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Dukearbela translucens gen. nov., spec. nov. – a remarkable taxon from South Africa (Lepidoptera: Metarbelidae)

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Abstract: The genus *Dukearbela* **gen. nov.** is established to accommodate the species *D. translucens* **spec. nov.**, collected in KwaZulu-Natal and Eastern Cape Provinces, South Africa. The new species differs externally from other African taxa in that the fore- and hindwings are translucent in the male sex. The wing venation resembles that of the genus *Salagena* Walker, 1865, but the male genitalia are structurally different. The sister-group is unknown.

Key words: Afrotropical Region, Metarbelidae, taxonomy, South Africa, KwaZulu-Natal, Eastern Cape.

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INTRODUCTION

While curating the Cossidae in the Lepidoptera collection of the Ditsong Museum of Natural History, Pretoria, I found two unidentified specimens, which differed in external appearance from all cossid moths known to date from South Africa. They looked similar to species from the genus *Stygioides* Bruand, 1953 (Fig. 1), which are remarkable for their small size and largely unscaled fore- and hindwings (Daniel, 1955).

Figure 1 – *Stygiodes colchicus* (Herrich-Schäffer, 1851) ♂ paratype (Turkey)

This genus has a Mediterranean and west Asian range, and representatives are not known to occur in Africa (Vári *et al*., 2002; Viette, 1990). It was obvious that the two specimens found in the Ditsong Museum belonged to a hitherto unrecorded southern African genus. A closer inspection, however, revealed the absence of some typical characters of Cossidae, such as the median cell in the forewings and the frenular bristles of the hindwings. Finally, the examination of the genitalia showed that the individuals are not cossids but belong, instead, to the related family Metarbelidae. This family is a characteristic Afrotropical group, with the majority of taxa occurring in sub-Saharan Africa (Gaede, 1929) and two species in Madagascar (Viette, 1990). Only a few species are recorded from south-east Asia. Species with translucent wings, however, are not known in described taxa of Metarbelidae, neither in Africa nor in Asia. The translucent appearance of the wings of *Janegoodallia* Lehmann, 2014 is not the result of an unscaled membrane but due to the presence of transparent scales. In addition to this exceptional character, the shape of the wings and the venation deviate remarkably from the known genera of Metarbelidae. The two individuals cannot be included easily in any of the existing genera. Without any doubt, the specimens belong to an undescribed species, which simultaneously represents a new, undetected phylogenetic lineage in the family. The results of the morphological examination prompted the author to establish a new genus to accommodate this new species.

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METHODS AND MATERIALS

Dissection of genitalia was performed according to the procedure described in Robinson (1976). The genitalia were embedded in Euparal. Chlorazol Black was used for staining. Prior to embedding the cleared genitalia on microscope slide, they were drawn using a camera lucida attached to a Leica MZ12 compound microscope. Photographic documentation of the imago and genitalia was done with a Nikon Coolpix 990. Type label data are quoted verbatim: quotation marks (") signify data on a single label, a forward slash (/) indicates the end of a line of print. The terminology

used in the description of the species follows Mey (2011) with the exception of aedoeagus, which is replaced by phallus.

Abbreviations

DMNH = Ditsong Museum of Natural History, Pretoria, Gauteng, South Africa.

DESCRIPTION OF NEW TAXA

***Dukearbela* gen. nov.**
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Type species: *D. translucens* spec. nov. Gender of genus: feminine. Description: see description of *D. translucens* spec. nov., below.

Diagnostic characters: Forewings elongate, twice as long as broad, costa slightly concave, apex broadly rounded; termen oblique, merging into broadly rounded tornus. Hindwings ovate, half the length of the forewings, evenly and broadly rounded; costa convex, with broad coastal field; both wings translucent, normal scaling along wing margins and in the anal and cubital field of the forewings; forewing venation with weak media in cell, areole absent, R3+R4+R5 stalked from upper edge of cell, Cu2 well developed close to wing margin, anal vein with long, basal loop; hindwing venation with traces of M in cell, upper radial vein fused with SC close to wing base; RS and M1 connected by long cross-vein. Middle- and hind- tibia with terminal spurs only, epiphysis very long, covered by thick scaling of tibia.

Etymology: The generic name is composed of the family name "Duke" and the suffix "arbela", which is often used as a suffix in genera of Metarbelidae. The c name honours the memory of Arthur and Neville Duke, enthusiastic father and son lepidopterists, whose collections are now preserved in the DMNH.

***Dukearbela translucens* spec. nov.** (Figs 2–4)
urn:lsid:zoobank.org:act:31BFB174-79A2-4CA4-A78B-06BE94EC628E

Holotype ♂, **South Africa**, KwaZulu-Natal.
"Sordwana Bay/ 22-23.ix.1974/ J. & H. Potgieter" (DMNH)
Paratype ♂, **South Africa**, Eastern Cape.
"Transkei/The Haven / 7/9 1985/ N.J. Duke leg.", genitalia slide Mey 70/17 (DMNH).

Description. Male (Figs 2–4): length of forewing 9–10 mm; wingspan 19–21 mm (n = 2). Frons and vertex with dense, long vestiture; labial palpi with long, spreading hairs. Antennae bipectinate, with 47–50 rami pairs, covered on all sides with small cilia, rami short, five times longer than shaft, becoming shorter towards tip, antennal shaft scaled dorsally. Scape and patagia with yellow-white, piliform scales; thorax grey-brown on dorsal side. Dorsal sides of forelegs with long and dense, grey scale brushes; spurs 0.2.2., epiphysis present. Wing venation depicted in Fig. 2.

Fore- and hindwings with grey-white scales along wing margin and at anal and costal fields; centre of wings nearly unscaled, with some tiny and scattered, needle-like scales on dorsal and ventral sides of translucent membrane, sometimes grouped to form short, black striae; veins somewhat darker than membrane; dark spots on marginal apex of veins in both wings; hindwing frenulum absent. Abdomen long, with dorsal scale tuft on segment II and with long terminal brush of scales on segment VIII and IX. The specimens depicted in Figs 3 and 4 are somewhat greased.

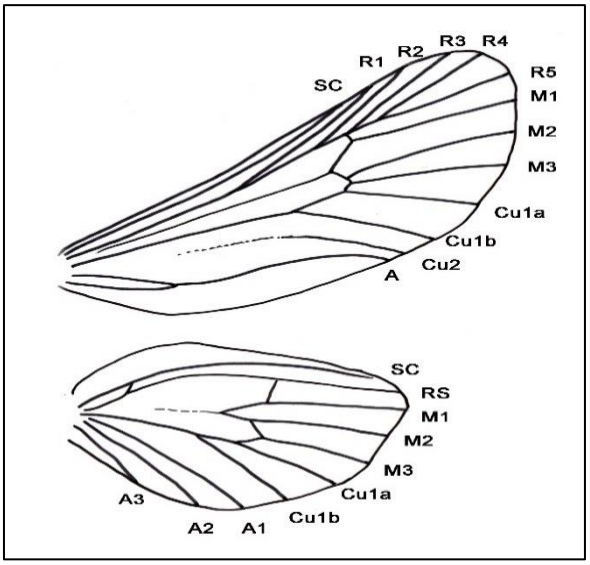


Figure 2 – *Dukearbela translucens* ♂ wing venation

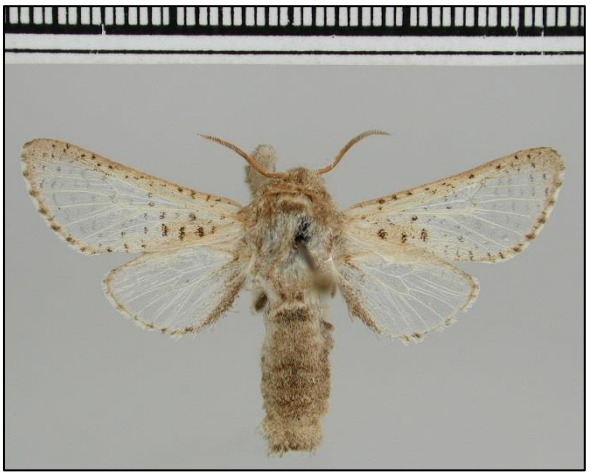
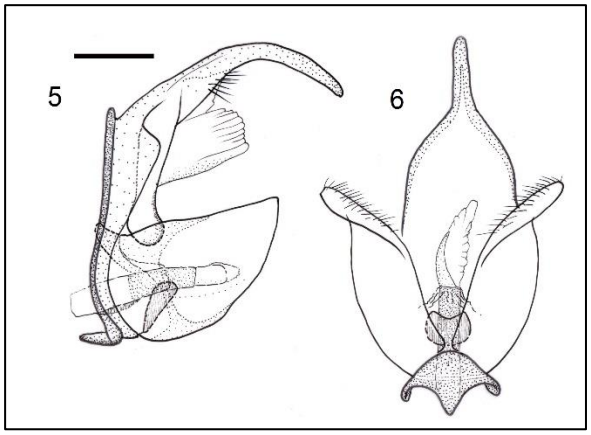


Figure 3 – *Dukearbela translucens* ♂ holotype

Figure 4 – *Dukearbela translucens* ♂ paratype

Male genitalia (Figs 5 & 6): Tegumen and vinculum fused to a ring-like structure, anterior margin strongly sclerotized; vinculum with short, triangular saccus; uncus with broad basis, narrowed in the middle (in dorsal view) and terminating as a long, slender and down-curved horn. Valvae triangular, apices membranous, bent laterad; juxta plate-like with concave distal margin; phallic apparatus straight and short, not longer than valvae, shaft around anellus sclerotized, vesica without cornuti.



Figures 5 & 6 – *Dukearbela translucens*, male genitalia: 5 –lateral view, 6 – ventral view (scale bar: 0.5 mm).

DISCUSSION

The Metarbelidae were downgraded to subfamily within Cossidae by Edward *et al*. (1998). Later, it was considered again as a family in its own right (De Prins & De Prins, 2018). At this stage its systematic position and rank is still unresolved pending a molecular analysis of Cossoidea.

The most significant distinguishing characters of the new genus are the wide, translucent areas on the fore- and hindwings. These areas are not entirely devoid of scales, but the scales that are present are tiny, needle-like and are widely scattered on the colourless membrane. This feature alone makes the genus unmistakable. When using the identification key of Janse (1925), which is based on wing venation and presence of spurs, the new species keys out at *Salagena* Walker, 1865. Indeed, the wing venation of the new genus is closer to *Salagena* than to other genera of Metarbelidae in Africa. It differs from *Salagena* by the presence of a long anal loop in the forewings (which is absent or small in *Salagena*), by the fusion of R with SC near the base of the hindwings (the fusion is close to the middle of SC in *Salagena*) and in the long cross-vein rs-m (short in *Salagena*). The shape of the forewings is elongate, without a clear tornal corner of the termen, which usually gives the forewings the approximately triangular form present in the many genera of Metarbelidae. In contrast to wing venation, the male genitalia of *Dukearbela* gen. nov. differ greatly from the architecture of *Salagena*. The slender segment IX with the short saccus, the long and slender uncus and the compact juxta are similar to species of the genus *Teragra* Walker, 1855. This genus is a heterogeneous assemblage of very small to very large species (Mey, 2011), and their inclusion in one and the same genus appears to be doubtful. The systematic position of the new genus cannot be defined at the moment and any associations are left to future findings and new material of this obviously very rare species, whose female and biology are as yet unknown.

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