

Taxonomic notes on *Liptena durbania* Bethune-Baker, 1915 (Papilionoidea: Lycaenidae: Poritiinae)

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Abstract: It is shown that *Liptena eukrinoides* Talbot, 1937 and *L. bergeri* Stempffer *et al.*, 1974 can be considered subspecies of *Liptena durbania* Bethune-Baker, 1915. The relationship between *L. durbania* and *L. eukrines* Druce, 1905 is briefly examined.

Key words: Rhopalocera, Liptenini, taxonomy, Afrotropical region, Africa.

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INTRODUCTION

The data collected during visits to different collections of Lycaenidae revealed a certain confusion about *L. durbania*, and prompted the writing of this note, which therefore consists of a presentation of the problems encountered and of the solutions provided.

No new taxon is described, but some modifications of the systematics are proposed and their repercussions on the species of the *L. eukrines* complex are then briefly exposed.

METHODS AND MATERIALS

Abbreviations

ABRI: African Butterfly Research Institute, Nairobi, Kenya.

ANHRT: African Natural History Research Trust, Leominster, United Kingdom.

RBINS: Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

MNHN: Muséum national d'Histoire naturelle, Paris, France.

MRAC: Musée Royal pour l'Afrique Centrale, Tervuren, Belgium.

NHM: Natural History Museum, London, United Kingdom.

NMK: National Museums of Kenya, Nairobi, Kenya.

DRC: Democratic Republic of the Congo.

CAR: Central African Republic.

CRD: Collection of Robert Ducarme.

Genitalia

Methods for preparation and examination of genitalia were described in Libert, 2022a.

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DNA barcode analysis

The analysis was performed as reported in Libert, 2021: 32; MP (Maximum Parsimony) and ML (Maximum Likelihood) trees were constructed with the same 130 sequences used by Libert, 2022b.

Six of these sequences concern taxa that are mentioned in the present paper:

L. d. durbania: 1 ♂ (Koutaba, Cameroon; ABRI); MLIB–2360 (GenBank: OQ740721);

L. d. eukrinoides: 1 ♀ (Matumbi, NE DRC; ABRI); MLIB–2361 (GenBank: OQ740719);

L. d. eukrinoides: 2 ♂, 1 ♀ (Kasugho, NE DRC; CRD); MLIB–2517/2518/1519 (GenBank: OQ740716/740718/740717);

L. minziro: 1 ♂ (Kasugho, NE DRC; CRD); MLIB–2521 (GenBank: OQ740720);

RESULTS

Liptena durbania Bethune-Baker, 1915

The description of *Liptena durbania* is based on a male from Bitje (Cameroon), and the species is not uncommon in this country where some 70 specimens have now been collected (most of them in the ABRI collection). It has also been observed in neighboring countries: Gabon (Vande weghe, 2010: 248 and pl. 106), Congo (Stempffer, 1965: 1454) and CAR (ABRI).

D'Abrebra (2009:649) limits the distribution of *L. durbania* to Cameroon and Congo, but Williams (2022) mentions its presence in northeastern DRC, citing Ducarme (2018: 31). However, Ducarme (*ibid.*) also mentions the existence in NE DRC of *L. bergeri* Stempffer *et al.*, 1974, a species which is only known by its holotype from Kafakumba (southern DRC) and which, according to its authors, is distinguished from *L. durbania* only by male genitalia. Obviously, this point deserves further investigation.

A new visit to Robert Ducarme's collection first showed that, given their variability, it was impossible to distinguish two taxa among the specimens in this collection, then that

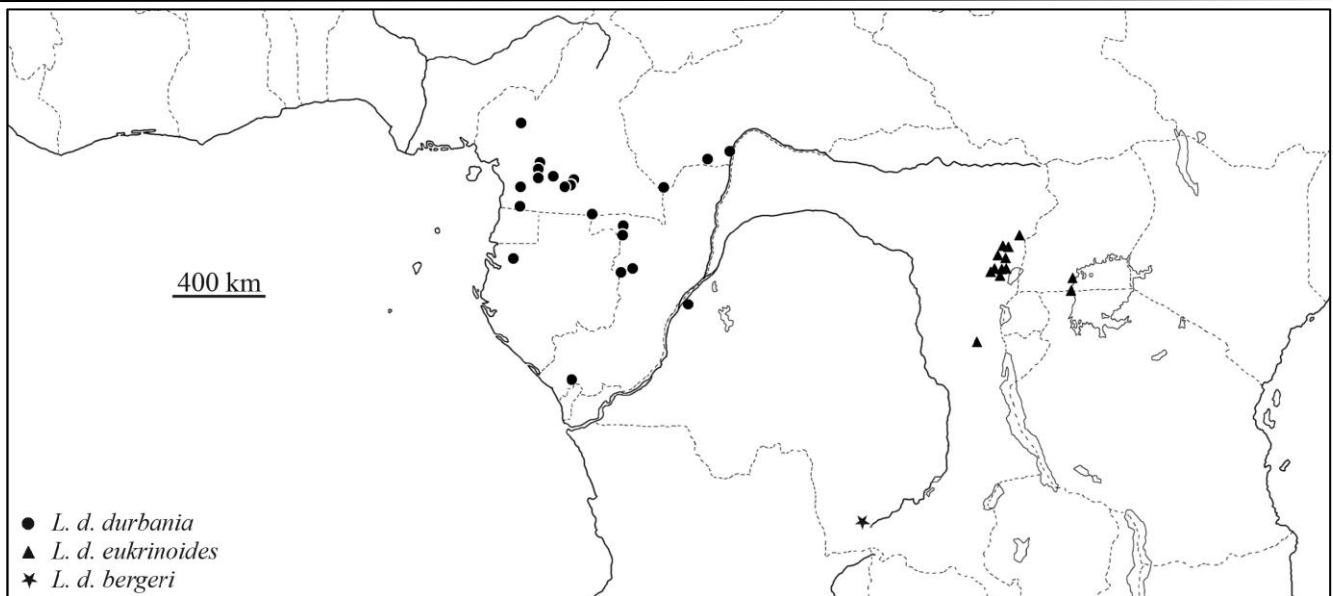
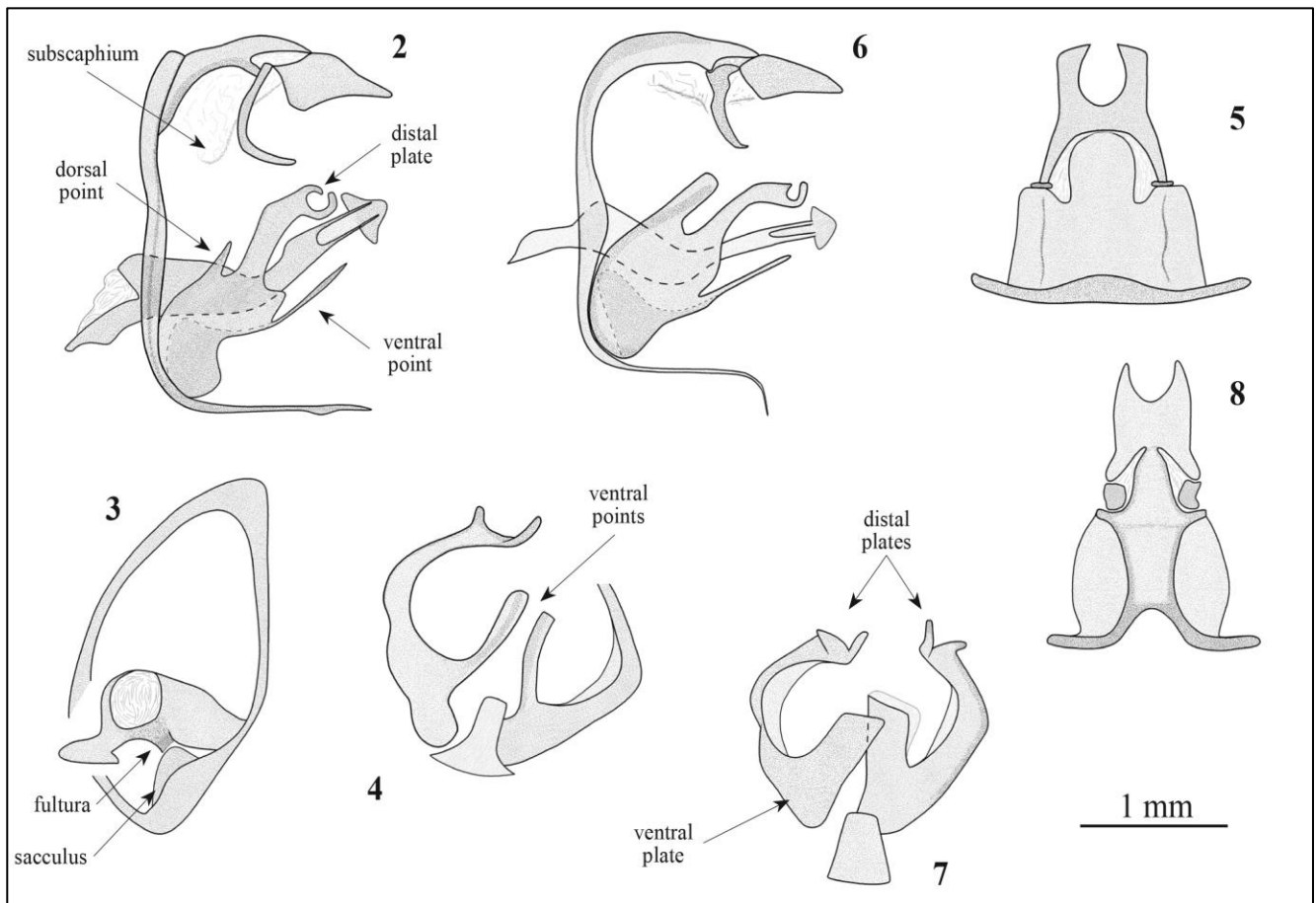


Figure 1 – Map of Central Africa showing the distribution of *Liptena durbania* subspecies



Figures 2 to 8 – Male genitalia of *Liptena d. durbania* (2 to 5. ♂ Ototomo, near Yaoundé, Cameroon; prep. Libert 120-205) and of *L. d. eukrinooides* (6 to 8. ♂ Kasuo, NE DRC; prep. Libert 120-206). 2, 6. Left lateral view of genitalia. 3. Three-quarter posterior view of penis and fultura. 4, 7. Ventral view of the valves. 5, 8. Dorsal view of the uncus and of the dorsal part of the tegumen.

the male genitalia of the single taxon (Figs. 6–8) are indeed close to those of *L. bergeri*, which are illustrated in the description of this species (Stempffer *et al.*, 1974 – Fig. 49), side by side with those of *L. durbania* (*ibid.* – Fig. 48).

As far as can be judged from Fig. 49, the main, and perhaps the only, difference is the much more indented uncus of the Kivu males, which are therefore closer in this character to *L. durbania* (Fig. 48). On the other hand, we find in the

Kivu males the wide ventral plate of the valves which distinguishes *bergeri* from *L. durbania* (it is possible that there are minor differences in the shape of the subunci or the dorsal tip of the valves, but the figures do not make it possible to say).

There is therefore in Kivu a taxon fairly close to both *L. durbania* and *L. bergeri*. The proximity of this taxon to *L. durbania* is confirmed by the relatively clear but limited

facies differences and the DNA barcode analysis which shows a difference of about 1% between the populations of Cameroon and Kivu.

Two other taxa also similar to both *L. durbania* and to the specimens from Kivu have been described.

obsoleta Dufrane, 1953 was described as a female form of *L. eukrines* (Dufrane, 1953: 49). Williams (2022) treats *obsoleta* as a synonym of *L. eukrines*, but it is also considered a synonym of *L. minziro* Collins & Larsen, 2008 in the description of this species close to *L. eukrines* (Collins & Larsen, 2008: 56); these decisions can only be explained by the fact that no illustration of the type exists. Indeed, although the type-locality is in South Kivu (Kamituga, near Mwenga, south of Bukavu), *obsoleta* is neither illustrated nor even mentioned by Berger (1981) (probably because the type is not in the MRAC collection but in that of the RBINS). Thanks to Stefan Kerkhof, it could be photographed, and the photos show beyond a shadow of a doubt that the specimen is much closer to *L. durbania* than to *L. eukrines*. This provides further evidence that a good illustration is more useful than a description, however detailed it may be.

It is therefore very likely that the type of *obsoleta* belongs to the same taxon as the specimens collected further north [see the case of *L. kamitugensis* Dufrane, 1953, whose type-locality is also Kamituga (Libert, 2022a)].

eukrinoidea Talbot, 1937 was described as a species of *Liptena* from two specimens collected in south-western Uganda. Although Talbot compares *L. eukrinoidea* to *L. eukrinaria* Bethune-Baker, 1926, the type of the latter (photographed at NHM in 1996) looks much more like *L. durbania* than like *L. eukrinoidea*. More recently, about twenty specimens were collected in north-western Tanzania (Minziro, not far from the type-locality of *L. eukrinoidea*), by Jan Kielland and then by ABRI collectors (Kielland, 1990; Congdon & Collins, 1998: 60). All of these specimens are in the ABRI collection, and photos sent by S. Collins do not show any differences with the specimens from Kivu.

The genitalia of *L. eukrinoidea* have not been described or figured, nor were they examined by Stempffer (1967: 54), but the abdomen of male from Minziro was sent by S. Collins, and dissection showed genitalia identical to those of the males from Kivu (Figs 6–8). It follows 1) that *eukrinoidea* is the name that should apply to specimens from Kivu, and 2) that *obsoleta* is a synonym of *eukrinoidea* (**syn. nov.**)

It therefore appears that there are three allopatric taxa (map, Fig. 1), *L. durbania*; *L. eukrinoidea* and *L. bergeri*, whose facies are not very different and for which it is necessary to determine whether it is justified to treat them as species distinct from *L. durbania*.

The barcode of *eukrinoidea* is similar to that of *L. durbania* ($\Delta \approx 1\%$), whilst male genitalia bring it closer to *bergeri*, whose barcode has not been sequenced. The female genitalia of *eukrinoidea* and *L. durbania* are also similar; but the female of *bergeri* is unknown.

These modest differences do not demonstrate whether *eukrinoidea* is closer to *durbania* or to *bergeri*, and the

status quo could be maintained, with the three taxa as distinct species. However, the modesty of these differences, the allopatry of the three taxa, their close resemblance and the existence of intermediate specimens within the population of *eukrinoidea* in Kivu, strongly suggests that there are three subspecies of *L. durbania*:

L. d. durbania, from Cameroon to CAR;
L. d. eukrinoidea (**stat. rev.**; NE DRC, W Uganda and NW Tanzania);
L. d. bergeri (**stat. rev.**), which is only known from Shaba.

***Liptena durbania durbania* Bethune-Baker, 1915** (Figs 9–13)

Liptena durbania Bethune-Baker, 1915. – Descriptions of new species of Lepidoptera from Africa and the East. *Annals and Magazine of Natural History*, **8**(16): 189 (male, Cameroon; not illustrated).

= *Liptena rectifascia* Hawker-Smith, 1933; type in NHM (male Bitje, Cameroon).

The underside of *L. durbania* is variable enough for Hawker-Smith to believe in the existence of a distinct species, which he described as *rectifascia* and whose type-locality is the same as that of *L. durbania* (Bitje, central Cameroon); because of this variability, one can say that the underside is similar in the three subspecies of *L. durbania*. The upper side of the nominate subspecies is also variable [Fig. 12 shows that of a very peculiar male from Cameroon (Ebogo, ABRI)], but subspecies *eukrinoidea* is distinguished by a more extensive orange area on the forewing upper side in most specimens. The difference is not considerable, and is even very small in some specimens from Kivu. There is no sexual dimorphism.

Holotype: male, Bitje, Ja River, Cameroons, 2000ft, ix-x.1912; NHM.

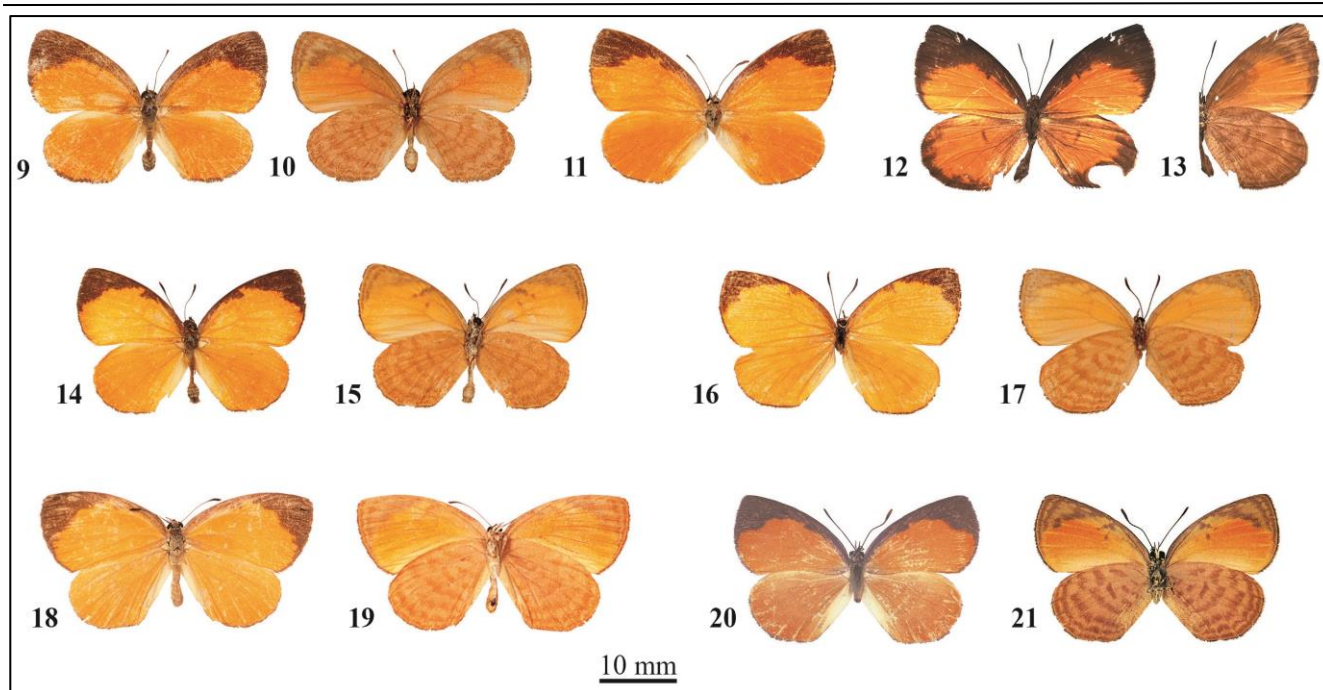
Distribution:

Most specimens of *L. durbania* were collected in Cameroon, particularly in the center-south (around Yaoundé and the type-locality), but it has been observed as far south as the border with Gabon (Maan, Mintom) and as far north as the vicinity of Fouban (Koutaba, where the barcoded male was captured); the majority of the specimens are in the ABRI collection.

It seems rare in Gabon (Vande weghe, 2010: 248 only mentions one locality, Kinguele, in the Monts de Cristal); in the Congo, about ten specimens were collected in several northwestern localities (Etoumbi, Kelle, Mambili, Sembe; NHM and NMK), three others in the north (Bomassa Nouabale-Ndoki park; ANHRT), as well as a male in the southwest, in Dimonika, which marks the southern limit of its range (Stempffer, 1965: 1454; MNHN). It is also present in the west of the DRC (Lukolela; ABRI), and in the CAR, where some twenty specimens have been collected around Bangui (ABRI), the eastern limit of its distribution.

Genitalia:

Stempffer *et al.* illustrated male genitalia of indeterminate origin (1974, Fig. 48), so the genitalia of a male from Cameroon are illustrated here (Figs 2–5). The uncus is deeply notched (Fig. 5), with subunci long, thin and curved



Figures 9–21 : 9, 10 *L. d. durbania* ♂ (Obout, Cameroon) R & V; 11 *L. d. durbania* ♀ (Obout, Cameroon) R & V; 12, 13 *L. d. durbania* ♂ (Ebogo, Cameroon) R & V; 14, 15 *L. d. eukrinoides* ♂ (Kasugho, NE DRC) R & V; 16, 17 *L. d. eukrinoides* ♀ (Musasa, NE DRC) R & V; 18, 19 *L. d. eukrinoides* ♀ (HT f. *obsoleta*) R & V; 20, 21 *L. d. bergeri* ♂ HT, R & V.

strongly in the middle; with a subscaphium visible (Fig. 2). The valves are characteristic; they bear three ornamentations, a short dorsal point, a long distal plate whose extremity is divided into two small points and a fine ventral point, turned towards the interior of the valves (Fig. 2), better visible in ventral view (Fig. 4). The penis is just as characteristic: it is strongly twisted to the right (the lateral view of Fig. 2 thus shows its extremity, which is also deeply indented), very curved towards the middle and its base is strongly swollen and wide open (Figs 2, 3). The fultura is extremely short, and the penis seems to rest on top of the sacculus, from which it is risky to separate it. The coremata are of medium size; they were removed to make the drawings.

A female from Cameroon was also dissected for comparison with a female from Kivu; the illustration of the genitalia turned out to be difficult to understand, and they are briefly described. The sinus vaginalis forms a cavity with well sclerified walls, easily identifiable at the level of sternite 7 after removal of the scales that cover the abdomen; this cavity, wide open to the outside, is bordered on either side by two large lateral plates, of a more membranous aspect. At the back of the sinus, the ostium bursae opens onto a ductus bursae folded over the sinus and strongly sclerified over approximately half of its circumference; a rather short bursa prolongs the ductus.

Liptena durbania eukrinoides Talbot, 1937. **stat rev.** (Figs 14–19)

Liptena eukrinoides Talbot, 1937. – New African Lycaenidae and Nymphalidae, and two new *Diestogyna*. *Transactions of the Royal Entomological Society of London*, **86**: 64 (male and female, SW Uganda; illustrated pl. 1, Fig. 18).

Liptena eukrinoides Talbot, 1937 *sensu* Congdon & Collins, 1998: 60, d’Abrera, 2009: 649, Williams, 2022; = *Liptena eukrines* f. female *obsoleta* Dufrane, 1953 *sensu* Williams, 2022.

Liptena minziro Collins & Larsen, 2008 *sensu* Collins & Larsen, 2008: 56.

Holotype: male, Tero forest, south-east Buddu, 3500ft., 26–30.ix.1911 (S.A. Neave); NHM.

Description:

On the upper side, the specimens of the eastern subspecies are generally a little smaller, a little more yellow, with a narrower black apical patch and a narrower costal margin on the forewings. These differences are observed in the specimens illustrated, but exceptions are not uncommon for each of the characters.

Genitalia:

Male genitalia differ from those of the nominate subspecies by the less indented uncus (Fig. 8) and the shorter, more robust and only slightly curved subunci (Fig. 6). On the valves, the dorsal point is stronger, the end of the distal plate is different and the ventral point is replaced by a wide plate, the difference being however visible only in ventral view (Fig. 7). The penis is similar, also twisted, but a little thinner; the fultura is similar.

In female genitalia, the ventral wall of the sinus vaginalis is wider, which results in a (slightly) narrower opening.

Liptena durbania bergeri Stempffer, Bennett & May, 1974, **stat rev.** (Figs 20, 21)

Liptena bergeri Stempffer, Bennett & May, 1974. – A Revision of some groups of *Liptena* Westwood (Lepidoptera: Lycaenidae). *Bulletin of the British Museum (Natural History)* (Entomology), **30** (2): 177 (male, Shaba; not illustrated).

Liptena bergeri Stempffer, Bennett & May, 1974 *sensu* Berger, 1981: 191.

Holotype: male, Kafakumba (Katanga), iv.1929 (F.G. Overlaet); genitalia Stempffer 3592; MRAC.

Genitalia:

Stempffer *et al.* illustrate those of the male holotype (1974, Fig. 49). The figure shows a weakly indented uncus; the subunci seem closer to those of subspecies *eukrinoïdes*, but the angle of observation is not the same as for Fig. 6. On the valves, the most conspicuous character is the wide ventral plate, perhaps even wider than in subspecies *eukrinoïdes*.

The *Liptena eukrines* species complex

Collins & Larsen (2008: 57) define this complex as the grouping of three species, *L. eukrines* Druce, 1905, *L. lloydi* Collins & Larsen, 2008 and *L. minziro* Collins & Larsen, 2008. It is affected by the above results on the one hand because *L. durbania* has often been considered as a species close to *L. eukrines*, on the other hand because the distributions of two of its three species are modified.

Relationship between *L. durbania* and *L. eukrines*:

In the description of *L. durbania*, Bethune-Baker writes that it is close to *L. eukrines*; similarly it is as a female form of *L. eukrines* that Dufrane described *obsoleta* (1953: 49), but this proximity is reduced to the resemblance of their upper sides. Their undersides are quite different, as are the genitalia of the males [those of *L. durbania* are illustrated by Stempffer *et al.* (1974, Fig. 48), those of *L. eukrines* by Collins & Larsen (2008: 56)].

It is also very likely that their barcodes are different as well. Indeed, if that of *L. eukrines* was not sequenced, a sequence was obtained for a male of *L. minziro* and it is very different from those obtained for the two subspecies of *L. durbania* (see above), in both the ML and MP trees.

Although these results are not robust and DNA barcode analysis is not suitable for phylogenetic studies, they are consistent with those of the study of genitalia. This difference also makes it completely impossible to consider that *minziro* is a subspecies of *L. eukrines* (Collins & Larsen, 2008: 56).

Distribution of species of the *L. eukrines* complex:

Regarding the distributions, the previous results show that *L. eukrines* was observed neither in the south of Kivu (Kamituga, type-locality of *obsoleta*), nor in the north-west of Tanzania¹. Its range is therefore limited to southern DRC, no farther north than Kapanga (MRAC) and north-west Zambia, as far west as Ikelenge (Heath *et al.*, 2002: 86); it probably flies in eastern Angola, but it has not been observed there (Mendès *et al.*, 2019).

If the distribution of *L. eukrines* is somewhat reduced, that of *L. minziro* is on the other hand more extensive than when it was described, since it was collected in the north-east of the DRC, both by Robert Ducarme (16 specimens, including those that were barcoded and dissected) and the ABRI team (14 specimens).

The distribution of the third species in the complex, *L. lloydi*, is not really modified, but two localities in Cameroon are added to those given in the description, Mont Féré near Yaoundé (one male, cited as *L. eukrines* in Libert, 1994: 355) and Yokaduma, in the east (a specimen in the collection of E. Joly, pers. com.); there is also another specimen from Ebogo at the MRAC (coll. Bouyer) and one from Nkolmekoui (about 50 km east of Ebogo) at ABRI.

From these modifications, it appears that the three species of the complex are indeed allopatric², and that their distributions differ little from those of the subspecies of *L. durbania* (and also from those, for example, of taxa close to *L. congoensis* Schultze, 1923³).

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¹ In the description of *L. minziro*, it is not specified that the name 'minziro' applies to specimens called *L. eukrines* in Collins & Congdon, 1998: 66.

² This is only mentioned in the legend of the figure illustrating the genitalia in Collins & Larsen (2008: 53).

³ *L. congoensis* Schultze, 1923, *L. kamitugensis* Dufrane 1945, and *L. hulstaerti* Hawker-Smith, 1926 (Libert, 2022a).

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