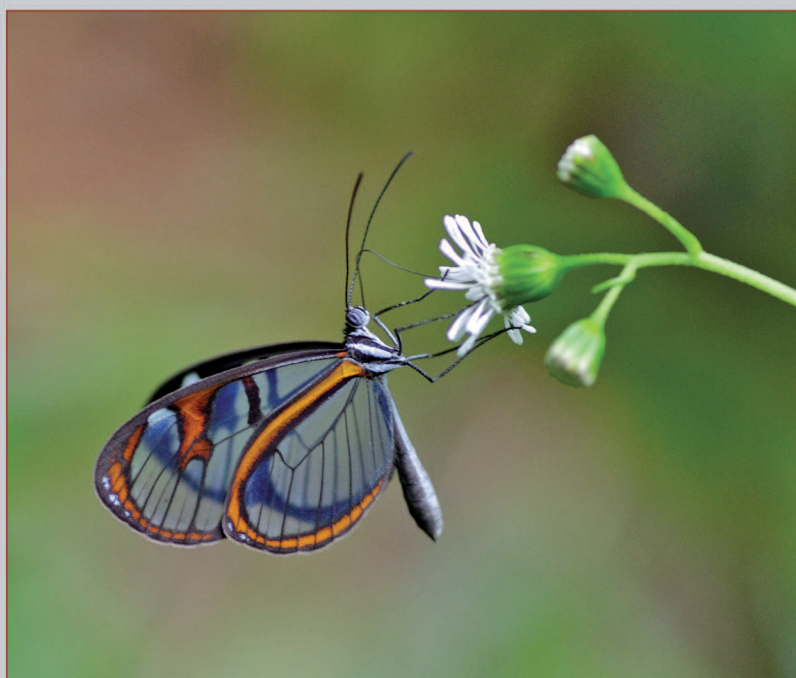




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The amazing story of *Morpho niepelti* Röber, 1927, the odd, last described *Morpho* species

(Lepidoptera Nymphalidae Satyrinae Morphini)

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Abstract

Following the recent description of a new subspecies of *Morpho niepelti* Röber, 1927, discovered in the north-east of the Colombian Cordillera Central, *M. niepelti antioquiensis* Rodríguez & Rodríguez, 2014, we explore the relationships between this new taxon, the original *niepelti*, known from the Pacific side of the Cordillera Occidental, and *staudingeri* Niepelt, 1927, a neglected taxon described from the western side of the Cordillera Central. We conclude that, in the present state of knowledge, it is reasonable to consider *antioquiensis* and *staudingeri* as distinct subspecies. Their relationships with the closely similar *M. theseus juturna* Butler, 1870, that exists along the eastern side of the Cordillera Oriental, are addressed.

Résumé

L'étonnante histoire de *Morpho niepelti* Röber, 1927, la dernière – et curieuse – espèce décrite dans le genre *Morpho* (Lepidoptera Nymphalidae Satyrinae Morphini)

À la suite de la récente description d'une nouvelle sous-espèce de *Morpho niepelti* Röber, 1927 découverte dans le nord-est de la cordillère centrale de Colombie, nous étudions les relations entre ce nouveau taxon, la forme originale de *niepelti*, connue du versant Pacifique de la cordillère occidentale, et *staudingeri* Niepelt, 1927, un taxon négligé qui fut décrit du versant occidental de la cordillère centrale. Nous concluons que, dans l'état actuel des connaissances, il est raisonnable de considérer *antioquiensis* et *staudingeri* comme des sous-espèces distinctes. Enfin, nous évoquons leurs relations possibles avec le très ressemblant *M. theseus juturna* Butler, 1870, qui est inféodé au versant oriental de la cordillère orientale.

Keywords. *Morpho*, *niepelti*, *staudingeri*, *antioquiensis*, *theseus*, *juturna*, taxonomy, Northern Andes, Colombia.

Mots-clés. *Morpho*, *niepelti*, *staudingeri*, *antioquiensis*, *theseus*, *juturna*, taxinomie, Andes septentrionales, Colombie.

Abbreviations

BMNH	Natural History Museum, London, United Kingdom.
ETH	Swiss Federal Institute of Technology, Zurich, Switzerland.
GR	Collection of Gabriel RODRÍGUEZ, Medellín, Colombia.
JFL	Collection of Jean-François LE CROM, Bogotá, Colombia.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
MNHU	Museum für Naturkunde, Humbolt-Universität, Berlin, Germany.

Introduction

Gleaming blue butterflies have made the genus *Morpho* famous worldwide. In May, 1927, a few *Morpho* males, exhibiting an odd, chalky blue tint, were collected in south-western Colombia, along the Pacific slopes of the Cordillera Occidental. They were described in September, 1927 as a new species and named *Morpho niepelti* by RÖBER (1927). According to LAMAS (2004) and BLANDIN (2007a), this taxon is the last indisputable species described in the genus *Morpho*. Specimens remained extremely rare in collections, and the female was only described 80 years after the male (BLANDIN 2007a, b).

A few weeks after the description of *M. niepelti*, NIEPELT (1927) described in the same journal, as *Morpho theseus* Deyr. *staudingeri* Niep. subsp. n., a rather similar male labelled from “Manizales, Cauca”, a locality situated on the western side of the Colombian Cordillera Central. Erroneously, LE MOULT & RÉAL (1962-1963), followed

by BLANDIN (1988), gave priority to *staudingeri*. This mistake was corrected by NEILD (2001). Independently of this nomenclatural point, *niepelti* and *staudingeri* were considered either as synonyms (BLANDIN, 1988; LAMAS, 2004; BLANDIN, 2007a, b), or as morphotypes possibly corresponding to a southern (*niepelti*) and a northern (*staudingeri*) subspecies (NEILD, 2001), or as different subspecies (LE MOULT & RÉAL, 1962-1963, SCHÄFFLER & FRANKENBACH, 2009).

Recently, a new subspecies, *Morpho niepelti antioquiensis* Rodríguez & Rodríguez, 2014, was described from six males collected in north-eastern slopes of the Colombian Cordillera Central (Amalfi area, Antioquia Department; Samaná area, Caldas Department). Following BLANDIN (2007a), the authors considered that all populations from the western slopes of the Cordillera Occidental belong to nominotypical *M. niepelti*, and they neglected the possibility that a distinct subspecies, *staudingeri*, might exist in the Cordillera Central.

Therefore, the status of *staudingeri* and *antioquiensis* needs to be discussed, and their possible relationships with the fairly similar *M. theseus juturna* Butler, 1870, addressed. However, it is necessary first to relate and clarify the somewhat chaotic taxonomical history of these taxa.

Examined specimens

We compared types of the taxa *niepelti*, *staudingeri* and *antioquiensis*, and various Colombian and Ecuadorian specimens. We examined the lectotype of *M. niepelti* in the Natural History Museum (London); photographs of this specimen are available on < www.butterfliesofamerica.com >. In the Muséum National d'Histoire Naturelle (Paris), there are two males of *M. niepelti* from western Colombia in the Aimée Fournier collection among which a paralectotype, two males from western Colombia in the Laurent Schwartz collection, six males and one female from western Ecuador and three males from western Colombia in the Patrick Blandin collection. There are two males from western Colombia in Jean-François LE CROM collection (Bogotá). There are also photographs of one male from western Colombia in SALAZAR (2001), four males and one female from western Ecuador and two males from western Colombia in SCHÄFFLER & FRANKENBACH (2009), two males and one female from western Ecuador in GAYMAN *et al.* (2016). Photographs of the type of *staudingeri* were provided by Gerardo LAMAS, with authorization of the Museum für Naturkunde (Berlin). Gabriel RODRÍGUEZ sent us pictures of the holotype and two paratypes of *antioquiensis*. Numerous specimens of *M. theseus juturna* were available in the MNHN (Aimée Fournier, Laurent Schwartz and Patrick Blandin collections) and in JFL, as well as pictures of several specimens in SCHÄFFLER & FRANKENBACH (2009).

The nomenclature used for the veins is the same as that of LE MOULT & RÉAL (1962-1963), and the nomenclature used to describe the patterns of the dorsal and ventral surfaces is that of BLANDIN (2007a), modified from LE MOULT & RÉAL (1962-1963).

Taxonomical history

Morpho Niepelti [sic] was described by RÖBER (1927) in the *Internationale entomologische Zeitschrift*, volume 21, issue 24, page 197, published on 22 September (LAMAS *et al.*, 1995) from several males, collected in May 1927 in “West-Columbien (zwischen Pasto und Tumaco, 500 m)”, in Nariño department. RÖBER did not specify their number, and did not designate a type. Five specimens are known (LE MOULT & RÉAL, 1962; NEILD, 2001), which were purchased by different amateurs: John LEVICK and James John JOICEY in the United Kingdom, Aimée FOURNIER DE HORRACK and Georges ROUSSEAU-DECELLE in France, Robert BIEDERMANN in Switzerland.

RÖBER (1927) described *niepelti* as a species, but he suggested that it could be a form related to *Morpho theseus* Deyrolle, 1860, or *juturna* Butler, 1870. In the same journal (volume 21, issue 29, page 252, published on 1 November), NIEPELT (1927) named *staudingeri* a single

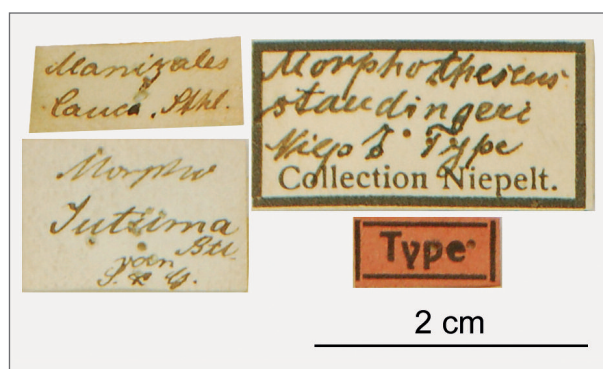


FIG. 1. — Labels attached to the holotype of *Morpho theseus staudingeri* Niepelt, 1927.

male, that he illustrated together with a specimen of *niepelti* that he designated as “Type”. NIEPELT regarded the two taxa as subspecies of *M. theseus*. The *niepelti* specimen figured by NIEPELT (1927: fig. 3, 4) was purchased by John LEVICK, whose collection was bequeathed to the BMNH. NEILD (2001: 442) designated this specimen as the lectotype and the JOICEY’s male (also in the BMNH), that has a “cotype” red label, as a paralectotype. The FOURNIER’s male (MNHN) and the ROUSSEAU-DECELLE’s male (now in the Allyn collection, Florida Museum of Natural History), having “paratype” red labels, were also designated as paralectotypes. The fifth male, in the Biedermann collection (ETH), is figured in < www.butterfliesofamerica.com >; it has a “cotype” red label, and may also be considered a paralectotype (NEILD, 2001). The single male of *staudingeri* (Niepelt collection, MNHU) is the holotype fixed by monotypy, as stated by NEILD (2001: 447); it has a hand-written label with the data “Manizales Cauca. Sthl.” (fig. 1).

LE MOULT & RÉAL (1962: 159) attached *niepelti* and *staudingeri*, as distinct subspecies, to *M. justitiae* Godman, 1881, which they separated from *M. theseus* Deyrolle, 1860. They gave erroneous bibliographical references for RÖBER’s paper (LE MOULT & RÉAL, 1962, index: 115-127), and wrote that *staudingeri* had been described before *niepelti*. They considered the specimen of *niepelti* figured by NIEPELT as the holotype, and they illustrated its dorsal surface in colour (LE MOULT & RÉAL, 1963: pl. V, fig. 23), the ventral surface in black and white (pl. LXIII, fig. 453). They also represented the holotype of *staudingeri* in black and white (pl. LXIII, fig. 449, 450). BLANDIN (1988: 29-30; map 4) paid no attention to the precise geographical origins of the types. Knowing a very few specimens, and considering LE MOULT & RÉAL’s figures, he supposed that differences between specimens resulted from individual variability and considered that *niepelti* and *staudingeri* should be synonyms. Unfortunately, trusting to LE MOULT & RÉAL’s bibliographical information, he regarded the former as a junior synonym of the latter. Noting the sympatry between *staudingeri* and *theseus* populations in western Colombia, he regarded *M. staudingeri* as a distinct species. NEILD (2001: 443) agreed but reversed BLANDIN’s synonymisation, and BLANDIN (2007a: 21) recognized his mistake.

In regard to the holotype of *staudingeri*, SALAZAR (2001: 372) argued that it was “procedente de un lugar cercano a Manizales, Caldas (LE MOULT & RÉAL, 1961 [sic]) dato que es erróneo, puesto que esta región carece de bosque húmedo tropical, hábitat típico de esta mariposa”. Referring to NEILD’s paper in preparation, SALAZAR (2001: 372) considered *staudingeri* as a subspecies of *M. niepelti*, and he designated as *M. niepelti staudingeri* a population he studied near San José del Palmar (western slope of the Cordillera Occidental, Chocó department). Julián SALAZAR communicated his viewpoint to Andrew NEILD, who consequently wrote about *staudingeri* (NEILD, 2001: 447): “Although the locality data states “Manizales, Cauca”, this is clearly a false commercial locality (Julián SALAZAR, pers. comm.), as there is no suitable habitat in this region of the Cauca valley (...). This taxon, with a silver-blue dorsal surface, is evidently related to *M. niepelti*, either as an individual form, or as a more northerly subspecies (see the notes for *niepelti*)”. Actually, NEILD (2001: 443) noted some differences between *niepelti* specimens that had been collected in Nariño and a few others collected further to the north, that he supposed to be “true *staudingeri*”; consequently, he wrote: “It is possible that these two phenotypes represent distinct subspecies, though their distributions are not well known, and the number of specimens I have been able to examine is low”. Later, LAMAS (2004: 199) did not regard *staudingeri* as a distinct subspecies, and BLANDIN, who only knew specimens from Pichincha Province in Ecuador and from western slopes of the Colombian Cordillera Occidental (BLANDIN, 2007a: 43-44), maintained that the differences indicated by NEILD (2001) come under individual variability. Later, SCHÄFFLER & FRANKENBACH (2009: 1; pl. 5: figs. 1-2) provided excellent colour illustrations of the *staudingeri* holotype, and considered this taxon as a distinct subspecies of *M. niepelti*, without disputing its geographical origin on the western side of the Cordillera Central.

The figure 1 illustrates the labels attached to the holotype of *staudingeri*. On the label indicating its geographical origin, the letters “Sthl” refer to Eduard Wilhelm STEINHEIL (°1830 – † 1879), who collected insects in Colombia in 1872 and 1873 (STEINHEIL, 1876-1877). Along the valley of the Río Cauca, he travelled from Cartago to Manizales in 1873, between 28 February and 2 March. A few days later, he travelled to Medellín, where he arrived on 13 March. From there, he visited various localities on the eastern side of the Cordillera Central, and finally he left for Baranquilla on 12 April. Thus, he collected on both sides of the Cordillera Central. However, as the specimen is labelled from “Manizales, Cauca”, it is likely that it was collected on the western side, where forested areas existed at that time, but were burnt from place to place by farmers in order to cultivate corn, according to STEINHEIL (1876-1877). The specimen was probably collected at the very beginning of March, 1873 near Santa Rosa de Cabal (south of Manizales, ca. 1700 m a.s.l.), as STEINHEIL collected a large number of insects in this area (Gerardo LAMAS, pers. comm.).

RODRÍGUEZ & RODRÍGUEZ (2014: 238), as NEILD (2001), SALAZAR (2001) and BLANDIN (2007a), ignored this historical information. Moreover, they erroneously interpreted the original descriptions of *niepelti* and *staudingeri*, writing: “*Morpho niepelti* fue descrita por RÖBER (1927) bajo el nombre de *Morpho theseus staudingeri*”. RODRÍGUEZ & RODRÍGUEZ (2014) were aware that *staudingeri* was regarded by BLANDIN (2007a) as a junior synonym of *niepelti*. They affirmed that *M. niepelti* is “restringida al Anden Pacífico desde el norte del Perú hasta el noroccidente de Colombia” (the indication “norte del Perú” is amazing, in the present state of knowledge), and they included all populations distributed along the western side of the Cordillera Occidental in the nominate subspecies (RODRÍGUEZ & RODRÍGUEZ, 2014: 241, fig. 2). Obviously, they ignored that SCHÄFFLER & FRANKENBACH (2009) had reconsidered the status of *staudingeri*, and they did not even mention the existence of the holotype. Thus, they compared their new subspecies, *antioquiensis*, only with specimens from the Cordillera Occidental.

Do specimens vary from the south to the north along the Pacific side of the Andes?

Some specimens from the north-west of Ecuador (Esmeraldas and Pichincha Provinces) have a rather protruding and acute forewing apex (fig. 2a), which is less protruding and more rounded in others, as in Colombian specimens from Nariño, Valle del Cauca and Chocó, in which the distal edge is slightly concave or almost straight (fig. 2b, c, d). Along the distal edge of hindwings, there are short points at the end of R, M₁ and M₂ veins. The caudal appendages on veins M₃ and Cu₁ are well pronounced; the former is often less protruding than the latter, but not always so, and this character can not be used to separate *M. niepelti* from *M. theseus*, as suggested by BLANDIN (1988).

In southern and northern specimens, the blue tint does not cover the anterior part of the forewing cell (fig. 2a, b, c, d). The black area at the distal end of the cell varies in size; it is larger in some Ecuadorian specimens (fig. 2a), but in others from the same area (collection Blandin, MNHN) it is as reduced as in Chocó specimens (fig. 2d). In all specimens, the blue tint reaches at least some of the sumarginal marks. These marks are blue, except the foremost ones that show a mixture of blue and ochre scales. The Ecuadorian specimen illustrated on figure 2a presents several submarginal marks with ochre scales, but we know specimens from the same area in which ochre scales are as reduced as in the illustrated specimen from Chocó (fig. 2d). In the latter, the dark margin of hindwings is less wide than in the Nariño and Valle del Cauca specimens (fig. 2b, c), but the specimen from Chocó illustrated by SALAZAR (2001: 273, fig. 2), has the dark margin as wide as for example in the Nariño male (fig. 2b). In all specimens, the ochre pre-marginal marks of the forewings are blurred, and there are no differences in the dorsal ornamentation of the hindwings. Furthermore, there are no obvious differences between ventral ornamentations (fig. 3a, b, c, d). Notably, the light submarginal area on the forewings always forms a fairly narrow line, with whitish scales in its anterior part.

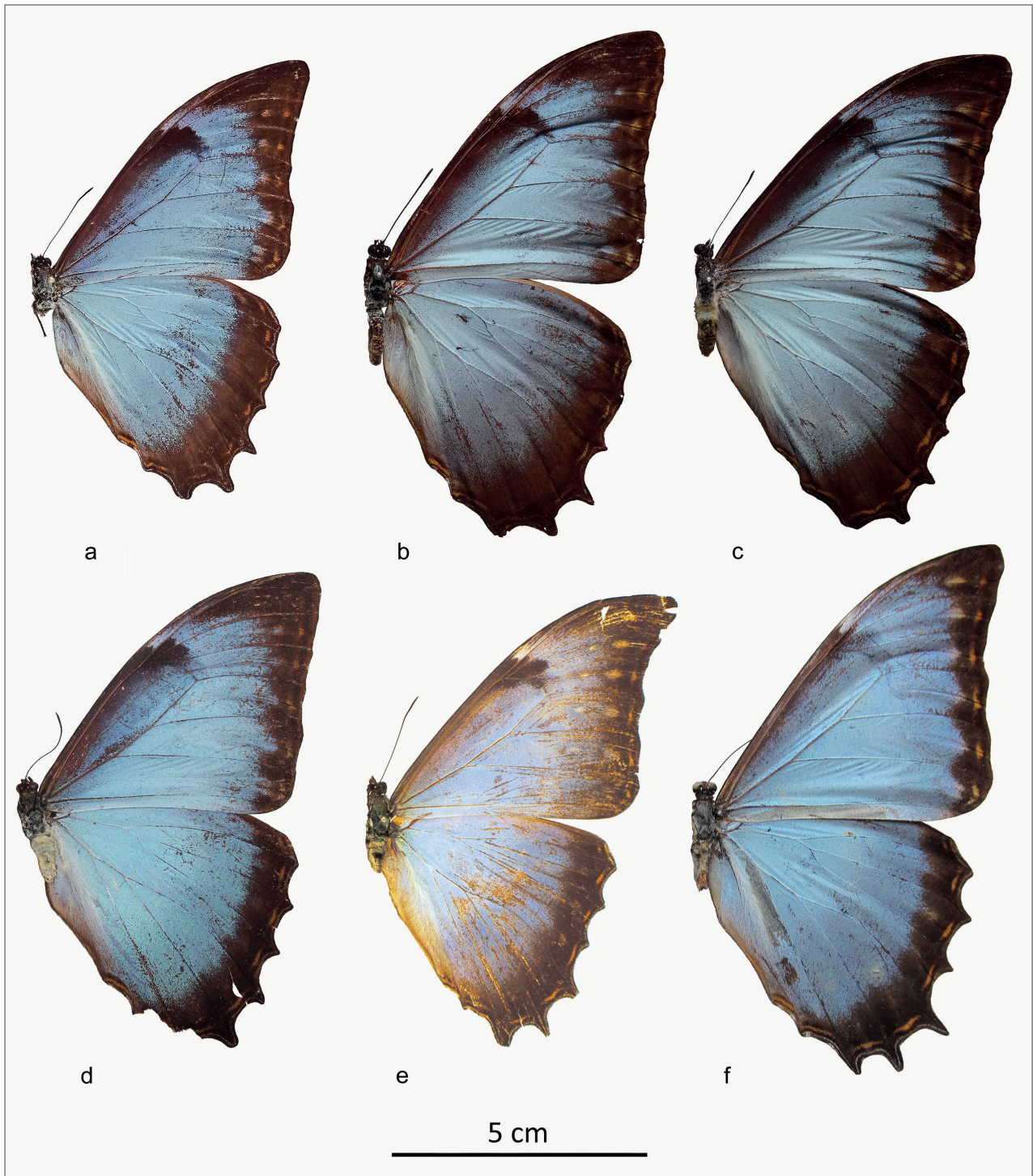


FIG. 2. — *Morpho niepelti* males, dorsal surfaces. **a**, Chuchuvi, Esmeraldas, 500-800 m, X-2013, Équateur (MNHN, coll. Blandin, PBM 2616). — **b**, Paralectotype *niepelti*; West Columbien, Altaquer 500 m, März-Juni 1927 (MNHN, coll. Fournier). — **c**, West-Columbien, Rio Micay, Febr.-April 1928 (MNHN, coll. Fournier). — **d**, San José del Palmar, Chocó, 900 m, 20-VII-91, J. SALAZAR leg. (JFL) — **e**, Holotype *staudingeri*; Manizales/Cauca. Sthl. (MNHU). — **f**, Holotype *antioquiensis*; Colombia, departamento de Antioquia, Amalfi, 1800 m, 14.IV.2005, G. RODRIGUEZ leg. (GR).

Thus, the hypothesis of a south-to-north variation of the habitus is not supported. However, as we were able to compare only a few specimens from different areas, we cannot exclude the possibility that the study of large numbers might reveal statistical differences. However, if that were so, these differences would be unimportant.

Is the holotype of *staudingeri* different from western *niepelti* specimens?

Comparing the *staudingeri* holotype with the original *niepelti* specimens, NIEPALT (1927: 252) first emphasized shape differences, notably the protruding forewing apex („Apex der Vdfl. ausgezogen”) in *staudingeri*. It should also be noted that the hindwing is more triangular (fig. 2e).



FIG. 3. — *Morpho niepelti* males, ventral surfaces. **a**, Chuchuvi, Esmeraldas, 500-800 m, X-2013, Équateur (MNHN, coll. Blandin, PBM 2616). — **b**, Paralectotype *niepelti*; West Columbien, Altaquer 500 m, März-Juni 1927 (MNHN, coll. Fournier). — **c**, West-Columbien, Rio Micay, Febr.-April 1928 (MNHN, coll. Fournier). — **d**, San José del Palmar, Chocó, 900 m, 20-VII-91, J. SALAZAR leg. (JFL). — **e**, Holotype *staudingeri*; Manizales/Cauca. Sthl. (MNHU). — **f**, Holotype *antioquiensis*; Colombia, departamento de Antioquia, Amalfi, 1800 m, 14.IV.2005, G. RODRIGUEZ leg. (GR).

Subsequently, Niepelt compared the dorsal and ventral patterns. It should be emphasised that the *staudingeri* male had been collected 54 years before the *niepelti* specimens. However, NIEPELT noted in *staudingeri* a darker ground colour („Grundfarbe dunkler als bei *niepelti*”) on the dorsal surface, with a light blue-violet („hellblau-violett”) tint spreading on. Today, 90 years after, the ground colour is paler in the *staudingeri* male (fig. 2e)

than in the FOURNIER's paralectotype of *niepelti* (fig. 2b), but the particular blue-violet tint is still obvious. Therefore, it is possible that this colour should have a diagnostic value. NIEPELT also noted that the blue-violet tint covers the forewing cell. Consequently, the black area at the extremity of the cell is isolated, while it is connected to the black costal part of the cell in all *niepelti* specimens. This is probably an important difference.

On the black and white picture of the *staudingeri* holotype (NIEPALT, 1927: fig. 1), five more or less blurred, pupillary marks are visible (they are difficult to see, as small, whitish points, on our figure 2e). In *niepelti* specimens, pupillary marks are absent. The *staudingeri* holotype also has a relatively large, orange-yellow submarginal mark in the R_5 - M_1 space (fig. 2e), which is more often absent, or very small and blurred, in *niepelti* specimens (fig. 2a, b, c, d).

On the ventral surface (fig. 3e), the forewing submarginal area forms a wider line, with a proximal limit more undulated, than in *niepelti*. Towards the apex, there are few whitish scales on this line. The hindwing submarginal area is also wider, and it is covered with more whitish scales. These differences, which were not indicated by NIEPALT (1927), give support to his taxonomic decision.

Is *antioquiensis* different from *niepelti*?

RODRÍGUEZ & RODRÍGUEZ (2014: 239) wrote that the forewing apex, in *antioquiensis*, is more protruding and acute than in *niepelti*. However, as figures 2a and 2f show, the apex of an Ecuadorian *niepelti* is more protruding and acute than the apex of the *antioquiensis* holotype. Moreover, the two *antioquiensis* paratypes we know have less acute forewings and are similar for example to a *niepelti* specimen from Valle del Cauca (fig. 2c). Therefore, the shape of the forewings does not provide a diagnostic character.

In the three specimens of *antioquiensis* we have studied, the distal edge of hindwings forms points at the ends of veins R , M_1 and M_2 that are more pronounced than in *niepelti*, and the caudal appendage at vein M_3 is more elongated. There is some variation from one specimen to the other, but we guess that these differences could be diagnostic.

RODRÍGUEZ & RODRÍGUEZ (2014: 239) noted that “la nueva subespecie presenta en la cara dorsal una coloración azul pálido con tinte de color lila claro constante en todos los especimenes”. On the photographs provided by Gabriel RODRÍGUEZ, this light lilac tinge is perceptible notably on the distal half of the blue zone on forewings and hindwings. In *niepelti* specimens, the corresponding areas more often present a slightly deeper blue than the basal areas, but a weak violet tinge may exist. These subtle differences are difficult to appreciate on photographs that have been taken in different conditions, and we can not affirm that they have a diagnostic value.

In the holotype and one paratype of *antioquiensis*, the blue tint reaches the submarginal marks and covers several of them, its distal limit thus forming a zigzag line. In the second paratype we have seen, more submarginal marks remain isolated. In the three specimens, there is a relatively large submarginal mark in the R_5 - M_1 space (fig. 2f), as in *staudingeri*. This difference with *niepelti* could be diagnostic.

RODRÍGUEZ & RODRÍGUEZ (2014) noted that the submarginal marks have an orange-yellow colour in *antioquiensis*. More precisely, yellow-orange scales are dominant in the three or two foremost marks. In *niepelti* such scales more often exist only in the M_1 - M_2 mark, but

in some specimens they also exist, in decreasing proportion, in the M_2 - M_3 and M_3 - Cu_1 marks (fig. 2a). Therefore, it is likely that the colour of the forewing submarginal marks has no diagnostic value. On the hindwings, the premarginal orange marks are more important in *antioquiensis* than in most *niepelti* specimens. Along the edge, there is a narrow line that is orange in *niepelti* (with sometimes a mixture of white scales; see fig. 2a); in *antioquiensis* specimens this line is more white and stronger between the M_3 and pCu veins.

Finally, on the dorsal surface, the more important difference between *antioquiensis* and *niepelti* is the extent of the blue tint on the forewings: it covers the whole cell and more or less the dark area at its distal end in *antioquiensis*. Moreover, it spreads more towards the apex than in *niepelti*.

On the ventral surface (fig. 3f), there are the same major differences between *antioquiensis* and *niepelti* as between *staudingeri* and *niepelti*: (i) – the forewing submarginal line is wider, its proximal limit is more undulated, and there are few whitish scales towards the apex in *antioquiensis*; (ii) – the hindwing submarginal line is wider than in *niepelti*, and covered with more whitish scales. These differences were noted by RODRÍGUEZ & RODRÍGUEZ (2014). Moreover, in the forewing cell, the cellular area draws a transversal whitish line that forms a different angle with the the costal edge of the wing in *antioquiensis* and *niepelti*.

Is *antioquiensis* different from *staudingeri*?

The *staudingeri* holotype has a more protruding forewing apex and more triangular hindwings than *antioquiensis* specimens. We do not exclude the possibility that these shape differences have a diagnostic value. We also believe that the light blue-violet tint of the *staudingeri* holotype actually differs from the deeper blue of the *antioquiensis* specimens, despite the fact that they were collected more than one century later. Anyhow, in *antioquiensis*, the dark area at the distal end of the forewing cell is covered by blue scales, while it remains dark in *staudingeri*.

Otherwise, both taxa share some important characters: (i) – the presence of a submarginal mark in the R_5 - M_1 space on the forewings; (ii) – on the ventral surface of forewings, a wide, more or less undulated light brown premarginal line, with few white scales towards the apex; (iii) – on the ventral surface of hindwings, a wide premarginal line covered with white scales except towards the apex.

Discussion

There are no convincing arguments supporting the idea that *M. niepelti* populations differ along the Ecuadorian and Colombian Pacific slopes. Consequently, we do not follow NEILD (2001) who suggested the existence of a southern subspecies, *M. niepelti niepelti*, and of a northern subspecies, *M. niepelti staudingeri*. On the contrary, there are few but important differences between the unique male of *staudingeri* and specimens from the

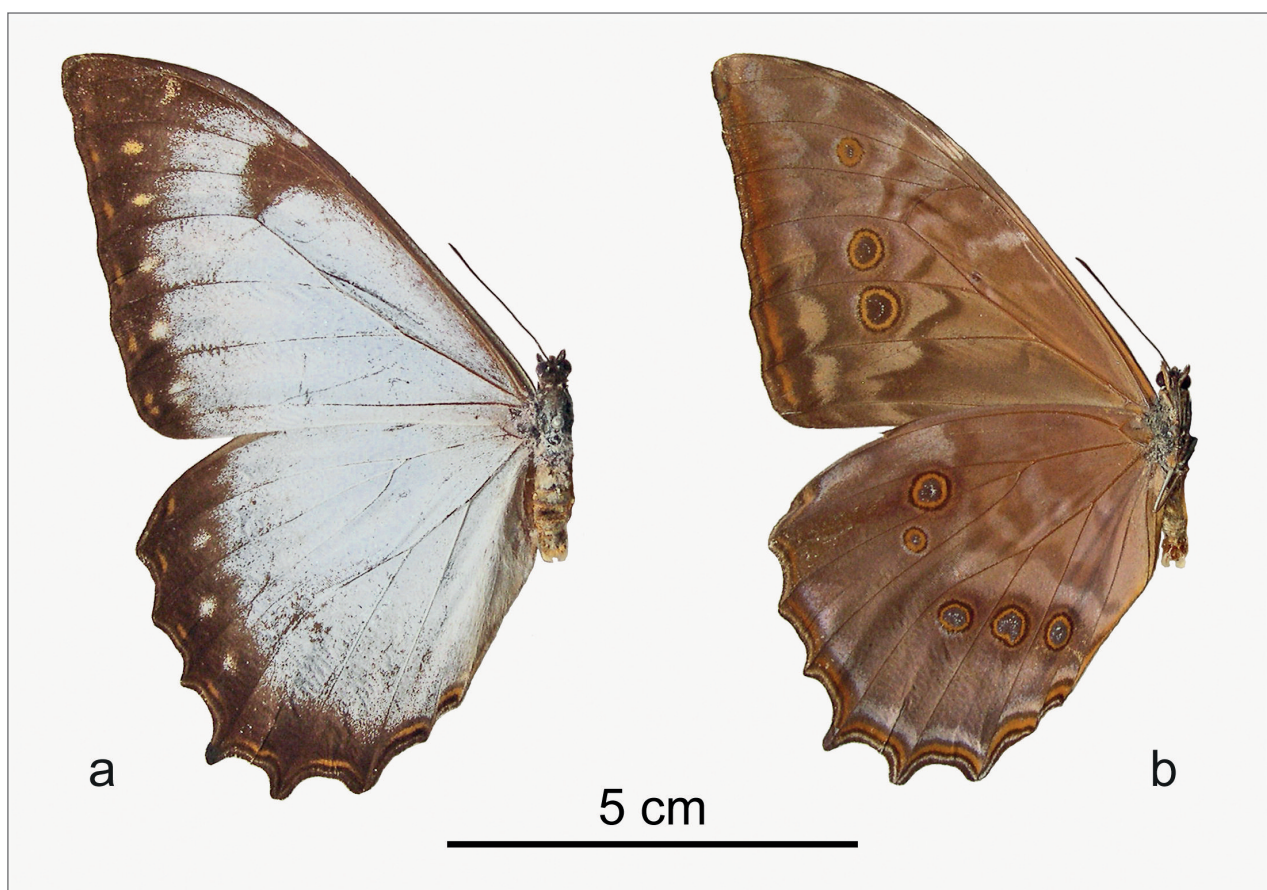


FIG. 4. — Dorsal (a) and ventral (b) surfaces of a male of *Morpho theseus juturna* Butler, 1870, collected in the area of Villavicencio, eastern side of the Cordillera Oriental, Colombia (MNHN, coll. Fournier).

Pacific slopes. Therefore, the name *staudingeri* should not be applied to populations for example from Chocó, as SALAZAR did (2001). Moreover, there is no reason to consider that the geographical origin of the holotype of *staudingeri* (area of Manizales, Colombian central cordillera) is false. It is possible that the natural habitat where STEINHEIL collected this specimen has been destroyed since the end of the XIXth century, as people were already burning forests at that time (STEINHEIL, 1876-1977). Thus, we confirm that SCHÄFFLER & FRANKENBACH (2009) were right in restoring *staudingeri* as a distinct subspecies.

Some of the differences between *antioquiensis* types and specimens from the Pacific slopes that were emphasized by RODRÍGUEZ & RODRÍGUEZ (2014) are probably insignificant, but others clearly support their decision to create a distinct subspecies. The holotype of *staudingeri* shares some of these diagnostic characters with *antioquiensis* specimens. There are some differences, however, and we prefer to maintain *antioquiensis* as a distinct subspecies, waiting for the discovery of a *staudingeri* population allowing to compare several specimens.

When RÖBER (1927: 197) described *M. niepelti*, he compared it with *juturna* Butler, 1870. This other Colombian taxon had been created without information on the number of studied specimens, and NEILD (2001: 442) designated as lectotype a specimen in the BMNH labelled as “*M. juturna* Butler type”, with “New Granada”

as geographical – imprecise! – origin. The *staudingeri* holotype, collected a few years after the description of *juturna*, had been first labelled “*Morpho juturna* Btl var” (fig. 1). However, NIEPELT (1927) only compared it with *M. niepelti*, and considered both taxa to be subspecies of *M. theseus*.

Like *M. niepelti* with its distinctive blue colour, *juturna*, with its chalky white colour, weakly tinged with blue, is an “odd” *Morpho* (fig. 4a). Presently, it is known from the eastern side of the Colombian Cordillera Oriental, eastern Ecuador and northern Peru (BLANDIN, 2007a). At first glance, it differs from *niepelti* in the colour of its dorsal surface. However, there are important similarities with *antioquiensis* and *staudingeri* on the ventral surface (fig. 4b): (i) – *juturna* also has wide, undulated, light brown premarginal lines on forewings, sometimes divided in more or less separated patches; (ii) – on hindwings, the corresponding premarginal lines are widely covered with whitish scales. In other words, considering these diagnostic characters, *antioquiensis* and *staudingeri* are closer to *juturna* than *niepelti* populations from the Pacific side.

Morpho niepelti has been considered as a species distinct from *Morpho theseus*, while *juturna* has been considered as a subspecies of the latter (BLANDIN, 1988; NEILD, 2001; LAMAS, 2004). Phylogenetic information, based on the analysis of two mitochondrial genes, support this taxonomic arrangement (CASSILDÉ *et al.*, 2012: 180).

In this study on the phylogeny of the genus *Morpho*, the authors compared an Ecuadorian male of *M. niepelti*, a male of *M. theseus theseus* from the Magdalena valley (Colombia), and four males of *M. theseus juturna* from northern Peru: in the resulting tree, *theseus theseus* and *juturna* formed a clade which had diverged from the *niepelti* sister clade. However, the discovery of *antioquiensis* and the “rediscovery” of *staudingeri*, that share important diagnostic characters with *juturna*, invite further phylogenetical researches. Microstructural studies of the scales that produce the original chalky white and blue colours in *juturna* and *niepelti* should also provide interesting

arguments on their relationships. Moreover, *antioquiensis* lives in the Cordillera Central between 1,400 and 1,800 m a.s.l. (RODRÍGUEZ & RODRÍGUEZ, 2014), therefore within the known altitudinal range (900-2,200 m) of *juturna* in the eastern slopes of the Cordillera Oriental (BLANDIN, 2007a). On the contrary, western *niepelti* populations are distributed at lower elevations, between approximately 200 and 1,500 m (RODRÍGUEZ & RODRÍGUEZ, 2014). Therefore, the ecology of the different taxa should be investigated to understand better the phylogenetic and biogeographic history of this fascinating *Morpho* group.

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