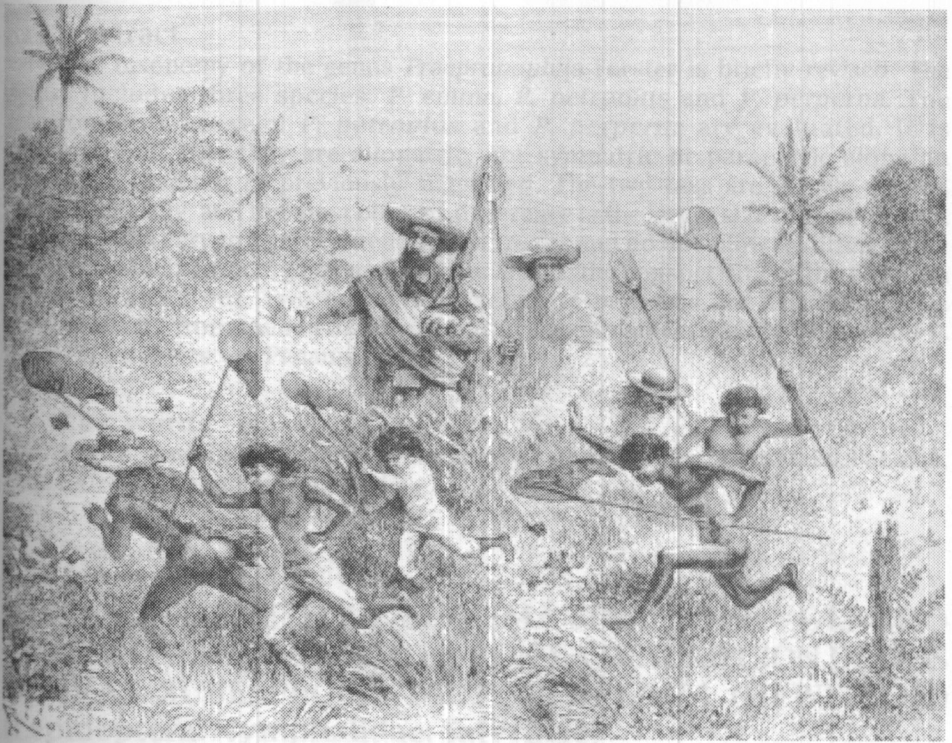


NOTES ON THE SYSTEMATICS OF THE GENUS
PERPERNA ROBERTSON WITH THE DESCRIPTION OF
THE NEW SUBSPECIES OF *P. PERPERNA* (BEWITSONI)
(Lepidoptera: Pieridae)

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NOTES ON THE SYSTEMATICS OF THE GENUS
PRAEPRONOPHILA FORSTER WITH THE DESCRIPTION OF
TWO NEW SUBSPECIES OF *P. PERPERNA* (HEWITSON)
(Lepidoptera: Nymphalidae: Satyrinae)*

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Abstract

The taxonomy of the genus *Praepronophila* Forster is briefly revised. The genus includes three species: *P. emma*, *P. petronius* and *P. perperna*. The relationships between *P. petronius* and *P. perperna* are evaluated. It is demonstrated that they are allopatric, not sympatric or parapatric along an altitudinal gradient as previously suggested. The two taxa are closely related morphologically, and the most obvious difference is the larger size of *P. petronius*. Male genitalia vary to a great extent in *P. perperna* and do not allow to differentiate unequivocally it from *P. petronius*. In conclusion, the conspecificity of the two taxa cannot be ruled out. Two new subspecies of *P. perperna* are described: *P. p. gabrieli* n. ssp. from the northern part of the Colombian Central Cordillera and *P. p. smalli* from western Panamá.

Key words

Andes, Antioquia, allopatry, Colombia, Western Cordillera, genitalia, Panamá, *Pedaliodes*, Pronophilini, Venezuela.

Resumen

NOTAS SOBRE LA SISTEMÁTICA DEL GÉNERO
PRAEPRONOPHILA FORSTER CON LA DESCRIPCIÓN DE DOS
NUEVAS SUBESPECIES DE *P. PERPERNA* (HEWITSON)
(Lepidoptera: Nymphalidae: Satyrinae)

Se revisa someramente la taxonomía de *Praepronophila*. El género incluye tres especies: *P. emma*, *P. petronius* y *P. perperna*. Se evalúan las relaciones entre las dos últimas especies, demostrando que son alopátridas, y no simpátridas o parápátridas a lo largo del gradiente altitudinal como previamente sugerido. Los dos taxones son muy estrechamente relacionados morfológicamente, la única

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diferencia notable siendo el tamaño superior de *P. petronius*. Los genitales masculinos varían mucho entre las subespecies de *P. perperna* y no permiten su separación inequívoca de *P. petronius*. En conclusión, no se puede descartar la posibilidad de que los dos taxones pueden ser coespecíficos. Se describen dos nuevas subespecies de *P. perperna*: *P. p. gabrieli* n. ssp. del norte de la Cordillera Central de Colombia, y *P. p. smalli* n. ssp. del occidente de Panamá.

Palabras clave

Andes, Antioquia, alopatria, Colombia, Cordillera Occidental, genitales, Panamá, *Pedaliodes*, Pronophilini, Venezuela.

INTRODUCTION

The genus *Praepronophila* was raised by FORSTER (1964: 182-183) for a single species, *Pedaliodes emma* Staudinger, 1897. The original diagnosis stressed on two features: the presence of wing ocelli and distinctive shape of the aedeagus compared to other genera of *Pedaliodes* Butler *sensu lato*. FORSTER (*Op. cit.*) argued that these characters indicate an intermediate position of *Praepronophila* between *Pedaliodes* and *Pronophila* Westwood, hence the generic epithet. MILLER (1968: 116), in the revision of Satyridae, considered *Praepronophila* as a valid genus belonging to the tribe Pronophilini (subtribe Pronophilina *sensu* LAMAS *et al.*, 2004), but did not discuss its taxonomy. However, some time later the same author (MILLER, 1986) concluded that the "male genitalia of *Pedaliodes petronius* Grose-Smith are somewhat reminiscent of those of *Praepronophila*, a very different butterfly in all other respects"!! The latter statement appeared without fundamentals, as the same year ADAMS (1986) included both *Pedaliodes perperna* (Hewitson) and *Pedaliodes petronius* in the genus *Praepronophila* pointing out that their underside markings are almost identical to *P. emma*, and that male genitalia also indicate close affinities, even though the aedeagus of the Venezuelan population of *P. perperna* is slightly contorted, as in *Pedaliodes sensu stricto*.

VILORIA (Ph.D.), who studied the phylogeny of *Pedaliodes sensu lato* based on morphological characters, confirmed the separate generic status of *Praepronophila*. He did not find any additional qualitative generic synapomorphies apart from those pointed out by FORSTER (1964). He underlined that the ocellar elements are present as well developed postdiscal ocelli on both wings, the upperside ocellus is visible only on forewing, and that ocelli are generally more developed in females and they exhibit postdiscal forewing coloured bands, embracing the ocelli. Male genitalia of *Praepronophila* are characterised, following VILORIA (*Op. cit.*), by dome-like or more or less flattened tegumen; short but hooked and well formed uncus; thin and well developed subunci, about half length of uncus; tubular saccus, as long as tegumen, slightly curved upwards; straight or contorted aedeagus,

relatively long and variably thick; valvae broader at base with variable ampullar processes, digitiform in *P. petronius*, but rudimentary in *P. emma*. None of these genital features is unique and sustain the monophyly of the genus. The presence of fully developed ocelli remains the strongest synapomorphy of *Praepronophila*, since this character is not found in other genera of the *Pedaliodes* complex, except in *Protopedaliodes* Vilorio & Pyrcz, an endemic, apparently relict genus from the Guyana Shield, whose affinities are even more obscure than those of *Praepronophila* (VILORIA & PYRCZ, 1999).

Currently, there is no other morphological or molecular data that would help evaluating the position of *Praepronophila* within the tribe Pronophilini or the *Pedaliodes* complex. Female genitalia have not been studied. The biology of *Praepronophila* is unknown, hence no morphological data on their larval stages. PEÑA *et al.* (2006), who carried out a phylogenetic revision of worldwide Satyrinae based on molecular data, unfortunately did not include in their study any representative of the genus *Praepronophila*. It remains however to be demonstrated that the ocelli of *Pronophila* and *Praepronophila*, particularly on the forewing are indeed homologous.

MATERIALS AND METHODS

Type material was examined in BMNH, ZMHB, MHN-UC, FMNH, TWP and GR. Additional material was examined in other major European and American collections. Male genitalia were dissected according to standard procedure, by soaking in hot 10% KOH solution, and preserved in glycerol. They were examined, alongside other morphological microstructures, under an Olympus SZX9 stereomicroscope. Adults were photographed with an Olympus E-500 digital camera, and colour plates were composed using Adobe PhotoShop version 8 software. The following abbreviations and collection codens were used:

FW: forewing.

HW: hindwing.

D: dorsum.

V: venter.

FMNH: Florida Museum of Natural History, Gainesville, USA.

BMNH: The Natural History Museum (formerly British Museum - Natural History), London, UK.

FRR: collection of Francisco Romero, Maracay, Venezuela.

GRC: collection of Gabriel Rodríguez, Envigado, Colombia.

MBLI: collection of Maurizio Bollino, Lecce, Italy.

MHN-UC: Museo de Historia Natural de la Universidad de Caldas, Manizales, Colombia.

MIZA: Museo del Instituto de Agronomía, Universidad Central de

Notes on the systematics of the genus *praepronophila* forster with the description of two new subspecies of *p. perperna* (hewitson) (lepidoptera: nymphalidae: satyrinae)

Venezuela, Maracay, Venezuela.

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

PBF: collection of Pierre Boyer, Le Puy Sainte Réparate, France.

SMTD: Staatliche Museum für Tierkunde, Dresden, Germany.

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

ZMHB: Zoologische Museum Humboldt Universität, Berlin, Germany.

SYSTEMATICS

Praepronophila Forster, 1964: 182-183.

Type species: *Pedaliodes emma* Staudinger, 1897 (by original designation).

Praepronophila emma (Staudinger, 1897) (Fig. 1).

[Type locality: Río Zongo, Yungas, Bolivia].

Pedaliodes emma Staudinger, 1897: 135-136, pl. 6, fig. 7.

Pedaliodes emma Staudinger; Thieme, 1905: 66, 67; Weymer, 1912: 253; Fassl, 1920: 26; Gaede, 1931: 489; Forster, 1964: 165; Adams & Bernard, 1977: 276; d'Abrera, 1988: 851, figs.

Praepronophila emma (Staudinger); Forster, 1964: 183, fig. 263 (male genitalia); Adams, 1986: 309; Lamas & Grados, [1997]: 58; Lamas *et al.*, 2004: 214.

Material examined: BOLIVIA: 1 male: Chaco, Garlepp, BMNH; 1 male: Yungas de La Paz, ex. coll. Staudinger & Bang-Haas, TWP; 1 male: Bolivia, Ex Grose Smith 1910, JB, BMNH; 1 male: Yungas, Ex Grose Smith 1910, (Rhop. slide No. 29535), BMNH; 1 male: Farinas, BMNH; 1 male: Yungas, Río Songo, 1200 m, 1895-6, Garlepp, (genit. vial M9250 male, L. D. Miller), [Lectotype of *Pedaliodes emma* Staudinger, selected by Lee D. Miller, unpublished], ZMHB; 2 males: same data, ZMHB; 1 male: [no data], (präparat Nr. SA450), ZMHB; PERÚ: 1 male: Chanchamayo, (genit. prep. ALV090-96), BMNH; 1 male: Huánuco, Cordillera del Sira, ca. 0925/7445, 1380 m, IX.[19]87-VIII.[19]88, Exp. Universidad Viena, MUSM.

Remarks: Available data indicate that *P. emma* is distributed from Bolivia (Yungas de La Paz) to central Perú (Huánuco). Judging from the limited number of examined specimens, it could be considered as a rare species. It is however most of all extremely localised, it apparently has a disjunct distribution and

occurs in seldom explored areas. Since the description of *P. emma* from the valley of Zongo, most individuals were collected in the nearby localities of the Yungas de La Paz. Bollino (pers. comm.) reports that *P. emma* is locally common in the area of Coroico east of La Paz. Two specimens of *P. emma* are known from central Perú. One of them is old, bears a vague locality label, Chanchamayo, and might even be considered as mislabelled. The second however was collected recently by a scientific expedition in a remote area, practically never sampled before or since, the Cordillera del Sira (LAMAS & GRADOS, 1997). Its colour pattern was not found to be markedly different from the Bolivian specimens. There is no data on the presence of *P. emma* in northern Perú or in Ecuador, which certainly does not prove the species does not occur there, considered that, on the other hand, it has not been reported anywhere between central Perú and Bolivia. We consider that *P. emma* most probably inhabits the outer easternmost escarpments of the Andes. These areas, such as the Cordillera Azul in northern Perú or the Sierra de Cutucú in Ecuador have never been sampled for butterflies.

Praepronophila perperna perperna (Hewitson, 1862) (Fig. 7, 8, 9).

[Type locality: South América (Venezuela)].

[*Dasynympha euchaeres* Moritz, *in litt.*, *nomen nudum*; Viloría et al., 2001: 33].

Pronophila perperna Hewitson, 1862: 16-17.

Pronophila perperna Hewitson; Herrich-Schäffer, 1865: 66; Kirby, 1879: 114; Riley & Gabriel, 1924: 45.

Pronophila satyroides C. & R. Felder, [1867]: 469-470 [Type locality: Caracas, Venezuela]; Butler, 1868: 173 (synonymy given); Kirby, 1871: 104; Thieme, 1905: 68; Weymer, 1912: 253; Gaede, 1931: 495 (all as synonym).

Pedaliodes perperna (Hewitson); Butler, 1867: 267, 1868: 173; Kirby, 1871: 104; Butler & Druce, 1874: 337; Scudder, 1875: 242; Godman & Salvin, [1881]: 104; Grose-Smith & Kirby, [1893]: 3-4, fig. 6; Reuter, 1896: 141-142; Godman, [1901]: 661; Thieme, 1905: 60, 68-69; Weymer, 1912: 253, pl. 53, row e; Fassl, 1915: 11; Krüger, 1924: 23, 31 (misidentification of *P. petronius* Grose-Smith); Gaede, 1931: 495; Forster, 1964: 166, fig. 224 (male genitalia); Lewis, 1973: 62, 234, fig. 6; Adams & Bernard, 1977: 270, 1979: 97, 1981: 360-361; Miller, 1985: 187-189, 192, 193, 194, fig. 1-4, 13 (male genitalia), 15 a & b (female genitalia); DeVries, 1987: 281, pl. 49, fig. 15, 16; d'Abbrera, 1988: 851, figs. Vélez & Salazar, 1991: 162, fig.

[*Pedaliodes mycalesoides* (C. & R. Felder); Grose-Smith & Kirby, [1895]: 10-11 (misidentification), pl. 2, fig. 3; Grose-Smith, 1900: 18; Godman, [1901]: 661 (synonymy given)].

[*Pedaliodes* sp.; Raymond, 1982: 202-203, pl. 46, fig. 7].

Praepronophila perperna (Hewitson); Adams, 1986: 309; Viloría, 1990: 246, 247-250, fig. 160-164, 269, 271; Pyrcz, 1999: 368 (misidentification);

Lamas *et al.*, 2004: 214; Pyrcz & Viloría, 2005: 259.

Material examined: VENEZUELA: 1 male: S. América, HC, type No. Rh. 3960, BMNH [Lectotype of *Pronophila perperna* Hewitson, designated by Viloría & Pyrcz, in press]; 9 males and 2 females: Edo. Aragua, Colonia Tovar, Cuesta de Maya, 1700-1750 m, 28.II.2004, M. Costa *leg.*, TWP; 3 males: same locality, 1800-1850 m, 30.XI.2003, T. Pyrcz *leg.*, TWP; 1 male and 1 female: Edo. Aragua, Colonia Tovar, vía Gavante, 1900-1950 m, 25.IV.2004, M. Costa *leg.*, TWP; 1 male: Dto. Federal, P.N. Ávila, 2000-2050 m, 22.X.2003, TWP; 1 male: same locality, 1900-1950 m, 31.VIII.2003, TWP; 1 male: Dto. Federal, P.N. Ávila, Qda. Anauco, 1400 m, VII.1987, T. Pyrcz *leg.*, TWP; 5 males: Edo. Carabobo, 15 km N. Bejuma, Cerro San Isidro, 1500-1600 m, 10.VIII.2003, T. Pyrcz *leg.*, TWP; 1 female: same locality and altitude, 24.VII.2003, M. Costa *leg.*, TWP; 1 female: same data, 27.IX.2002, TWP; 5 males: Aragua, carretera Maracay-Choroní, 1400 m, 04.VIII.1952, J. Requena *leg.*, MIZA; 2 males: Aragua, carretera Maracay-Choroní, 1600 m, 19.IV.1953, F. Fernández Y. *leg.*, MIZA; 1 male: Aragua, carretera Maracay-Choroní, La Cumbre, 1000 m, 16.V.1989, A. Chacón *leg.*, MIZA; 1 male: Aragua, Colonia Tovar, vía Cuesta Maya, 2100 m, 14.V.1996, J. DeMarmels y A. Chacón *leg.*, MIZA; 1 male: Aragua, Colonia Tovar, 26.VIII.1987, J. DeMarmels *leg.*, MIZA; 2 males: Aragua, carretera Maracay-Choroní, 11.IX.1970, J. Salcedo and J. Clavijo *leg.*, MIZA; 1 male: Aragua, P.N. Henri Pittier, Pico Guacamaya, 1740 m, 13-17.VI.1989, A. Chacón *leg.*, MIZA; 1 male: Aragua, Colonia Tovar, vía Naranjal, 1700-1800 m, 30.XI.2004, T. Pyrcz *leg.*, TWP; 1 female: Aragua, Rancho Grande, 1100 m, 25.III.1987, T. Pyrcz *leg.*, MIZA; 1 female: Aragua, carretera Maracay-Choroní, 11.IX.1970, J. Salcedo and J. Clavijo *leg.*, MIZA; 1 male: Aragua, carretera Maracay - Choroní, 1200 m, VIII.1985, F. Romero *leg.*, FRRM; 1 male: same data but X.1968, FRRM; 1 male: same data but IX.1968, FRRM; 1 male: same data but VIII.1967, FRRM; 1 male: same data but 1550 m, VIII.1990, FRRM; 1 male: same data but VIII.1995, FRRM; 1 female: same data but 1200 m, VIII.1983, FRRM; 1 female: same data but 1450 m, II.1978, FRRM; 1 female: same data but 1200 m, IX.1986, FRRM; 1 female: same data but III.1983, FRRM; 1 female: same data but IX.1967, FRRM; 1 male: same data, no altitude, V.1969, FRRM; 1 male and 1 female (BMNH type No. Rh. 3961), S. América, HC, BMNH; 1 male and 1 female: Venezuela, Moritz, Felder Coll., BMNH; 4 males: Venezuela, purch. from Dyson, BMNH; 3 males and 2 females: Venezuela, Druce Coll., (1 genit. prep. ALV092-96), G-S, BMNH; 1 female: Mérida, Briceño, BMNH; 1 male: [no locality], Moritz, Coll. Sommer, ZMHB; 1 male: Venez.[uela], Coll. H. Sch., ZMHB.

Remarks: Even though the type locality of *P. perperna* was not specified by HEWITSON (1862), it was almost certainly described, alongside other species in the same paper, from specimens collected in the Venezuelan Cordillera de la Costa (VILORÍA *et al.*, 2001). The type-locality of *P. satyroides* C. & R. FELDER [1867] described five years later was pointed out as Caracas, therefore there are no doubts that it is a junior synonym of *P. perperna*. *P. perperna perperna* is known from several localities scattered throughout the Cordillera de la Costa, including its western extremity, the Sierra de Nirgua.

Data from other Venezuelan localities are extremely scarce, which is due to the lack of sampling at appropriate elevations. Although extraordinary it may seem, only two specimens are known from the well-sampled Cordillera de Mérida are known, including one collected a hundred years ago by Briceño. The second individual was caught recently by P. Boyer at 1500 m in San Isidro (Barinas State). The senior author observed one individual in San Cristóbal, in a patchy premontane forest belonging at 1100 m, and to our knowledge this is the only record of *P. perperna* from Táchira state. Two specimens of *P. perperna perperna* were collected in the Sierra de Perijá by the La Salle expeditions (1947-1951).

***Præpronophila perperna gabrieli* Pyrcz & Viloría n. ssp.** (Fig. 4, 5, 6, 10).

[Type locality: Amagá, Antioquia, Colombia].

Type material: COLOMBIA: Holotype (male): Amagá, Antioquia, 1500 m, 15.XII.2004, G. Rodríguez leg., GR (to be deposited in MHN-UC); Paratypes (18 males and 6 females): *Antioquia*: 1 male: Amagá, 1500-1550 m, 13.IX.2005, G. Rodríguez leg., TWP; 1 male: Amagá, 1500 m, 15.XII.2004, G. Rodríguez leg., TWP; 1 male: Amagá, 1500 m, 29.I.2006, G. Rodríguez leg., TWP; 1 male: Titiribí, 1800 m, 15.XI.2004, G. Rodríguez leg., (prep. genit. 02/19.IX.2005, TWP), MZUJ; 1 male: El Retiro, 2100-2200 m, 28.III.2004, G. Rodríguez leg., TWP; 1 female: Amagá, 1500 m, XI.2005, G. Rodríguez leg., TWP; *Caldas*: 2 males and 1 female: Manizales, A. M. Patino, BMNH; *Risaralda*: 3 females: Distrito de Pereira, 1886, Román M. Valencia, BMNH; *Department?*: 1 male: Nouv. Grenada, de Bogotá a Buenaventura, 14.II.1877/22.II.1978, Thieme, BMNH; 4 males: Cauca, Corinto, V/VII.1906, (Paine & Brinkley), BMNH; 1 male and 1 female: Cauca valley, Torne[ll], VIII.1907, (male wing prep.), BMNH; 2 males: West Cordillera, Carmen, 1600 m, XII.1908, Fassel, BMNH; 1 male and 1 female: Cauca, Patiño, BMNH; 1 female: Cauca valley, El Congo, IV.1907, BMNH; 1 female: N. Grenada, Cauca valley, BMNH; 1 female: Colombia, [18]87, Kalbreyer, ZMHB; 1 male: Ocaña (locality unreliable), Kalbreyer, ZMHB.

Description: MALE (Fig. 4, 5): Head, thorax and abdomen as in the nominate subspecies. Wings: FW (length: 26-29 mm; mean: 27.5 mm; n=6) with a rounded apex, and straight, smooth outer margin, outer and inner margins at straight angle, compared to the nominate, which has slightly undulated outer margin with a little notch below apex, and outer and inner margins forming at open angle. HW rounded with very a slightly undulated outer margin, whereas in the nominate subspecies HW is square and the undulation is more prominent. FWD blackish brown, same as in the nominate; in most examined individuals a well marked FWD black submarginal ocellus with a white pupil in cell Cu1-Cu2, in the nominate subspecies sporadically showing as a little black dot. HWD uniform blackish brown, same as in the nominate. FWV ground colour blackish brown, considerably darker than the

chocolate brown of the nominate, with some lighter scales specking along costa and towards apex, and a faint brick red and black ripple pattern in discal cell; subapical white dot same as in the nominate; submarginal black ocellus with a white pupil in Cu1-Cu2 about the same size as in the nominate but the light brick red area surrounding it generally fainter and smaller. HWV blackish brown, considerably darker than the chocolate brown of the nominate, almost uniform, with some lighter scaling forming a faint ripple pattern, in some individuals more prominent in the submarginal area; black ocellus with a white pupil in Cu1-Cu2 same as in the nominate subspecies. MALE GENITALIA (Fig. 10): Dorsal process on the valva shaped similarly to *smalli* but shorter; ampulla smooth as in *smalli* in contrast to the serrate ampulla of the nominate; saccus deeper than in other subspecies; aedeagus longer than in other subspecies.

FEMALE (Fig. 6): Differs from the nominate subspecies as follows: FWV and HWV ground colour darker, blackish brown, instead of chocolate brown, particularly the area between postdiscal and submarginal lines darker, which is grey brown and little contrasting compared to the area basad, without any light, yellow or beige suffusion; FWV and HWV ocelli similar in size, shape and colour to the nominate subspecies. FEMALE GENITALIA: not examined.

Etymology: This subspecies is dedicated to Gabriel Rodríguez, a Colombian lepidopterist from Envigado (Medellín), who contributed with material and data to the production of this paper.

Remarks: *P. perperna gabrieli* occurs in the departments of Antioquia, Caldas, Risaralda and Valle del Cauca (and possibly also in Quindío and Cauca) on the left (Western Cordillera) and right bank (Central Cordillera) of the Río Cauca. Numerous old specimens are simply labelled "Cauca valley" and may come from either range. Most type specimens were collected recently by G. Rodríguez in the northern part of the Central Cordillera, in the immediate surroundings of Medellín, the capital of Antioquia. The specimens collected by Kalbreyer (even though one of them is labelled Ocaña, a locality in Norte de Santander, Eastern Cordillera) come most probably from the northern part of the Western Cordillera (see ADAMS, 1986, on this issue). *P. perperna gabrieli* occurs dense montane forests at 1500-1800 m. In most sampled localities, we observed it associated with *Chusquea* stands. However, in Envigado (RODRÍGUEZ, pers. obs.) *P. perperna gabrieli* apparently feeds locally on *Guadua* and secondary *Bambusa*.

Praepronophila perperna smalli Viloría & Pyrcz (Fig. 2, 11).

[*Praepronophila perperna* n. ssp. Viloría, 2004: 214].

Type material: PANAMÁ: Holotype (male): V. de Chirriquí, 2500-4000 ft, Champion, ex Grose-Smith, BMNH; Paratypes (10 males and 2 females): 1

male: Panamá, BMNH; 5 males and 1 female, V. de Chirriquí, 2500-4000 ft, Champion, (1 male genit. prep. ALV093-96 + wing prep.), ex Grose-Smith, BMNH; 1 female: Boquete, 3500 ft., Champion, ex Grose-Smith, BMNH; 3 males: Chirriquí, ex. Staudinger & Bang-Haas, SMTD, TWP.

Additional material (not included in type series): **COSTA RICA:** Holotype (male): Tarbacoa, x-1902, (Underwood), RB; Paratypes (1 male and 4 females): 1 male, Costa Rica, Coll. A. G. M. Gillott, Brit. Mus. 1939-353; 1 female, Costa Rica, Van Patten, Druce Coll., G-S; 2 females, Azahar de Cartago, (Underwood) [1 RB; 1 JB]; 1 female, Cartago, 5000 ft., 6-ii-[19]30, W. F. Kaye, all BMNH.

Description: MALE (Fig. 2): Head, thorax and abdomen as in the nominate subspecies. *P. perperna smalli* is characterised by the lighter FWV and HWV pattern than in *gabrieli*, similar to the nominate subspecies. The FWD Cu-Cu2 ocellus is small, faint or not apparent, similarly to the nominate subspecies. FW outer margin almost perfectly straight, compared to concave of the nominate or convex of *gabrieli*. The size is similar to other subspecies (FW length: 26-27 mm). In genitalia, dorsal process on the valva is longer than in *gabrieli* and the nominate, ampulla is smooth similarly to *gabrieli*, saccus is similar in depth as in the nominate, whereas aedeagus is of similar length as in the nominate, slightly more contorted.

FEMALE (not illustrated): Differs from other subspecies of *P. perperna* by the presence of a wide orange patch on the FWD covering the wing distal one-third from postmedian to submarginal area; FWD black ocellus in Cu1-Cu2 is situated within this orange area and thus, it is very conspicuous. HWD is medium brown with some orange scaling along basal edge of submarginal line from costa to approximately vein M1. FWV and HWV similar to the male but lighter brown with a noticeable yellowish suffusion in the postmedian to submarginal area. Dorsal surface of the female collected by Champion in Boquete was illustrated by d'Abrera (1988: 851).

Etymology: This subspecies is dedicated to Gordon B. Small who has contributed significantly with the knowledge of butterflies from Panamá, the collector of the type series of *P. petronius kerrianna*.

Remarks: *P. perperna smalli* differs from other subspecies first of all by the female, which has a conspicuous FWD orange patch. Such a pattern does not exist in any other subspecies of *P. perperna*. Interestingly enough, the local Panamenian subspecies of *P. petronius* also has such a distinctive colour pattern feature, which discriminates it from the nominate subspecies. *P. perperna smalli* is known to occur in western Panamá, from the Chirriquí volcano and Boquete. Considering the ecological preferences of this species for lower montane forests and its distribution, in South and Central América, it most probably occurs in the Darien highlands on the Colombia-Panamá

border, which have barely been sampled for butterflies.

It is possible that the Costarican populations represent yet another separate subspecies. Due to insufficient comparison material we decline now from attributing *P. perperna* from Costa Rica a separate status. Furthermore, there are hardly any geographical barriers or ecological particularities that would substantiate such a differentiation process. DeVries (1987: 281) reports it from both Atlantic and Pacific slopes of Costarican mountains at 1300-1800 m.

Praepronophila petronius petronius (Grose-Smith, 1900) (Fig. 3, 12).

[Type locality: Valdivia [Antioquia], Colombia].

Pedaliodes petronius Grose-Smith, 1900: 18, pl. 5, fig. 4, 5.

Pedaliodes petronius Grose-Smith; Thieme, 1905: 69; Adams & Bernard, 1977: 276; Miller, 1985: 187-195; DeVries, 1987: 281, pl. 49, fig. 17, 18; d'Abbrera, 1988: 851, fig. [male, misidentified as female].

Pedaliodes perperna (Hewitson) form *petronius* Grose-Smith; Weymer, 1912: 253.

Pedaliodes perperna (Hewitson) var. *petronius* Grose-Smith; Gaede, 1931: 495.

Pedaliodes perperna petronius Grose-Smith; Gabriel, 1932: 15.

Praepronophila petronius (Grose-Smith); Adams, 1986: 309; Pyrcz, 1995: 522; Lamas et al., 2004: 214; Pyrcz & Vilorio, 2005: 259.

Material examined: COLOMBIA: Antioquia: 1 male: Valvedia [sic], [18]97, Pratt, Ex Grose Smith 1910, presented by J. J. Joicey, Esq., Brit. Mus. 1931-29 [Lectotype of *Pedaliodes petronius* Grose-Smith, selected by Vilorio, unpublished], BMNH; 4 males: Valdevia [sic], Pratt, Ex Grose Smith 1910, (1 Rhop. slide No. 29534, genit. prep. ALV091-96), BMNN; Cauca: 1 male: Res. Tambito, 1850 m, 12.II.1997, T. Pyrcz, TWP; 3 males: same data, 1750 m, III.1997, TWP; ECUADOR: 1 male: Ecuador, I. Aldas leg., TWP.

Remarks: *P. petronius* was described from Valdivia in Antioquia. This locality is situated in the Western Cordillera, and so far *P. petronius* has not been reported from other Colombian ranges. In common with other species of the genus, it is rare or at least extremely localised. Beside the four type specimens, *P. petronius* is known from a series of individuals collected much further south, on the western slopes of the Cordillera in Cauca, in the Tambito Forest Reserve. *P. petronius* is probably endemic of the Chocó slopes of the Andes in Colombia. One specimen with no precise locality label comes from Ecuador, most probably from Las Juntas-Golondrinas (Carchi) a few kilometres from the Colombian border. It was caught by I. Aldas, who is a reliable local collector has been providing the senior author with material from Ecuador from many years. It appears therefore that *P.*

petronius extends into the Ecuadorian Chocó, at least to its northern extremity. The reports of nominate *petronius* from Panamá (MILLER, 1986) are certainly erroneous. The illustrated female from Cerro Jefe (Panamá province) apparently represents an undescribed subspecies, or a variation of *kerrianna*. In the absence of a larger comparison material this issue cannot be sorted out at present. MALE GENITALIA (Fig. 12): As illustrated.

Praeppronophila petronius kerrianna (Miller, 1986).

[Type locality: Cocle, La Mesa, near El Valle, Panamá].

Pedaliodes petronius kerrianna Miller, 1986: 192, fig. 9-12, 14 (male genitalia), 16 a-c (female genitalia); d'Abrera, 1988: 865, figs. (male, female).

Praeppronophila petronius kerrianna (Miller); Lamas *et al.*, 2004: 214.

Material examined: COSTA RICA: 1 male and 1 female: Costa Rica, Coll. A. G. M. Gillott, Brit. Mus. 1929-353, BMNH; PANAMÁ: 1 male: Cocle, La Mesa, nr. El Valle, 820 m, V.1978, G. B. Small, Allyn Museum Acc. 1978-5, *holotype* of *Pedaliodes petronius kerrianna* Miller, FMNH (before, Allyn Museum of Entomology) [examined].

Remarks: *P. petronius kerrianna* was described by MILLER (1986) from La Mesa, in the Cocle province in central Panamá. DeVries (1987) reports it only from the Atlantic slopes in Costa Rica in Moravia de Chirripo, however the type locality in Panamá is actually situated on the Pacific slopes. The most noticeable difference between the two subspecies of *P. petronius* is the presence of a wide FW postdiscal sandy yellow (buff) suffusion in *kerrianna*, more intense in the female. MILLER (1986) speculates that in the absence of *Chusquea* bamboo, the primary host plant of Pronophilini, in the type locality of *P. petronius kerrianna* this subspecies feeds on another woody bamboo, *Olyra standleyi*.

DISCUSSION

The specific status of *P. emma* considering its distinctive wing colour pattern, male genital morphology and geographic range is beyond reasonable doubt. However, the relations between the remaining two taxa of *Praeppronophila* have been for some time a debated issue (MILLER, 1985; ADAMS, 1986; DEVRIES, 1987). MILLER (1985) dedicated some attention to the morphological comparison of *P. perperna* and *P. petronius* and expressed the opinion that he demonstrated convincingly that they are indeed separate species. He illustrated the male genitalia drawings of both species, that show evident differences in the shape of the aedeagus, and valval dorsal process.

However, we have to point out that the specimens dissected by MILLER (*Op. cit.*) come from the two extremities of the range, the Venezuelan Cordillera de Mérida, in case of *P. perperna* and Panamá, for *P. petronius*. It is interesting to quote ADAMS (1986: 309) who stated that "the aedeagus of *perperna* seems to vary ... it is narrow with a short anterior end, in a male from the Eastern Cordillera in Colombia; the latter is close to *petronius*, including the valves". Our dissections confirm that the male genitalia of *P. perperna* show important variation between the populations, and that the differences compared to *P. petronius* are quantitative (large size of the latter) rather than qualitative.

In the absence of convincing morphological differences between *P. perperna* and *P. petronius*, their occurrence in sympatry would be a proof of their separate specific status. On the South American continent *P. perperna* and *P. petronius* are definitely allopatric. The latter is found on the western, Pacific slopes of the Western Cordillera only. The former has a much wider range (eastern slopes of Western Cordillera, central and northern Central Cordillera, northern Eastern Cordillera, Tamá range, Cordillera de Mérida and Cordillera de La Costa in Venezuela). The situation appears more complicated in Central América. DEVRIES (1987) reports *P. perperna* from both Atlantic and Pacific slopes, whereas *P. petronius* only from the Atlantic side of the Cordillera in Costa Rica, implying that the two may occur in the same area. However, ADAMS (1986: 309) states that DeVries, in a personal communication, affirmed that the two species are rather allopatric in Costa Rica! MILLER (1985) reported *P. perperna* and *P. petronius* from Panamá but concentrated on morphological differences and did not provide any valuable information on their geographical relations. No consulted author demonstrated that *P. petronius* and *P. perperna* are effectively sympatric in Central América.

Another point in favour of the separate specific status of *P. perperna* and *P. petronius* would be their parapatric exclusion along an altitudinal gradient. MILLER (1985) stressed that all the examined specimens of *P. perperna* come from between 1500 and 2200 m elevation. This was corroborated by DeVries, who defined the altitudinal range of *P. perperna* as 1300-1800 m. Also in our experience *P. perperna* is most frequently observed at 1500-1800 m in the Venezuelan Cordillera de la Costa and in Antioquia. Most data for *P. petronius* in Central América indicate lower elevations, generally below 1000 m. DEVRIES (1987) reports it from a narrow band of 800-1000 m, and MILLER's (1986) types series of *kerrianna* come all from 820-850 m. This would indicate that *P. petronius* inhabits effectively lower altitudes. However, MILLER (1985) also mentioned a personal comment of R. Hesterberg, who collected *kerrianna* occasionally at 1500 m. Moreover, the specimens from Tambito in western Colombia (PYRCZ & WOJTUSIAK, 1999; PYRCZ & VILORIA, 2005) were caught in baited traps at 1750-1850 m,

considerably higher than any individual in Costa Rica or Panamá. On the other hand, *P. perperna* occurs locally at 800 m in the Venezuelan Cordillera de La Costa (Rancho Grande). Therefore, available data do not confirm the hypothesis that *P. petronius* replaces *P. perperna* parapatrically at higher elevations, at least not throughout their range. On the contrary, they indicate that their altitudinal ranges closely overlap.

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Adults (dorsum / venter).

Fig. 1. *Praepronophila emma* male (Yungas de La Paz, Bolivia).

Fig. 2. *Praepronophila perperna smalli* male (Chirriquí, Panamá).

Fig. 3. *Praepronophila petronius petronius* male (Tambito, Colombia).

Fig. 4. *Praepronophila perperna gabrieli* male, holotype (Amagá, Colombia).

Fig. 5. *Praepronophila perperna gabrieli* male, paratype (Amagá, Colombia).

Fig. 6. *Praepronophila perperna gabriela* female, paratype (Amagá, Colombia).

Fig. 7. *Praepronophila perperna perperna* male (Colonia Tovar, Venezuela).

Fig. 8. *Praepronophila perperna perperna* female (Colonia Tovar, Venezuela).



Fig. 1.

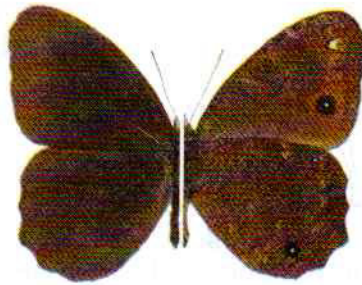


Fig. 2.

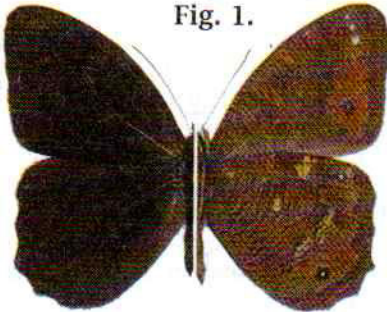


Fig. 3.

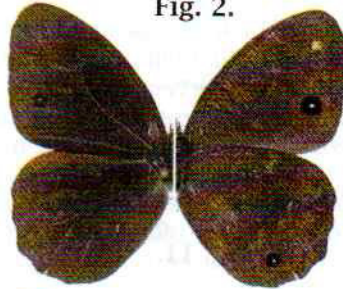


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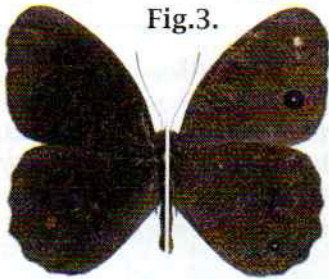


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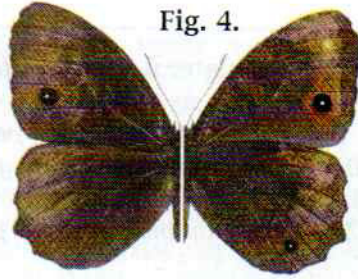


Fig. 6.

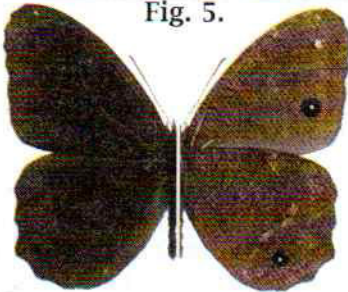


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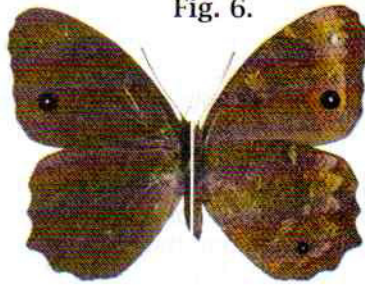


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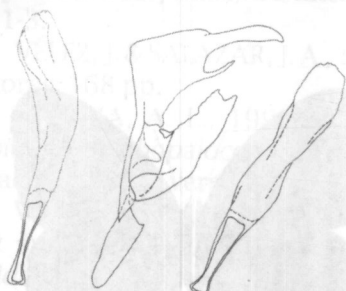


Fig. 9.

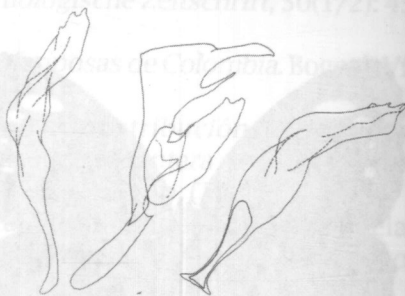


Fig. 10.

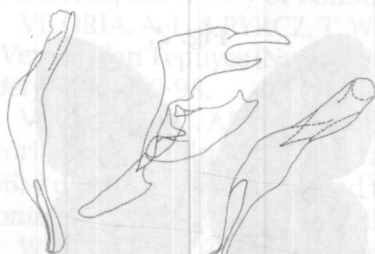


Fig. 11.

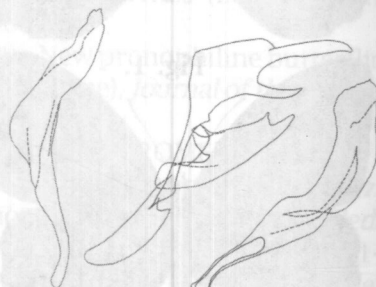


Fig. 12.

Male genitalia (lateral view, aedeagus extracted).

- Fig. 9. *Praepronophila perperna perperna* (Colonia Tovar, Venezuela).
 Fig. 10. *Praepronophila perperna gabrieli*, paratype (Amagá, Colombia).
 Fig. 11. *Praepronophila perperna smalli* (Chirriquí, Panamá).
 Fig. 12. *Praepronophila petronius petronius* (Tambito, Colombia).