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Systematics, zoogeography and bionomics of high Andean pedalioidines,
Part 11: A new subspecies of *Pedaliodes ornata* GROSE-SMITH et KIRBY
in the Venezuelan Cordillera de Mérida
(Lepidoptera: Nymphalidae: Satyrinae)

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ABSTRACT. *Pedaliodes ornata* is an endemic species of the Cordillera de Mérida, known thus far only from the Chama valley in the centre of the range. Its new subspecies, *P. ornata haroldboxi* n. ssp., is described from the northern part of the Cordillera. Ecological traits, altitudinal and geographic ranges, and the affinities of *P. ornata* are discussed.

Key words: entomology, taxonomy, Boconó, Chama valley, cloud forest, male genitalia, *Pedaliodes ornata haroldboxi* n. ssp.

INTRODUCTION

The species which is the object of this study was described twice. First, by Henley GROSE-SMITH and William Forsell KIRBY (1895) as *Pedaliodes ornata*, then by Otto STAUDINGER (1897) as *Pedaliodes phaeaca*. The latter was clumped as a junior synonym of the former by THIEME (1905), an unambiguous action, since the types of *ornata* and *phaeaca* are morphologically identical and were collected by the same person, BRICEÑO, in the same locality, presumably in the valley of La Pedregosa in the suburbs of Mérida, in the Venezuelan Cordillera de Mérida. VILORIA (2007) held that there was competition for priority between the German and British entomologists. STAUDINGER had been preparing an extensive work on the Andean species of *Pedaliodes* since the late 1880's by carefully studying his continuously increasing collection. His reference

collection is currently held by the Zoological Museum of the Humboldt University in Berlin, whereas his commercial collection by the Staatliche Museum für Naturkunde in Dresden. STAUDINGER'S specimens in Berlin and Dresden often bear handwritten labels, either pinned under spread butterflies or on sheets of papers alongside unspread butterflies stored in carton boxes, indicating their names, some of which were never published. GROSE-SMITH and KIRBY knew the names suggested by STAUDINGER for new species. One explanation is that they might have visited STAUDINGER (whereas STAUDINGER never examined GROSE-SMITH'S collection in Great Britain). On the other hand, STAUDINGER, who was above all a butterfly dealer, certainly has sold many specimens to KIRBY and GROSE-SMITH, as well as to many other lepidopterists, and might have given away his butterflies accompanied by their working names. Several STAUDINGER'S manuscript names were used (often without crediting the author) by the British authors in their descriptions. It led us to believe that they occasionally blatantly plagiarised STAUDINGER'S work. For example *Pedaliodes porima* GROSE-SMITH & KIRBY, *P. phrasa* GROSE-SMITH & KIRBY [1894], *P. lora* GROSE-SMITH & KIRBY [1895] (a misspelled homonym of *P. loca* STAUDINGER, 1894, and both junior synonyms of *P. pausia* HEWITSON), were all originally STAUDINGER'S names (the first one also a misspelling of the original *P. porrima*) that the German author inadvertently used later in a publication that has to be ironically regarded as presenting a number of redescriptions and homonyms, and several not less irritating synonyms (STAUDINGER 1897) [i.e., *Pedaliodes obscura* GROSE-SMITH & KIRBY [1894] (= *P. pronoe* STAUDINGER, 1897), *P. pheretiades* GROSE-SMITH & KIRBY [1894] (= *P. subtangula* STAUDINGER, 1897)]. On the other hand, they made the notorious mistake of redescribing *P. hopfferi* 13 years after the original description by STAUDINGER (1887). They used the same name (therefore, it is a homonym), but gave no credit to STAUDINGER for it, although they claimed to have seen specimens in the German collection. GROSE-SMITH & KIRBY have also described the taxon *P. phrasina*, a junior synonym of *P. prosa* STAUDINGER, for which they obviously stole the name from the German entomologist. This time the confusion was aggravated by the fact that the plagiarisers applied the name to a different species [!].

MATERIALS AND METHODS

The material used in this study was obtained by the senior author during field work in Venezuela (1991-2006) and was examined in the Museum of Zoology of the Jagiellonian University in Kraków (MZUJ) and author's collection. Type specimens were examined in BMNH, ZMHB, MIZA, MZUJ and TWP. Male genitalia were dissected according to standard procedure, and examined under an Olympus SZX9 stereomicroscope, and preserved in glycerol vials. Adults were photographed with a Minolta E-500 digital camera. Colour plates were composed using Adobe PhotoShop 8. The following abbreviations and collection codens are used in the text:

FW: forewing;
HW: hindwing;
D: dorsum;

V: venter;

BMNH: The Natural History Museum, London, UK;

MIZA: Museo de Agronomía de la Universidad Central, Maracay, Venezuela;

MZUJ: Zoological Museum of the Jagiellonian University, Kraków, Poland;

PBF: collection of Pierre BOYER, Le Puy Sainte Réparate, France;

TWP: collection of Tomasz W. PYRCZ, Warsaw, Poland (to be integrated into MZUJ);

SMTD: Staatliche Museum für Tierkunde, Dresden, Germany;

ZMHB: Zoologische Museum Humboldt Universität, Berlin, Germany;

ZSBS: Zoologisches Staatssammlung München, München, Germany.

SYSTEMATICS

Pedaliodes ornata ornata GROSE-SMITH et KIRBY, [1895]

(Figs. 3, 4, 8)

Pedaliodes ornata GROSE-SMITH et KIRBY, [1895]: 10, pl. 3, figs. 1, 2; THIEME 1905: 125; WEYMER 1912: 261, pl. 55, fow f; GAEDE 1931: 492; GABRIEL 1932: 14; FORSTER 1964: 174, fig. 257 (male genitalia); HUBER 1973: 192; ADAMS & BERNARD 1981: 365, fig. 10 (male genitalia); ADAMS 1983: 474; 1985: 47, 49, fig. 10; D'ABRERA 1988: 860, 861, figs.; LAMAS, VILORIA & PYRCZ 2004: 212; PYRCZ 2008: 133.

Pedaliodes phaeaca STAUDINGER, 1897: 123-124 [Type locality: Sierra Nevada von Merida, 2500-3000 m, Venezuela], pl. 6, fig. 1; THIEME 1905: 125 (synonymy given); WEYMER 1912: 261; GAEDE 1931: 492; LEWIS 1973: 62, 234, fig. 8 (as *bona spec.*); ADAMS & BERNARD 1981: 365 (as synonym); LAMAS, VILORIA & PYRCZ 2004: 212 (as synonym).

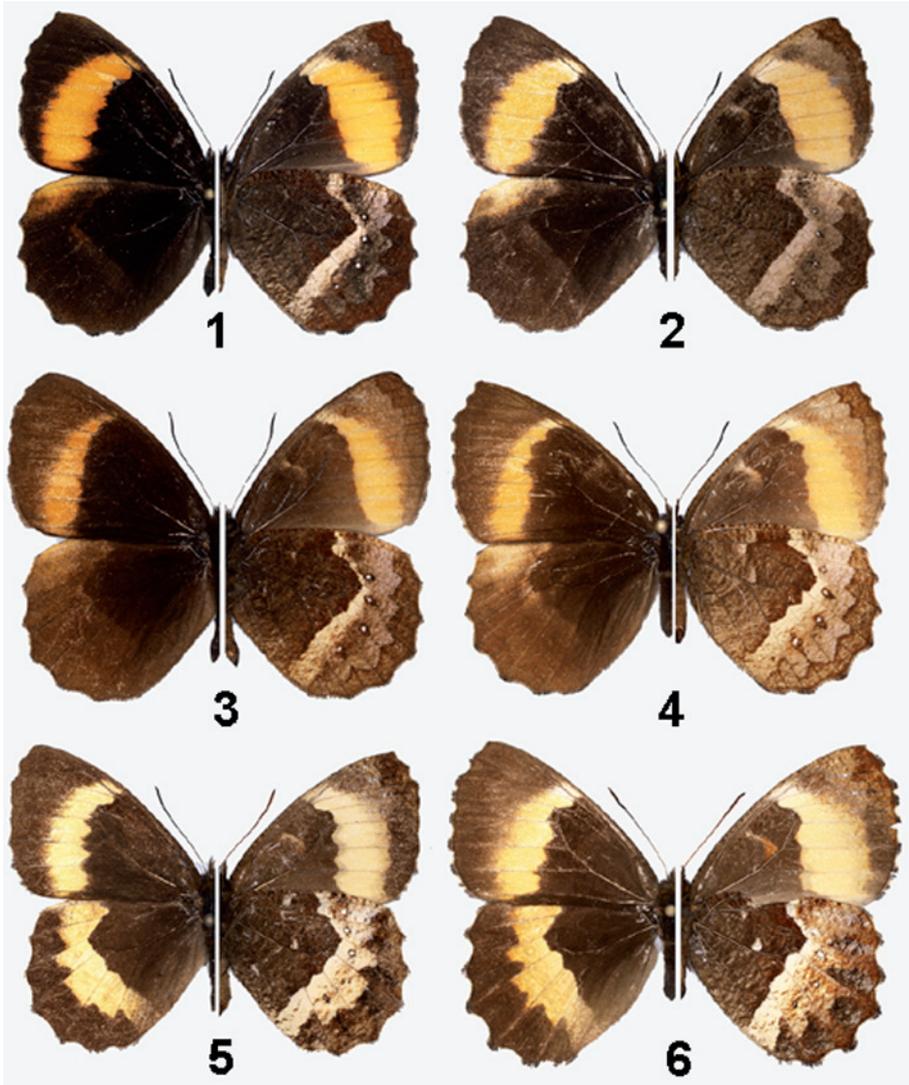
TYPE LOCALITY

Mérida, Venezuela [erroneously cited as Bolivia in original description].

MATERIAL EXAMINED

VENEZUELA: 1 ♂: Merida, Ex Grose Smith 1910, presented by J. J. Joicey, Esq. Brit. Mus. 1931-29, [BMNH] [LECTOTYPE of *Pedaliodes ornata* Grose-Smith & Kirby, herein designated]; 1 ♂: Mérida, Ex Grose Smith 1910 [PARALECTOTYPE of *P. ornata* Grose-Smith & Kirby, herein designated], JB; 5 ♂♂, 1 ♀: Mérida, Briceño, JB; 2 ♂♂: Mérida, Ex Staudinger, G-S; 1 ♂: Merida, Ex Coll. Ed Brabant 1920, JB; 1 ♂: Mérida, AB; 1 ♂: Mérida, 1897, OC; 1 ♂: Venezuela, CF, AB; 1 ♂: Mérida, 1630 m (altitude data unreliable), Briceño; 2 ♂♂: Quintero, CB; 2 ♂♂: Merida, Walle [*sic*], 2200 m, [18]97, Briceño, RB; 1 ♂: Mérida, Montan. Japi, 2-3000 m, 08.IV.[18]98, Briceño; 16 ♂♂, 1 ♀: Cordillera de Mérida, S. of Mérida, La Montaña, 2450-2550 m, 19.VIII.1977, M. J. Adams & G. I. Bernard *leg.*, AB2; 16 ♂♂, 1 ♀: same data, 09.VIII.1977, (1 male genit. prep. ALV164-96); 5 ♂♂: same data, 2600-2650 m, 06.VIII.1977; 2 ♂♂: same data, 2600 m, 03.VIII.1977; 1 ♂: same data, 2450-2550 m, 20.VIII.1977; 1 ♂: Cordillera de Mérida, S. of Mérida, between La Aguada & La Montaña, 2600 m, 03.VIII.1977, M. J. Adams & G. I. Bernard *leg.*, AB2; 9 ♂♂, 1 ♀: Cordillera de Mérida, S. of Mérida, above La Montaña, 2450-2550 m, 09.VIII.1977, M. J. Adams & G. I. Bernard *leg.*, AB2; 3 ♂♂, 1 ♀: same data, 19.VIII.1977; 1 ♂: same data, 2500 m, 20.VIII.1977; 1 ♂: Cordillera de Mérida, N. of Mérida, Río Albarregas, 2800 m, 14.VIII.1977, M. J. Adams & G. I. Bernard *leg.*, AB2; 2 ♂♂: same

data, 2700 m, 16.VIII.1977; 1 ♂: same data, 2600 m, 17.VIII.1977; 1 ♂: same data, 2800-2850 m, 13.VIII.1977, (wing prep.); 1 ♂: [no data] [BMNH]; 4 ♂♂: Edo. Mérida, San Eusebio, 2200 m, 20/24.X.1991, T. Pyrcz leg.; 1 ♂: Edo. Mérida, Qda. La Cuesta, 06.XII.1991, 2400 m, T. Pyrcz leg.; 6 ♂♂, 2 ♀♀: Edo. Mérida, Monte Zerpa, La Culata N. P., 31.V.1992, T. Pyrcz leg.; 2 ♂♂: same data, 13.III.1992; 9 ♂♂, 2 ♀♀: same data, 2200-3000 m, 15.II.1996; 4 ♂♂: same data, 04/08.IV.1996; 11 ♂♂, 2 ♀♀: same



1-6. Adult (dorsum: left, venter: right): 1 – *Pedaliodes ornata haroldboxi* male (holotype); 2 – *Pedaliodes ornata haroldboxi* female (paratype); 3 – *Pedaliodes ornata ornata* male (Monte Zerpa); 4 – *Pedaliodes ornata ornata* female (Monte Zerpa); 5 – *Pedaliodes reyi* male (holotype); 6 – *Pedaliodes reyi* female (paratype)

data, 19/20.II.1996; 5 ♂♂: same data, 01/30.IV.1996; 10 ♂♂, 1 ♀: same data, 01/28.II.1996; 6 ♂♂: same data, 14.II.1996; 3 ♂♂: same data, 25.II.1996; 7 ♂♂, 2 ♀♀: same data, 12.II.1996; 8 ♂♂, 1 ♀: same data, 23-II-1996; 1 ♂: no data; 1 ♂: Edo. Mérida, P. N. La Culata, vía Cabaña de los Curas, Sector Monterrey, 2800-2850 m, 06.IV.2006, T. Pyrcz *leg.*; 11 ♂♂ and 1 ♀: Edo. Mérida, P. N. Sierra Nevada, above La Mucuy, 2700-2750 m, 07.II.2007, T. Pyrcz *leg.*; 10 ♂ and 1 ♀: Edo. Mérida, P. N. Sierra Nevada, above La Montaña, 2600-2700 m, 04.II.2007, T. Pyrcz *leg.*; 1 ♂: Edo. Mérida, P.N. La Culata, Monte Zerpa, 2800-2850 m, 05.II.2007, T. Pyrcz *leg.* [TWP]; 4 ♂♂, 1 ♀: Mérida, Bricenno [*sic*] [1 ♂ LECTOTYPE, 3 ♂♂, 1 ♀ PARALECTOTYPES of *Pedaliodes phaeaca* Staudinger, herein designated]; 1 ♂: Edo. Mérida tal Río Albarregas, 2500 m, 24.X.1970, H. Huber; 1 ♂: Mérida, Teten, Ernest A. Böttcher, Berlin, Coll. O. Thieme, (präparat Nr. SA406) [ZSBS]; 5 ♂♂: Mérida, La Culata N. P, Monte Zerpa, 2200-3000 m, 01-31.III.1996, T. Pyrcz *leg.*; 1 ♂: Mérida, Mucuy, 19.IV.1989, P. Bleuzen *leg.*; 1 ♂: Mérida, La Culata, vía Cabaña de los Curas, Sector Monterrey, 2900 m, 06.IV.2006, P. Boyer *leg.* [PBF].

REMARKS

P. ornata is endemic in the Venezuelan Cordillera de Mérida where it has no closer relatives and is the only species of *Pedaliodes* bearing conspicuous FW orange bands. Several similarly patterned orange banded species occur in the main Andes of Peru, Ecuador, Colombia and the Venezuela – Colombia border. They form a group of closely related allopatric and parapatric (in altitude) species characterised by similar male genitalia and colour patterns (ADAMS 1985; PYRCZ et al. 2008). In geographic and also morphological terms, it appears that *P. ornata* is most closely related to *P. reyi* VILORIA et PYRCZ (Figs. 5, 6, 9) found in the Tamá range separated from the Cordillera de Mérida by the Táchira depression (PYRCZ & VILORIA 2007). *P. ornata* differs from *P. reyi* in male genitalia by the thinner and longer aedeagus with a longer proximal opening.

The nominate subspecies of *P. ornata* is found in the central part of the range, within the valley of Chama - on southern slopes of the Sierra de La Culata and northern slopes of the Sierra Nevada. The only locality outside the valley it was reported from is the San Eusebio - La Carbonera forest situated on the northern, Lago de Maracaibo slopes of the Páramo Tambor. The individuals from La Carbonera do not present any distinctive morphological features compared to those found within the valley of Chama. *P. ornata* has never been collected in the southern part of the Cordillera de Mérida, in the El Batallón massif, despite rather intensive collecting carried out by the authors and other lepidopterists. *P. ornata* is an upper cloud forest species. In La Culata range (Monte Zerpa, Sector Monterey) it is found at 2525 – 3050 m with an abundance peak at 2775-2800 m (PYRCZ & WOJTUSIAK 2002). It is co-dominant in the *Pedaliodes* community within this elevational band alongside *Pedaliodes minabilis* (PYRCZ 2008). One individual was exceptional, being caught at 2250 m in Monte Zerpa. On the opposite side of the valley, in the Sierra Nevada range (La Mucuy, La Montaña) it occurs at similar elevations (2450-2850 m). In La Carbonera it occurs at particularly low elevations, down to 2200 m.

***Pedaliodes ornata haroldboxi* PYRCZ et VILORIA, n. ssp.**

(Figs. 1, 2, 7)

TYPE MATERIAL

HOLOTYPE ♂: Venezuela, Trujillo State, Old road Boconó – Trujillo, Sector Pico Tonojo, 2450-2500 m, 18.IV.2006, T. Pyrcz *leg.*, [MIZA]. PARATYPES (15 ♂♂ and 6 ♀♀): 8 ♂♂: same data as the holotype, 2 [MIZA], 6 [MZUJ]; 4 ♀♀: same data as the holotype, [TWP]; 6 ♂♂: Edo. Trujillo, Carretera vieja a Trujillo km 8, “El Rucio”, Pie del Pico Tonojo, 30 km de Bocono, 2500 m, 16.IV.2006, P. Boyer *leg.*, 2 [MIZA], 4 [PBF]; 2 ♀♀: same data, [PBF]; 1 ♂: Trujillo, Páramo de Boconó, 2400 m, 08.II.1953, H. Box, [MIZA].

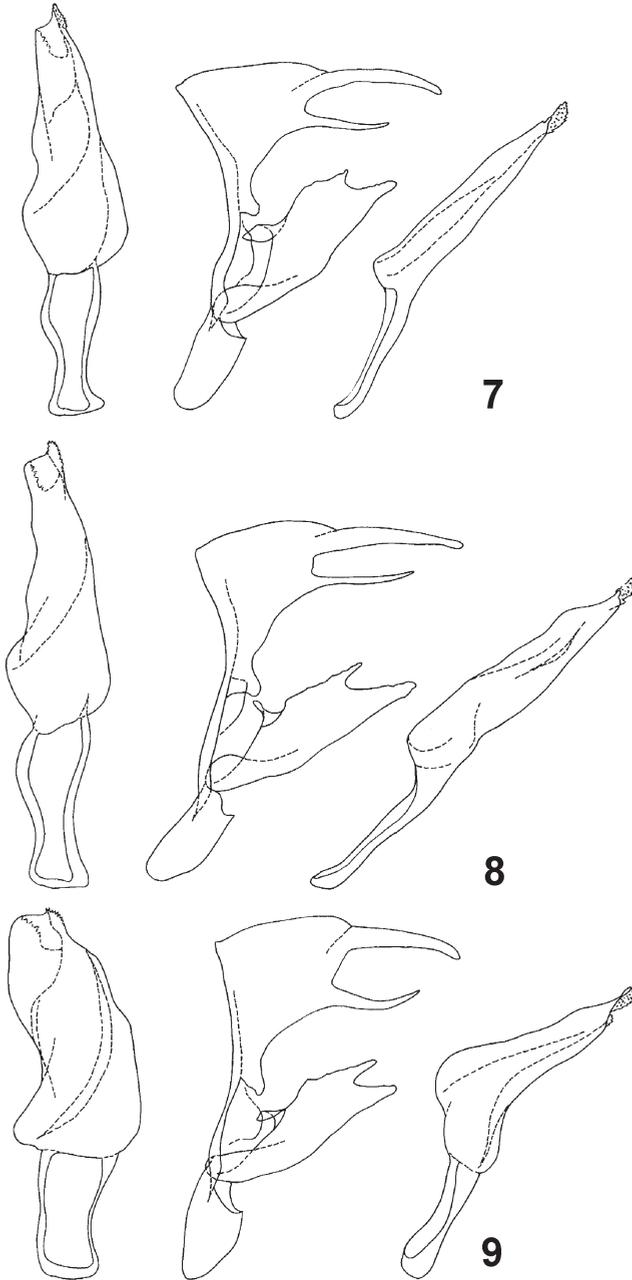
DESCRIPTION

MALE (Fig. 1): FWD blackish brown, darker than in the nominate subspecies; the most striking difference between *haroldboxi* and the nominate is in the shape and colour of the FWD postdiscal orange band, three times wider in *haroldboxi*, basally with an irregular basal edge bearing several undulations and incisions, compared to the smooth edge of the nominate, distally extending considerably more towards outer margin, rich orange instead of pale reddish orange of the nominate. HWD blackish brown, darker than in the nominate, with a costal lightening suffused with rich orange. FWV ground colour blackish brown, darker than in the nominate subspecies; orange shaped as on the dorsal surface but slightly lighter coloured and wider distally, twice as wide as in the nominate subspecies; some magenta scales in the subapical area, apical area and outer margin chocolate brown, as in the nominate. HWV ground colour blackish brown instead of chocolate brown in the nominate; postdiscal band shaped as in the nominate but whitish, instead of milky white, with a grey and brown suffusion progressively denser distally with a series of four white dots, same as in the nominate; submarginal line irregular and somewhat variable however less undulating with shallower basal incisions along the veins than in most examined individuals of the nominate subspecies. Male genitalia (Fig. 7): The differences between *haroldboxi* and the nominate subspecies are slight and consist only in the somewhat longer dorsal process on the valves of *P. ornata ornata*.

FEMALE (Fig. 2): Differs from the male in the lighter, grey brown FWD and HWD ground colour, wider and lighter orange FWD postdiscal band, and considerably lighter HWV, chestnut ground colour with a more prominent whitish overcast, particularly in distal half. The differences between the females of *haroldboxi* and the nominate are same as in the males.

ETYMOLOGY

This taxon is named after Harold Box, an English entomologist who worked in Venezuela on biological control of *Diatraea* spp., a pest of sugar cane, and carried out massive breeding and evaluations of Amazonian fly in laboratory. H. Box was the first collector of this subspecies over fifty years ago.

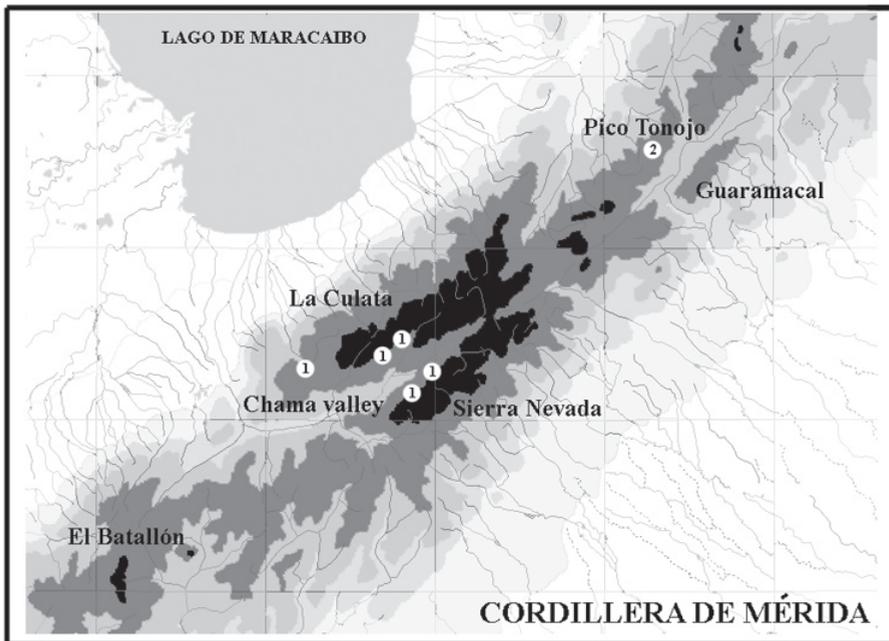


7-9. Male genitalia (in lateral view, aedeagus removed from its natural position, in lateral and dorsal view):
 7 – *Pedaliodes ornata haroldboxi* (paratype); 8 – *Pedaliodes ornata ornata* (Monte Zerpa); 9 – *Pedaliodes reyi* (paratype)

REMARKS

The first known, unique individual collected by Harold Box was donated to MIZA (Maracay) where it was curated and overlooked for many years. It was eventually located by A. VILORIA, in the course of his revisional work on the genus *Pedaliodes* in the 1990, who immediately recognised it as undescribed and related to *Pedaliodes ornata*. The collecting locality specified by Box was vague and pointed out a place in the area of the town of Boconó, for there is no such specific place called „Páramo de Boconó”. Boconó is a locality situated in a deep valley of the river of the same name, between two parallel ranges. Immediately to the south-east lies the Guaramacal massif, rising to 3250 m, a compact ridge with páramo vegetation pockets above 2800 m. Guaramacal has been repeatedly sampled from the 1980' by the researchers from MIZA, and was also visited on several occasions by the authors from 2003 on, and other lepidopterists. Several endemic species and subspecies of Pronophilina have been discovered in the upper section of Guaramacal, including *Steromapedaliodes schuberti* VILORIA et PYRCZ (2002), *Lymanopoda* sp. (PYRCZ & VILORIA, MS) and *Cheimas opalinus* ssp. (PYRCZ, MS). However, the presence of *Pedaliodes ornata* was not confirmed. Eventually, during a research trip in April 2006, *Pedaliodes ornata haroldboxi* was spotted by T. PYRCZ on the opposite side of the Boconó valley along the old road linking Boconó and Trujillo.

P. ornata haroldboxi was observed in the upper section of the road, between the ridge at 2550 m and 2350 m asl, exclusively on its north-western slopes. Nearly all the



Map. Distribution of *Pedaliodes ornata* in the Cordillera de Mérida (1. *Pedaliodes ornata ornata*, 2. *Pedaliodes ornata haroldboxi*)

specimens were collected in two spots, at 2500 m asl and some 50 metres down the road. Males and females were observed when flying along the forest edge, and occasionally crossing the road. When doing so, they were moving fast and zigzagging, alarmed and visibly feeling unsafe in open areas, and readily seeking shelter under dense vegetation cover. Males were seen to demonstrate territorial behaviour in two adjacent, apparently strategic clearings. Incoming individuals were observed to patrol the clearing for some time then picking one sunny spot, usually a large leaf, for perching. By the time one male was holding a spot, no other conspecific individual attempted to overtake its territory. The resident male was taking on the wing occasionally to inspect other passing butterflies, such as *Pedaliodes minabilis* PYRCZ (PYRCZ 2008) or *Lymanopoda* n. sp. (PYRCZ & VILORIA, MS). When the resident individual was removed, another male was invariably coming after some time to occupy the clearing, demonstrating the same patrolling / perching sequence of activity. Recorded flight activity of *P. ornata haroldboxi* presented a sharp peak corresponding with the late morning, at 1000-1100. On sunny and particularly hot days, flight activity was sharply falling towards midday and practically stopping at 1300.

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