Tibetanja tagoroides gen. et sp. n., a new genus and species from Tibet (Lepidoptera, Eupterotidae)

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Abstract: A new genus and species in the family Eupterotidae (Bombycoidea) are described from Tibet: ***Tibetanja* gen. n. *tagoroides* sp. n.** Holotype male will be deposited in Museum für Naturkunde, Berlin. Based mainly on morphological aspects, it is classified provisionally within the African subfamily Janinae. The taxon is described; males, male genitalia structures and some other Eupterotidae taxa are figured for comparison.

***Tibetanja tagoroides* gen. et sp. n., eine neue Gattung und Art aus Tibet (Lepidoptera, Eupterotidae)**

Zusammenfassung: Eine neue Gattung und Art aus der Familie Eupterotidae (Bombycoidea) werden aus Tibet beschrieben: ***Tibetanja* gen. n. *tagoroides* sp. n.** Der männliche Holotypus gelangt ins Museum für Naturkunde, Berlin. Aufgrund morphologischer Details wird die Gattung vorerst provisorisch in der ansonsten afrikanischen Subfamilie Janinae geführt. Das Taxon wird beschrieben; das Männchen, männliche Genitalstrukturen und zum Vergleich einige andere Eupterotidae-Arten werden abgebildet.

***Tibetanja tagoroides* gen. et sp. n., nouveau genre et nouvelle espèce du Tibet (Lepidoptera, Eupterotidae)**

Résumé: Un nouveau genre et une nouvelle espèce sont décrits du Tibet, dans la famille des Eupterotidae (Bombycoidea): ***Tibetanja* gen. n. *tagoroides* sp. n.** L'holotype mâle sera déposé au Museum fûr Naturkunde, Berlin. Son placement provisoire dans la sous-famille africaine des Janinae est basé principalement sur des caractères morphologiques. Ce nouveau taxon est décrit; l'habitus et les structures des genitalia du mâle, ainsi que ceux d'autres espèces d'Eupterotidae sont illustrés pour comparaison.

Introduction

The higher systematics on family, subfamily and tribal levels and phylogeny of the family Eupterotidae Swinhoe, 1892 are still somewhat unsolved and are under current research (see overview Oberprieler et al. 2003, Nässig & Oberprieler 2008, or Kitching et al. 2018). A catalogue of the worldwide genera of the family was compiled by Nässig & Oberprieler (2008).

The present paper deals with a new species which first came into the hands of the senior author some years ago and since then was found in further expedition results, all from Tibet Autonomous Province, PR China; collecting results from the first source already resulted in the description of an *Antheraea* Hübner, 1819 ("1816") species (Saturniidae Boisduval, 1837 ("1834")) (Naumann & Löffler 2015). The species described here could not be found in any of the more recent Chinese literature where faunal elements of Eupterotidae from Tibet are dealt with (Zhu & Wang 1983, Zhang et al. 1986, Hou 1988).

At first glimpse, external morphology and preliminary results of mtDNA barcode analysis of the new Eupterotidae species made the classification outside of any recognised genus clear, although there are superficial external similarities in pattern with some species of the Asian genus *Tagora* Walker, 1855. After a more thorough study, its placement in any of the currently recognized subfamilies proved difficult. While preliminary results of genetic distance analyses revealed that it might be a member of the African subfamily Janinae Aurivillius, 1892, in plausible agreement with comparative observations of the male genitalia structures, further analyses with relevant mtDNA COI sequences in Bold (Barcode of Life 2020) using Mega5 software proved inconclusive (see results in Text-Fig. A; barcode data available from Bold, see Ratnasingham & Hebert 2007 [www.boldsystems.org] in public dataset DS-EUPTIB01).

The affinities of the new genus within the family Eupterotidae thus remain ambiguous. Nevertheless, on the basis of morphological characters observed in male genitalia we consider that its placement within the formerly purely African subfamily Janinae is the most plausible.

A similar situation was already found some years earlier for the Himalayan genus *Sinobirma* Bryk, 1944 in the family Saturniidae (Nässig & Oberprieler 1994, Rougerie et al. 2012), based on comparative morphological studies and later supported by mtDNA barcoding and sequencing of nuclear marker genes. This enigmatic genus from the eastern end of the Himalayas was found to be the first (and only) non-Afrotropical representative of the otherwise solely African tribe Urotini Packard, 1902 (see Nässig et al. 2015); its biogeographical and evolutionary history remains still somehow enigmatic. Perhaps the new genus described here represents another case of such a rather uncommon disjunctive distribution. Further molecular phylogenetic analysis is currently in progress to address this question.

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[2] Studies in Eupterotidae, no. 14. (No. 13 see: Nässig, W. A., Treadaway, C. G., Löffler, S., & Naumann, S. (2013): New information on the genus *Pseudoganisa* Schultze, 1910 (Lepidoptera: Eupterotidae): mtDNA barcode indicates two cryptic species on the Philippines. – Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **33** (4): 150–166.)

Collections and other abbreviations

CMWM	Collection Museum Witt, München, assigned to Zoologische Staatssammlung München, Germany.
CSLL	Collection Swen Löffler, Lichtenstein, Germany. Now part of CSNB.
CSNB	Collection Stefan Naumann, Berlin, Germany. Dedicated to the Rainer-Seegers-Stiftung, to be deposited in MfN, Berlin.
CTBO	Collection Thierry Bouyer (Eupterotidae part), Barvaux S/Ourthe, Belgium. Now part of CMWM.
HT	Holotype.
MfN	Museum für Naturkunde, Berlin, Germany.
PT	Paratype.
SMFL	Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.
ST	Syntype.

Systematic part

Tibetanja, gen. n.

Type species: *Tibetanja tagoroides* sp. n. (described below). – Grammatical gender: feminine.

Etymology: The name of the new genus *Tibetanja* gen. n. was chosen following recent Janinae generic descriptions by Bouyer (2011). *Malagasanja* Bouyer, 2011 was proposed for a single Madagascan species, *Jana palliatella* Viette, 1954. *Tibetanja* gen. n. is a combination of the origin of the genus described here, and an anagram of *Jana* Herrich-Schäffer, 1854, as it was used already in *Malagasanja*.

The new genus currently comprises only one single species from Tibet, *Tibetanja tagoroides* sp. n., which is described below.

Description and differential diagnosis

♂ (Figs. 1a–b, 2a–b, 3a–b, 6, 9; genitalia: Figs. 10a–c): Antennae bipectinate to the last about 6 segments, then reduced rami. Labial palpi long, 2-segmented. Tibial spurs 0–2–4 (following Lemaire & Minet 1999). Abdominal pelt without any processes. Thorax and abdomen covered with long hair.

Wing pattern with a typical broad and rounded zigzag median line on both wings. Forewing margin rounded, ending in an acute tip of a pronounced apex. Subapically, a light ochreous yellow part in the costal area. On the forewing upperside and on all wing undersides a small black dot in the basal area of the median area. Wing venation in the forewing with straight veins Rs1 and Rs2, and on both fore- and hindwings the origins of veins M1 and M2 separated from each other.

Male genitalia with a long, slender uncus with two apical lateral teeth. Gnathos with two long lateral processes. Valves with an internal process emerging from the ventral margin, with two longer projections. Juxta small, rounded, the phallus not fused with this structure.

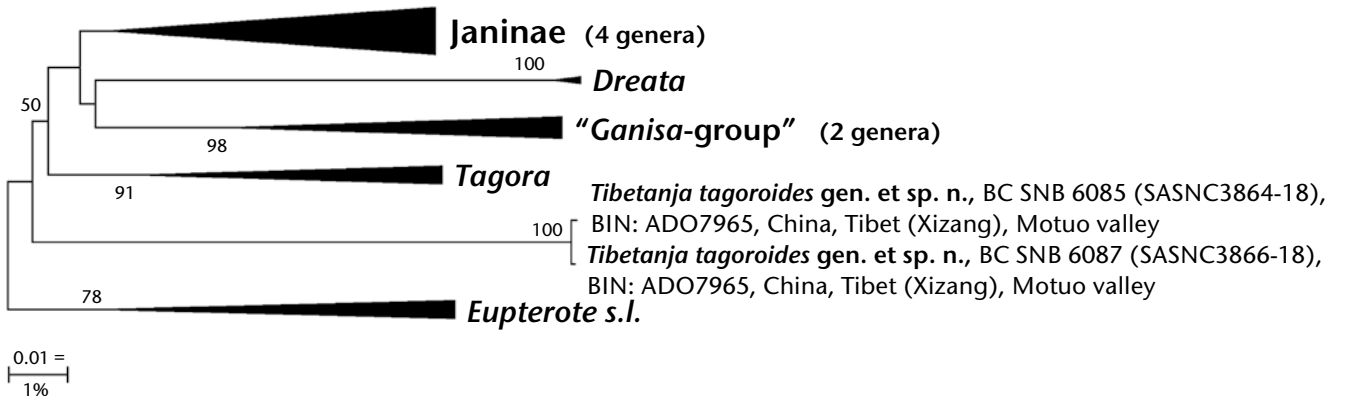
♀ and preimaginals unknown.

We follow anatomic nomenclature and family description in Lemaire & Minet (1999) who mention 2 pairs of spurs on the hindtibia as being typical for Janinae but also sometimes occurring in Eupterotinae Swinhoe, 1892. Parts of the spurs can be seen in Fig. 9, but are here mainly covered with bristles. The antennae, with their relatively short rami directed latero-ventrally, resemble more the structure of other Janinae members (Fig. 8: *Malagasanja palliatella*) than the generally longer ones in most Asian genera of Eupterotinae (Fig. 7: *Tagora glaucescens* Walker, 1855). The wing pattern is somewhat unique for the family, though still showing the typical rows of undulated lines which can be found in almost all eupterotid genera; again, for comparison we figure specimens of *M. palliatella* (Figs. 5a–b) and *T. glaucescens* (Figs. 4a–b). Male genitalia structures show elements such as the lateral processes of the gnathos or the internal structure emerging from the ventral margin of the valves, which can also be found in other members of Janinae: the processes of the gnathos are easily visible in *Acrojana* Aurivillius, 1901 (Fig. 13: *A. sciron* (Druce, 1888)); they are also present, but reduced in *M. palliatella* from Madagascar (Fig. 12; already drawn by Viette 1954 and again, though very schematic, in Griveaud 1961).

An overview of genitalia structures of different Janinae genera was published by Bouyer (2011), who allowed us to use here his illustration of *M. palliatella* again from the same genitalia photo. Also genitalia structures of the Janinae genus *Hoplojana* Aurivillius, 1901 resemble the structures of those of *Tibetanja* gen. n. in some details, similar to some of the members of the "*Ganisa*-group" (as defined by Oberprieler et al. 2003 and Nässig & Oberprieler 2008), whereas all known Asian Eupterotinae have different genitalia structures (e.g. Fig. 11: *Mallarctus* [= *Tagora*] *acheron* Mell, 1930)

With those morphological details currently known for the new genus *Tibetanja* we place it provisionally within the subfamily Janinae of Eupterotidae, which is widely distributed in Africa including Madagascar, but has not yet been known to occur in Asia.

Notes. As mentioned already by Oberprieler et al. (2003), the higher systematics and phylogeny of the family Eupterotidae is still largely unresolved. Forbes (1955) was the first to publish a checklist of the world genera, but listed many errors due to insufficient knowledge (there were only a very few workers ever working on the family Eupterotidae), and Fletcher & Nye (1982) mentioned the generic names in their catalogue on Bombycoidea and other superfamilies. Since then several taxonomic changes took place, an overview of which was published by Nässig & Oberprieler (2008). They counted 16 genera for the subfamily Janinae, and Bouyer (2011) later added five more genera for former members of the genera *Jana* and *Hoplojana*. With description of *Tibetanja* gen. n. and its tentative classification based on morphological characters as a first Asian member, the number of currently accepted Janinae genera increases to 22. – We deliver the description of a clearly identified new genus and species here in advance of further studies on its phylogeny to make the names available (in accordance with ICZN 1999) for other work.



Text-Fig. A: Neighbor-Joining (NJ) COI barcode tree (*cf.* Saitou & Nei 1987) for representatives of different systematic groups of Eupterotidae, including the new genus and species ***Tibetanja tagoroides***. The tree is based on the analysis of 33 records in Bold dataset DS-EUPTIB01 with Mega5 software (Tamura et al. 2007, 2011) using uncorrected p-distances. The optimal tree with the sum of branch length = 1.39520153 is shown, with bootstrap support values over 50% indicated on branches (calculated from 2000 replicates). The tree is drawn to scale, with branch lengths in the same units as those of the genetic distances used to infer the phylogenetic tree. For details about the specimens see **Table 1.** All branches but the two of *Tibetanja tagoroides* are collapsed in the shown illustration to have a better overview; all the individuals used in the calculation are listed in Table 1.

Table 1: Data of the 33 specimens (all with 658 bp analysed) of Eupterotidae of different groups and outgroups used for the mtDNA barcode analyses with Mega5. Specimens arranged from top to bottom in the order of the NJ-tree graph (**Text-Fig. A**), based on data extracted from Bold on 27. ix. 2020. — **Additional abbreviations:** SL = Sequence Length (bp-data from Bold); Bold BIN-Code = Barcode Index Number; an automatically assigned identifier for genetic clusters within Bold, see Ratnasingham & Hebert (2013).

Sample ID	Process ID	Species — Bold BIN-Code	Deposition	SL	Sex	Origin
BC-TB5596	EUPTB071-10	*Hoplojana indecisa* — **Bold**:ABY4470	CTBO	658 bp	♂	**Tanzania,** Kitulangalo
BC-TB5597	EUPTB072-10	*Hoplojana indecisa* — **Bold**:ABY4470	CTBO	658 bp	♀	**Tanzania,** Kitulangalo
BC-TB5595	EUPTB070-10	*Hoplojana indecisa* — **Bold**:ABY4470	CTBO	658 bp	♂	**Tanzania,** Kitulangalo
BC-TB5893	TBMOT378-10	*Hoplojana rhodoptera* — **Bold**:AAO5257	CTBO	658 bp	♂	**Angola,** Cassoco
BC-TB5894	TBMOT379-10	*Hoplojana rhodoptera* — **Bold**:AAO5257	CTBO	658 bp	♂	**Angola,** Cassoco
BC SNB 6335	SASNC4177-18	*Acrojana sciron* — **Bold**:AEC6147	CSNB	658 bp	♀	**Sierra Leone,** Northern
BC SNB 6419	SASNC4301-19	*Acrojana sciron* — **Bold**:AEC6147	CSNB	658 bp	♂	**Guinea,** Haute Guinee
BC-TB6741	TBMOT1131-11	*Stenoglene thelda* — **Bold**:ABZ0824	CTBO	658 bp	♂	**Guinea,** Diecke
BC-TB6742	TBMOT1132-11	*Stenoglene thelda* — **Bold**:ABZ0824	CTBO	658 bp	♂	**Guinea,** Diecke
BC-TB5230	LBAFR209-09	*Malagasanja palliatella* — **Bold**:AAI7927	CTBO	658 bp	♂	**Madagascar,** Manompana
BC SNB 6277	SASNC4119-18	*Malagasanja palliatella* — **Bold**:AAI7927	CSNB	658 bp	♂	**Madagascar,** Fianarantsoa
CTBB-1154	SUBHB047-14	*Stenoglene citrina* — **Bold**:ACL8029	CTBO	658 bp	♂	**Democratic Republic of the Congo,** Masako
CTBB-1155	SUBHB048-14	*Stenoglene citrina* — **Bold**:ACL8029	CTBO	658 bp	♂	**Democratic Republic of the Congo,** Masako
BC SNB 2963	SASNC974-11	*Dreata hades* — **Bold**:ABA7628	CSLL	658 bp	♂	**Myanmar,** Chin State, Mt. Victoria N.P.
BC SNB 2964	SASNC975-11	*Dreata hades* — **Bold**:ABA7628	CSLL	658 bp	♂	**Myanmar,** Chin State, Mt. Victoria N.P.
BC SNB 2532	SASNC448-11	*Apha cf. subdives* — **Bold**:ACE9975	CSLL	658 bp	♂	**Bhutan,** Wangdue Phodrang dzongkhag
BC SNB 2603	SASNC519-11	*Pseudojana obscura* — **Bold**:AAB9593	CSLL	658 bp	♂	**W. Malaysia,** Cameron Highlands
BC SNB 2604	SASNC520-11	*Pseudojana obscura* — **Bold**:AAB9593	CSLL	658 bp	♀	**W. Malaysia,** Cameron Highlands
BC SNB 2597	SASNC513-11	*Pseudojana cf. clemensi* — **Bold**:AAY8451	CSLL	658 bp	♂	**Philippinen,** E. Visayas, Leyte
BC SNB 2598	SASNC514-11	*Pseudojana cf. clemensi* — **Bold**:AAY8451	CSLL	658 bp	♂	**Philippinen,** E. Visayas, Leyte
BC SNB 5542	SASNC3173-15	*Pseudojana cf. clemensi* — **Bold**:AAY8451	CSLL	658 bp	♂	**Philippinen,** W. Visayas, Panay
BC SNB 2465	SASNC381-11	*Tagora cf. glaucescens* — **Bold**:AAL7623	CSLL	658 bp	♂	**Nepal,** Ganesh Himal
BC SNB 2466	SASNC382-11	*Tagora cf. glaucescens* — **Bold**:AAL7623	CSLL	658 bp	♂	**Nepal,** Ganesh Himal
BC SNB 5559	SASNC3190-15	*Tagora* sp. [N. Thailand] — **Bold**:AAU2106	CSLL	658 bp	♂	**Thailand,** Chiang Mai
BC SNB 5560	SASNC3191-15	*Tagora* sp. [Palawan] — **Bold**:AAY7650	CSLL	658 bp	♂	**Philippines,** Palawan (Mimaropa)
BC SNB 5561	SASNC3192-15	*Tagora* sp. [Palawan] — **Bold**:AAY7650	CSLL	658 bp	♂	**Philippines,** Palawan (Mimaropa)
BC SNB 6085	SASNC3864-18	***Tibetanja tagoroides* gen. et sp. n.** — **Bold**:ADO7965	CSNB	658 bp	♂	**China,** Tibet (Xizang), Motuo valley **[HT]**
BC SNB 6087	SASNC3866-18	***Tibetanja tagoroides* gen. et sp. n.** — **Bold**:ADO7965	CSNB	658 bp	♂	**China,** Tibet (Xizang), Motuo valley [PT]
BC SNB 5553	SASNC3184-15	*Eupterote kalliesi* — **Bold**:ACU0072	SMFL	658 bp	♂	**Indonesia,** W. Sumatra (Sumatera Barat) **[HT]**
BC SNB 6550	SASNC4436-20	*Eupterote* (*s.l.*) sp.1 — BIN not yet available	SMFL	658 bp	♀	**Thailand,** Mae Hong Song, Soppong
BC SNB 6551	SASNC4437-20	*Eupterote* (*s.l.*) sp.1 — BIN not yet available	SMFL	658 bp	♀	**Thailand,** Mae Hong Song, Soppong
BC SNB 6552	SASNC4438-20	*Eupterote* (*s.l.*) sp.2 — BIN not yet available	SMFL	658 bp	♀	**Thailand,** Mae Hong Song, Soppong
BC SNB 6553	SASNC4439-20	*Eupterote* (*s.l.*) sp.2 — BIN not yet available	SMFL	658 bp	♂	**Thailand,** Mae Hong Song, Soppong

Figs. 1–3: ***Tibetanja*** **gen. n.** ***tagoroides*** **sp. n.; a = upperside, b = underside. Fig. 1:** HT ♂, PR China, Motuo Co. (CSNB, in MfN). **Fig. 2:** PT ♂, PR China, Tibet, Motuo Co. (CSNB). **Fig. 3:** PT ♂, PR China, Tibet, Nyingchi Pref. (CSNB). — Scale bars = 1 cm; approx. natural size. — **Fig 4a:** *Tagora glaucescens* ♂, PR China, Tibet, Nyingchi Pref. (CSNB). — **Fig 5a:** *Malagasanja palliatella* ♂, Madagascar, Fianarantsoa Prov. (CSNB). — Scale bars = 1 cm; smaller than natural size. — **Figs. 6–8:** Dorsal views of ♂ head and antenna. **6:** ***Tibetanja*** **gen. n.** ***tagoroides*** **sp. n.; 7:** *Tagora glaucescens;* **8:** *Malagasanja palliatella.* — Photos: S. Naumann.

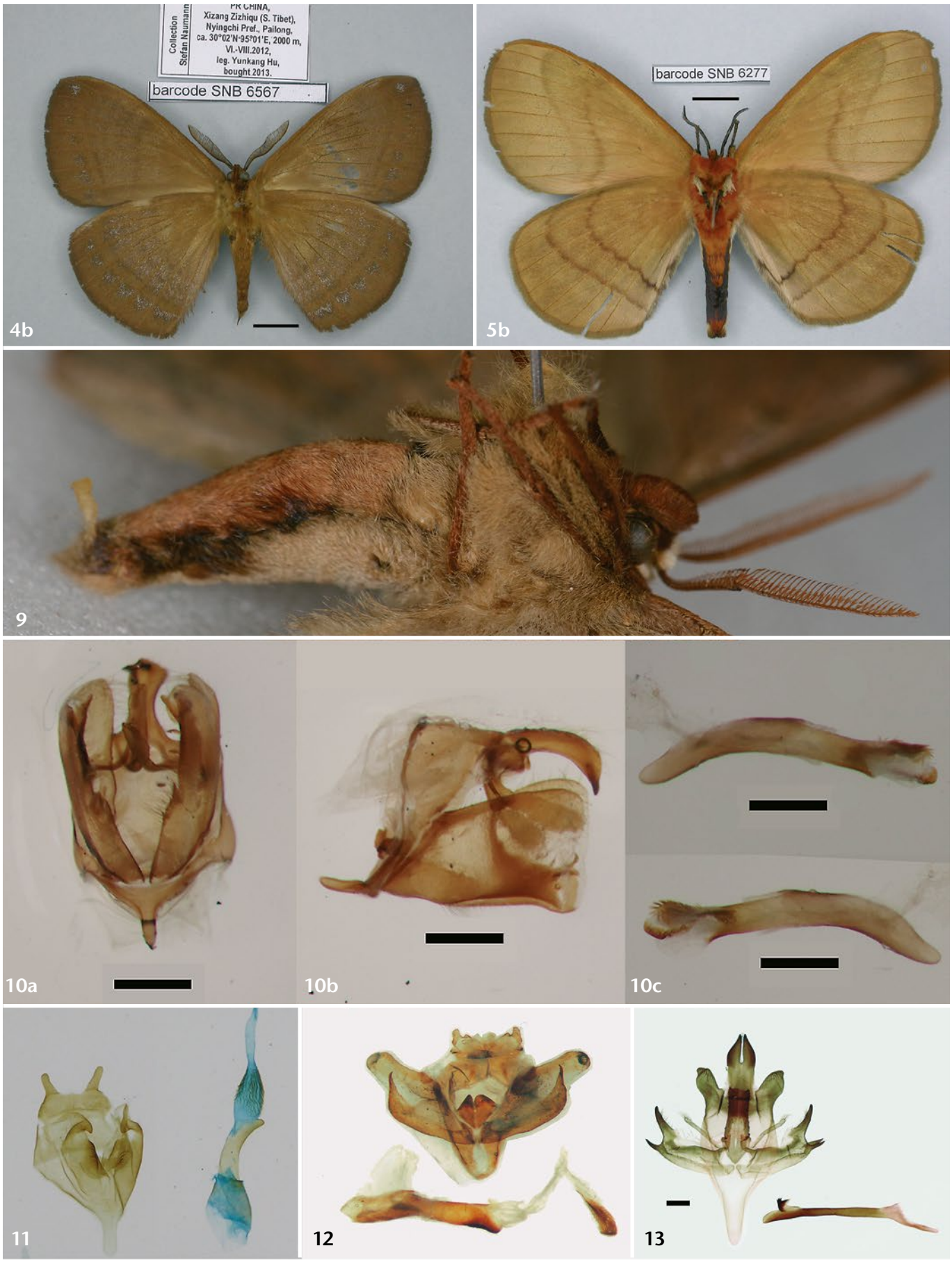


Fig 4b: *Tagora glaucescens* ♂, same specimen as 4a, underside (CSNB). — **Fig 5b:** *Malagasanja palliatella* ♂, same specimen as 5a, underside (CSNB). — Scale bars = 1 cm; smaller than natural size. — **Fig. 9:** ***Tibetanja* gen. n. *tagoroides* sp. n.;** paratype, body in ventro-lateral view. — **Fig. 10:** ***Tibetanja* gen. n. *tagoroides* sp. n.;** ♂ genitalia GP 2623/19 SNB, PT (CSNB), **a** = ventral, **b** = lateral view, **c** = phallus separate: top = left, bottom = right side. Scale bars = 1 mm. — **Fig. 11:** ♂ ST, *Mallarctus* (= *Tagora*) *acheron,* Borneo, in MfN; no scale. — **Fig. 12:** ♂ *Malagasanja palliatella,* Madagascar, ventral view (opened) and phallus, no scale; from Bouyer (2011: fig. G). — **Fig. 13:** ♂ *Acrojana sciron,* Sierra Leone, GP 2560/18 SNB, scale bar = 1 mm. — Photos: 4–10 = S. Naumann; 11 = V. Zolotuhin; 12 = T. Bouyer; 13 = N. Ignatyev.

The new species

Tibetanja tagoroides sp. n.

Holotype ♂ (Figs. 1a–b): PR China, Xizang Zizhiqu (S. Tibet), Motuo (Metok) County, Duoxiongla valley, Hanmi, ca. 29°21' N, 95°7' E, 2200 m, 15. VIII.–5. IX. 2016, leg. Yunkang HU, bought XII. 2016 from HU; BOLD SampleID code: barcode SNB 6085 (CSNB). – A red holotype label will be added accordingly. The holotype will be deposited within the Rainer SEEGERS Foundation in the collections of MfN Berlin.

Paratypes (4 ♂♂; Fig. 2a–b, 3a–b): 2 ♂♂, same data as holotype, 1 ♂ with GP 2623/19 SNB, BOLD SampleID code: barcode SNB 6087 (CSNB; one of those two specimens will be donated to SMFL). 1 ♂, PR China, Tibet (Xizang Zizhiqu), Nyingchi Pref., Chayu, Xiachayu, ca. 28°29' N, 97°0' E, 2300 m, VI.–VII. 2012, leg. Yang YANG, bought VI. 2014 from Yang YANG, Beijing (CSNB). 1 ♂, PR China, Tibet, Bomi County, 2500 m, VIII. 2019; bought IV. 2020 on ebay (CSNB). – Blue paratype labels will be added accordingly.

Etymology: The name *tagoroides* refers to the external similarities with some species of the Eupterotidae genus *Tagora*.

BIN code (Barcode Index Number, compare RATNASINGHAM & HEBERT 2013, as of Oct. 4th, 2020): BOLD: ADO7965.

Description and differential diagnosis

♂ (Figs. 1a–b, 2a–b, 3a–b, 6, 9): Forewing length, from basis to apex, 35–38 mm (Holotype 36 mm), the apex with a small pointed acute tooth.

Antennae broadly bipectinate to the last 6 segments, of 12.5–13.0 mm length, with longest rami of 0.9 mm, of dark ochreous brown colour.

The five known male specimens are of greyish to sepia brown ground colour with markings in dark grey and ochre. Head greyish white, with dark chocolate brown collum and labial palpi; thorax and abdomen completely in ground colour, legs a little darker than ground colour.

Upperside forewing antemedian area in ground colour. Median area separated from ante- and postmedian area by a thin dark greyish zigzag line. In the median area, proximal to the costal part of the antemedian line, a small dark dot of about 1 mm diameter, and a central zigzag median line of dark grey colour. Postmedian area separated in two parts by an ochrous line; the inner part in ground colour, becoming ochreous to the costal third of the wing, the marginal one again in ground colour with reddish brown scales along the veins, suffused with violet scales in the apical half. The postmedian line ends with a dark brown portion near the apical area. Marginal fringes dark brown, about 1 mm long.

Hindwing pattern and colour very similar to that of the forewing, antemedian line missing, and lighter portions along the veins in median and postmedian areas.

Underside again in ground colour, but markings more homogenous. Only visible pattern elements are the intense, dark grey median line and a tiny zigzag postmedian line. Both fore- and hindwing bear a small black dot in the basal part of the median area. In the marginal and apical area of the forewing a whitish grey triangular portion which ends in the acute apex. Orange scales visible along the veins in the marginal half of the median area and in the postmedian area. Outer margin dark grey.

♂ **genitalia** (Figs. 10a–c, dissection no. 2623/19 SNB): Uncus long, slender, ending scoop-like with two lateral teeth, bent ventrally. Gnathos with two bent and slender lateral processes, slightly enlarged toward their end. Valves almost rectangular, with small dorsal and ventral teeth. The upper part of the sacculus with an internal sclerotized process with two projections, a short lateral one and a longer dorsal one. Juxta small and rounded, saccus short and slender. Phallus ca. 3.2 mm long, vesica opening on right dorsal side with a large number of small teeth as well as a small ventrolateral prolate sclerite.

♀: Unknown.

Acknowledgements

First of all, we would like to thank Yungkang HU and Yang YANG (then both Beijing, PR China) for their efforts in collecting and preserving this very valuable material. Many thanks to Thierry BOUYER (Barvaux S/Ourthe, Belgium) who kindly sent us his photos of the genitalia structures of *M. palliatella*. Also Nicolai IGNATYEV (České Budějovice, Czech Republic) and Vadim ZOLOTUHIN (Uljanovsk, Russia) kindly contributed photos of genitalia. Swen LÖFFLER (Lichtenstein, Germany) gave his collection to the senior author when stopping his entomological activities. Harald SULAK (Museum Witt, München, Germany) gave kindly access to the Eupterotidae collection purchased from Thierry BOUYER by the late Thomas WITT. Thanks also to Jeremy DOBSON (Johannesburg, South Africa) and other organizers of the third Afrotropical Lepidoptera Workshop of The Lepidopterists' Society of Africa held in Madagascar in April 2018, which made it possible to S.N. to collect comparative material under permit. The earlier molecular work (COI barcoding) was funded by NSERC and Genome Canada through grants to Paul D. N. HEBERT at the Canadian Centre for DNA Barcoding (CCDB) based at the Biodiversity Institute of Ontario at the University of Guelph, Ontario, Canada. Rolf G. OBERPRIELER (CSIRO, Canberra, Australia) is in current discussion on the family Eupterotidae with us.

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