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Diogodiasia Yakovlev – New Genus of Cossinae (Lepidoptera, Cossidae) from Madagascar with descriptions of two new species

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Abstract
The article describes *Diogodiasia* Yakovlev gen. n. (type species: *Cossus crassilineatus* Gaede, 1929) and two new species *Diogodiasia catalai* Yakovlev sp. n. and *Diogodiasia martini* Yakovlev sp. n. from the Madagascar. We establish a new combination, *Diogodiasia crassilineatus* (Gaede, 1929) comb. n. The detailed diagnosis is given. The article is illustrated with 14 figures.

Key words: biodiversity, Cossoidea, Asia, Paleotropics, taxonomy.

Introduction

Cossidae (Lepidoptera) of Madagascar are relatively well studied. Currently, we know 26 species, all of them are endemics (Yakovlev 2015; De Prins & De Prins 2022). The nominative subfamily Cossinae includes 3 genera: *Hirtocossus* Schoorl, 1990 (type species, by original designation – *Cossus cirrilator* Le Cerf, 1919), *Rambuasalama* Yakovlev & Saldaitis, 2008 (type species, by original designation – *Rambuasalama augustasi* Yakovlev & Saldaitis, 2008), and *Planctogystia* Schoorl, 1990 (type species, by original designation – *Cossus breviculus* Mabille, 1879).

Gaede (1929-1930) described *Cossus crassilineatus* Gaede, 1929 on a series of specimens, deposited in Natural History Museum (London, U.K.) from Madagascar, Diego Suarez. Viette (1951: 135) allocated the lectotype *C. crassilineatus* and synonymized it with *C. brevicolus*. Schoorl (1990: 61–62) allocated the genus *Planctogystia* and did not support the synonymy suggested by Viette, indicating *P. crassilineatus* (Gaede, 1929) as a separate species.

We have studied the genital morphology of the paralectotype (male) of this little studied species, and several close species from Madagascar, which clearly differ from other representatives of the nominative subfamily. Below we give a description of the new genus and two new species of Cossinae from Madagascar. Additionally, the male genital morphology of the little studied taxon *crassilineatus* is provided for the first time.

Material and methods

The images of adults were taken by the camera of Canon EOS 70D and illuminated in lightbox. The male genitalia slides were examined with a Zeiss Stemi 2000 C microscope and Olympus SZX16 microscope. The images were taken with the Olympus SZX16 camera. The photos were enhanced and arranged to plates with CorelDraw software. The genital preparations were made according to the method of Lafontaine & Mikkola (1987) and Lafontaine (2004). The morphological terminology used in the description follows Kristensen (2003).

Material deposited in the:
MNHN Muséum National d'Histoire Naturelle (Paris, France),
MWM Museum Witt (Munich, Germany),
NHMUK Natural History Museum (London, U.K.).

Taxonomical part

Description of new taxa

Diogodiasia **Yakovlev gen. n.**
https://zoobank.org/urn:lsid:zoobank.org:act:865071AD-A728-413E-AE9F-A4C1C891AF94
Figs 1–7

Type species (by original designation) *Cossus crassilineatus* Gaede, 1929.

Description

Male. Moths of small size, not bigger than 30 mm in wingspan. Antenna short (from 1/3 to 1/2 of fore wing in length), bipectinate (setae 2–2.5 times longer than antenna rod diameter). Fore wing with poorly expressed pattern of thin lines, hind wing without pattern.

Male genitalia. Uncus narrow, edges almost parallel, apex acute of tapered; tegumen large; gnathos arms of medium thickness, long; gnathos robust, covered with fine spikes; valve with robust crest on costal margin (on border between medium and distal thirds), apex of valve poorly sclerotized, semicircular; transtilla process uncinate, long, apically acute; juxta compact, with long thick lateral processes; saccus semicircular, compact; phallus poorly curved, equal to valve in length, apically acute, vesica aperture in dorso-apical position, vesica without cornuti.

Diagnosis. The new genus clearly differs from all the Madagascar genera of Cossinae.

- *Hirtocossus* (Figs 8, 12) is much bigger, light-colored, has a crest with transverse ribs on the costal margin of the valve, on its inner surface;
- *Rambuasalama* (Figs 9, 13) is significantly bigger, the fore wing is elongated and narrow, the uncus is apically blunt;
- the species of the genus *Planctogystia* (Figs 10–11, 14) have a triangular uncus and a serrated crest on the costal edge of the valve.

The new species is mostly close to the genera *Planctogystia* (endemic for Madagascar) and *Brachylia,* widely distributed in Africa (type species, by monotypy – *Brachylia terebroides* Felder, 1874), from which it differs in the relatively narrow base of the uncus and in the smooth, not serrated crest on the costal margin of the valve.

Composition. The new genus includes three species.

Distribution. Madagascar.

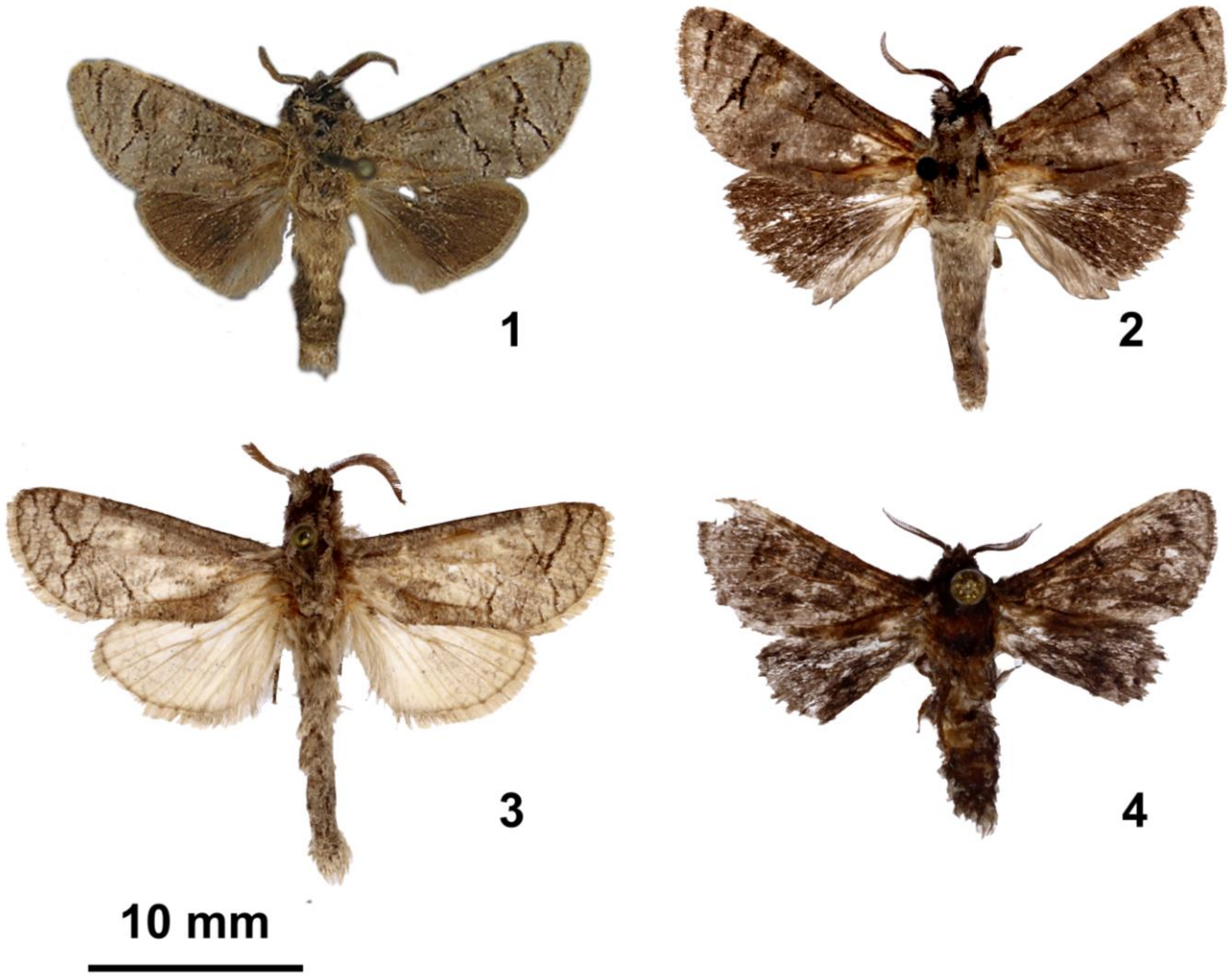
Etymology. I named the new genus in honor of the Diogo Dias, also known as Diogo Gomes, who was a 15th-century Portuguese explorer. Diogo Dias was the first European to sight the island of Madagascar.

***Diogodiasia crassilineatus* (Gaede, 1929) comb. n.**
Figs 1–2, 5

Material examined (all NHMUK). Lectotype, male, [Madagascar], Diego Suarez [Antsiranana], 23 April [19]17, (G. Melou). Paralectotype, male, Diego Suarez, 10 Sept. [19]17 (G. Melou) // NHMUK individual number 012832438 // slide NHMUK: 010315471.

Description. Male genitalia. Uncus basally narrow, with parallel edges, apex tapered; tegumen robust; gnathos arms of medium thickness, long; gnathos robust, covered with fine spikes; valve with robust crest on costal edge (on border between medium and distal third), sclerotized rib on inner surface of valve (about 1/3 of valve in width), apex of valve poorly sclerotized, semicircular; transtilla process uncinate, long, apically acute; juxta compact with long lateral thick processes; saccus semicircular, compact; phallus poorly curved, thin, equal to valve in length, apically acute, vesica aperture in dorso-apical position, about 1/3 of phallus in length, vesica without cornuti.

Diagnosis. The species differs from the other representatives of the genus in the fine reticulated pattern of black lines on the dark-brown fore wing and in the apically tapered uncus.



Figures 1–4. Adult specimens (males) of *Diogodiasia* Yakovlev, gen. n. (NHMUK): 1. *D. crassilineatus* (Gaede, 1929), lectotype; 2. *D. crassilineatus* (Gaede, 1929), paralectotype (NHMUK individual number 012832438); 3. *D. catalai* Yakovlev sp. n., holotype; 4. *D. martini* Yakovlev sp. n., holotype.

Figures 5–7. Male genitalia of *Diogodiasia* Yakovlev, gen. n.: 5. *D. crassilineatus* (Gaede, 1929), paralectotype; 6. *D. catalai* Yakovlev sp. n., holotype; 7. *D. martini* Yakovlev sp. n., holotype.

***Diogodiasia catalai* Yakovlev sp. n.**
https://zoobank.org/urn:lsid:zoobank.org:act:448E08BC-29FE-4820-BF47-C84D2E9DB3B0
Figs 3, 6

Material (NHMUK). Holotype, male, Amboasary [25°3′S / 46°23′E], R. Mandrare, [Anosy Region], S. Mad.[agascar], (R. Catala, 1934) // NHMUK individual number 012832487 // slide NHMUK: 010315518.

Description. Male. Antenna bipectinate, setae three times longer than antenna rod diameter. Length of fore wing 13 mm. Fore wing light-creamy with poorly expressed sputtering of brown scales (more expressed in anal area), thin dark-brown bands postdiscally and submarginally, poorly noticeable reticulated pattern of wavy brown lines in marginal and submarginal area. Hind wing light-creamy without pattern. Fringe on all wings light-creamy.

Male genitalia. Uncus basally narrow, with parallel margins from base to middle of length, gradually narrowing distally, apically acute; tegumen robust; gnathos arms of medium thickness, long; gnathos robust, covered with fine spikes; valve with robust crest on costal margin (on border between medium and distal third), sclerotized rib on inner surface of valve (about 1/2 of valve in width), apex of valve poorly sclerotized, semicircular; transtilla process hook-like, long, apically acute; juxta compact with long thick lateral processes; saccus semicircular, compact; phallus poorly curved, very thick, with two small prongs on ventral surface in distal third, equal to valve in length, with obliquely cut, acute apex, vesica aperture in dorso-apical position, about 1/2 of phallus in length, vesica without cornuti.

Female unknown.

Diagnosis. The new species differs from the other species of the genus in the very light coloring, very thick phallus with two small prongs on the ventral surface in distal third.

Distribution. Southern Madagascar, Anosy Region.

Etymology. The new species is named after the type specimen collector, Dr. René Catala, a famous French entomologist and hydrobiologist who worked for a long time in Madagascar, and later participated in the creation of the French Institute of Oceania in New Caledonia in 1946 (Hladik 2014; Meunier 2016).

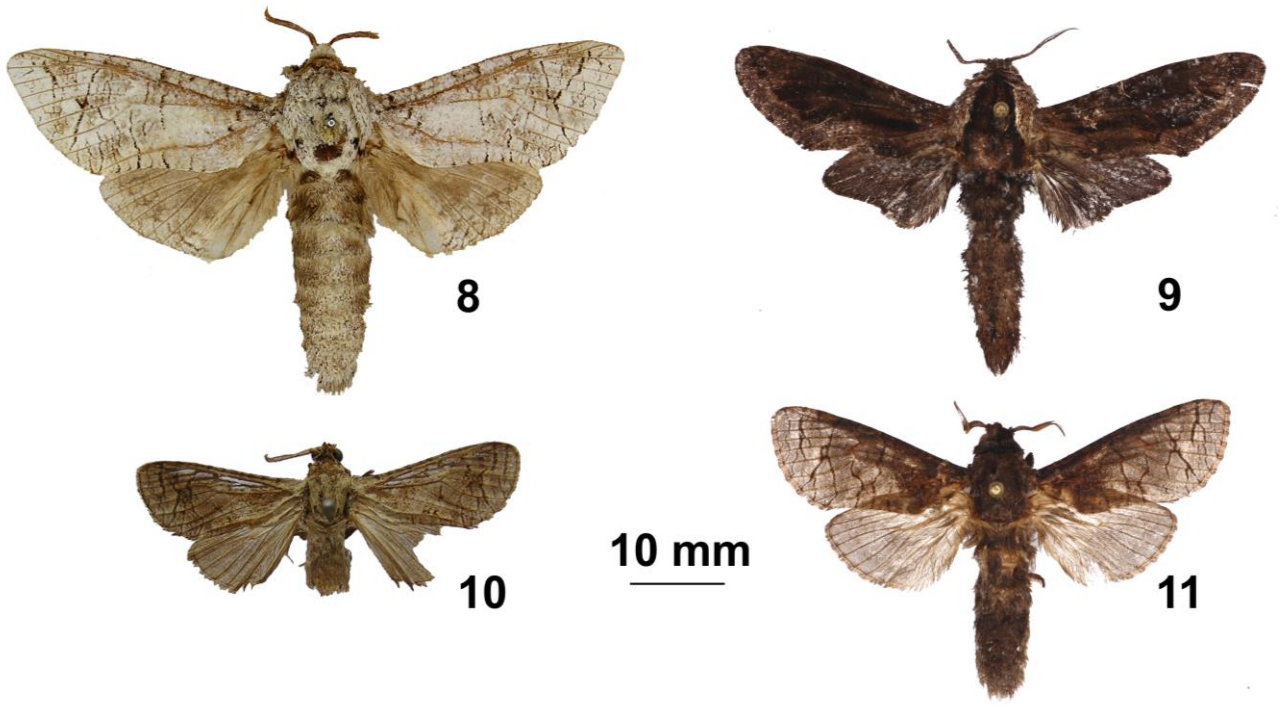
***Diogodiasia martini* Yakovlev sp. n.**
https://zoobank.org/urn:lsid:zoobank.org:act:B81B1F62-67B4-49AB-AF6F-6D29D70EF724
Figs 4, 7

Material (NHMUK). Holotype, male, Madagascar, Province Mahajanga, Tsingi de Namoroka N.P., 16º28.154′S, 45º20.890′E, at MV light, 125 m, 02–12.ix.2012, G. Martin, BMNH(E) 2012-141 // NHMUK individual number 012832540 // slide NHMUK: 010315557.

Description. Male. Antenna bipectinate, setae 3 times longer than antenna rod diameter. Length of fore wing 11 mm. All wings dark-brown, pattern poorly visible due to poor condition of the specimen, very dark portions noticeable discally and postdiscally. Hind wings without pattern.

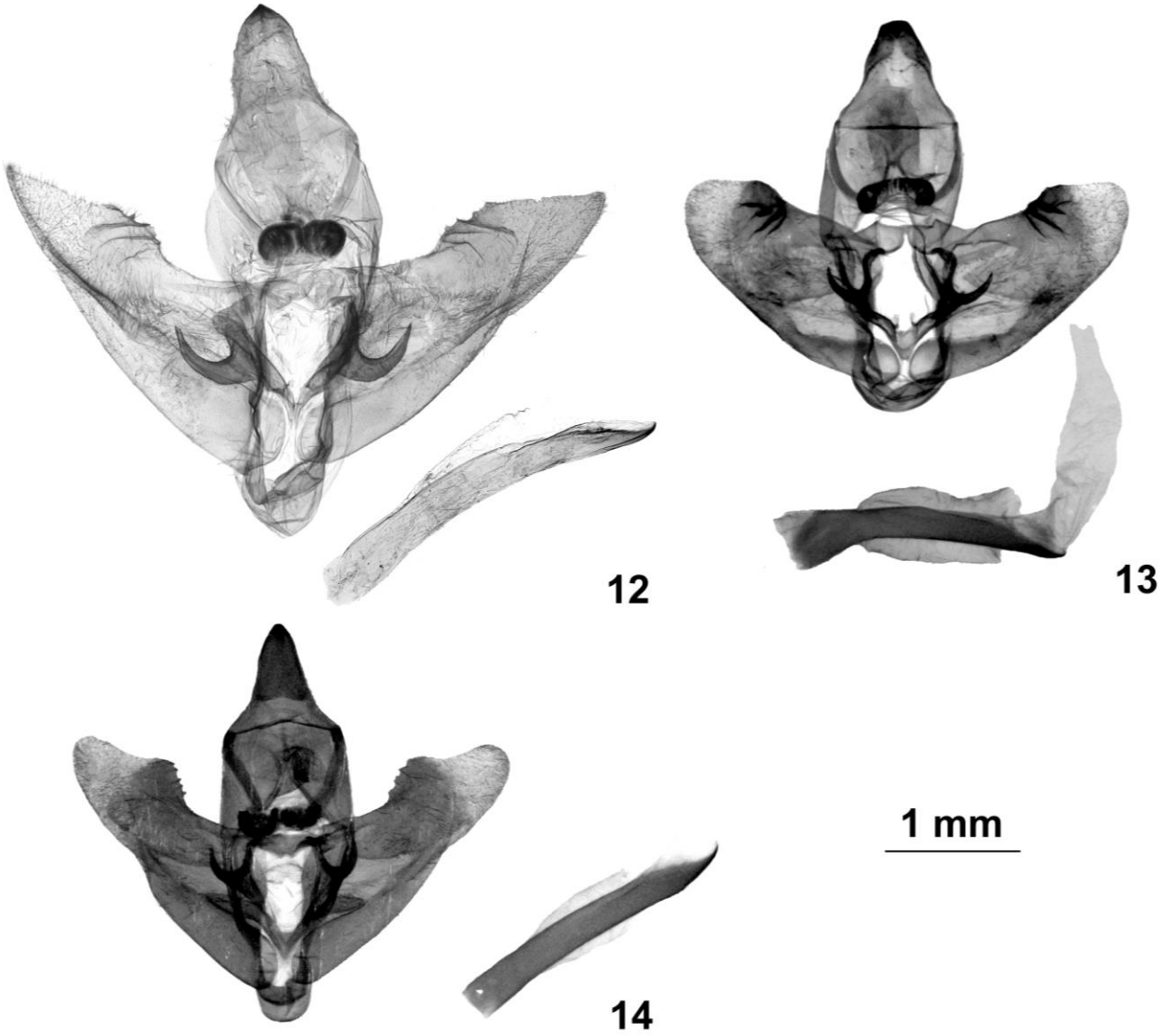
Male genitalia. Uncus basally narrow, with parallel margins from base to middle of length, gradually narrowing distally, apically acute; tegumen robust; gnathos arms of medium thickness, long; gnathos robust, covered with fine spikes; valve with robust crest on costal margin (on border between medium and distal third), sclerotized rib on inner surface of valve (about 1/4 of valve in width), apex of valve poorly sclerotized, semicircular, wide; transtilla process hook-like, with thick basal end, long, apically acute; juxta compact, with long thick lateral processes; saccus semicircular, compact; phallus poorly curved, thin, equal to valve in length, with obliquely cut, acute apex, vesica aperture in dorso-apical position, about 1/2 of phallus in length, vesica without cornuti.

Female unknown.



Figures 8–11. Adult specimens (male) of Cossinae: 8. *Hirtocossus crucis* (Kenrick, [1914]), holotype (NHMUK); 9. *Rambuasalama augustasi* Yakovlev & Saldaitis, 2008, Madagascar, Province Fianarantsoa, Ranomafana National Park, Centre Valbio, 917 m, 21º15.249′S, 47º25.313′ E, 4–21.xi.2005, G. Martin, D.L.G. Quicke & L.P. Holland, BMNH(E) 2005-205 (NHMUK individual number 012832543); 10. *Planctogystia breviculus* (Mabille, 1879), holotype (MNHN); 11. *Planctogystia breviculus* (Mabille, 1879), Madagascar, Province Mahajanga, Tsingi de Namoroka N.P., 16º28.154′S, 45º20.890′E, at MV light, 125 m, 02–12.ix.2012, G. Martin, BMNH(E) 2012-141 (NHMUK individual number 012832538).

Diagnosis. The new species clearly differs from other species of the genus in the very dark coloring and in the relatively wide apex of the valve. From *D. crassilineatus* it differs in the acute apex of the uncus; from *D. catalai* – in the thin phallus without prongs on the ventral surface.



Figures 12–14. Male genitalia of Cossinae: 12. *Hirtocossus crucis* (Kenrick, [1914]), Madagascar, Ranomafana, 40 km NE Fianarantsoa, 900 m, 16–22.xi.2003, leg. S. Murzin & A. Shamaev (Genitalpräparat Heterocera Nr. 33.163 MWM), 13. *Rambuasalama augustasi* Yakovlev & Saldaitis, 2008 (slide NHMUK: 010315560); 14. *Planctogystia breviculus* (Mabille, 1879) (slide NHMUK: 010315555).

Etymology. The new species is named after the type specimen collector, Mr. Geoff Martin, a Senior Curator in Charge, Lepidoptera in NHMUK.

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