

Taxonomic considerations on the genera *Moneuptychia* Forster and *Carminda* Dias, *reval.* (Lepidoptera, Nymphalidae, Satyrinae)

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(With 6 figures)

Abstract

Euptychia soter Butler, 1877, the type species of *Moneuptychia* Forster, 1964, is compared to *Satyrus paeon* Godart, 1824, the type species of *Carminda* Dias, 1998. The male genitalia and wing design patterns of these species are dealt with. Some additional data from other species from both genera are also presented. The morphological comparisons carried out in this study indicate that *Carminda* is not a junior synonym of *Moneuptychia*. Thus, *Carminda* is revalidated.

Keywords: male genitalia, morphology, taxonomy.

Considerações taxonômicas sobre os gêneros *Moneuptychia* Forster e *Carminda* Dias, *reval.* (Lepidoptera, Nymphalidae, Satyrinae)

Resumo

Euptychia soter Butler, 1877, espécie-tipo de *Moneuptychia* Forster, 1964, é comparada com *Satyrus paeon* Godart, 1824, espécie-tipo de *Carminda* Dias, 1998. A genitália do macho e o padrão de desenho das asas dessas espécies são comparados. Alguns dados sobre outras espécies de ambos os gêneros são também incluídos. As comparações morfológicas ora apresentadas mostram que *Carminda* não é um sinônimo júnior de *Moneuptychia*. Portanto, *Carminda* é revalidado.

Palavras-chave: genitália do macho, morfologia, taxonomia.

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Carminda Dias, 1998, revalidated

Carminda Ebert & Dias, 1997, **nomen nudum**; no type species designation (ICZN, Art.13.3).

Carminda Dias, 1998: 1119; type species: *Satyrus paeon* Godart, 1824.

Carminda was proposed by Ebert and Dias (1997) to include two species formerly placed in *Euptychia* Hübner, 1818 and one new species, but the type species was not designated and the name became invalid (ICZN, Art. 13.3). Dias (1998), repairing the error, designated the type species and indicated the reference of Ebert and Dias (1997), thus the name *Carminda* became valid, with the author Dias (1998)

(ICZN, Art. 13.1.2). According to Lamas (2004) *Carminda* is a junior synonym of *Moneuptychia* Forster, 1964.

Carminda includes three species: *C. paeon* (Godart, 1824), *C. griseldis* (Weymer, 1911) and *C. umuarama* Ebert & Dias, 1997; *Satyrus paeon* Godart, 1824 is the type species of this genus (Dias, 1998: 1119). *Moneuptychia* includes four species: *M. soter* (Butler, 1877), *M. melchiades* (Butler, 1877), *M. itapeva* Freitas, 2007 and *M. giffordi* Freitas, Emery and Mielke, 2010; *Euptychia soter* Butler, 1877 is the type species of this genus by original designation (Forster, 1964). In order to support the revalidation of *Carminda*, a comparison of the wings and the male genitalia of *C. paeon* and *M. soter* is herein provided. Data on other species of both genera are also given. The characteristics that distinguish *Moneuptychia* from *Carminda* are given below and summarized in Table 1.

Table 1. The main characteristics for identifying the *Moneuptychia* and *Carminda* species. See text for additional explanations.

Characteristic	<i>Moneuptychia</i>	<i>Carminda</i>
outer margin of hindwings	with moderate to slight waviness	with distinct waviness
wavy median lines on ventral hindwing surface	not extended and not angular	extended and distinctly angular
ventral wing surface	color pattern is the same on the fore and hindwings	color pattern on the hindwings differs from that on the forewings
uncus in dorsal view	not laterally extended	extended or strongly extended laterally
latero-posterior apophyses of tegumen	short and conical projections	long, curvy and tapered at the end
angular appendices	developed and visible	not developed

Wings

In the *Carminda* species, the outer margin of the hindwings is distinctly wavier than in the *Moneuptychia* species; in *M. soter* this margin is wavy, whereas it is only slightly wavy in *M. itapeva* and *M. giffordi*. In the *Moneuptychia* species, the outer margin of the forewings does not have waves, whereas in *Carminda* the waviness varies from wavy to slightly wavy. Both *Moneuptychia* and *Carminda* have hindwings with two undulating median lines, which are arranged from the costal margin to the anal margin. The first line crosses the discal cell near the center, and the second line crosses immediately after the apex of this cell. These lines are visible on the ventral hindwing surface, but only slightly visible on the dorsal surface. On the ventral hindwing surface of *Carminda*, these lines are extended as two transverse narrow or wide bands, which are wavy and distinctly angular, whereas the median lines are not so angular on the ventral hindwing surface of *Moneuptychia*. Moreover, the ventral hindwings of *M. soter* have wavy median lines, which are reminiscent of the *Carminda* species, but they are not angular; in *M. itapeva* and *M. giffordi* these lines are less wavy when compared with those of *M. soter*. On the ventral hindwing surface of the *Carminda* species, the staining located between the median lines does not differ from that observed on the rest of the wing, or it is clearer; in *C. umuarama* (Figure 2) this area is white with sparse gray scales, some of them grouped to form stains. The ventral forewing surface has an enlarged marginal line in *C. paeon* and *C. umuarama*, which is more noticeable in the latter. The ventral hindwing surface of the *Carminda* species has varied coloration, with dark-brown points that can be solid and coalescent, and there are also brown or other stains, which can be large and conspicuous. In the *Moneuptychia* species, the two median lines on the ventral hindwing surface are continuous with those on the forewings; the coloration on the ventral side is the same on both wings (Figure 1), and it is extremely variable, from light-brown to moderately dark, with sparse dark-gray points. In the *M. soter*, the presence of a yellowish band on both wings is not rare and it is located between the sub-marginal line and the second median line. *Moneuptychia itapeva* and *M. giffordi* also have variable staining on the ventral wing surfaces, as demonstrated by Freitas (2007) and Freitas et al. (2010)

respectively, with the same pattern observed on both the fore and hindwings. The ventral surfaces of both wings of *M. melchiades* have the same pattern, as illustrated by Hayward (1967). The ventral hindwing surface of the *Carminda* species has a conspicuous pattern that differs from that of the forewings. The latter are principally light-brown, with a second median line present, whereas the first is reduced or absent (Figures 2-4). In the *Carminda* species, there are four small ocelli on the ventral hindwing surface, which are black and surrounded by an ocher ring and with some white scales (pupil) on the black area. These ocelli are located between the veins Rs - M1, M1-M2, CuA1 - CuA2 (the largest ocellus); *Moneuptychia* species also have ocelli between the M2 - M3 (generally two ocelli, which can be coalescent) and M3 - M4 veins.

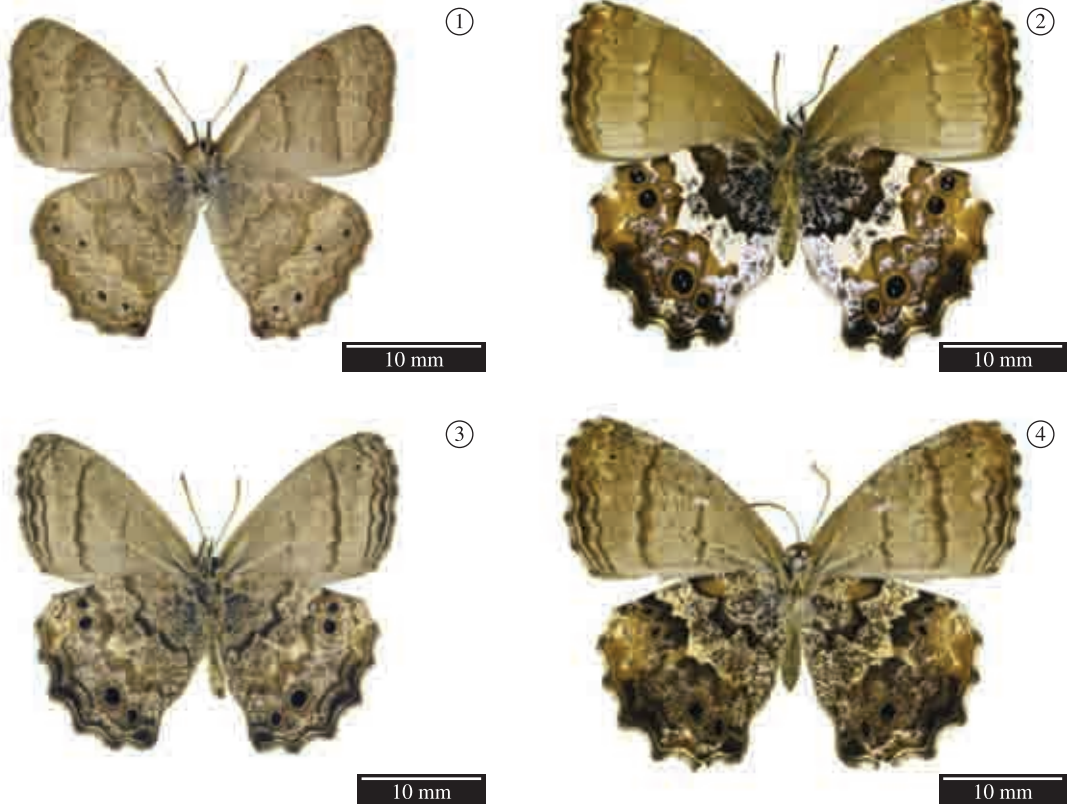
Male genitalia

In the male genitalia of *M. soter*, in the dorsal view, the uncus is not laterally extended. In addition, the latero-posterior apophyses of tegumen are two short and conical projections (Figure 5) and the angular appendices are well developed and elongated (Figure 6). In the *Carminda* species, the uncus, in dorsal view, is extended or strongly extended laterally and the latero-posterior apophyses of tegumen are long, curved and tapered at the end, as illustrated by Ebert and Dias (1997). Furthermore, the angular appendices are not developed. As mentioned by Freitas (2007), the angular appendices are an important diagnostic characteristic of *Moneuptychia*, and they are not found in other Euptychiina. The male genitalia of *M. melchiades*, with visible angular appendices, was illustrated by Hayward (1967). Angular appendices were also illustrated by Freitas et al. (2010).

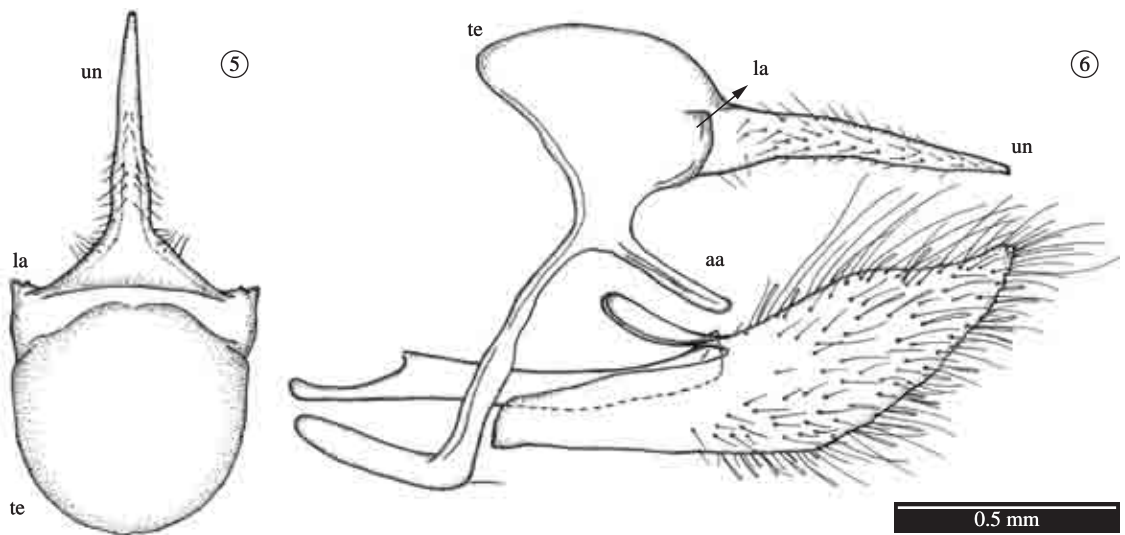
Peña et al. (2006) considered the *C. paeon* (= *Moneuptychia paeon*) sister to *Paryphthimoides* Forster, 1964.

Material examined

Carminda paeon (5 males, 9 females). *Paraná*: Paranaguá, Alexandra, 19.IX.1970, O. Mielke, 1 female (UFSCAR). Colombo, 23.III.1995, M. M. Dias, 1 female (UFSCAR). Curitiba, Cascatinha, 30.IV.1966, O. Mielke, 1 female (UFSCAR). *Rio Grande do Sul*: Taquari, B. Pohl, 1 male (MZSP). Derrubadas, Parque Florestal Estadual do Turvo, 10.XI.1985, O. Mielke, Araújo & M. M. Casagrande,



Figures 1-4. *Moneuptychia* and *Carminda* species, ventral views. 1) *M. soter*, male, Rio Claro, São Paulo; 2) *C. unuarama*, female, Itatiaia, Rio de Janeiro; 3) *C. paeon*, male, Derrubadas, Rio Grande do Sul; and 4) *C. paeon*, female, São Bento do Sul, Santa Catarina. Scales: 10 mm.



Figures 5-6. *Moneuptychia soter*, male genitalia. 5) tegumen, uncus and latero-posterior apophyses of tegumen, dorsal view; and 6) genitalia, lateral view; aa, angular appendices; la, latero-posterior apophyses of tegumen; te, tegumen; and un, uncus. Scale: 0.5 mm.

1 male (UFSCAR). *Santa Catarina*: Joinville, V.1941, B. Pohl, 1 female (MZSP). São Bento do Sul, Rio Vermelho, II.1988, I. Rank, 1 female (UFSCAR). Seara, Nova Teutônia, VI.1938, B. Pohl, 1 male (MZSP). Timbó, X.1934, B. Pohl, 1 female (MZSP). *São Paulo*: Cananéia, Ilha do Cardoso, 17.XII.1980, M. M. Dias, 1 female (UFSCAR). Salesópolis, Estação Biológica de Boracéia, 850 m, 8.I.1968, J. O. Santos, 1 female (MZSP). São Paulo, Ipiranga, XII.1918, 1 male (MZSP). São Paulo, Santo Amaro, 27.VII.1974, L. Yoshii, 1 male (UFSCAR). São Vicente, 15.VII.1975, M. M. Dias, 1 female (UFSCAR).

Carminda griseldis (2 males, 2 females). *Paraná*: Guarapuava, Santa Clara, 600 m, 1-2.X.1987, O. Mielke & M. M. Casagrande, 1 male (UFSCAR). Tijucas do Sul, Vossoroca, 850 m, 14.I.1979, O. Mielke, 1 male (UFSCAR). *Santa Catarina*: São Bento do Sul, Rio Vermelho, 31.V.1987, I. Rank, 1 female (UFSCAR). *São Paulo*: São Carlos, Fazenda Canchim, 6.II.1977, M. M. Dias, 1 female (UFSCAR).

Carminda umuarama (2 males, 2 females). *Rio de Janeiro*: Itatiaia, Parque Nacional do Itatiaia, 2000 m, II.1966, H. Ebert, 1 male (UFSCAR). Itatiaia, Parque Nacional do Itatiaia, 3.II.1967, K. S. Brown, 1 male (UFSCAR); 20.I.1969, K. S. Brown, 1 female (UFSCAR). *São Paulo*: Campos do Jordão, 22.I.1994, U. Fernandes, 1 female (UFSCAR).

Moneuptychia soter (8 males, 11 females). *Minas Gerais*: Serra do Caraça, 1380 m, XI.1961, Kloss, Lenko, U. Martins & L. Silva, 1 female (MZSP); III.1963, F. Werner, U. Martins & L. Silva, 1 female (MZSP). *São Paulo*: Piracaia, VII.1969, N. Bernardi, 1 female (MZSP). Rio Claro, 28.VIII.1971, M. M. Dias, 1 male (UFSCAR); 4.I.1973, 1 female (UFSCAR). Santo André, 3.IV.1937, no. 56287, R. Spitz, 1 female (MZSP). Santo André, Paranapiacaba, Alto da Serra, II.1933, no. 56289, R. Spitz, 1 female (MZSP); 27.III.1933, no. 56291, R. Spitz, 1 female (MZSP). São Bernardo do Campo, XII.1925, R. Spitz, 1 female (MZSP); 15.III.1926, R. Spitz, 1 female (MZSP). São Paulo, III.1913, B. Pohl, 1 male (MZSP); VIII.1913, B. Pohl, 1 female (MZSP); III.1914, B. Pohl, 2 males (MZSP); IV.1914, B. Pohl, 1 male, 1 female (MZSP); V.1914, 1 male (MZSP). São Paulo, Ipiranga, IV.1925, no. 56288, 56293, R. Spitz, 2 males (MZSP).

Moneuptychia itapeva (1 male, 1 female). *São Paulo*: Pindamonhangaba, Pico do Itapeva, 31.XII.2005,

1980-2000 m, A. V. L. Freitas, holotype male (MZSP); II.2006, 2000 m, A. V. L. Freitas, paratype female (MZSP).

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