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First records of the *Eublemma deserta* (Staudinger, 1900)-species group from Saudi-Arabia (Lepidoptera, Erebidae, Boletobiinae) with description of a new species

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Abstract
The genus *Eublemma* Huebner, [1821] (Lepidoptera, Erebidae) is currently subdivided into nine species groups along diagnostic character states in the wing pattern and in the male and female genitalia. In this paper faunistic and taxonomic results on one of these species groups, the *Eublemma deserta* Staudinger, 1900 species group, are presented on the basis of specimens collected in Saudi-Arabia and in Oman. The specimens are attributed to two species. One of the two species is *Eublemma skoui* Fibiger, Hacker, 2004, which is reported as new to the entomo fauna of Saudi-Arabia. The diagnostic characters, the global distribution and the local distribution of this species on the Arabian Peninsula are commented on. Data on the phenology and macro-habitat choice of the newly discovered Saudi-Arabian populations are given. The other species is closest related to *Eublemma skoui* Fibiger, Hacker, 2004, however differs significantly in external and internal character states, namely in the scaling of the labial palpus, the shape of the valva, the shape of the clasper and the harpe, the shape of the saccus, the shape of the phallus apodeme and in the sclerotization of the vesica. These differential character states result in the description of the new species *Eublemma constricta* sp. nov. The adults and the male genitalia of the new species are described and figured. The female is unknown.

Keywords: Noctuoidea**,** eublemma, morphology, taxonomy, fauna, distribution, Arabian Peninsula

Introduction
The genus *Eublemma* Huebner, [1821] comprises 500 - 700 species and is thus one of the most diverse genera in the Noctuoidea superfamily. The vast majority of the species is distributed in the tropics and subtropics of the Old and the New worlds, with 50 species known from the Palearctic region and 234 species known from the Afrotropical zone (Hacker, 2019) [1]. The genus is attributed to the tribe Eublemmini Forbes, 1954, which is attributed to the quadrifine Erebidae.
The genus has been subdivided into the subgenera *Eublemma* Huebner, [1821], *Odice* Huebner, [1823], *Rhypagia* Nye, 1975. A most recent comprehensive revision of the Afrotropical species of the genus has been done in Hacker (2019) [1]. In this revision 83 new species are described and nine species groups in the eponymous subgenus are erected, one of which is the *Eublemma deserta* Staudinger, 1900 species group.
This species group is differentiated from the other species groups by the unicolorous whitish to yellowish forewings, the strongly reduced proboscis and the structure of the clasper-harpe complex, with the harpe basally broadened and distally exceeding the clasper. The vast majority of the species in this group is differentiable exclusively on the basis of internal character states in the genitalia. Diagnostic characters in the male genitalia are given in the shape of the uncus, the overall shape of the valva, the clasper-harpe complex and in the vesical surface of the phallus apodeme.
Till date, 21 species have been attributed to this species group, which are distributed in the Eremic, Oriental and Afrotropical zones, spanning the eremic parts of the Maghreb, the Levante, Northern India, Subsaharan Africa and the Arabian Peninsula. From the Arabian Peninsula one third of the species has been reported till date, four of them considered as endemic. Records have been reported from the south-eastern parts (UAE, Northern Oman) and the south-western parts (Dhofar, Yemen). No records have been known till date from Saudi-Arabia (Hacker, 2019, De Prins, De Prins, 2022) [1, 2]. Faunistic and taxonomic studies on the Arabian species have been done till date in Fibiger, Hacker (2002, 2004) [3, 4], Fibiger, Legrain (2009) [5], Hacker, Saldaitis (2010) [6], Hacker (2016) [7].

In this paper, the presence of the *Eublemma deserta* Staudinger, 1900 species group in Saudi-Arabia is reported for the first time on the basis of records of *Eublemma skoui* Fibiger, Hacker, 2004 from the southern Hedjaz and the northern Asir mountain systems. Furthermore, a new species *Eublemma constricta* sp.nov.closest related to *Eublemma skoui* Fibiger, Hacker, 2004 is described from Saudi-Arabia.

Materials and Methods

Sampling

The material presented is part of samples collected in Saudi-Arabia (provinces Mekka, Albaha, Asir) in April / May 2022 and in Oman (province Dhofar) in November 2021. The specimens were captured by night by means of two light traps. Each trap was equipped with four UV- Power-LEDs covering a wave spectrum of 365 nm – 385 nm (Nichia, Tokushima, Japan; Starlight, Weissenburg, Germany). The trapping technique applied is described in Brehm (2017) [8].

Macro-Preparation and Dissection

The adults were photographed after relaxation and subsequent preparation with a CANON EOS M6 Mark II under a MP-E-65mm zoom. For examining the genitalia, dissection, preparation and slide-mounting techniques were applied on the specimens on the basis of the protocol described in Robinson (1976) [9]. The preparation of the genitalia was done under a Motic stereomicroscope (SMZ-171). The slides were photographed with a Toup Cam c-mount camera (Toup Tek Inc., Zhejiang, China) under a resolution of 18 megapixels. The images were optimized by means of the imaging software Adobe Photoshop PS, Version 21.0.2.

Morphological Analyses

Analyses of wing pattern characters and morphological structures in the specimens were done on the images. Structural ratios were calculated on the images by means of the imaging software Toup View, Version 1.0 (Toup Tek Inc., Zhejiang, China). The adults and the genitalia slides of the sample were compared with the images in Fibiger, Hacker (2002, 2004) [3, 4], Hacker (2016, 2019) [1, 7].

Terminology and Abbreviations

The descriptions of external and internal character states follow the terminology and systematics in Hacker (2019) [1]. Abbreviations: ZSM = Zoological State Collection Munich, Germany.

Results and Discussion

Eublemma skoui Fibiger, Hacker, 2004

Material

Saudi-Arabia, Province Asir, 2km NE Sawi, 730 m, 01-V-2022, 2 ♂, slide no 22GP041, 22GP050, Saudi-Arabia, Province Mekka, Al Shafa Mt., 1700 m, 03-V-2022, 3 ♂, slide no 22GP042, 22GP044, 22GP049, Saudi-Arabia, Albaha Region, 5 km S Baljurashi, 2100 m, 02-V-2022, 4 ♂, slide no 22GP045, 22GP047, 22GP052, 22GP052. Oman, Dhofar, Jebel Samhan, Viewpoint, 1400 m, 05-XI-2021, slide no. 22GP054, leg. prep. et coll. M. Seizmair.

Diagnosis (Fig 1A-B, 2A, 3A, 4A-B)

Wingspan 13.2 mm – 22.7 mm. Proboscis rudimentary, length relative to the diameter of the eye 0.65, absolute length less than 1.5 mm, scaling ochreous. Labial palpus brownish-beige dorsally, greyish-white ventrally, with medial dilatation, acuminate anteriorly. Antenna filiform ciliate, flagellum concolorous with the proboscis, ciliae greyish-white. Thorax, abdomen and vertex ochreous interspersed with tufts of long greyish scales. Femur of the fore- and hind leg concolorous with the proboscis, tibia covered with greyish-white scales. Forewing upper side yellowish-grey. Presence of a transversal brownish streak going through the post medial reni form stigma. Presence of brownish interneural streaks. Hind wing upper side greyish-white, termen brownish. Fore- and hind wing fringes yellowish-white. Forewing underside greyish-brown, with the maculation as for the upper side (Fibiger, Hacker, 2004 [4]; Fig 1A-B, 2A). Uncus elongate, bent, apically strongly tapered, pointed and down-hooked, sub-apically flattened. Tegumen and vinculum broadened, pleurite absent. Saccus u-shaped, rounded. Valva medially broadened, maximum width relative to the total length 0.20. Basal costa sclerotised, postbasal costa with a convex dilatation. Ventral border sclerotised, medially slightly concave. Clasper basally strongly broadened, length relative to the width 0.8, apically smoothly rounded. Harpe of sigmoid shape, composed of a medial convex dilatation and two elongate, acuminate arms, total length relative to the length of the clasper 2.5. Cucullus apically constricted, evenly rounded. Basal sacculus constricted, acuminate, strongly sclerotized. Vesica bare from cornuti (Fibiger, Hacker, 2004 [4]; Fig 3A, 4A-B).

Distribution

South-western parts of the Arabian Peninsula: Yemen (Fibiger, Hacker, 2004; Hacker, 2016, 2019) [1, 4, 7], Oman, Dhofar (Hacker, 2016, 2019 [1, 7]; own observation). Northern Africa: Algeria, Levante: Jordan (Hacker, 2019) [1]. The species is reported as new to the entomofauna of Saudi-Arabia.

Bionomics (Fig 5): The present material was collected at night in an altitudinal spectrum from 700 m – 2100 m NN in densely vegetated mountain valleys and escarpments. The hitherto known material presented in Hacker, Fibiger (2004) [4], Hacker (2016, 2019) [1, 7] was collected in early spring from late January to the beginning of March. The material presented here however was collected in late spring, end of April / beginning of May in Saudi-Arabia and at the beginning of November in Dhofar. These data can be seen as evidence of multi-voltinity.

Eublemma constricta sp. nov.

Zoo bank ID

Urn:lsid:zoobank.org:act:0549AF1F-28EB-439D-89C1-844EB94CFB4A

Material

Holotype, ♂, Saudi-Arabia, Province Mekka, Al Shafa Mt., 1700 m, 03-V-2022, slide no 22GP048, leg. M. Seizmair, coll. ZSM. Paratypes: 1♂, Saudi-Arabia, Province Asir, 2km NE Sawi, 730 m, 01-V-2022, 2 ♂, slide no 22GP041, leg. et coll. M. Seizmair.

External characters (Fig 1C-D, 2B)

Wingspan of the holotype: 18.7 mm, wingspan of the paratype: 10.8 mm. Head: Antenna filiform ciliate, flagellum darkish-ochreous, ciliae white, length of the ciliae

relative to the width of the flagellum 1.17-1.67. Proboscis ochreous, short, length relative to the diameter of the eye 0.86. Labial palpus concolorous with the proboscis, upturned, constant in width, length relative to the diameter of the eye 1.25. Frons and vertex darkish-ochreous interspersed with tufts of greyish-white scales.

Thorax: Darkish-ochreous interspersed with tufts of greyish-white scales. Legs concolorous with the thorax, tibia covered with greyish-white scales.

Abdomen: whitish-yellowish dorsally, darkish-ochreous ventrally.

Forewing: Apex pointed, upturned. Termen straight up to Cu1, then angled. Upper side: Ground greyish-yellow. Cellular spots absent. Presence of several brownish transversal streaks on the M2 and M3. Costa darkish-yellow from the basis to the medial area, covered with brownish scales from the post medial area onwards. Presence of brownish intermural sub terminal spots, termen brownish. Fringe yellowish-white. Underside like upper side.

Hind wing: Apex rounded, costa straight, termen convex and protracted between R2+R5 and M1. Upper side: Ground, termen and fringe concolorous with the ground and fringe of the forewing. No maculation present. Underside like upper side.

Male genitalia (Fig 3B, 4C-D)

Uncus elongate, bent, medially chaetose, sub-apically broadened, apically sclerotised and down-hooked. Tegumen triangular-shaped. Vinculum strongly broadened. Saccus double as broad as long, anterior end flattened, stout. Valva narrowed and elongate, width relative to its length 0.14. Costal and ventral borders straight, bare from sclerotization. Cucullus chaetose, ventrally concave, obliquely rounded towards the costal border. Clasper sub-triangular shaped, posteriorly pointed. Harpe simple, basally broadened, acuminate, concave, angled in the posterior fourth, with the opening of the angle directed costad, double as long as the clasper. Basal sacculus elongate, rounded. Juxta strongly broadened, ovate. Phallus apodeme elongate, coecum ventrally emarginate, posterior end constricted, acuminate, vesica with a granulate patch and two cornuti.

Diagnosis

The new species is closest related to *E. skoui*, with which it shares the brownish transversal striation in the forewing and the pointed forewing apex in external character states, the elongate, apically down-hooked uncus and the oblong harpe. The new species is differentiated from *E. skoui* in the following character states: Scaling of the labial palpus: bicolorous in *E. skoui*, unicolorous in the new species. Presence of a disco cellular stigma in the forewing: present in *E. skoui*, absent in the new species. Overall shape of the clasper-harpe complex: broadened, with the costal border convex in *E. skoui*, narrowed, with the costal border straight in the new species. Shape of the clasper: posteriorly broadened and rounded in *E. skoui*, posteriorly constricted and pointed in the new species. Shape of the harpe: sigmoid, quasi symmetrical in *E. skoui* with two acuminate ends, asymmetrical, angled in the posterior fourth in the new species. Shape of the cucullus: ventral and costal borders running straight and parallel, evenly rounded in *E. skoui*, ventral border concave, obliquely rounded ventrad in the new species. Shape of the sacculus: post-basally broadened, basally constricted in *E. skoui*, constant in width, basal sacculus rounded in the new species. Shape of the saccus: u-shaped, rounded in *E. skoui*, strongly broadened, stout and flattened in the new species. Shape of the phallus apodeme: regular, constant in width, rounded at both ends in *E. skoui*, posteriorly constricted, with dilatation near the anterior end in the new species. Presence of sclerotization in the vesica: absent in *E. skoui*, present in the new species.

Bionomics (Fig 5)

The types were captured at the light in densely vegetated mountain valleys in syntopy with *E. skoui*.

Distribution

Till date only known from the type localities in the southern Hejaz and the northern Asir mountain systems in Saudi-Arabia.

Etymology

The epitheton refers to one of the differential character states in the male genitalia, the posterior constriction in the clasper (lat. constricta = constricted).

Conclusion

The presence of the *Eublemma deserta* Staudinger, 1900 species group was reported for the first time for Saudi-Arabia: New records of *E. skoui* were reported for Saudi-Arabia from the southern Hedjaz and northern Asir mountain systems. Data on the macro-habitat selection were given. Furthermore, a new species *Eublemma constricta* sp. nov., closest related in external characters and in the male genitalia to *E. skoui* was described as new for science. The new species is presently known exclusively from the southern Hedjaz and the northern Asir mountain systems in Saudi-Arabia (provinces Mekka and Asir).

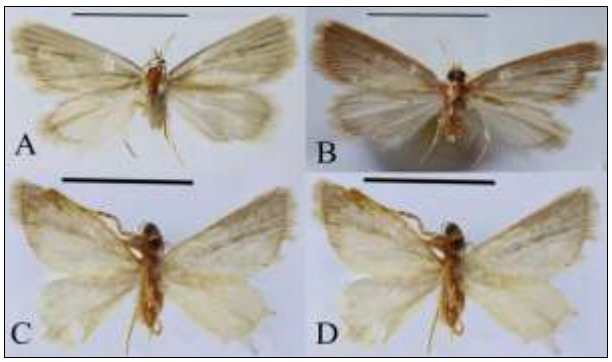

Fig 1: Adults. A, B: *Eublemma skoui* Fibiger, Hacker, 2004, 22GP041, Saudi-Arabia, Province Asir, 2km NE Sawi, 730 m, 01-V-2022, ♂. A: upper side. B. underside. C, D: Eublemma constricta sp. nov., holotype, ♂, Saudi-Arabia, Province Mekka, Al Shafa Mt., 1700 m, 03-V-2022, slide no 22GP048. C: upper side. D: underside. Scale bar = 10 mm

Fig 2: Head profiles. A: *Eublemma skoui* Fibiger, Hacker, 2004, 22GP041, B: Eublemma constricta sp. nov., holotype, 22GP048

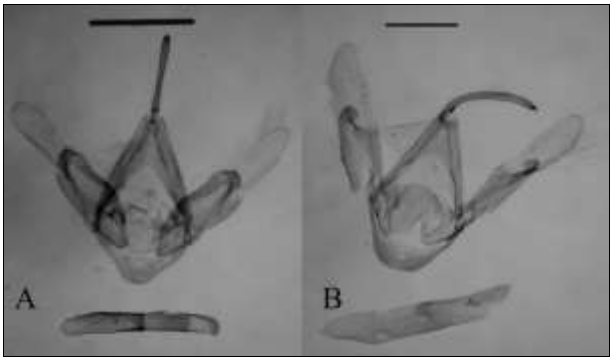

Fig 3: Male genitalia. A: *Eublemma skoui* Fibiger, Hacker, 2004, 22GP041, B: Eublemma constricta sp. nov., Holotype, 22GP048. Scale bar = 1 mm

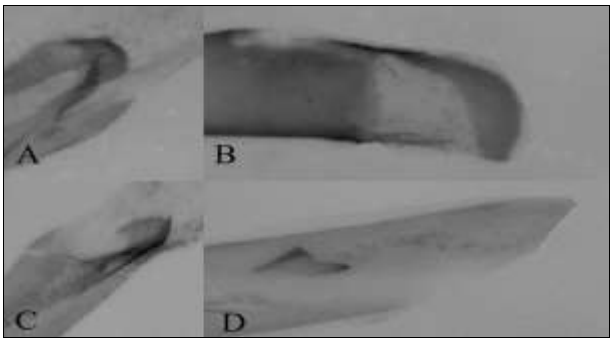

Fig 4: Male Genitalia, close-ups. A, B: *Eublemma skoui* Fibiger, Hacker, 2004, 22GP041, a: clasper-harpe system, B: vesica. C, D: Eublemma constricta sp. nov., Holotype, 22GP048, C: clasper-harpe system, D: vesica

Fig 5: Habitat of *Eublemma constricta* sp. nov. and *E. skoui*, Saudi-Arabia, Province Mekka, Al Shafa Mt., 1700 m

References

1. Hacker H. Biogeography; Boletobiinae (Lepidoptera Noctuoidea, Erebidae). Moths of Africa. Systematic and illustrated catalogue of the Heterocera (Lepidoptera) of Africa. 2019;1:1-816.
2. De Prins J, De Prins W. Afromoth online database of Afrotropical moth species (Lepidoptera); c2022. https://www.afromoths.net/, accessed 02 November.
3. Fibiger R, Hacker HH. The *Eublemma* Hubner, [1821] species of Yemen, with description of ten new species (Lepidoptera, Noctuidae, Eublemminae) (Part 1) (plts. 24, 25). Esperiana. 2002;9:481-510.
4. Fibiger R, Hacker HH. The *Eublemma* Hubner, [1821] species of Yemen, with description of six new species (Lepidoptera, Noctuidae, Eublemminae) (Part 2) (plts. 28, 29). Esperiana. 2004;9:481-510.
5. Fibiger R, Legrain A. Order Lepidoptera, superfamily Noctuoidea. Arthropod Fauna of the United Arab Emirates, van Harten, A, Dar Al Humah Printing, Abu Dhabi. 2009;2:480-660.
6. Hacker HH, Saldaitis A. Noctuidae of the Socotra Archipelago (Yemen) with notes to the fauna of the Southerm Arabian Peninsula. Esperiana Memoir. 2010;5:172-241.
7. Hacker HH. Systematic and Illustrated Catalogue of the Macroheterocera and Cossoidea, Zygaenoidea, Thyridoidea and Hyblaeoidea of the Arabian Peninsula, with a survey of their distribution (Lepidoptera). Esperiana. 2016;20:1-742.
8. Brehm G. A new LED lamp for the collection of nocturnal Lepidoptera and a spectral comparison of light-trapping lamps. Nota Lepidopterologica. 2017;40(1):87-108.
9. Robinson G. The Preparation of Slides of Lepidoptera Genitalia with Special Reference to the Micro lepidoptera. Entomologist's Gazette. 1976;27:127 -132.