



A new species of *Zophopetes* Mabille, 1904 (Lepidoptera: Hesperiiidae) from Cameroon

Published online: 21 May 2017

urn:lsid:zoobank.org:pub: E6145A32-174B-4193-9AA1-21508092F8B3

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Abstract: A new species of the African genus *Zophopetes* Mabille, 1904 (Lepidoptera: Hesperiiidae), *Zophopetes barteni*, is described from the forest around Ebogo, Cameroon. Differentiating characters of the *Zophopetes* species are presented in a diagnostic key. Remarks are made on the relationship of *Zophopetes* to other genera of the *Ploetzia* group, as well as to other genera groups.

Key words: Lepidoptera, Hesperiiidae, *Zophopetes barteni*, *Ploetzia* group, Cameroon, asymmetric genitalia, venation, crepuscular.

Citation: De Jong, R. (2017). A new species of *Zophopetes* Mabille, 1904 (Lepidoptera: Hesperiiidae) from Cameroon. *Metamorphosis* 28: 11–20.

INTRODUCTION

The specimen described here as belonging to a new species of *Zophopetes* Mabille, 1904, was collected during one of the expeditions of the Ebogo 2100 Inventory Project, that aims to perform a survey as complete as possible of the butterflies occurring around the village of Ebogo, 80 km south of Yaoundé, Cameroon (by June 2016, 1067 species had been listed, see www.westafricanlepidoptera.com/), as a yardstick for possible future changes in habitat and species composition. The author discussed the finding with the late Torben Larsen, a well-known expert on African butterflies who was working on a monograph of the African Hesperiiidae (the first, and so far only, similar work was produced by Evans in 1937). Larsen expressed his surprise that such a large and distinct looking new hesperiid species could still turn up, as most recently described species of African Hesperiiidae were much smaller and showed more subtle differences between related species. Assigning this new species to an existing genus proved less straightforward, since the group of genera it apparently belongs to, is dire need of revision, as will be explained in the Discussion. We agreed that publication of the description should not be postponed to a later date when the monograph on the African Hesperiiidae would have been completed, if only to draw attention to the new species with the hope of additional material turning up. Further, we decided that for the time being

placing it within the present genus *Zophopetes* Mabille, 1904, would be the obvious choice, as will also be explained in the Discussion. Sadly, Torben's untimely death on 21 May 2015 has stalled the completion of the much needed revision of the *Ploetzia* group, the genus group that *Zophopetes* belongs to.

The genus *Zophopetes* was described by Mabille in 1904 (*Zophopetes* Mabille, 1904, Fam. Hesperiiidae, in P. Wytsman, *Genera Insectorum* 17: 1-208). Mabille included two species in the genus, of which *Pamphila dysmephila* Trimen, 1868, was fixed as genotype by Lindsey (1925). The other species mentioned, *Hesperia natalica* Plötz, 1882, was a manuscript name and was synonymized with *Proteides fiara* Butler by Evans (1937), who erected the new genus *Moltena* for it.

As conceived at present (Larsen, 2005), the genus *Zophopetes* consists of six rather similar, large and robust species, which together occur across sub-Saharan Africa. Antennae longer than half of the costa, club white above in male; according to Evans (1937) the apiculus is short, but actually it is much longer than the width of the club. Palpi porrect, third segment stout. Upper side of forewing dark brown, male often with violet sheen, with or without a pale area along apical half of termen, hyaline spots (at most) in cell (upper and lower spot or lower spot only) and between veins M1 and R5 (missing in most species), M3 and CuA1, and CuA1 and CuA2; occasionally, in females, a non-hyaline dot on vein 1A+2A. Upper side of hind wing plain brown. Underside forewing as upper side, partly paler, particularly towards hind margin, and with some additional tiny dark spots. Underside hind wing as upper side, but paler, with small to obvious dark or white markings, in females usually with a whitish stripe from wing base to termen, veins may be outlined in a paler shade. Male with or without a brand

Received: 29 December 2016

Published: 21 May 2017

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(patch of androconial scales) from vein 1A+2A to the origin of CuA2.

Male genitalia slightly asymmetrical, right and left valve not exactly mirroring each other, as found in related genera. Uncus broad, entire or (most species) with indented apex, as in several related genera.

All species are crepuscular and can produce an audible buzzing noise when flying. According to Larsen (2005) and Cock *et al.* (2014) the larvae of all species feed on palms (Arecaceae), and the presence of suitable palms may therefore be of more importance for their occurrence than other factors such as an open or closed habitat.

MATERIALS AND METHODS

Throughout the text the nomenclature of veins and interspaces follows the Comstock system as adopted by, e.g., Nielsen & Common (1991); the veins are indicated by an upper case, the interspaces (named after the vein in front) by lower case letters. The nomenclature for parts of the genitalia follows Evans (1949), except that the term ‘cuiller’ is replaced by the currently used ‘cucullus’.

DESCRIPTION

Zophopetes barteni sp. nov. (Figs 1 & 2)

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Holotype: ♂ Cameroon, Ebogo (about 80 km, as the crow flies, south of Yaoundé), 4°21'00"N, 11°25'00"E, 600 m, 25–26 December 2012, leg. Frans Barten. In collection of Naturalis Biodiversity Center, Leiden, The Netherlands, RMNH INS 910268. No further specimens known.

External characters: (Fig. 1) Forewing length: 24.4 mm. Wingspan: 45.5 mm. Antennae; club with long apiculus, about three times as long as width of club, strikingly white above. Palpi correct; small third segments converging (readily visible in Fig. 1). Forewing upper side uniformly dark brown, violet sheen in apical half (not shown clearly in Fig. 1; depends on angle of light). Three large pale ochreous hyaline spots: a very large one from vein CuA2 to cell and to CuA1, distal half covering basal third of latter; a much smaller spot between CuA1 and M3, touching both veins and just distally to the large spot below it, and a large spot across the cell, consisting of a lower cell spot lying over the large spot under the cell and separated from it by the dark cubital vein, and with a slightly smaller upper cell spot fused with it. No further spots; no brand. Forewing underside: hyaline spots as on upper side; small, indistinct black markings between M1 and M2, between M2 and M3, and, further away from termen, between R2 and R3, R3 and R4, and R4 and R5 (the three apical spots as found in many HesperIIDae). Ground colour of forewing underside very different from upper side; pale ochreous from near CuA2 to hind margin; remaining part of wing brown with very strong violet sheen. Hindwing

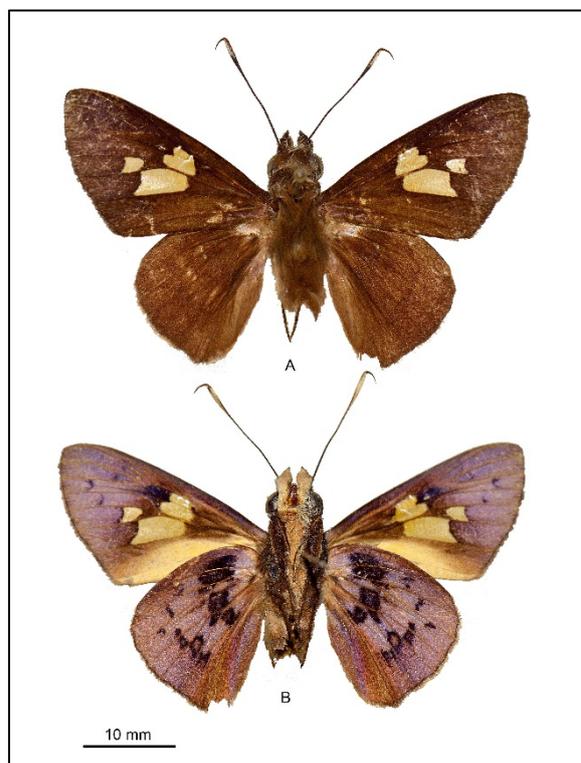


Fig. 1 – *Zophopetes barteni* sp. nov., holotype, upper (A) and underside (B). Cameroon, Ebogo, 4°21'00"N, 11°25'00"E, 25–26 December 2012, leg. F. Barten. Coll. Naturalis, Leiden, RMNH INS 910268.

upperside dark brown; unmarked. Hindwing underside ground colour brown with strong violet sheen as on forewing; conspicuous black markings as follows: series of median spots between Sc+R1 and 1A+2A, the one between CuA1 and CuA2 oval, filled with violet; more or less connected larger black spots in Sc+R1, from Sc+R1 to cell and Rs, between Rs and M1 at the very base of the internervular space; in distal part of cell, between CuA1 and CuA2 against cell, and between CuA2 and 1A+2A near origin of CuA2. No brand. Coxae densely fringed with conspicuous, long, blackish hairs, mid and hind tibiae fringed with dense, shorter, ochreous hairs.

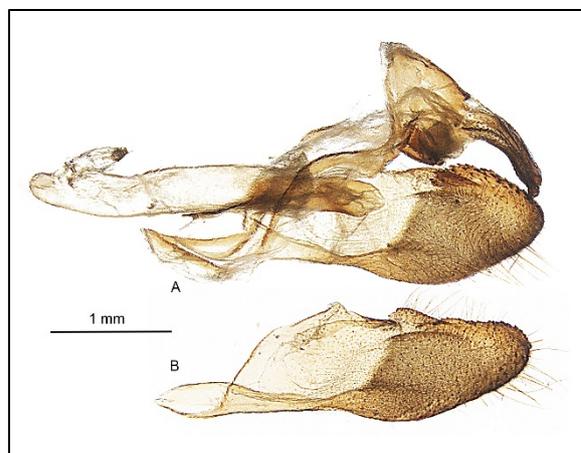


Fig. 2 – Male genitalia of *Zophopetes barteni* sp. nov., holotype. Data, see fig. 1. A, left lateral view, left valva removed. B, outside of left valva.

Male genitalia: (Fig. 2) Uncus broad-ended, medially indented in dorsal view; as in other *Zophopetes* species except *Z. haifa* Evans, 1937. Gnathos represented by ill-defined sclerotization in U-folded membrane right and left under tegumen+uncus; slight rounded swelling with minute spines at distal end of fold. Valvae elongate, proximal edge oblique (about 45°); cucullus covering almost half of valva, apically rounded, dorsal part of cucullus of both valvae with irregular teeth; valvae slightly asymmetrical, right valva wider (dorsal to ventral side) than left valva. Aedeagus as long as valvae, coecum as long as high.

Diagnostic key to the species of *Zophopetes*

1 Forewing with small apical spot (space r5); two subequal cell spots. Male with brand (androconial stripe from CuA2 to base of CuA1) ***ganda*** Evans, 1937
- Forewing without apical spot. Male with or without brand 2

2 Forewing with only lower cell spot (against vein Cu), or upper cell spot (against vein R) much smaller than lower one 3
- Forewing with lower and upper cell spot (separate or fused), rarely upper spot missing 4

3 Forewing with only lower cell spot, or upper cell spot much smaller than lower one. Male without brand ***dysmephila*** (Trimen, 1868)
- Forewing with upper and lower cell spot, upper one much smaller than lower one. Male with a brand (see Kielland, 1990) ***nobilior*** (Holland, 1896)

4 Fore wing, upper and lower cell spot fused into a single, large cell spot, lying directly over the basal half of the large spot in space cua1 and separated from it by the dark cubital vein. Apical half of underside fore wing and entire underside of hind wing with strong violet gloss, latter with prominent dark spots. Male, fore wing without brand ***barteni*** spec. nov.
- Forewing, upper and lower cell spots much smaller, subequal, separate, at least as far from spot in space cua1 as latter from spot in m3. Male, fore wing with or without brand 5

5 Fore wing 22 mm; upper cell spot sometimes small or even missing. Male, fore wing without brand ***quaternata*** (Mabille, 1876)
- Fore wing 22 mm; cell spots (sub)equal. Male fore wing with brand ***haifa*** Evans, 1937
- Fore wing 27 mm; upper cell spot no more than half the size of the lower cell spot. Male, fore wing with brand ***cerymica*** (Hewitson, 1876)

Habitat: The specimen was collected during daylight, sitting on a leaf in a shaded patch along a narrow trail through a partly degraded rain forest (Fig. 3).

Etymology: The new species is named after its collector, Frans Barten.

DISCUSSION

In his treatise on African Hesperidae, Evans (1937)



Fig. 3 – Collecting spot of the new species at Ebogo (Cameroon), with its collector, Frans Barten. Photo by G.J. Bergsma (Appelscha, The Netherlands).

recognised the *Ploetzia* group of genera (Hesperinae) as consisting of 15 strictly African genera (including *Zophopetes*), characterized by a combination of characters, such as the shaggy thorax below, and the densely fringed coxae and hind tibiae. In their extensive study of the Hesperidae of the world, based on morphological and molecular information, Warren *et al.* (2008, 2009) retained the *Ploetzia* group of Evans, but since they had complete molecular data for only two genera in the three gene regions studied, the interrelationships of the genera of the group as well as the relationship with genera outside the group in Africa and the Oriental Region remained uncertain. Within a clade of Old World Hesperinae genera the two genera of the *Ploetzia* group with complete molecular data (for the three gene regions studied), *Gamia* Holland, 1896, and *Caenides* Holland, 1896, did not turn up as sisters and nested with a number of strictly Asian genera. So, for the time being, the monophyly of the *Ploetzia* group remains unsupported. Even so, several genera of the *Ploetzia* group are rather similar, and the allocation of a species fitting well in the larger group, and into one of the existing genera, necessitates some discussion.

Most species of the *Ploetzia* group sensu Evans (1937) are medium-sized to large skippers, generally dark brown with white or ochreous hyaline spots on the forewing, sometimes marked with yellow or orange, and black and white, particularly on the hind wing. Evans (1937) divided the genera of the *Ploetzia* group according to a few morphological characters. The first division is between three genera in which the cubital vein (erroneously called the median vein by Evans)

and vein M3 (called vein 4 by Evans) of the hind wing are collinear (genera restricted to Madagascar) and twelve genera in which this is not the case. It is a convenient character for identification of the two groups of genera, but since both conditions are found outside the *Ploetzia* group as well, this character in the hind wing venation is not a good foundation to argue for the monophyly of the two subgroups. The subgroup with the cubital and vein M3 of the hind wing not collinear was further divided on the basis of the position of the palpi, either porrect or erect, a criterion widely used by Evans for HesperIIDae of other parts of the world as well.

The genera with porrect palpi are *Ploetzia* Saalmüller, 1884, *Moltena* Evans, 1937, *Chondrolepis* Mabille, 1904, *Zophopetes* and *Gamia*. Those with erect palpi are *Artitropa* Holland, 1896, *Mopala* Evans, 1937, *Gretna* Evans, 1937, *Pteroteinon*, *Leona*, *Caenides* and *Monza* Evans, 1937. Species of *Zophopetes*, *Leona* and *Caenides*, and to a lesser degree *Pteroteinon*, can be rather similar externally, notwithstanding the difference in the position of the palpi, and one may wonder if separation into two groups on the basis of the position of the palpi alone is appropriate. If taking another character, e.g. presence/absence of a brand (stripe of androconial scales) on the forewing of the male, or presence/absence of hyaline spots in the forewing as yardstick for subdivision, the arrangement would be very different. Moreover, while Lindsey & Miller (1965) considered *Leona* and *Caenides* synonymous, Berger (1967) and Larsen (2005) were of the opinion that there are discordant elements in *Caenides*. Larsen (2005) saw consistent differences in the genitalia of *Leona* when compared to *Caenides*, and Larsen (*in litt.*, 22 March 2014) was of the opinion that at least two of the species of *Leona* did not belong there. Clearly, the group needs a thorough taxonomic revision. Larsen was working on this (as part of his planned monograph of all African HesperIIDae), when he died.

With these uncertainties in mind and in the absence of a modern revision of the *Ploetzia* genus group sensu Evans (1937), the assignment of the new species to one of the genera must be based on overall similarity and not on a synapomorphic character. As explained below, it fits best in the genus *Zophopetes*. The new species shares the porrect palpi with small converging third segments and antennae that are white above with the other *Zophopetes* species. The latter character is also found in *Leona*, which however has erect palpi with a very short third segment. Spots on the fore wing are similar to what is found in the other *Zophopetes* species, but none of the known species has the large cell spot found in the new species. In the other genera of the *Ploetzia* group such a large cell spot is the usual condition in the genera *Gamia* and *Leona*, and it is found, in a less pronounced form, in some species of *Artitropa*, *Gretna*, *Pteroteinon*, and *Caenides*. Of these genera, only the spotting and the general appearance of *Leona* come close to *Z. barteni*, but all *Leona* species have one to three apical spots on the upper side of the forewing, and in *Z. barteni* the spot between M3 and

CuA1 completely overlaps the large spot between CuA1 and CuA2 instead of being separate from it and in a more distal position. None of the species belonging to the *Ploetzia* group shows an underside like *Z. barteni*, with large dark spots and the pronounced violet gloss. The position of the spots on the underside of the hind wing is comparable to what is found in *Zophopetes* species, but their strong development is unique. The genitalia of *Z. barteni* agree well with the general shape found in *Zophopetes*. The apex of the uncus is broad and medially indented as found in the other *Zophopetes* species, except *Z. haifa* (see sketches in Evans, 1937). An indented uncus is also generally found in *Leona*. The proximal edge of the valva is strongly oblique (c. 45°), but in the other *Zophopetes* species the apex of the cucullus, at least of the left valva, is more or less curved up into a rounded or sharper point. In *Leona* species the valva has a less elongate appearance, with the proximal edge at an angle of 70–90° to the base line.

ACKNOWLEDGEMENTS

Implementation of the Ebogo 2100 Inventory Project, during which the new species was detected, is financially supported by the Dutch Uyttenboogaart-Eliassen Stichting, which support is gratefully acknowledged here. Frans Barten (Boxtel, The Netherlands), collector of the new species, generously donated it to Naturalis Biodiversity Center, Leiden. The habitat photo of the collecting spot was taken and provided by G.J. Bergsma (Appelscha, The Netherlands). The late Torben Larsen was most helpful in discussing the taxonomic position of the new species. Matthew Cock (CABI, Egham, UK) made helpful suggestions for improvement of the text.

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