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## **A new species of the genus *Ceridia* ROTHSCHILD & JORDAN, 1903 (Lepidoptera: Sphingidae, Smerinthini) from Ethiopia.**

**Harald SULAK, Stefan NAUMANN & Thomas J. WITT**

### **Abstract**

A new species of the genus *Ceridia* ROTHSCHILD & JORDAN, 1903, *Ceridia quirini* nov.sp., is described and illustrated from Ethiopia. A comparison of the habitus and male genitalia is done with those of its closest relative, *Ceridia mira* ROTHSCHILD & JORDAN, 1903. There are found several obvious differences in the external appearance as well as differences in the shape of male genitalia structures between *Ceridia quirini* nov.sp. and its closest relative *Ceridia mira*.

Key words: Lepidoptera, Afrotropical region, new species, taxonomy, *Ceridia*

### **Zusammenfassung**

Aus Äthiopien wird eine neue Schwärmer-Art der Gattung *Ceridia* ROTHSCHILD & JORDAN, 1903, *Ceridia quirini* nov.sp., beschrieben und illustriert. Der Habitus und das männliche Geschlechtsorgan werden mit der nächstverwandten Art *Ceridia mira* ROTHSCHILD & JORDAN, 1903, verglichen. Es sind mehrere deutliche Unterschiede in der äußeren Erscheinung sowie in der Form der männlichen Genitalien zwischen *Ceridia quirini* nov.sp. und ihrer nächsten Verwandten *Ceridia mira* festzustellen.

## Introduction

The genus *Ceridia* contains few species occurring in the northern subtropical parts of Africa, plus two endemic species in Madagascar. Species are confined to thornbush savannah and grassland habitats (CARCASSON 1976: 42). In continental Africa so far following taxa are described:

*C. heuglini* (C. & R. FELDER, 1874), occurring in Uganda, Sudan, and Ethiopia [described from "Abyssinia" in the genus *Smerinthus* LATREILLE, [1802]];

*C. mira* ROTHSCHILD & JORDAN, 1903, known from Kenya and Tanzania [locus typicus: Western side of Luitpold Mts., near Ikutha, British East Africa];

*C. agilei* MELICHAR & ŘEZÁČ, 2013, known from RCA and Burkina Faso [locus typicus: RCA, Bamingui-Bangoran Prov., 75 km SSW Ndélé], and replacing *C. heuglini* in West Africa; with subspecies

*C. agilei occidentalis* MELICHAR & ŘEZÁČ, 2013, from Cameroon, Chad, and Ghana [locus typicus: Cameroon (N), Wak].

An overlook about the then known details of the genus was published by CARCASSON (1976), giving also extensive details of generic diagnosis. His statements were almost copied one by one by D'ABRERA (1986: 83) later on who figured specimens from the Natural History Museum nicely. MELICHAR & ŘEZÁČ (2013) separated the West African populations of *C. heuglini* as a separate taxon.

During an informal meeting of the senior author in The Natural History Museum, London, in February 2015 some material of the genus *Ceridia* brought along was discussed with I. Kitching. Also he immediately considered it as specifically distinct sister species of *C. mira*.

The new species *C. quirini* nov.sp. is described below.

### ***Ceridia quirini* SULAK, NAUMANN & WITT, nov.sp.**

**H o l o t y p e :** ♂, Ethiopia, Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak (in coll. Museum Witt Munich).

**P a r a t y p e s :** 6 ♂♂, 1 ♀: 5 ♂♂, 1 ♀ Ethiopia, Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak, (genitalia slides MWM 25.398 and 25.310) (coll. Museum Witt Munich); 1 ♂, Ethiopia, Sidamo Pr., 10 km SE Konda, [SNNPR Region, 10 km SE Konso] 1150 m, N 05°18', E 37°28', IV.[20]07 (coll. Melichar, Sphingidae Museum Orlov; this specimen was used for DNA-barcode sequencing).

## Etymology

The new species is named in honour of Quirin Ponnath, the son of the lucky collector of the holotype. The species name derives from his first name.

## Description

Forewing length of ♂ (from the base to the apex of the right forewing) 21–23 mm, antennae 9 mm, abdomen 12 mm. Forewing length ♀, 27 mm, antennae 9 mm, abdomen 13 mm.

Important diagnostic features are the shape of the head and the antennae:

The antennae of the male and the female are bipectinated, but in female the rami are shorter. Wings, thorax and abdomen are of a yellowish sandy brown colour. There is a darker dorsal shadow, which divides both parts of the thorax and the first abdominal segment. First and second abdominal segment fuscous brown, darker coloured than the remaining abdomen. Thorax with dorsal band which does not surround the abdomen. The forewings display a rectangular dorsal patch, divided by an indistinct shadow (sometimes weakly developed).

The border of the conspicuous costal area in the medium field towards the apex of the forewing is straight in *mira*, but convex in *quirini* nov.sp. The postmedian band in *quirini* nov.sp. is indistinct and weakly developed (in one specimen absent), while sharply developed and full of contrast in *mira*. Outer margin of the forewings moderately curved and unruffled in *quirini* nov.sp., but rather straight and wavy in *mira*. A fine yellowish-brown marginal line of the forewings is a diagnostic feature of *quirini* nov.sp., and not seen in the other congeners.

A further characteristic feature of *quirini* nov.sp. and *mira* is the whitish apical streak of the forewings, which is somewhat variable in its shape. The hindwing pattern contrastingly developed. The postmedian field darker than in the forewings. The submarginal area of the hindwing rather fuscous brown coloured in *mira*, but in *quirini* nov.sp. weaker visible. The fringes uniform sandy brown, but in *mira* brown-blackish chequered.

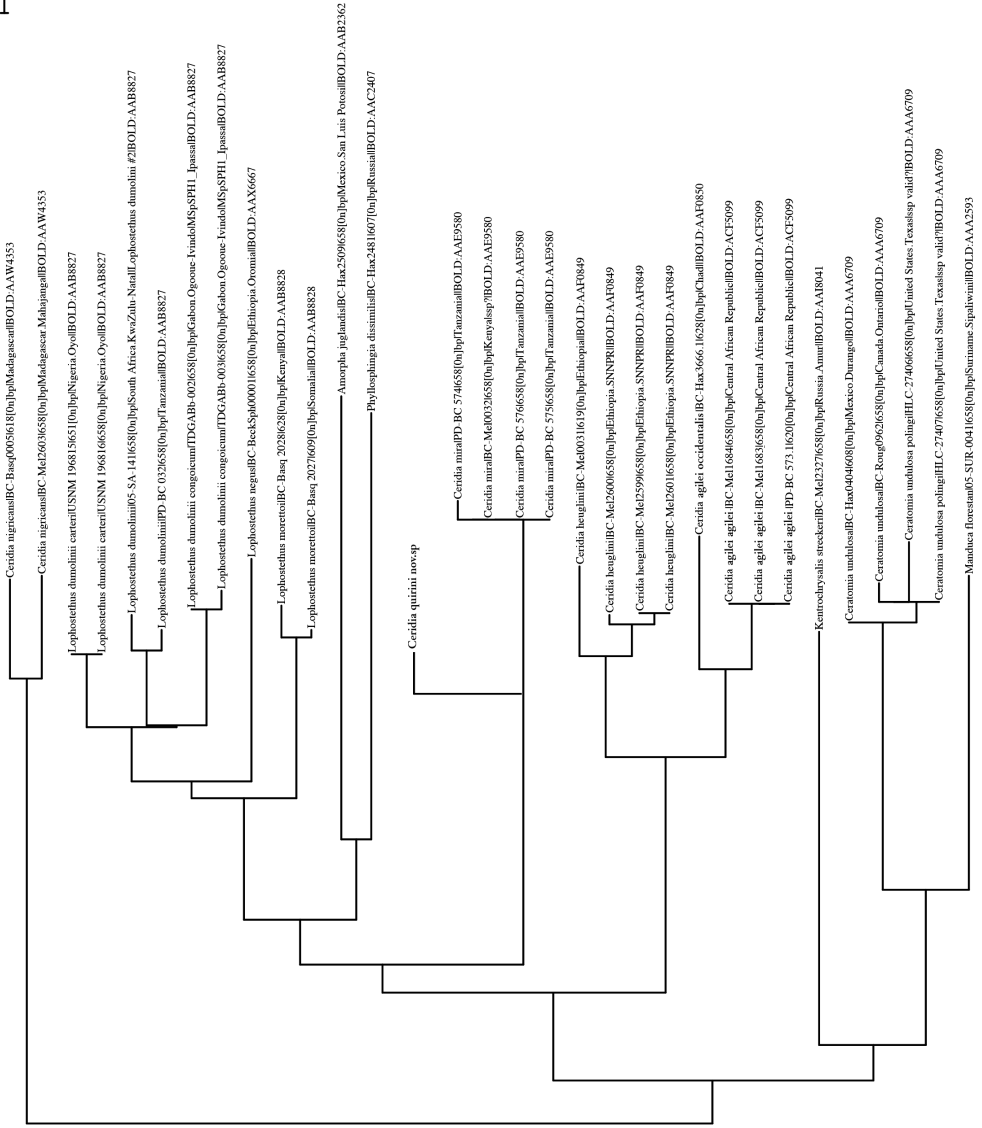
The male genitalia of *quirini* nov.sp. resemble those of *mira*, but differ in several important structures as follows:

The rectangular shaped uncus slightly broader in *quirini* nov.sp., compared with *mira*. The sclerotized structure of the tegumen below the uncus displays in its central part a pointed protuberance, which is much smaller and not pointed in *mira*.

The sacculus of the valves displays a convex curved, elongated and pointed tip, whereas in *mira* this part is rather concave and more rounded than pointed. The second appendix of the sacculus is significantly larger in *quirini* nov.sp. in comparison to *mira*. A diagnostic feature for separating both species is seen in the shape of the juxta. The shape of a reversed bulbous spire is much more robust in *quirini* nov.sp. and does not show a convex part toward the tip as in *mira*. The phallus of *quirini* nov.sp. resembles *mira* in its shape. The everted endophallus of both species bears a serrated row of numerous strongly sclerotized cornuti of variable size.

The morphological aspects used for specific diagnosis were supported by the results found in the BOLD project of the University of Guelph, Canada (details see RATNASINGHAM & HEBERT 2007) within the mt-DNA COI barcode analysis. The barcode sequence of the here described *C. quirini* nov.sp. resulted from analysis in the Czech Central European Institute (CEITEC), Brno, and was combined with others from the Guelph project which resulted in the figured NJ-tree. In this tree *C. mira* and *C. quirini* nov.sp. are sisterspecies, and *C. heuglini* with *C. agilei* on the other side which fits very well with morphological aspects such as the unusual antenna morphology of *C. mira* and *C. quirini* nov.sp. (see also KITCHING & CADIOU 2000: 1). *C. nigricans* GRIVEAUD, 1959 from Madagascar is here widely separated from all other *Ceridia* species. Standing of some other Sphingidae species inside this tree is shown for comparison, mainly with African species, but also from other continents.

1%



**Table 1**

**Fig. 1:** *Ceridia quirini* nov.sp., ♂, Ethiopia, Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak, (coll. MWM).

**Fig. 2:** *Ceridia quirini* nov.sp., ♂, holotype, underside.

**Figs. 3:** *Ceridia quirini* nov.sp., ♀, paratype, Ethiopia, Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak, (coll. MWM).

**Figs. 4:** *Ceridia quirini* nov.sp., ♀, paratype, underside.

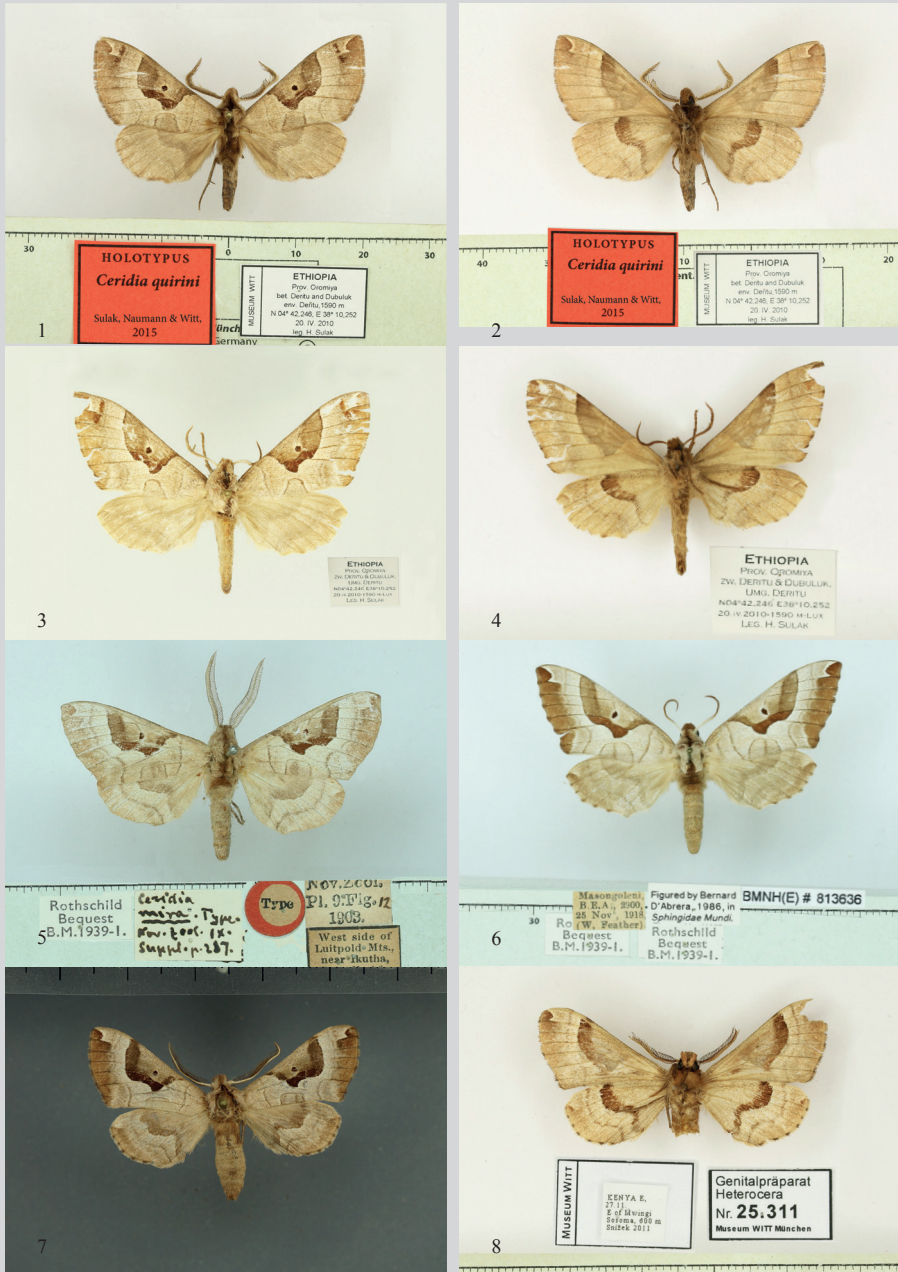
**Fig. 5:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♂, holotype, [Kenya], West side of Luitpold Mts., near Ikutha, Brit. E. Afr.; "Type"; holotype, (coll. BMNH).

**Fig. 6:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♀, [Kenya], Masongoleni, B.E.A. 2900, 25 Nov, 1918 (W. Feather); Rothschild Bequest B.M. 1939-I; Figured by Bernard D'ABRERA, 1986, in *Sphingidae Mundi*; BMNH(E) # 813636; (BMNH).

**Fig. 7:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♂, [Ethiopia], Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak, (coll. MWM).

**Fig. 8:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♂, [Kenya E], E of Mwingi, Sosoma, 600 m, 25.11.2011, leg. Snižek, MWM(E) # 25.311; (coll. MWM).

Table 1



## Table 2

**Figs. 1:** *Ceridia quirini* nov.sp., ♂, paratype, Ethiopia, Oromia Region, road between Deritu and Dubuluk, env. Deritu, 1.590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak (Gen.Präp. No. MWM 25.398) (coll. MWM).

a) Genitalia apparatus; b) phallus.

**Figs. 2:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♂, Kenya (E), 27.XI., E of Mwingi, Sosama, 600m, [leg.] Snižek (Gen.Präp. No. MWM 25.311) (coll. MWM).

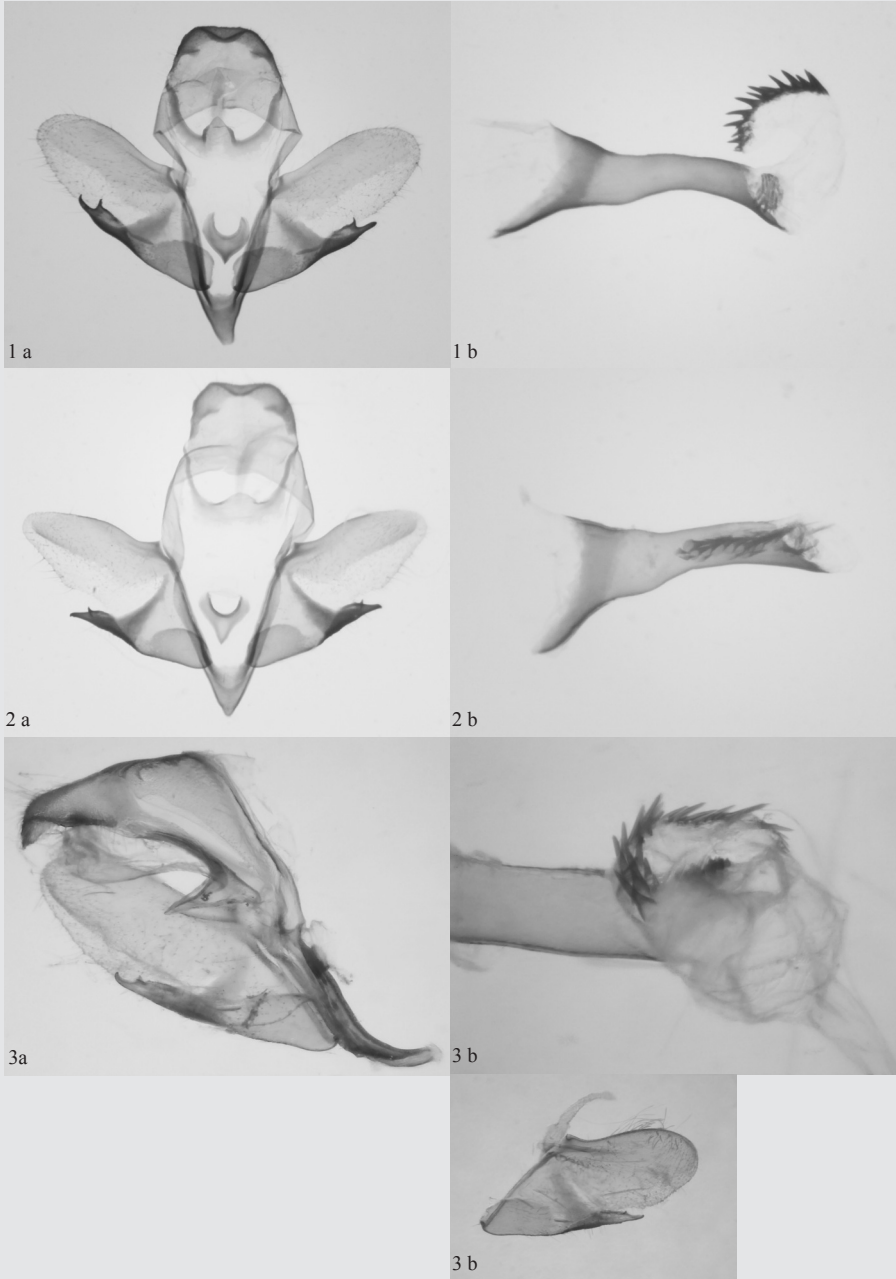
a) Genitalia apparatus; b) phallus.

**Figs. 3:** *Ceridia mira* ROTHSCHILD & JORDAN, 1903, ♂, holotype, [Kenya], West side of Luitpold Mts., near Ikutha, Brit. E. Afr.; "Type" (BMNH).

a) Genitalia apparatus; b) everted endophallus; c) right valve.



**Table 2**

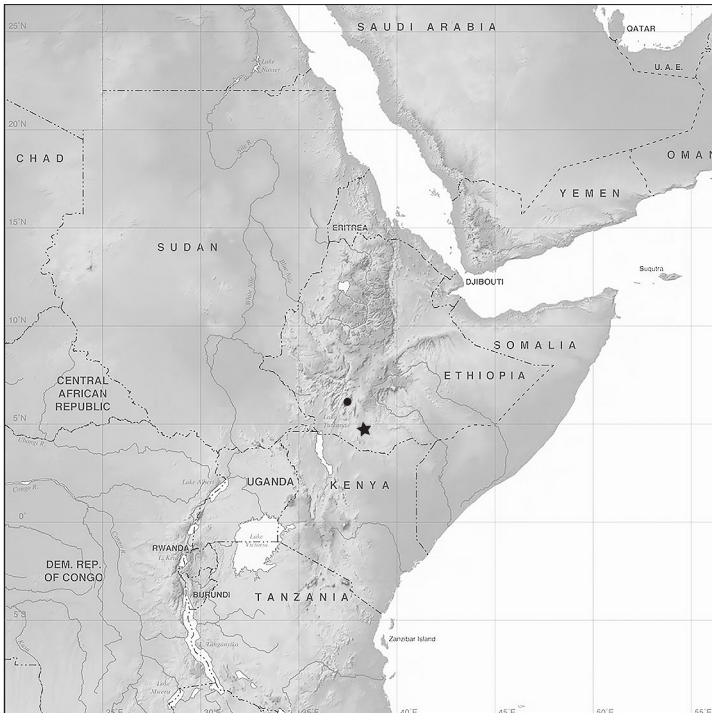


## Bionomics



**Fig. 1:** Locus typicus of *Ceridia quirini* nov.sp. in southern Ethiopia, Oromia Region, near Dubuluk at 1.590 m.

## Distribution



**Fig. 2:** Ethiopia, Oromia Region, between Deritu and Dubuluk, env. Deritu, 1590 m, N 04° 42.264', E 38°10.252', 20.IV.2010, leg. H. Sulak

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