

A new Subspecies of *Parides erlaces* (GRAY, 1852) from Ecuador

(Lepidoptera: Papilionidae)

von

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Abstract: *Parides erlaces guillerminae* subspec. n. from Ecuador, Rio Napo region is described. Comments are made on refugial hypothesis in South America and evolution of the patterns of the *Parides* species.

Introduction

The systematics and nomenclature of the *Parides* species is still fluid and, apart from the revision of ROTHSCILD & JORDAN (1906) no satisfactory classification of the taxon has appeared over the years. MUNROE (1961) and HANCOCK (1983) both revised the classification of the Papilionidae, but the genus *Parides* has been treated mostly on the basis of purely morphological aspects, not considering in many cases the species limit, in the absence of various biological parameters.

Parides erlaces (GRAY, 1852) comprises a number of populations ranging from Mexico to Argentine, with a great deal of variability. Many nominal taxa are included under *Parides erithalion* (BOISDUVAL, 1836) which is evidently the vicariant of *P. erlaces*. Until a thorough revision of neotropical Troidini is carried out the status of the two taxa cannot be changed.

During a field trip to Ecuador in the Rio Napo area, the senior author collected a series of *Parides erlaces* which are different morphologically and in colouration from the nearby populations of the Pastaza Valley known as *Parides erlaces lacydes* (HEWITSON, 1869).

The distribution area of this latter taxon includes mainly rain forest up to 1600 m along the Rio Pastaza and apparently the depression with lowland forest in the area around Canelos, southwards to Loja. *P. erlaces lacydes* is characterised by having females with a FWs/HWs white/white-pattern and other populations with the same patterns extend their range into northern Peru. The pattern of the females progressively changes into white/yellow and white/red in central and southern Peru and Bolivia.

Diagnosis

The male is differentiated from the subspecies *lacydes* by the conspicuous green band on the upper side of the FWs and the series of red spots on the under side of the HWs. The female is characterised by the presence of greyish-white adnervular

scales of the outer half of the underside of the FWs and by a red band of 6-7 spots of the HWs.

Description

Parides erlaces guillerminae subsp. n. (colourplate, figs. 3-6)

Type: Holotype male from: Ecuador, Napo, Tena, Rio Illicullin m 900, 12.VII. 1983. T. RACHELI leg. In coll. RACHELI, in coll. Museo di Zoologia, Università di Roma „La Sapienza“.

Palpi black, patagia red, a series of red scale-patches along the thorax and on the first and second abdominal segment. Valvae ringed with red scales. FW length 44 mm.

Upperside FWs: olive-green discal band extending from costal margin to S2, a few green scales in S3. Basally the band is interrupted at the level of the median vein and does not reach the base of the wing. Fringes white. Underside FWs: completely black without any dot. Upperside HWs: strong opalescence on the red band formed by three similar elongate spots, S2-S4, that in S4 smaller and rounded, slightly displaced outwardly. Fringes white. Underside HWs: a series of five pink-red discal spots from S1 to S4, the first two small and rounded, the third elongate and shaded with black scales, the next two elongate, drop-like with the basal two-third white. A few red scales in S5. Large abdominal fold with white hair inside and with brownish hair along the anal margin and S1.

Description of Paratypes

A series of 11 ♂♂ and 3 ♀♀ from the following localities all in the neighbourhood of Tena, Rio Napo: Rio Pununo; Puerto Misahualli m 650; Rio Talac m 900; El Auca m 700; Archidona; Yanahurco; Rio Umbuni; Atahualpa m 630. Dates of collecting V-VIII, XII, 1979-1984.

Males: FW lengths ranging from 32 to 45 mm. Mean value 40.5 mm on 12 ♂♂ specimens.

Upperside: FWs: the males show a certain degree of variability in the extension of the green patch which in two specimens runs into the cell, always touching the lower vein of the cell in all the other specimens. Four specimens with a red streak or at least a few red scales before the three red spots on the upperside HWs.

Underside FWs: always devoid of white patches. Underside HWs: the band is fairly constant in the disposition of the spots, those in S2-S3 always centred with white; in two specimens there is a further red dot in S5.

Females (figs. 3-4): FW length ranging from 38 to 42 mm. Palpi black, patagia red which dorsally do not fuse on the median line. A series of red hairy patches, three on the thorax, one or two on the first two abdominal segments. Ostium bursae and ostium oviducti ringed with red hair.

Upperside FWs: chocolate-brown, apical area transparent. One specimen with a

minute white dot in S2. Fringes white. Underside FWs as upperside but with greyish-white adnervular scales of the outer half of the wing.

Upperside HWs: a series of six-seven pinkish-red spots, those in S1a-S1b fused together, the other ones separated by brown veins. The first five spots with the inner margin on a straight line, the sixth smaller, the seventh rounded, reduced to a dot and widely separated from the band. Underside HWs as upperside, spot S1a red, the other more pinkish. Fringes white.

Discussion

Extensive recent literature (BROWN, 1975, 1979; BROWN, SHEPPARD & TURNER, 1974; HAFFER, 1969, 1974; MÜLLER, 1972; VANZOLINI, 1973; VUILLEUMIER, 1972) supports the theory of forest refugia in the neotropics, depending on the correspondence of actual distribution of both vertebrates and invertebrates. The synthesis of this theory, for the first time hypothesized by HAFFER (1969), was worked out by BROWN (1979) on Heliconiini and Ithomiinae, analysing an enormous series of parameters ranging from biology, to systematics, genetics, present and paleoclimate, geology and botany. More recently, BROWN (1982) summarized his previous investigation on biogeography and ecology of neotropical forest showing the centres of biological endemism for polytypic species of Heliconiini and Ithomiinae and areas with high probability of paleoecological forest refuges.

A series of papers on butterflies, on Brassolini (BLANDIN, 1977, 1978; BLANDIN & DESCIMON, 1977; BRISTOW, 1981), Attacidae (LREMAIRE, 1977), Charaxinae (DESCIMON, 1977), Sphingidae (SCHREIBER, 1978) of various area of South America seem to support this point of view. On the contrary, ENDLER (1982) shows that the current distributional patterns are in congruence with geographic divergence and adaptations to present-day ecogeographic factors.

Parides erlaces and its vicariant *P. erithalion* occupy at least 18 refuges from Guatemala to Yungas. BROWN (1982a) reports that the subspecies of *Parides* fit well with the subspecies-endemicity centres. Interestingly, the new subspecies occurs in the Napo and Loreto refuges. This latter refuge must be investigated because it is supported only by a single male in the British Museum of Natural History, London, labeled „Rio Cachiacu, Iquitos, Stuart 1893“. Because of the relationships between these two refuges (BROWN, 1975) it is not unlikely that this taxon may extend its range from middle heights of approx. 600-700 m, to lower down, and southward to South-east Peru.

Other than *P. erlaces*, more species of *Parides* occur in the Napo area, that is to say *P. vertumnus* and *P. anchises* which present females with black/red pattern, this characteristic shared also with *P. lysander* and *P. neophilus*. The exception being *P. cutorina* and *P. aeneas* the females of which are black/white. Various species of *Eurytides* and *Papilio* show the same pattern, the males and the females being similar to those of the *Parides* species. In the Napo area black/white

pattern seems to be the rarer, whilst the black/red pattern is common. As in this refuge a mixed muellerian and batesian mimicry is involved, selective forces must have acted for the evolution and maintainance of these two patterns. Eco-ethological factors can be invoked as the cause of the differentiation of the patterns through stabilizing selection. In fact, species of the *anchises*-group fly normally outside the forest along tracks and pathways, while *P. cutorina* and *P. aeneas* and particularly their black/white females are found inside the forest. Different selective pressures on the population of *P. erlaces* in the Napo and Abitagua refuges, may have caused divergence of the black/white and white/white patterns which were predominant in Hylea. When segregated in altitude during cold phases *P. erlaces lacydes* maintained the white/white pattern due to stoppage of gene-flow and the absence of other *Parides* species. Otherwise in the lowland the black/red pattern was sustained by the mimicry.

However, basic information are needed on the biology, distribution and systematics of Troidini and therefore more research has to be carried out for any theory on the evolution of the taxon.

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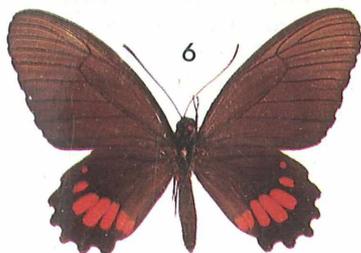
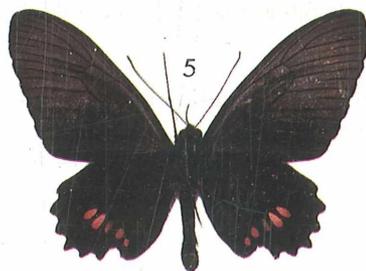
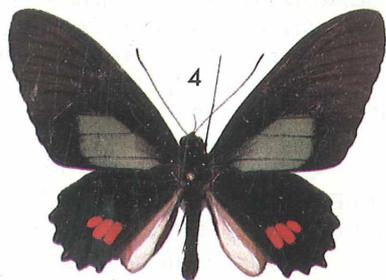
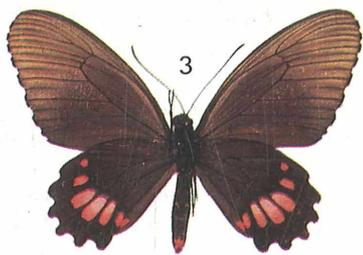
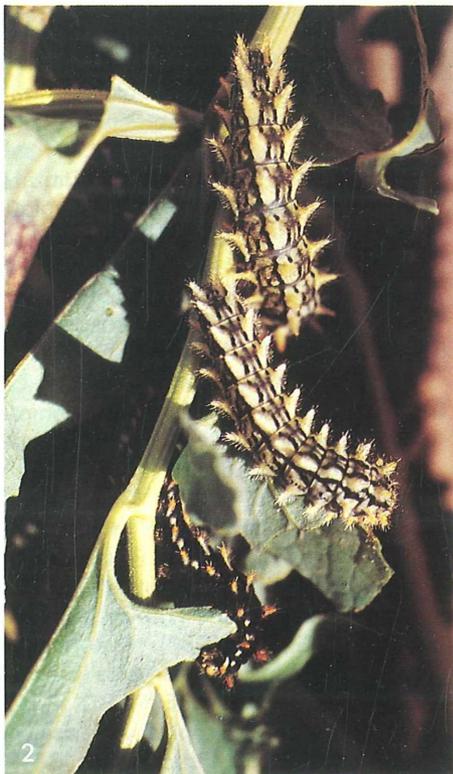
Parides erlaces guillerminae subspec. n.

Fig. 4 Holotype ♂, Ecuador, Napo, Tena, Rio Illicullin m 900, upperside.

Fig. 5 idem, underside.

Fig. 6 Paratype ♀ Ecuador, Al Auca, VI. 1979, de LAFEBRE leg., upperside.

Fig. 3 idem, underside.



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