morphology of the Male Clasp Organs and the Corresponding Organs of the Female. Publ. by author, Liverpool. 226 pp.
- TORRE-BUENO, J. R. DE LA. 1937. A Glossary of Entomology. Smith's "An Explanation of Terms Used in Entomology", completely revised and rewritten. Science Press, Lancaster, PA. 336 pp.