



New records of six moth (Lepidoptera: Erebiidae, Lasiocampidae) species in south African countries, with comments on their distribution

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Abstract

Background

Southern Africa hosts a high diversity of ecosystems and habitats with a tremendous diversity of Lepidoptera. Although it is one of the most studied parts of the Afrotropics, the knowledge on diversity and distribution of south African moth fauna remains insufficient. To partly fill this gap, we surveyed macromoths by automatic light traps in five localities in two relatively less sampled south African countries.

New information

We reported six species and one genus (*Remigioides*) of moths which had not yet been recorded in Namibia or Zimbabwe. Although none of these records broadened the known distribution of individual species to a new biogeographical region, they still fill important

gaps in their distributions. The known distributional ranges of two species have been substantially extended, although they are still within the same biogeographical regions: ca. 800 km southwards for *Remigioides remigina* (Mabille, 1884) and ca. 600 km westwards for *Haplopacha cinerea* Aurivillius, 1905.

Keywords

Afrotropics, faunistic report, light trapping, savannahs, southern African region, Zambezi region

Introduction

The south African countries offer a wide variety of biomes, from deserts and grasslands to woodland savannahs. Some of them are considered to be biodiversity hotspots, such as the Succulent Karoo, the Cape Floristic Province and the Maputaland-Pondoland-Albany (Myers et al. 2000, Mittermeier et al. 2004). Besides these unique ecosystems, most of southern Africa is covered by open and woodland savannahs belonging to two distinct bioregions: the Southern African region and the Zambezi region (Linder et al. 2012). For some taxa (including many groups of plants, mammals and birds), parts of these savannahs are known to harbour a species richness similar to Afrotropical rainforests (Murphy et al. 2016).

However, knowledge on the diversity and distribution of macromoths (Lepidoptera: Macroheterocera, hereinafter referred as *moths*) in these regions is uneven. Due to the long tradition of entomological research, the moth fauna of South Africa is relatively well known, with ca. 7,300 taxa identified in De Prins and De Prins (2020). In comparison, the neighbouring countries of Namibia and Zimbabwe are only represented by ca. 1,500 and 3,000 moth taxa, respectively, in the same database.

Our recent sampling of moths in savannahs of Namibia and Zimbabwe resulted in more than 12,000 trapped individuals. Amongst these, we identified six moth species recorded for the first time in one or the other of the two countries. Here, we present the sampled material of these six species, with remarks on their general distribution and their reported expansion.

Materials and methods

All reported moth specimens were collected in five localities in Namibia and Zimbabwe (Figs 1, 2, Table 1) in 2016 and 2017. The nomenclature for biogeographical region follows Linder et al. (2012). Vegetation units are based on Burgess et al. (2004), Sayre et al. 2013, Heppner (1991) and Hacker (2019) (Table 1).

Table 1.

List of the localities and habitats where the moth specimens have been collected.

Locality	Country	Biogeographical region	Sampling dates	Altitude (m a.s.l.)	Habitat
Bwabwata National Park	Namibia	Zambezeian	18-20/11/2016	1,050	mosaic of <i>mopane</i> woodland, secondary grasslands and <i>Baikiaea plurijuga</i> forests
Grootfontein	Namibia	Southern African	15/16/2016	1,200	mosaics of <i>Vachellia</i> woodland, mixed with <i>mopane Colophospermum mopane</i> (Fabaceae) and <i>Baikiaea</i> (Lamiaceae), and microphyllous savannahs
Namibgrens	Namibia	Southern African	04/11/2016	1,150 to 1,800	dry savannahs and shrubby areas with scattered trees
Hwange	Zimbabwe	Zambezeian	13/12/2017	950	mosaic of miombo woodland, savannahs and shrubs and <i>mopane</i> (<i>Colophospermum mopane</i>) woodlands
Victoria Falls	Zimbabwe	Zambezeian	13-14/12/2017	900	mosaic of <i>mopane</i> woodland, secondary grasslands and <i>Baikiaea plurijuga</i> forests

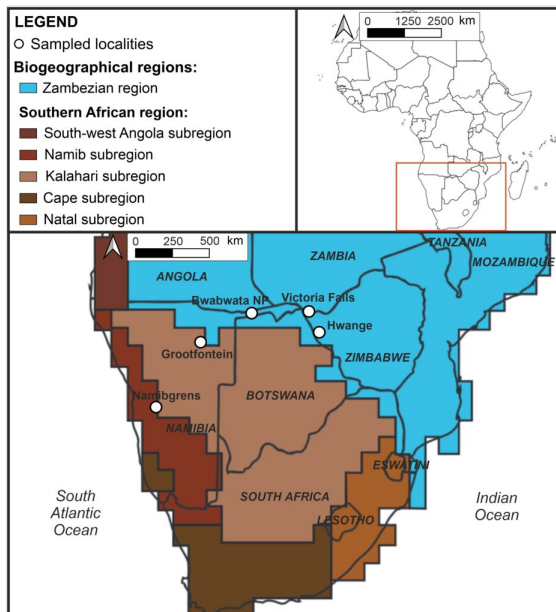


Figure 1. doi

Map of the biogeographical regions and subregions in outhern Africa (modified after Linder et al. 2012), with positions of the study localities.

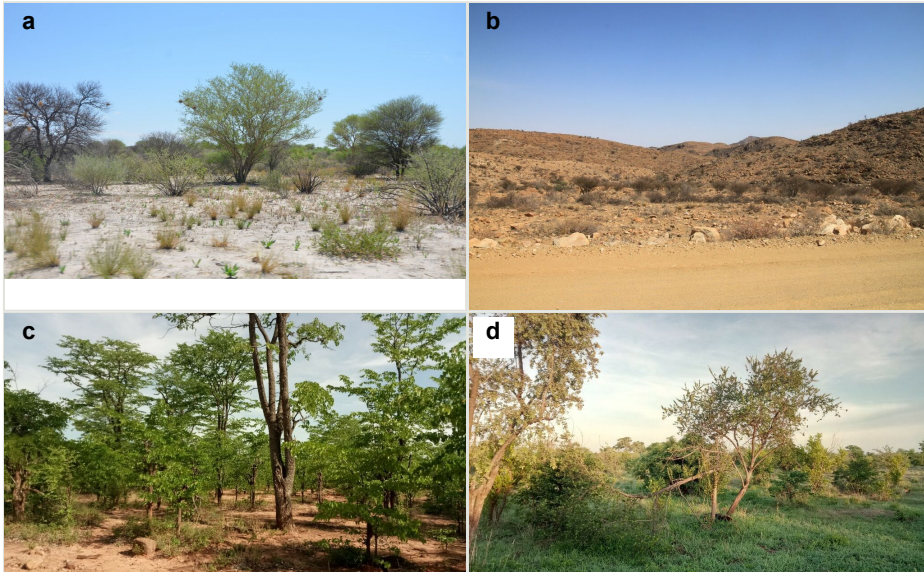


Figure 2.

Selected sampled habitats.

a: Mosaics of *Vachellia* woodland, mixed with *mopane* (*Colophospermum mopane*) and *Baikiaea* and microphyllous savannahs (Grootfontein). [doi](#)

b: Dry savannahs and shrubs with scattered trees (Namibgrens). [doi](#)

c: Mosaic of miombo woodland, savannahs and shrubs and *mopane* (*C. mopane*) woodlands (Hwange). [doi](#)

d: Mosaic of *mopane* (*C. mopane*) woodland, grasslands and *Baikiaea plurijuga* forests (Bwabwata National Park, Victoria Falls). [doi](#)

All moths were attracted by light. The traps consisted of a two-sided strip of 48 LEDs emitting UV light and powered by 12V batteries placed at the intersection of three plexiglass panels placed on top of a plastic bucket. Attracted specimens were anaesthetised by ammonium hydrogen carbonate. More than 12,000 individuals were trapped. Nine families were focused on (i.e. Erebidae, Eutellidae, Noctuidae, Notodontidae, Eupterotidae, Lasiocampidae, Saturniidae, Sphingidae and Limacodidae) and, after removing non-focused groups (mainly Geometridae), our dataset comprised 9,048 specimens belonging to 488 species or morphospecies, based mostly on external morphology using various available literature, including numerous online resources. Genitalia dissection was done when needed and the exhaustive collection in the Nature Education Centre (Krakow, Poland) was consulted for confirmation of some species identification. From this material, six reliably identified species appeared to be new country records; these are included in this report.

Nomenclature and distribution of the reported species were based on the AfroMoths online database (De Prins and De Prins 2020), on the Global Biodiversity Information Facility data infrastructure (GBIF.org 2020), on the LepiMAP database (LepiMAP 2014) and on the

Barcoding of Life Data System (Ratnasingham and Hebert 2007). The voucher material is deposited in the Nature Education Centre of Jagiellonian University in Krakow, Poland.

Taxon treatments

Plecoptera sarcistis Hampson, 1910

Nomenclature

Erebiidae, Anobinae

Materials

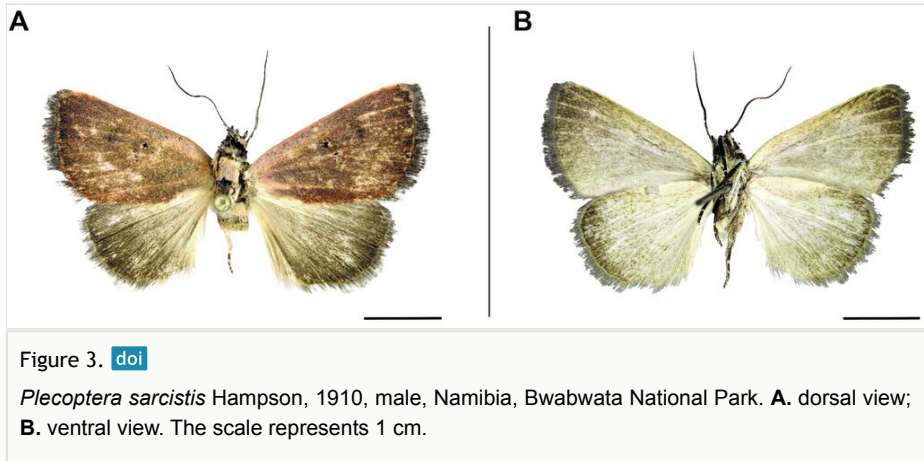
- a. scientificName: *Plecoptera sarcistis* Hampson, 1910; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,018 m; decimalLatitude: -18.1170; decimalLongitude: 21.6797; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Plecoptera sarcistis* Hampson, 1910; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,042 m; decimalLatitude: -18.0688; decimalLongitude: 21.6702; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 2; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Plecoptera sarcistis* Hampson, 1910; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,044 m; decimalLatitude: -18.0592; decimalLongitude: 21.6872; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 1; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- d. scientificName: *Plecoptera sarcistis* Hampson, 1910; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,051 m; decimalLatitude: -18.0545; decimalLongitude: 21.6954; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 2; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- e. scientificName: *Plecoptera sarcistis* Hampson, 1910; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,047 m; decimalLatitude: -18.0498; decimalLongitude: 21.7035; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 7; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

Description

The identification was based on Hampson (1910).

Distribution

This species is recorded for the first time in Namibia. All reported specimens were collected in the Bwabwata National Park belonging to the Zambebian biogeographical region. In this region, the species was already known from Zimbabwe and Zambia and it was also already recorded in the neighbouring Southern African region. Therefore, its distribution in north-eastern Namibia could be expected (Fig. 3).



Hypopyra africana (Kirby, 1896)

Nomenclature

Erebidae, Erebininae

Materials

- a. scientificName: *Hypopyra africana* (Kirby, 1896); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Victoria Falls; verbatimElevation: 927 m; decimalLatitude: -17.9018; decimalLongitude: 25.7634; samplingProtocol: Light-trapping; eventDate: 14/12/2017; individualCount: 2; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Hypopyra africana* (Kirby, 1896); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Victoria Falls; verbatimElevation: 969 m; decimalLatitude: -17.9099; decimalLongitude: 25.7487; samplingProtocol: Light-trapping; eventDate: 14/12/2017; individualCount: 1; sex: female; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Hypopyra africana* (Kirby, 1896); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Victoria Falls; verbatimElevation: 908 m; decimalLatitude: -17.8281; decimalLongitude: 25.6568; samplingProtocol: Light-trapping;

eventDate: 13/12/2017; individualCount: 2; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

- d. scientificName: *Hypopyra africana* (Kirby, 1896); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Victoria Falls; verbatimElevation: 909 m; decimalLatitude: -17.8416; decimalLongitude: 25.6446; samplingProtocol: Light-trapping; eventDate: 13/12/2017; individualCount: 1; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

Description

The identification of this species was based on photograph of the type specimen in De Prins and De Prins (2020) and comparison with the original description in Kirby (1896).

Distribution

Our records expand the known distribution of the species to Zimbabwe. *Hypopyra africana* was previously reported from the Somalian (Kenya), Zambezan and Southern African regions, including countries bordering with Zimbabwe (Botswana, Namibia, South Africa, Zambia). All six reported specimens were found near Victoria Falls and partially fill the gap in our knowledge of the distribution of this species (Fig. 4).

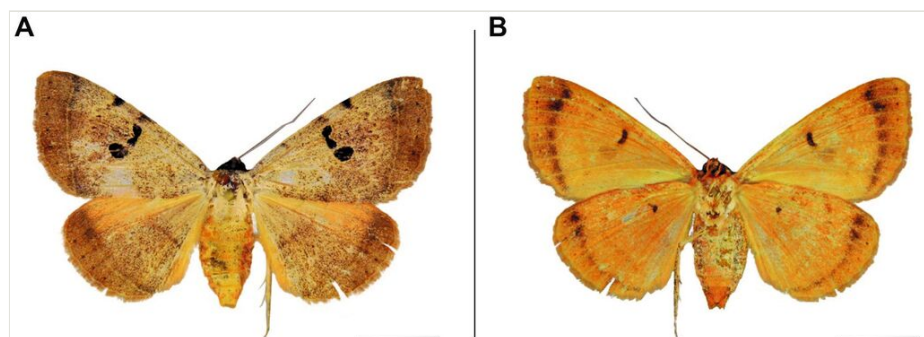


Figure 4. [doi](#)

Hypopyra africana (Kirby, 1896), female, Zimbabwe, Victoria Falls. **A.** dorsal view; **B.** ventral view. The scale represents 1 cm.

Remigiodes remigina (Mabille, 1884)

Nomenclature

Erebidae, Erebininae

Materials

- a. scientificName: *Remigiodes remigina* (Mabille, 1884); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Hwange; verbatimElevation: 1,033 m; decimalLatitude: -18.7051; decimalLongitude: 26.2039; samplingProtocol: Light-trapping; eventDate: 13/12/2017; individualCount: 3; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URLhttp://grbio.org/cool/8t1f-g2z6; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Remigiodes remigina* (Mabille, 1884); continent: Africa; country: Zimbabwe; stateProvince: Matabeleland North; locality: Hwange; verbatimElevation: 1,014 m; decimalLatitude: -18.6954; decimalLongitude: 26.1880; samplingProtocol: Light-trapping; eventDate: 13/12/2017; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URLhttp://grbio.org/cool/8t1f-g2z6; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

Description

The detailed diagnosis made by Hacker (2016) enabled identification of this species.

Distribution

Our four captured individuals represent the first record of *R. remigina* in Zimbabwe. It is also the first record of *Remigiodes* in the country. This widespread species was already known from the Guinean (Togo, Nigeria), Congolian (Democratic Republic of Congo), Somalian (Ethiopia, Somalia and Kenya) and Zambezian (Tanzania) biogeographic regions and from Madagascar. Our record extended its known continental distribution range by ca. 800 km southwards (Fig. 5).

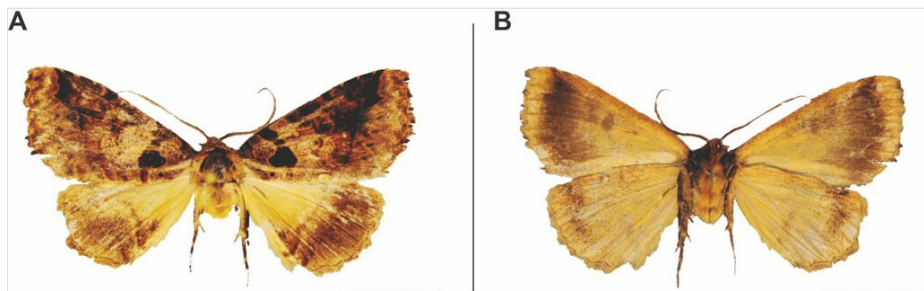


Figure 5. [doi](#)

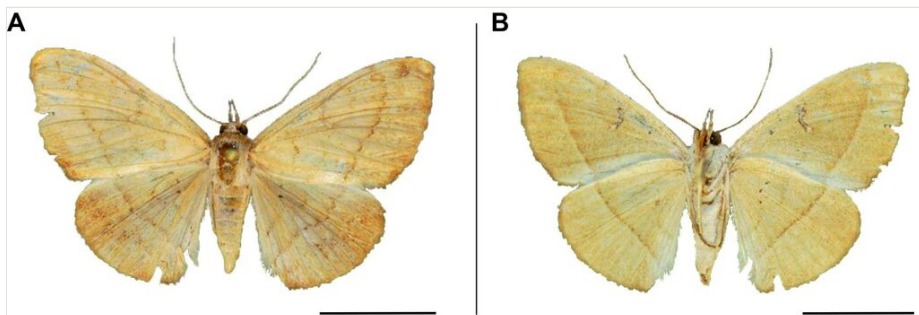
Remigiodes remigina (Mabille, 1884), male, Zimbabwe, Hwange. **A.** dorsal view; **B.** ventral view. The scale represents 1 cm.

Taviodes subjecta* (Walker, 1865)*Nomenclature**

Erebidae, Pangraptinae

Materials

- a. scientificName: *Taviodes subjecta* (Walker, 1865); continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,042 m; decimalLatitude: -18.0688; decimalLongitude: 21.6702; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 1; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URIhttp://grbio.org/cool/8t1f-g2z6; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Taviodes subjecta* (Walker, 1865); continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,044 m; decimalLatitude: -18.0642; decimalLongitude: 21.6784; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 1; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URIhttp://grbio.org/cool/8t1f-g2z6; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Taviodes subjecta* (Walker, 1865); continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,044 m; decimalLatitude: -18.0592; decimalLongitude: 21.6872; samplingProtocol: Light-trapping; eventDate: 20/11/2016; individualCount: 1; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URIhttp://grbio.org/cool/8t1f-g2z6; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

Figure 6. [doi](#)

Taviodes subjecta (Walker, 1865), male, Namibia, Bwabwata National Park. **A.** dorsal view; **B.** ventral view. The scale represents 1 cm.

Description

The identification of this species was based on Pinhey (1975).

Distribution

We report this species for the first time in Namibia. It was already known from several countries in the Congolian (Democratic Republic of Congo), Somalian (Kenya), Zambezi and Southern African biogeographic regions, including South Africa, Zimbabwe and Zambia, all bordering with Namibia (Pinhey 1975). All three specimens were collected in the Bwabwata National Park, in the Zambezi region (Fig. 6).

Haplopacha cinerea Aurivillius, 1905

Nomenclature

Lasiocampidae, Lasiocampinae

Materials

- a. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,026 m; decimalLatitude: -18.1118; decimalLongitude: 21.6717; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,018 m; decimalLatitude: -18.1170; decimalLongitude: 21.6797; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 8; sex: 2 females, 6 males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,009 m; decimalLatitude: -18.1237; decimalLongitude: 21.6862; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- d. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,025 m; decimalLatitude: -18.1308; decimalLongitude: 21.6923; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- e. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,017 m; decimalLatitude: -18.1375; decimalLongitude: 21.6990; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID:

GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

- f. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Khomas Region; locality: Namibgrens; verbatimElevation: 1,769 m; decimalLatitude: -23.6517; decimalLongitude: 16.2934; samplingProtocol: Light-trapping; eventDate: 4/11/2016; individualCount: 1; sex: female; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- g. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Otjozondjupa Region; locality: Grootfontein; verbatimElevation: 1,210 m; decimalLatitude: -19.2951; decimalLongitude: 18.7968; samplingProtocol: Light-trapping; eventDate: 15/11/2016; individualCount: 3; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen
- h. scientificName: *Haplopacha cinerea* Aurivillius, 1905; continent: Africa; country: Namibia; stateProvince: Otjozondjupa Region; locality: Grootfontein; verbatimElevation: 1,219 m; decimalLatitude: -19.3909; decimalLongitude: 18.8282; samplingProtocol: Light-trapping; eventDate: 16/11/2016; individualCount: 1; sex: males; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

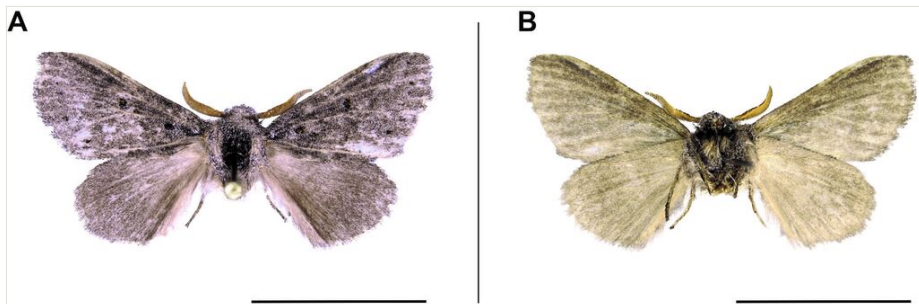


Figure 7. [doi](#)

Haplopacha cinerea Aurivillius, 1905, male, Namibia, Bwabwata National Park. **A.** dorsal view; **B.** ventral view. The scale represents 1 cm.

Description

The genitalia dissection and the diagnosis of this species made by Dupont et al. (2016) enabled identification of our specimens.

Distribution

Our specimens represented the first record of this species in Namibia. We collected them in the Zambezian (Bwabwata National Park) and Southern African (Namibgrens, Grootfontein) regions. This species was previously reported from these two

biogeographical regions only, with records from numerous countries from Tanzania to South Africa. In South Africa, the species was known only from the north-eastern parts of the country (Dupont et al. 2016). Hence, our records substantially extended its known distribution range westwards (Fig. 7).

Laeliopsis punctuligera Aurivillius, 1911

Nomenclature

Lasiocampidae, Lasiocampinae

Material

- a. scientificName: *Laeliopsis punctuligera* Aurivillius, 1911; continent: Africa; country: Namibia; stateProvince: Kavango East; locality: Bwabwata National Park; verbatimElevation: 1,018 m; decimalLatitude: -18.1170; decimalLongitude: 21.6797; samplingProtocol: Light-trapping; eventDate: 18/11/2016; individualCount: 1; sex: male; lifeStage: adult; identifiedBy: Sylvain Delabye; dateIdentified: 2019; type: PhysicalObject; institutionID: GRBIO URI<http://grbio.org/cool/8t1f-g2z6>; institutionCode: ZMJU; basisOfRecord: PreservedSpecimen

Description

The identification of this species was based on Pinhey (1975).

Distribution

Our single specimen is the first record of this species in Namibia. It was collected in the Bwabwata National Park, belonging to the Zambebian biogeographical region. The species was previously known from only this region, including from Zambia and Zimbabwe bordering with Namibia. Therefore, extension of its distribution into the Caprivi Strip in north-eastern Namibia is not surprising (Fig. 8).

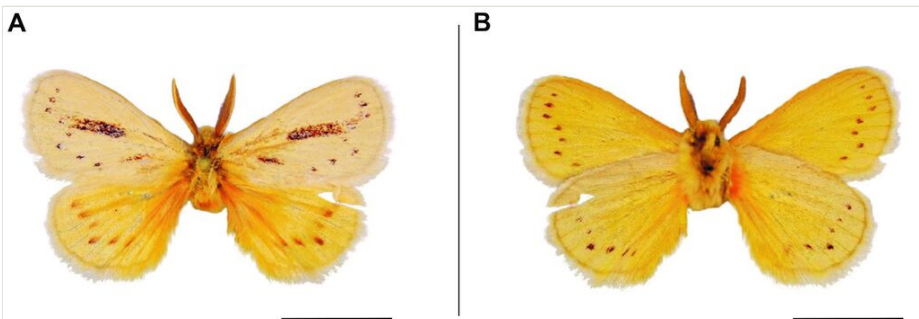


Figure 8. [doi](#)

Laeliopsis punctuligera Aurivillius, 1911, male, Namibia, Bwabwata National Park. **A.** dorsal view; **B.** ventral view. The scale represents 1 cm.

Discussion

We presented records of six species of moths (*Plecoptera sarcistis*, *Hypopyra africana*, *Remigiodes remigina*, *Taviodes subjecta*, *Haplopacha cinerea* and *Laeliopsis punctuligera*) newly reported to occur in one or the other of the two sampled countries. Altogether, we reported four species so far not recorded in Namibia and two species so far not recorded in Zimbabwe. Additionally, the genus *Remigiodes* was reported for the first time in Zimbabwe.

All of these species could have been expected in the reported countries because they were previously known to occur in either the Southern African or Zambezan region, whilst four species (except *R. remigina* and *L. punctuligera*) occur in both. All but *R. remigina* were already reported from one or several adjacent countries.

Even though most of the presented new country records could have been expected, at least two of our findings substantially extend the species' known distribution. The nearest known distribution of *R. remigina* prior to our study was from the Democratic Republic of the Congo. Therefore, our records extend its known distribution by ca. 800 km southwards, although still within the Zambezan geographic region. *Haplopacha cinerea* was previously known from both studied regions. Still, our records from central Namibia extended its known distribution by ca. 600 km westwards.

We consider the presented new country reports as additional evidence of the insufficient knowledge of moth diversity in the Afrotropics. Although the result of a relatively non-intensive sampling effort, our records did increase the number of moth taxa recorded in both countries. Since those records either extend the known distribution of particular species or fill gaps in their continuous distribution, we consider reporting of moth records even from such non-intensive sampling as interesting and highly important for improving our knowledge of diversity and distribution of south African moths.

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Author contributions

All authors collected the materials. SD prepared part of the material for identification and identified all reported specimens. SD and RT wrote the manuscript, which was later commented upon and approved by all co-authors.

References

- Burgess N, Underwood E, Dinerstein E, Olson D, Itoua I, Schipper J, Ricketts T, Newman K (2004) Terrestrial ecoregions of Africa and Madagascar: a conservation assessment. Island Press, Washington, 501 pp.
- De Prins J, De Prins W (2020) Afromoths, online database of Afrotropical moth species (Lepidoptera). <http://www.afromoths.net/>. Accessed on: 2020-9-25.
- Dupont S, Simonsen TJ, Zilli A (2016) Haplopacha (Lepidoptera: Lasiocampidae) reviewed: Four new species, first descriptions of the genitalia of both sexes, and unique alar scale organs. *Zootaxa* 4109 (4): 445-457. <https://doi.org/10.11646/zootaxa.4109.4.3>
- GBIF.org (2020) GBIF Home Page. <https://www.gbif.org>. Accessed on: 2020-11-09.
- Hacker HH (2016) Systematic and illustrated catalogue of the Macroheterocera and Cossioidea Leach, [1815], Zygaenoidea Latreille, 1809, Thyridoidea Herrich-Schäffer, 1846 and Hyblaeoidea Hampson, 1903 of the Arabian Peninsula, with a survey of their distribution (Lepid.). *Esperiana* 20 (1): 1-742.
- Hacker HH (Ed.) (2019) Moths of Africa. Systematic and illustrated catalogue of the Heterocera (Lepidoptera) of Africa. Volume 1. Biogeography; Boletobiinae (Lepidoptera, Noctuoidea, Erebidae). Hermann H. Hacker - Esperiana, Bad Staffelstein.
- Hampson GF (1910) Zoological collections from Northern Rhodesia and adjacent territories: Lepidoptera Phalaenae. *Proceedings of the Zoological Society of London* 1910 (2): 439-440.
- Heppner JB (1991) Faunal regions and the diversity of Lepidoptera. *Tropical Lepidoptera*. Volume 2, Supplement 1. ATL., 85 pp.
- Kirby WF (1896) On a collection of moths from East Africa formed by Dr. W. J. Anson, Medical Officer to the Uganda Administration. *Annals and Magazine of Natural History* (6) 18 (107): 375-376, pls 36-41. <https://doi.org/10.1080/00222939608680473>
- LepiMAP (2014) The atlas of African Lepidoptera. <http://lepimap.adu.org.za>. Accessed on: 2020-11-09.
- Linder HP, de Klerk H, Born J, Burgess N, Fjeldså J, Rahbek C (2012) The partitioning of Africa: statistically defined biogeographical regions in sub-Saharan Africa. *Journal of Biogeography* 39 (7): 1189-1205. <https://doi.org/10.1111/j.1365-2699.2012.02728.x>
- Mittermeier RA, Robles Gil P, Hoffman M, Pilgrim J, Brooks T, Mittermeier CG, Lamoreux J, Da Fonseca GA (2004) Hotspots Revisited. Mexico City: CEMEX.
- Murphy B, Andersen A, Parr C (2016) The underestimated biodiversity of tropical grassy biomes. *Philosophical Transactions of the Royal Society B: Biological Sciences* 371 (1703). <https://doi.org/10.1098/rstb.2015.0319>
- Myers N, Mittermeier R, Mittermeier C, da Fonseca GB, Kent J (2000) Biodiversity hotspots for conservation priorities. *Nature* 403 (6772): 853-858. <https://doi.org/10.1038/35002501>

- Pinhey EG (1975) Moths of Southern Africa. Tafelberg, Cape Town, 273 pp.
- Ratnasingham S, Hebert PD (2007) bold: The Barcode of Life Data System (<http://www.barcodinglife.org>). Molecular Ecology Notes 7 (3): 355-364. <https://doi.org/10.1111/j.1471-8286.2007.01678.x>
- Sayre R, Comer P, Hak J, Josse C, Bow J, Warner H, Larwanou M, Kelbessa E, Bekele T, Kehl H, Amena R, Andriamasimanana R, Ba T, Benson L, Boucher T, Brown M, Cress J, Dassering O, Friesen B, Gachathi F, Houcine S, Keita M, Khamala E, Marangu D, Mokuia F, Morou B, Mucina L, Mugisha S, Mwavu E, Rutherford M, Sanou P, Syampungani S, Tomor B, Vall A, Vande Weghe J, Wangui E, Waruingi L (2013) A new map of standardized terrestrial ecosystems of Africa. Association of American Geographers, Washington, DC, 24 pp.