

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/365205525>

Revisional notes on the genus Tagora Walker, 1855, stat. rev. as genus, with description of 18 new species (Lepidoptera: Eupterotidae, Eupterotinae)

Book · August 2022

CITATIONS

0

READS

359

2 authors, including:



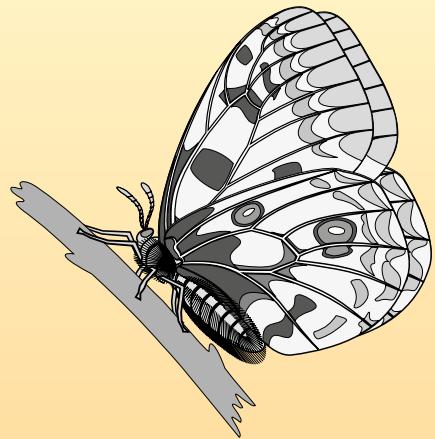
Wolfgang A. Nässig

Senckenberg Society for Nature Research

75 PUBLICATIONS 326 CITATIONS

[SEE PROFILE](#)

Nachrichten des
Entomologischen
Vereins
Apollo



Supplementum 21

Revisional notes on the genus *Tagora* WALKER, 1855, stat. rev.
as genus, with description of 18 new species (Lepidoptera:
Eupterotidae, Eupterotinae)

by Stefan NAUMANN and Wolfgang A. NÄSSIG



Jahrgang 43
Suppl. 21
August 2022

ISSN 0723-9920

Nachrichten des Entomologischen Vereins Apollo, Supplementum 21

Herausgeber Entomologischer Verein Apollo e. V., Frankfurt am Main (gegr. 1897)
Erster Vorsitzender: Dr. Wolfgang Eckweiler ·
Gronauer Straße 40 · D-60385 Frankfurt ·
E-Mail: eckweiler@apollo-frankfurt.de

Schriftleitung Dr. Wolfgang A. Nässig · Entomologie II,
Senckenberg-Museum · Senckenbergsanlage 25 ·
D-60325 Frankfurt am Main (verantwortlicher
Redakteur und Redaktionsanschrift)

E-Mail redaktion@apollo-frankfurt.de

Adressenänderungen an Dr. Wolfgang Eckweiler · Gronauer Straße 40 ·
D-60385 Frankfurt · Telefax: (0 69) 46 45 52 ·
E-Mail: eckweiler@apollo-frankfurt.de

Redaktionskomitee Dr. Wolfgang Eckweiler (we), Frankfurt ·
Dr. Wolfgang A. Nässig (wng), Frankfurt ·
Dr. Klaus Schurian (ks), Kelkheim ·
Alfred Westenberger (aw), Hofheim

Manuskripte an die Schriftleitung

Autorenrichtlinien verbindliche Fassung im Internet (s. unten)
oder gegen Rückporto bei der Schriftleitung
erhältlich.

Freixemplare Der Entomologischer Verein Apollo e. V. verfolgt als gemeinnütziger Verein keine wirtschaftlichen Ziele. Autoren erhalten daher kein Honorar, sondern als kostenfreies Separatum eine PDF-Datei. Bei der Weiterverbreitung der PDF-Datei sind die Copyright-Auflagen strikt zu beachten. Autoren von Supplementa erhalten darüber hinaus 3 gedruckte Freixemplare.

Farbtafeln Der Druck von Farbabildungen ist nach Rücksprache möglich. Interessierte Autoren wenden sich bitte an die Redaktion.

Titelbild ♂ of *Tagora loeffleri*, in resting position, photo taken by Swen LOEFFLER in N. Vietnam, Bac Kan Prov., xi. 2000. See colour Fig. 75 in text.

Inhalt Die Autoren sind für den Inhalt ihrer Beiträge allein verantwortlich. Die Artikel geben nicht notwendigerweise die Meinung der Redaktion oder des Vereins wieder.

Layout, Titelgrafik Dr. Wolfgang Eckweiler

Druck Volpe Services · Fünfhäusergasse 4 ·
D-63179 Oberursel · gedruckt auf chlorfrei
gebleichtem und säurefrei hergestelltem Papier.

Abonnement Jahresmitgliedsbeitrag, inkl. Bezug der NEVA ohne Supplementa, € 45,—, Schüler und Studenten mit Nachweis € 25,—, Versand als Luftpost ins Ausland zuzüglich Porto, Anfragen an Dr. W. Eckweiler (siehe oben).

Einzelpreis des Supplementums 21 für Mitglieder € 25,— (zuzüglich Porto), Preise für Nichtmitglieder auf Anfrage. Bestellungen an Dr. W. Eckweiler.

Bankverbindung Volksbank Dreieich-Langen
BIC: GENODES1DRE
IBAN: DE71 5059 2200 0000 0473 33

Kassierer Anton Bogner · Theodor-Heuss-Straße 56 ·
D-63225 Langen ·
E-Mail: kasse@apollo-frankfurt.de

Internet <http://www.apollo-frankfurt.de>

Copyright © 2022 by Entomologischer Verein Apollo e.V.,
Frankfurt am Main, Germany. All rights reserved

Kein Teil dieser Publikation darf ohne ausdrückliche schriftliche Genehmigung des Herausgebers in irgendeiner Form reproduziert oder unter Verwendung elektronischer Systeme verarbeitet, vervielfältigt oder verbreitet werden.

ISSN 0723-9920

Revisional notes on the genus *Tagora* WALKER, 1855, stat. rev. as genus, with description of 18 new species (Lepidoptera: Eupterotidae, Eupterotinae)

Stefan NAUMANN¹ and Wolfgang A. NÄSSIG²

Dr. Stefan NAUMANN, Hochkirchstrasse 11, D-10829 Berlin, Germany; sn@saturniidae.com

Dr. Wolfgang A. NÄSSIG, Research Associate, Entomologie II, Forschungsinstitut Senckenberg, Senckenbergsanlage 25, D-60325 Frankfurt am Main, Germany; wolfgang.naessig@senckenberg.de

Abstract: The genus *Tagora* WALKER, 1855, stat. rev. as genus, is for the first time since its original description re-established as a separate monophyletic genus (with generic synonym *Mallarctus* MELL 1930, syn. rev.), and its species are revised. We identified 23 species, 5 of these were already described before (with two additional synonyms), 18 are described here as new species. Two lectotypes are designated, one new and one revised synonymy are established. A checklist of all known taxa and summarising further information is found at the end of this publication. All holo- and lectotypes are figured in colour, as well as their corresponding specimens of opposite sex (if known), most male and female genitalia and diagnostic male abdominal pelt (8th sternites) structures. In addition to morphological characters we used results of the mtDNA barcoding campaign to define the often superficially very similar taxa.

Anmerkungen zu einer Revision der Gattung *Tagora* WALKER, 1855, stat. rev. als Gattung, mit Neubeschreibung von 18 Arten (Lepidoptera: Eupterotidae, Eupterotinae)

Zusammenfassung: Die Gattung *Tagora* WALKER, 1855, stat. rev. (mit dem revidierten Synonym *Mallarctus* MELL 1930, syn. rev.) wird erstmals seit ihrer Beschreibung wieder als separate monophyletische Gattung anerkannt, und die in ihr enthaltenen Arten werden revidiert. Wir erkennen 23 zu separierende Arten an, 5 davon waren vor der hier vorliegenden Arbeit bereits beschrieben (mit 2 zusätzlichen Synonymen); 18 Arten werden als neu beschrieben, 2 Lectotypen designiert, eine neue und eine revidierte Synonymie aufgestellt. Eine Checkliste mit allen bekannten Arten und den zusammengefaßten weiteren Informationen befindet sich am Ende des Artikels. Alle Holo- und Lectotypen sowie Falter des gegenteiligen Geschlechts, soweit bekannt, werden farbig abgebildet, außerdem fast alle Genitalstrukturen (Männchen und Weibchen) und diagnostischen Anteile der männlichen Abdominalhäute (8. Abdominalsternite). Neben morphologischen Merkmalen nutzten wir mtDNA-Barcode-Ergebnisse zur Definition der häufig oberflächlich sehr ähnlichen Taxa.

Introduction

The phylogeny and higher systematics (at the family, subfamily, tribus and genus levels) of the family Eupterotidae are still not reliably resolved and are at present under research (see OBERPRIELER et al. 2003, NÄSSIG & OBERPRIELER 2007, 2008, ZWICK 2008, ZWICK et al. 2011, KITCHING et al. 2018, HAMILTON et al. 2019, NAUMANN et al. 2020, NÄSSIG & NAUMANN 2021). For general problems with the family-group names of Eupterotidae see NÄSSIG

& OBERPRIELER (2007); a catalogue of the then existing genera of the family was compiled by NÄSSIG & OBERPRIELER (2008).

The present paper intends to revise another species-group of Eupterotidae: Eupterotinae, restoring the well-defined and clearly monophyletic generic name *Tagora* WALKER, 1855 permanently for the first time since 1855, based on the correct type species, and describing 18 new species.

Taxonomic history of the genus *Tagora* and its species

The generic name *Tagora* was erected by F. WALKER (1855b: 1188[–1190]) within the family “Drepanulidae” (= Drepanidae); at that time this family contained a rather wild mixture of moths of, as we know today, different present-day families and even superfamilies, also including, besides many others, species of Saturniidae and Eupterotidae. WALKER included in *Tagora* a group of three species, also described as new, which, as known today, are not very closely related to each other within Eupterotidae.

These three species originally described and included by WALKER in fact belong to three different present-day genera of the subfamily Eupterotinae:

- *Tagora glaucescens* is the type species of *Tagora* (designated later by MOORE 1883, see below),
- “*Tagora*” *patula* from “Silhet” (described after obviously a single female) belongs to a species-group of *Sphingognatha* C. & R. FELDER, 1874 *sensu lato*, the “*patula*-group”, and finally
- “*Tagora*” *amaena* from “Java”, which obviously belongs to *Eupterote* HÜBNER, 1820 *sensu latissimo* (the huge genus *Eupterote* is unrevised so far).

Note 1: For the correct authorship of *Sphingognatha* (C. & R. FELDER, 1874: pl. XCIV, fig. 1), compare NÄSSIG & SPEIDEL (2007: 71); for the justification of the status of this genus as a separate generic unit, see OBERPRIELER et al. (2003: 108) and NÄSSIG & OBERPRIELER (2008: 67).

According to FLETCHER & NYE (1982: 158), MOORE (1883: 142) was the earliest author to validly designate a type species for the genus *Tagora*: When he illustrated the “lasiocampid” moth *Tagora murina* MOORE, 1877[: 347] for the first time, which he had interpreted while

¹ Research Associate of Museum für Naturkunde Berlin, Germany.

² Studies in Eupterotidae no. 16. – No. 15 see NÄSSIG, W. A., & NAUMANN, S. (2021): Revisional notes on *Palirisa lineosa* (WALKER, 1855) and its closest relatives, with the description of seven new species and the separation of the new genus *Mellirisa* gen. n. (Lepidoptera: Eupterotidae, Eupterotinae). – Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. 42 (1/2): 51–73. – Corresponding author.

describing 6 years before to be a new member of the genus *Tagora* from Ceylon (= Sri Lanka), he designated the first of the three species originally listed by WALKER (1855b), i.e., *Tagora glaucescens*, as “type” (= type species) of *Tagora*.

Note 2: The identity of this species “*Tagora*” *murina*, described by MOORE (1877) from an undefined number of “♂” specimen[s] only, is still rather enigmatic: According to MOORE’s (1883: pl. 136, fig. 2) not very accurate illustration 6 years later, one could, besides *Tagora*, probably as well expect a member of the genus *Ganisa* WALKER, 1855 or, in fact more likely, of *Sphingognatha* s. l., at least from superficial external wing pattern (i.e., without dissection or DNA analysis). However, a series of 8 moths today labelled as specimens of “*T. murina*” in the NHMUK (photographed in the drawer by H. SULAK in 2015), showing a type label on the ground of the drawer and possibly consisting of syntypes (at least in part), in contrast, consists of 6 ♂♂ and 2 ♀♀; as a variable series it resembles very much *Sphingognatha* s. l. — About a century after MOORE (1877), HOLLOWAY (1976: 54) wrote in his description of *Tagora weberi* again about the “closely related *murina* MOORE (Sri Lanka)”, but this was obviously incorrect; “*T.*” *murina* is neither a true *Tagora* at all nor in any way very closely related to this genus. — We shall deal with this taxon *murina* in a later paper separately.

Tagora glaucescens, the later type species of *Tagora*, was described by WALKER based on a single ♂ specimen (= HT by monotypy) of Eupterotidae at his hands from the “Himalaya Mountains. From Captain PARRY’s collection” (WALKER 1855b: 1188; HT in NHMUK; see our Figs. 65a, b).

MOORE (1877 and in other publications) described rather many taxa of Eupterotidae. At the time, when he described “*T.*” *murina*, 22 years after WALKER’s description of *Tagora*, Lasiocampidae was the family in which most present-day Eupterotidae species were placed, at least by British authors. Generic type species just came slowly in use at that time, but there was not yet a firm framework of rules in zoological nomenclature to be applied at that time like our present-day “Code” (ICZN 1999). In spite of the fact that MOORE’s (1883) valid type designation of *T. glaucescens* for *Tagora* was accepted by at least some authors (e.g. KIRBY 1892), others ignored it (e.g., FORBES 1955, see below). However, while MOORE (1883) kept *Ganisa* for the species *postica* WALKER, 1855 and *Tagora* for *murina* [which he had in error described as such], KIRBY (1892: 802) explicitly synonymized *Ganisa* with *Tagora* and lumped thereby 3 true *Ganisa* species (*postica*, *plana*, *similis*) with 2 true *Tagora* species (*glaucescens*, *pandya*) and, further, “*Tagora*” *murina* (= *Sphingognatha* s. l.) and an fully unrelated species from Madagascar (“*Lasiocampa*” *leonina* BUTLER, 1882: 21); however, in KIRBY (1892) the name “*leonina*” is cited several times: on p. 184 for *Pericopis leonina* BUTLER, 1872, Cist. ent. 1: 89, Costa Rica [family Arctiidae, irrelevant, not searched]; on p. 319 for *Argina leonina* (WALKER, 1864), “l.c. xxxi, p. 262”, [unclear citation; family Lithosiidae, irrelevant, not searched], Sierra Leone; and *Tagora leonina* (BUTLER, 1882), Cist. ent. 3: 21, Madagascar, family Lasiocampidae, original citation in genus *Lasiocampa*. Only shortly after KIRBY, HAMPSON (1893) kept both genera, *Tagora* (but with type species *patula*, not *glaucescens* like MOORE!) and *Ganisa* (with type species *glaucescens* [sic!]), but

mixed the species within the genera again different from MOORE and KIRBY, with true *Tagora* species only in *Ganisa* (together with one true *Ganisa*) and *Tagora* only with species of *Sphingognatha* s. l. — all that just contained in only 3 contemporary catalogue lists, but following 3 totally different concepts, and none of them complying with earlier or modern definitions.

In this chaotic tradition, this genus *Tagora* was since its description for a long time (ca. more than 150 years!) widely used either only as a synonym or as a badly defined incoherent assembly of species without any clear generic concept and without a generally accepted type species. Even well-known entomologists often used completely fictitious, sometimes new “*al gusto* definitions” for the genus often based on ignorance of MOORE’s (1883) type species selection and of different earlier concepts for the genus, or for example FORBES (1955: 114) who knew MOORE’s valid type designation, but in fact plainly pushed it away and seemingly just re-defined it on basis of his private concept, but did not explain this in detail (FORBES much relied on wing venation characters, which were fashionable at that time, but evidently are often not very reliable in most bombycoid families).

Most of the early authors used *Tagora* (just like several other such only vaguely defined eupterotid genera) as some sort of a more or less undefined “dumping-ground genus” for describing other, often very unrelated odd new species, often based just on some superficial external resemblance and not based on any relevant apomorphic characters. This may have been due to the fact that many Asian Eupterotinae as well as members of the “*Ganisa*-group” (see Note 3 below) share at first glance a big overall pattern and colour similarity with only a rather restricted basic variability and, at first glance, only very few differences between the different species-groups or genera and share a quite similar basic habitus with their variants of indistinct wavy lines, an oblique postdiscal line and a few more pattern elements on a more or less dark background, often in parallel similar development and variation series across groups not closely related. (And, of course, these modern concepts of analyzing phylogenetic relevant characters just like genitalia morphology or perhaps DNA or similar for their synapomorphic status and the true phylogenetic relationships came up only much later in the 20th century ...) Nevertheless, just alone with a more careful analysis of the existing external similarity vs. dissimilarity and, in addition, perhaps some rearing attempts, some of the early authors could probably have done much better than they actually did.

Between the mid-19th century and ca. the 1980s there were very different ideas and concepts, varying during time and by individual authors, about which moths might or might not be called a “*Tagora*”; and perhaps none of these was (or only very few were) really correct. This chaos even included species from different subfamilies (or analogously ranked groups) of the Eupterotidae: For

about a century the generic name *Tagora* was often used by authors for members of *Ganisa* – or vice versa: true *Tagora* species were listed under *Ganisa*; in any case, species of both evidently monophyletic and not closely related genera were generally freely mixed and/or, as additional alternative to further complicate the scene, including members of *Sphingognatha* s. l. and even other genera, in spite of the fact that they (as we know today) belong to different subfamilies (respectively, subfamily-equivalent groups) and surely to different genera.

This was obviously also a result of the lacking of real specialists for Asian species of the family Eupterotidae between the earliest times and the times of, e.g., MELL or HOLLOWAY, but why these specialists did not exist (in contrast to other bombycoid families) is unclear – in any case, there just *were* no specialists to bring forward systematic research in Eupterotidae.

Note 3. This genus *Ganisa* does not belong to the subfamily Eupterotinae at all but to the so-called “*Ganisa*-group”, an informal collective group of genera proposed by OBERPRIELER et al. (2003) and NÄSSIG & OBERPRIELER (2008) on a level equivalent to a subfamily for a number of genera not readily attributable to the formal subfamilies of Eupterotidae, including Eupterotinae, in which most of these genera had been placed before (e.g., FORBES 1955, HOLLOWAY 1982, 1987, HOLLOWAY et al. 2001). The “*Ganisa*-group”, originally based on clear differences in ♂ genitalia morphology only, has recently also been largely supported by HAMILTON et al. (2019) as a monophyletic unit on DNA basis, in spite of the fact that these authors sequenced only a restricted taxonomic sample (not *all* Asian genera originally included in the “*Ganisa*-group” and in Eupterotinae or other subfamilies have been checked by HAMILTON et al. 2019, and only one of the two American genera, *Neopreptos* DRAUDT [*in* SEITZ], 1930, was checked, and these American taxa have probably to be excluded from the “*Ganisa*-group”, based on HAMILTON’s et al. DNA study). *Ganisa* itself (as well as the other Asian genera of the “*Ganisa*-group”) has a very different and distinct ♂ genitalia morphology compared to the Eupterotinae (see HOLLOWAY 1982, 1987, NÄSSIG et al. 2009 etc.). The observed state of ♂ genitalia morphology in the “*Ganisa*-group” may perhaps be interpreted as a combination of on one side a plesiomorphic version, somewhat similar to the African subfamily Janinae or similarly generalized; on the other side it has as well so many unique, surely apomorphic traits that it must be interpreted as an as well specialized state characterizing a separate phylogenetic unit. Both evolutionary trends are reciprocally found in the Eupterotinae, where there is a simplified, but at the same time also highly specialized, surely synapomorphic construction, but with sufficient synapomorphic traits to keep it apart (just like within the Eupterotinae to keep *Eupterote* s. *latiss.* apart from *Tagora*, *Sphingognatha* and other genera, as indicated by HAMILTON et al. 2019 and our own research [unpubl.]). The genital of a true *Tagora* ♂ is clearly that of a typical Eupterotinae s. str. species with reduced mobility of uncus, valves and phallus, more of a “hooking in”-type (see colour photos Figs. 76–78 and ♂ and ♀ b&w genitalia photos) than the plesiomorphic “3” or “4-fingers grasping”-type of ♂ genitalia as found in the “*Ganisa*-group”.

And caused by all that, many well-known entomologists, who usually did a good job in other systematic groups, messed the species and genera regularly up:

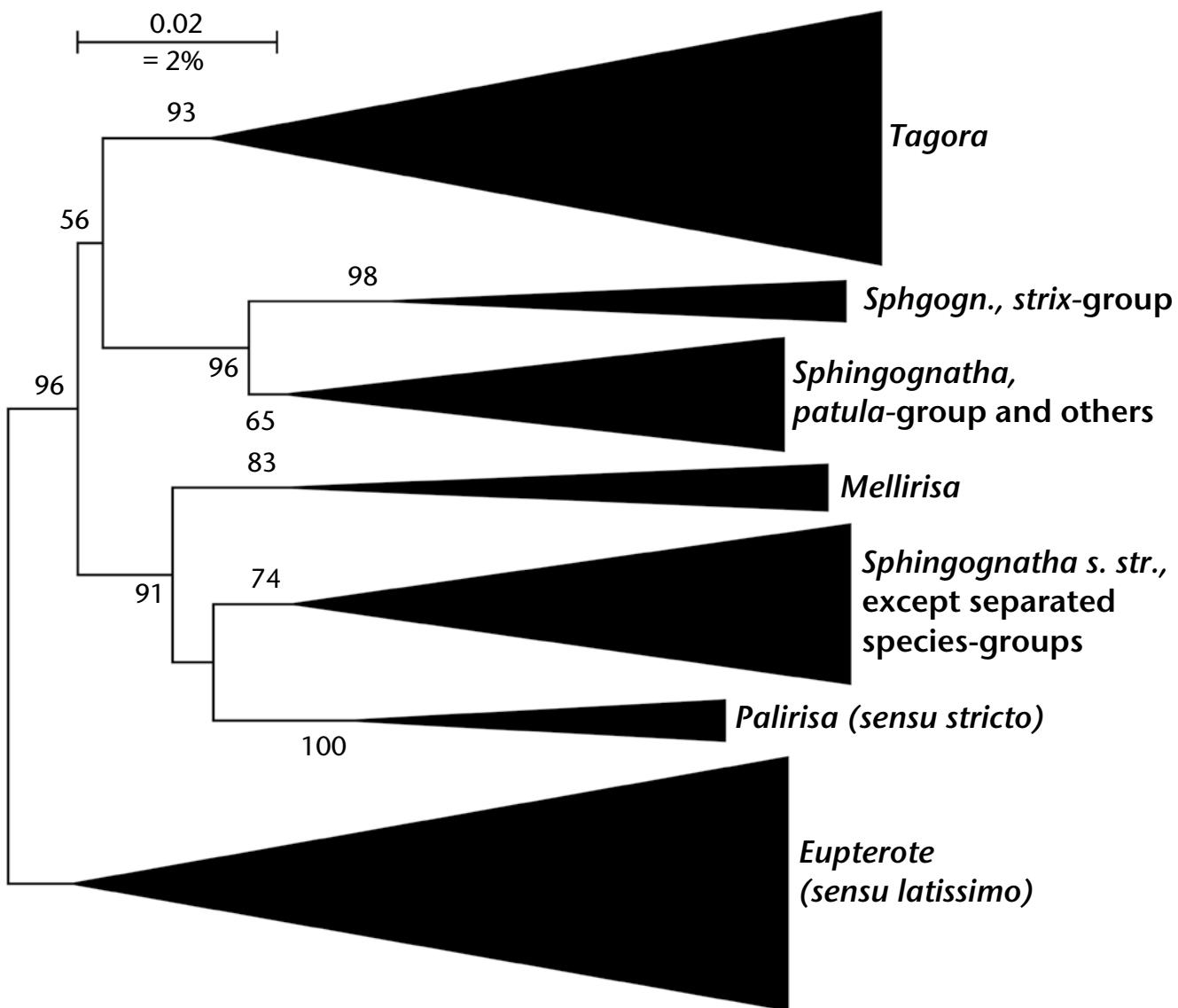
The family name Eupterotidae takes SWINHOE, 1892 as author (see NÄSSIG & OBERPRIELER 2007). At that time, HAMPSON obviously worked together with SWINHOE on the

subject; evidently both coined the family name together (see NÄSSIG & OBERPRIELER 2007). However, just HAMPSON is a good example for the confusion: HAMPSON (1893: 47) illustrated in the paragraph on “*Tagora patula*” (which he incorrectly interpreted as type species of *Tagora*, ignoring the earliest formally correct and valid type species designation by MOORE 1883 just 10 years before and, further, synonymising *Tagora* as older synonym with *Sphingognatha*, thereby “banning” *Sphingognatha* into some sort of temporary invisibility) an obvious ♂ of an unidentified “true” *Tagora* species in a rather poor b&w line drawing. The illustrated species cannot be safely identified at species level, maybe it is the Himalayan *T. pandya* MOORE or another Himalayan [or Indian] *Tagora* species; it is not a *Sphingognatha patula* nor any other *Sphingognatha* s. l. whatsoever. In the text he described as “putative ♀” of the illustrated species obviously a true *Sphingognatha* ♀ of the *patula* species-group with its typical double hyaline discoidal spots (or “vitreous spots”, as named by WALKER 1855 or MOORE 1865) in the fw. (just as WALKER’s HT ♀ of *patula*), a character which is entirely lacking in both sexes of *Tagora* and most often also in both sexes of *Sphingognatha sensu stricto*, but obviously only found in the ♀♀ and some ♂♂ of the *Sphingognatha patula* species-group, which have often just one such hyaline “discoidal” spot on each forewing in males, rarely two, especially in Myanmar populations. Further research is planned with more material.

Under the early authors, obviously only MELL (1930) had identified the monophyletic group of species correctly which we call *Tagora* today. He even described a new separate genus name for it: *Mallarctus* (see below), as he as well obviously did not know MOORE’s formally correct type species definition of 1883 and, therefore, did not know the formally correct concept of *Tagora*. MELL also included, besides *pandya* and a few more taxa, the Himalayan type species of *Tagora*, *T. glaucescens*, into his genus *Mallarctus* – he had recognized and identified it correctly and knew this entire group obviously quite well, but just did not know the correct references and type species designation.

Also FORBES (1955) identified the distinct genitalia morphology of the later so-called “*Ganisa*-group” (in contrast to “true Eupterotinae” in the modern sense) and interpreted these genera as “more primitive forms”, but still included them altogether in his “tribe Eupterotini” [sic] and received no systematic conclusions from his observation; evidently he did not even fully realize the mixing-up by other authors of these two “forms” of moths doubtlessly defined by their different genitalia in some of the then still badly defined genera (like *Ganisa* or *Tagora*) at all.

This mayhem went on for a long period, in fact, with a very few exceptions, from the 2nd half of the 19th century to Jeremy D. HOLLOWAY’s early work on the SE Asian, especially the Eupterotidae of Sundaland (1982), where he found, described and illustrated in some detail as



Text-Fig. A: Neighbor-Joining (NJ) COI barcode tree (cf. SAITOU & NEI 1987) for representatives of different systematic groups of Eupterotidae: Eupterotinae closely related to and including the genus *Tagora* WALKER. The tree is based on the analysis of a total of 174 nucleotide sequences (≥ 600 bp, 47 for *Tagora*, 127 for the other groups) from BOLD with MEGA5 software (TAMURA et al. 2007, 2011) using uncorrected p-distances. The optimal tree is shown (bootstrap support values 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. Details about all these specimens are here not provided. All supposed genus branches are collapsed in the shown illustration to have a better overview.

earliest modern author the clear and distinct differences in ♂ genitalia of the genus *Ganisa* and the Eupterotinae s. str. on his pp. 190–191 in his notes 15 & 16; compare, e.g., the comments on synonymy by NÄSSIG & OBERPRIELER (2008: 64–67) under the genus names *Eupterote* and *Sphingognatha*.

In an earlier publication, HOLLOWAY (1976: 54) still had to follow the “Card Index” of the BMNH, in which no type species was identified for *Tagora* at all. MOORE’s (1883: 142) valid original type species designation was only rediscovered 99 years later and made generally available by FLETCHER & NYE (1982: 158), but, however, their results were regrettably never incorporated into the BMNH Card Index, see BECCALONI et al. (2005): there *Tagora* was for a long time still combined with the formally younger “synonym” *Sphingognatha* C. & R. FELDER, 1874; later as a synonym or *Eupterote*. Only more recently

(last checked in May 2021) this was eventually corrected (probably based on information by the late V. V. †ZOLOTUHIN and hints of one of the authors of the present paper, W.A.N.), and *Tagora* became listed as a separate genus, while in KITCHING et al. (2018) it is still listed as junior subjective synonym of *Eupterote*. HOLLOWAY (1976) consequently still misinterpreted the type species and concept of *Tagora*, but he later (1982: 190, 191; 1987: 63–66, under *Eupterote*) was the first author to acknowledge the relatively close association of *Tagora* (and *Sphingognatha* s. l.) with *Eupterote* s. lariss. in the Eupterotinae, when he unnecessarily synonymised *Tagora* and *Sphingognatha* s. l. with *Eupterote*; but at least he separated these clearly from the only quite distantly related *Ganisa*. This improved, but, as seen from today’s viewpoint, still incorrect generic synonymy was then followed by most of the (very few) subsequent authors.

It took some years (until around 2000) before one of the authors (W.A.N.) slowly had learned the combination of wing pattern elements, ♂ genitalia groundplan and a few other indicators (later also supported by COI barcodes) to begin reliably identifying most genera of Asian eupterotids at first glance, including several still unnamed supposedly new genera. During recent (since ca. 2005/2009) independent studies by the authors of the present publication in Germany and Russian researchers (V. V. †ZOLOTUHIN, S. PUGAEV and N. IGNATYEV, then all Ulyanovsk), the true *Tagora* was found to be, first, an apparently clear monophylum and, second, sufficiently well distinct from *Eupterote s. l.*, possibly more closely related to *Sphingognatha* (or, in fact, to a subunit of it, the provisionally so-called “*patula* species-group”) than to *Eupterote*.

Note 4. The only European Eupterotidae researchers in Germany and Russia of that time got into contact during the early 2000's decade, when Vadim ZOLOTUHIN repeatedly came to the “Museum WITT” collection in Munich at Tengstrasse working mainly on Lasiocampidae and Bombycidae. Our common and overlapping interest in the Asian species of the family Eupterotidae later resulted in an informal cooperation between W.A.N. (working at Senckenberg Frankfurt) and Vadim ZOLOTUHIN and his candidates at Ulyanovsk University. We met and discussed several times in Frankfurt or Munich, and due to our overlapping interest we made a short handwritten reciprocal agreement (“who works first on which genus?”) on 14. iv. 2011 about the genera we intended to work upon for the period until the doctoral candidates have finished their theses and published the results (i.e. for ca. 2–5 years). The Russian candidates loaned a lot of material from colls. Museum WITT and Senckenberg and other collections and museums in central Europe, which was usually stored in mixed drawers in CMWM. Time went by, and for reasons not known to us in Germany both Sergey PUGAEV and Nikolay IGNATYEV did not finish their theses. Nevertheless, as we in Germany were busy with other studies mostly on Saturniidae at that time, we did not at once intend to change the agreement. Vadim, however, in the 2nd half of the 2010s during a short visit in Frankfurt opened the window for us again to go on working on all eupterotid genera except *Apha* WALKER, 1855b; the first part of their *Apha* revision was then published in 2020: ZOLOTUHIN et al. (2020). — On January 28th, 2019, Thomas J. WITT, the founder and owner of CMWM, died, and, due to resulting organisational problems in Munich, the loans of Senckenberg Frankfurt were then not returned; in winter 2019/20 W.A.N. caught different infections (no Corona), and in March 2020 the Covid pandemia started in Germany. — As the Corona pandemic situation and delayed vaccinations in Germany prevented for the vulnerable W.A.N. to work intensively in Senckenberg-Museum in Frankfurt or to travel around and study (or collect back loaned) moths anywhere else in a museum since mid-March 2020, we (S.N. and W.A.N.) intensified our studies on Saturniidae and Eupterotidae at home. Then, inmidst the Covid pandemia, on January 1st, 2021, W.A.N. was retired by age. — Half a year later Vadim V. ZOLOTUHIN unexpectedly and at the age of only 53 years (less than 2 weeks before his 54th birthday) died on June 3rd, 2021, and most of the loaned material was still missing at that time. So we temporarily stopped our work on *Tagora* and tried in June–August 2021 to trace and collect back the DNA data, the genitalia dissection vials and slides and the specimens of the loans of *Tagora* (and of all the other genera away at loan) from SMFL as far as possible at that time, and then decided to complete and finish the *Tagora* manuscript with priority as far as possible, as colleagues in London, Paris and elsewhere were waiting for the resulting information, in spite of the fact that a few loans were not rediscovered and still are lacking.

When we started our “serious” studies specifically on *Tagora* originally in the late 2010s (mainly because we found so many errors, misinterpretations and other incorrect information in literature), we did not expect that this genus would come out as complicated, surprising and rich in species as it finally resulted from our work; maybe we wouldn't have restarted the project in a period of pandemia if we had known all that before ...

For the supposed relationships between some of the Asian genera of Eupterotinae (all somehow related to *Tagora* and *Sphingognatha*) compare **Text-Fig. A**. This graphic NJ tree is so far only based on COI-barcodes, so it may of course not yet be interpreted as fully reliable for the phylogeny on genus level, but may perhaps just give some ideas about the relationships. HAMILTON et al. (2019) in their DNA study on much broader basis at the DNA side, but with many and severe gaps in the systematic coverage did not cover all the different genera and all “species-groups”, which supposedly at least in part require separate generic status (as were already identified by the Russian and German workers at that time, but was still unpublished then). Regrettably, HAMILTON et al. (2019) in their wider DNA study did especially not consider the placement of *Tagora* at all; they did not sequence any member of the genus.

Sphingognatha s. l. was already restored as a separate genus by OBERPRIELER et al. (2003: 108; based on ♂ genitalia and external morphology), later also supported by the results of HAMILTON et al. (2019). Thus, the taxon *Tagora* as well requires the status of a distinct genus, based both on ♂ genitalia and external morphology, and also clearly supported by mtDNA COI barcode.

Our studies on *Tagora* and other Asian genera of Eupterotidae starting especially in the first decade of the 2000s tried to clear the general taxonomic chaos left by most earlier authors before Jeremy D. HOLLOWAY started clearing the relationships of *Ganisa* in the 1980s and thereby opened a vast field of new information and interpretations on Asian Eupterotidae in general, and we had further new thoughts about speciation processes of those most often understorey-dwelling bombycoid “bush-hoppers” in primary rainforests (see our ideas below in short). We tried to solve most (or at least some ...) of the problems, and we identified several (in fact: more than expected) undescribed species based on a much broader geographical sampling than anybody before; so we decided to publish our present (still somehow provisional and incomplete) state of knowledge on *Tagora* here and now because of continued travel restrictions and collection lockdowns caused by the Covid pandemia preventing further studies at present (2020–2022) to make it available to other researchers. Our main intention is to set an end to the perpetuation by ignorance of the systematic chaos in the ever and always neglected family Eupterotidae. We hope to find sufficient time to study and publish other (similarly chaotic) genera of Asian Eupterotidae in the next years.

General notes on preimaginal morphology, ecology and biology within the genus *Tagora*

Besides of several printed pages of general observations by MELL (1930) on Chinese “*Mallarctus*” (= *Tagora*) and a few ecological observations on Bornean imagines by HOLLOWAY (1987), nothing appears to be known so far on the genus.

Although it is noted on one label of a PT of the here described *T. diehli* sp. n. that it was reared by the late Lutz †KOBES, no details and photos about this rearing and the larval morphology are known or published.

MELL (1930: 494; pl. IX figs. 1–4) illustrated in colour the penultimate and ultimate instar of the caterpillar of what he called “*Mallarctus pandya*” from China (see our faksimile print from scan in the colour Figs. 62). For his “*Mallarctus pandya*” from China he (MELL 1930: 398) indicated as foodplants: “polyphagous on dicots from herbaceous plants over climbers to wooden plants” [„polyphag an dikotylen Stauden, Kletterpflanzen und Hölzern“]. We do not believe presently that this taxon is identical with the true Himalayan species *Tagora pandya* of MOORE on ecological and zoogeographical reasons (compare also our thoughts about speciation processes in this group below).

The correct identity of MELL’s Chinese species “*Mallarctus pandya*” is presently unknown; most likely there will be more than just only two or three species of the genus in China. These illustrations by MELL of penultimate instar (Figs. 62.1–3) and ultimate instar (Fig. 62.4) in rolled alert or defensive position, are apparently the only illustrations of a *Tagora* caterpillar published in print; at least we do not know of any other.

MELL (1930) states in his lengthy detailed descriptions (pp. 458–463) that the larval development is “extraordinarily long (ca. 10 months)”, which is generally known for all the few Asian Eupterotidae of several genera and species reared so far. The larvae of MELL’s *Tagora* (1930: pl. IX, figs. 1–4) showed some superficial resemblance to spiny Arctiinae caterpillars in habitus (all larval hairs, whether spiny or soft, of about the same length) and behaviour (as defensive posture the caterpillar is “rolling in”) and are apparently also, similar to these, rather polyphagous.

MELL also illustrated (in rather poor line drawings) the ♂ genitalia apparatus of *T. glaucescens* and “*Mallarctus pandya*” and describes correctly both the big differences of these to *Ganisa* (a member of the “*Ganisa*-group”) and the similarity to “*Palirisa*” (recte: *Mellirisa* NÄSSIG & NAUMANN, 2021, which is like the true *Palirisa* and also like *Tagora* a true member of subfamily Eupterotinae, compare NÄSSIG & NAUMANN 2021).

HOLLOWAY (1987) characterises the altitudinal distribution of the two Bornean *Tagora* species recognized by him as follows:

- For “*Eupterote niassana* RÖTHSCHILD” [misidentified, i.e., evidently a complex of *acheron* (including its “ssp.

weberi”)] and *polychroma* sp. n. described here]: „The species is montane, taken from 1000–1800 m on G. Kinabalu, at 1618 m on Bukit Retak, Brunei, and in upper montane (mossy) forest at around 1800 m on G. Mulu, Sarawak.“

- For *T. obsoleta* (as “*Eupterote obsoleta*”): “The species was originally described from Mt. Murud, Sarawak. Two specimens were taken in lowland limestone forest on G. Api during the Mulu survey.”

However, as J. HOLLOWAY did not recognize the four different *Tagora* species on Borneo as identified here and confounded some of them during time (as shown by misidentified illustrations in his later publications of HOLLOWAY 1982, 1987), the ecological differences of them observed by him become automatically smaller. As can be seen from further specimens now known in collections, the differences in elevation of finding them are anyway not so pronounced: all species obviously have a broad overlap in their altitudinal distribution on Borneo; it may be that just some of the elevational extremes or of the main ecologically based distribution in the mountains differ a bit.

Thoughts about speciation processes in short-lived bombycoid “bush-hoppers” in primary rainforest understorey (and other biotopes)

Species of most families of Bombycoidea (of course, except most of the Sphingidae and maybe a few other, less species-rich groups of strong flyers, but especially of most Saturniidae, Brahmaeidae and Eupterotidae) are not known to migrate; even active long-distance fliers are generally unknown. In addition, the imagines have reduced mouthparts and generally (with some exceptions) do not regularly feed and are, therefore, rather short-lived, i.e. the imagines, especially ♂♂, rarely live longer than a few days (for some species we expect only a day or less), which they better do not spoil in flying longer distances, especially across unsuitable and uninhabitable (at least for the species here in question) biotopes, to spare their chances for offspring.

While in tropical to subtropical Asia some genera and species of Saturniidae are known to live as larvae in the canopies of big trees and often also flying in free air above them (e.g., the *Actias* group), others (especially species of Eupterotidae – as far as there is any knowledge at all) are known to live mainly in the understorey of (primary) forest or in bushland, generally avoid flight in open air, and to predominantly remain there in their respective biotope type.

Observations of the behaviour of moths approaching during collecting at light by, e.g., Harald Lux during his expeditions in Laos in 2008–2010 (compare NÄSSIG & NAUMANN 2021: 54, for *Palirisa* s. str. WALKER, 1855) and by the authors (S.N. & W.A.N.) at different localities in SE Asia showed that many or most (if not all – perhaps all except those few diurnal species, flying normally at day-

time, especially in the ♂ sex, compare, e.g., NÄSSIG 2000 or NÄSSIG & SCHULZE 2007) Asian species of the family Eupterotidae normally tend to fly rather fast at night just through the bushes in the understorey or, at higher elevations in mountain mossy and fog forest, through the bush-shaped dwarf trees and other vegetation, not in the canopy floor up in high trees, and also not up in free air, and tend to avoid crossing open land or other unsuitable biotopes. So they usually remain confined and isolated to more or less local primary forest biotopes and – as long as they are not syntopic there to a related species – have no good chance to find any congeners to have genetic interchange (or even panmictic pairings at longer term) with any population outside their own.

On the other side, if closely related species after some isolation event (caused by events such as climate change, desertification, rise of sea level, deforestation by natural or anthropogenic effects or any other) do meet again (usually caused by the end of that isolation event), they have some evolutionary pressure to either become panmictic again – or they build up barriers against such genetic interchange very fast, which apparently is the “preferred speciation method” for many of the more or less stationary bombycoids. As generally in other systematic groups of non-migratory, not far flying moths, stationary moth species apparently do not tend to be panmictic, but have distinct, isolated populations on, e.g., separate islands, separate mountain ranges, especially between larger river valleys etc., or otherwise isolated habitats (i.e., just any small patches of suitable biotopes), and these populations may (in the sense of the biological species-concept) be interpreted at least as species *in statu nascendi* or usually often already as separate species.

During our studies on species of *Tagora* (and often also other genera of the family) we found that the differences between species in *external habitus* are often small and cryptic (not surprising seen on the background of general uniformity and restricted variability of pattern elements and colouration in the family, usually being some sort or another of an apparently successful camouflage, respectively within the distinct genera and species-groups) or apparently sometimes even next to non-existing and maybe sometimes overlapping between species by individual variability.

However, there is a big number of different mtDNA barcodes (as expressed by the BOLD BIN Code numbers *sensu* RATNASHINGHAM & HEBERT 2013, see **Text-Fig. B** and **Tab. 1**) which often also show relatively high percentages of genetic differences for the mt-COI gene between obviously closely related populations (up to about 8%, much higher than the average in Saturniidae), including syntopic populations, which externally sometimes are close to indistinguishable.

These barcode differences are usually supported by generally “sufficient”, sometimes surprising large differences in genitalia morphology (which we had observed for ♂♂ already before our barcoding studies), expressed often in

the shape and size of the saccus, but also in other details and, especially, also in the shape of the 8th abdominal tergites – just like in *Palirisa* s. str., see NÄSSIG & NAUMANN (2021). The inclusion of the 8th sternites (sometimes also of 8th tergites) into the functional apparatus of the ♂ genitalia is known (of course, besides in many other lepidopteran families) in very similar parallel expressions both from Saturniidae (e.g., *Antheraea* HÜBNER, 1819) and Eupterotidae (e.g., some genera of Eupterotinae like *Palirisa* or *Tagora*).

For the relatively few known and dissected ♀♀ of *Tagora* we can at present state of knowledge find as well small, but apparently sufficient and constant differences in their genitalia morphology between species, mainly in the shape of the lamella antevaginalis and the posterior part of the ductus bursae, but also in the length of the apophyses and, less developed, the form of the lamella postvaginalis. As ♀♀ in general do not often come to light, for about half of the species (for 12 or 13 [the ♀ of *T. obsoleta* is not safely identified] of the 23 species) we just do not know *any* female so far; the opposite (only ♀♀ known, no ♂) is just a single case at present (in *T. niassana*). Further, as ♀♀ in most species show sexual dimorphism compared to their ♂♂, we are not in all cases (especially when no BC result is available for both sexes at present) finally sure about correct male-female associations.

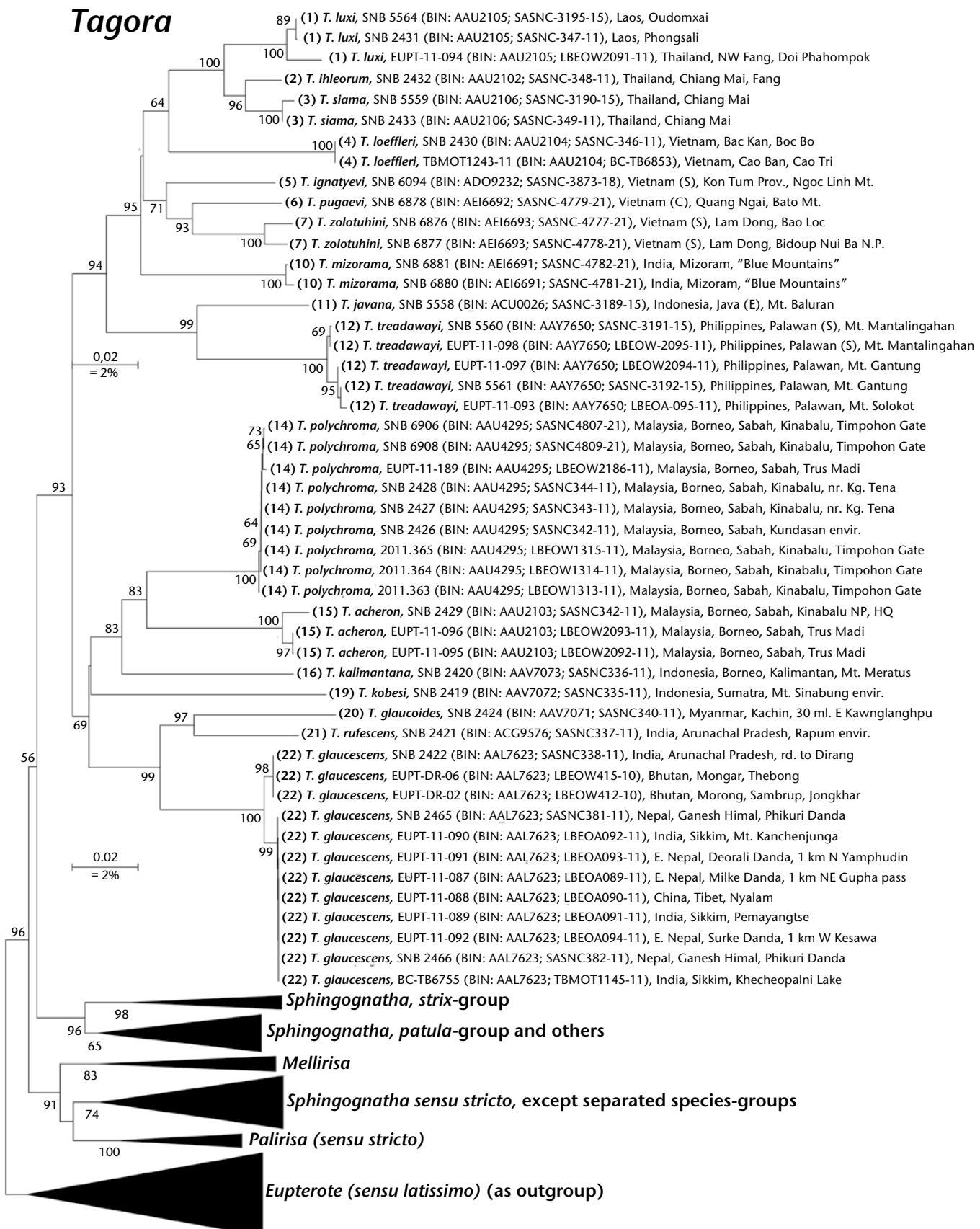
In this context it is interesting that MELL (1930: 415–416) wrote of a higher percentage of ♀♀ at light in most Eupterotidae in China; however, this was before 1930, when there was no ultraviolet light available for insect collecting at night, and it may suggest that the ♀♀ prefer longer wavelengths of light.

Most remarkable is the observation that there are very often (at most of the locations, but especially on large islands of Sundaland like Sumatra or, with a maximum, on Borneo – in spite of the fact that this is at the fringe areas of the entire generic distribution area of the genus to the Southeast) two or more different species in one region or even just syntopic. These do nearly always (where known) show different BINs and different male (at least, often also female) genitalia. Such two or more species at the same place may be quite similar externally (perhaps except where the externally rather homogenous species-subgroup of *glaucescens* is concerned in one of the species), and in the early times of our studies long before 2000 we sometimes interpreted these as “different local colour variants” of the same species. It was only later during our studies that we noticed the differing genitalia structures especially in ♂♂ and then also different barcodes between such populations.

As we did not get barcoding results for all taxa dealt with (some specimens, especially in museum collections, were just too old for the standard procedures or had been softened with too much water before spreading and, where we tried, usually did not deliver useful mtDNA sequence data), we decided to accept the status of **different species** for such populations which are *either* different in relatively large percentages of the barcode, also expressed by different BIN Codes of BOLD, *and/or* in (especially ♂)

Table 1: Specimen and barcode data, locality of collecting and depository for the 47 *Tagora* specimens used for the mtDNA barcode analyses of the present publication. The specimens of the collapsed other groups are not listed in detail here. Specimens arranged from top to bottom in the order of the NJ-tree graph (see Text-Fig. B). The double line between *treadawayi* and *polychroma* separates the two main species groups. — Additional abbreviations: HT = holotype; PT = paratype; SL = sequence length (data from BOLD). BIN = Barcode Index Number (most of 17. v./16. VIII. 2021); an automatically assigned identifier for genetic clusters within BOLD, see RATNASINGHAM & HEBERT (2013); (number) in "Taxon" field = running number of the species in text; lacking numbers belong to species not yet barcoded, their placement in the row within the text is provisionally. — The holotype of *T. polychroma* was analysed twice, one time under no. PUGAEV 2011.364 in 2011 and 10 years later under BC SNB 6906; there were minor differences in the number of bp (658 in 2011 vs. 652 in 2021).

BC-Sample-ID	Process-ID	Taxon	BOLD BIN-Code	Deposition	SL	Sex	Locality
SNB 5564	SASNC 3195-15	(1) <i>Tagora luxi</i> sp. n., HT	AAU2105	SMFL ex CWAN	658	♂	Laos, Oudumxai, Nam Khat Waterfalls
SNB 2431	SACNC 347-11	(1) <i>Tagora luxi</i> sp. n., PT	AAU2105	CSNB ex CSLL	658	♂	Laos, Phongsali, Phou Fa
EUPT-11-094	LBEOW-2091-11	(1) <i>Tagora luxi</i> sp. n., PT	AAU2105	CMWM	620	♀	Thailand, Chiang Mai, Fang, Doi Phahompok
SNB 2432	SACNC 348-11	(2) <i>Tagora ihleorum</i> sp. n., HT	AAU2102	CSNB ex CSLL	658	♂	Thailand, Chiang Mai, Fang
SNB 5559	SACNC 3190-15	(3) <i>Tagora siama</i> sp. n., HT	AAU2106	SMFL ex CWAN	637	♂	Thailand, Chiang Mai, Doi Suthep
SNB 2433	SACNC 349-11	(3) <i>Tagora siama</i> sp. n., PT	AAU2106	CSNB ex CSLL	658	♀	Thailand, Chiang Mai, Doi Suthep
SNB 2430	SASNC 346-11	(4) <i>Tagora loeffleri</i> sp. n., PT	AAU2104	CSNB ex CSLL	658	♀	Vietnam (N), Bac Kan, Boc Bo
BC-TB 6853	TBMOT1243-11	(4) <i>Tagora loeffleri</i> sp. n., PT	AAU2104	CMWM ex CTBO	658	♂	Vietnam (N), Cao Bang, Cao Tri
SNB 6094	SASNC 3873-18	(5) <i>Tagora ignatyevi</i> sp. n., HT	ADO9232	CSNB	658	♂	Vietnam (SC), Kon Tum, Ngoc Linh Mt.
SNB 6878	SASNC 4779-21	(6) <i>Tagora pugaevi</i> sp. n., HT	AEI6692	CSNB	640	♂	Vietnam (C), Quang Ngai, Bato Mt.
SNB 6876	SASNC 4777-21	(7) <i>Tagora zolotuhini</i> sp. n., HT	AEI6693	CSNB	640	♂	Vietnam (S), Lam Dong, Bao Loc
SNB 6877	SASNC 4778-21	(7) <i>Tagora zolotuhini</i> sp. n., PT	AEI6693	CSNB	655	♂	Vietnam (S), Lam Dong, Bidoup Nui Ba N.P.
SNB 6881	SASNC 4782-21	(10) <i>Tagora mizoramana</i> sp. n., PT	AEI6691	CSNB	653	♂	India, Mizoram, Blue Mountains
SNB 6880	SASNC 4781-21	(10) <i>Tagora mizoramana</i> sp. n., HT	AEI6691	CSNB	654	♂	India, Mizoram, Blue Mountains
SNB 5558	SASNC 3189-15	(11) <i>Tagora javana</i> sp. n. HT	ACU0026	SMFL ex CWAN	615	♂	Indonesia, Java (E), Mt. Baluran
SNB 5560	SASNC 3191-15	(12) <i>Tagora treadawayi</i> sp. n., PT	AAY7650	SMFL ex CWAN	658	♂	Philippines, Palawan (S), Mt. Mantalingahan
EUPT-11-098	LBEOW-2095-11	(12) <i>Tagora treadawayi</i> sp. n., PT	AAY7650	SMFL ex CWAN	658	♀	Philippines, Palawan (S), Mt. Mantalingahan
EUPT-11-097	LBEOW-2094-11	(12) <i>Tagora treadawayi</i> sp. n., PT	AAY7650	SMFL ex CCGT	658	♀	Philippines, Palawan, Mt. Gantung
SNB 5561	SASNC 3192-15	(12) <i>Tagora treadawayi</i> sp. n., HT	AAY7650	SMFL ex CCGT	658	♂	Philippines, Palawan, Mt. Gantung
EUPT-11-093	LBEOA-095-11	(12) <i>Tagora treadawayi</i> sp. n., PT	AAY7650	CMWM	632	♂	Philippines, Palawan, Mt. Solokot
SNB 6906	SASNC 4807-21	(14) <i>Tagora polychroma</i> sp. n., HT	AAU4295	MfNB	652	♂	Malaysia, Sabah, Kinabalu-NP, Timpohon Gt.
SNB 6908	SASNC 4809-21	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	MfNB	653	♂	Malaysia, Sabah, Kinabalu-NP, Timpohon Gt.
EUPT-11-189	LBEOW2186-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	SMFL ex CWAN	658	♀	Malaysia, Sabah, Trus Madi
SNB 2428	SASNC 344-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	CSNB ex CSLL	658	♂	Malaysia, Sabah, Mt. Kinabalu, nr. Kg. Tena
SNB 2427	SASNC 343-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	CSNB ex CSLL	658	♀	Malaysia, Sabah, Mt. Kinabalu, nr. Kg. Tena
SNB 2426	SASNC 342-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	CSNB ex CSLL	658	♂	Malaysia, Sabah, Kundasan envir.
2011.365	LBEOW1315-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	MfNB	658	♂	Malaysia, Sabah, Kinabalu-NP, Timpohon Gt.
2011.364	LBEOW1314-11	(14) <i>Tagora polychroma</i> sp. n., HT	AAU4295	MfNB	658	♂	Malaysia, Sabah, Kinabalu-NP, Timpohon Gt.
2011.363	LBEOW1313-11	(14) <i>Tagora polychroma</i> sp. n., PT	AAU4295	MfNB	658	♂	Malaysia, Sabah, Kinabalu-NP, Timpohon Gt.
SNB 2429	SASNC 345-11	(15) <i>Tagora acheron</i> (MELL, 1930)	AAU2103	CSNB ex CSLL	658	♂	Malaysia, Sabah, Kinabalu-NP, HQ
EUPT-11-096	LBEOW-2093-11	(15) <i>Tagora acheron</i> (MELL, 1930)	AAU2103	CMWM	658	♀	Malaysia, Sabah, Trus Madi
EUPT-11-095	LBEOW-2092-11	(15) <i>Tagora acheron</i> (MELL, 1930)	AAU2103	CMWM	658	♂	Malaysia, Sabah, Trus Madi
SNB 2420	SASNC 336-11	(16) <i>Tagora kalmantana</i> sp. n., HT	AAV7073	CSNB ex CSLL	658	♂	Indonesia, Borneo, Kalimantan, Mt. Meratus
SNB 2419	SASNC 335-11	(19) <i>Tagora kobesi</i> sp. n., HT	AAV7072	CSNB ex CSLL	658	♂	Indonesia, Sumatra, Sinabung envir.
SNB 2424	SASNC 340-11	(20) <i>Tagora glaucooides</i> sp. n., HT	AAV7071	CSNB ex CSLL	658	♂	Myanmar, Kachin, 30 ml. E Kawnglanghpu
SNB 2421	SASNC 337-11	(21) <i>Tagora rufescens</i> sp. n., HT	ACG9576	CSNB ex CSLL	658	♂	India, Arunachal Prad., Along Distr., Rapum
SNB 2422	SASNC 338-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CSNB ex CSLL	658	♀	India, Arun. Prad., Bomdila D., rd. to Dirang
EUPT-DR-06	LBEOW415-10	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CVVZ	658	♀	Bhutan, Mongar, Thebong
EUPT-DR-02	LBEOW412-10	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CVVZ	658	♂	Bhutan, Morong, Sambrup Jongkhar
SNB 2465	SASNC 381-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CSNB ex CSLL	658	♂	Nepal, Ganesh Himal, Phikuri Danda
EUPT-11-090	LBEOA092-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	653	♀	India, Sikkim, Mt. Kanchenjunga, SE
EUPT-11-091	LBEOA093-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	658	♂	E. Nepal, Deorali Danda, 1 km N Yamphudin
EUPT-11-087	LBEOA089-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	658	♂	E. Nepal, Milke Danda, 1 km NE Gupha pass
EUPT-11-088	LBEOA090-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	658	♂	China, Tibet, Nyalam
EUPT-11-089	LBEOA091-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	658	♂	India, Sikkim, Pemayangtse
EUPT-11-092	LBEOA094-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM	658	♀	E. Nepal, Surke Danda, 1 km W Kesawa
SNB 2466	SASNC 382-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CSNB ex CSLL	658	♂	Nepal, Ganesh Himal, Phikuri Danda
BC-TB 6755	TBMOT1145-11	(22) <i>Tagora glaucescens</i> WALK., 1855	AAL7623	CMWM ex CTBO	658	♂	India, Sikkim, Khecheopalni Lake



Text-Fig. B: Neighbor-Joining (NJ) COI barcode tree (cf. SAITOU & NEI 1987) for representatives of different systematic groups of Eupterotidae closely related to (127 specimens) and including the genus *Tagora* WALKER (47 specimens). The tree is based on the analysis of a total of 175 (one HT specimen analysed twice) nucleotide sequences (≥ 600 bp) from BOLD with MEGA5 software (TAMURA et al. 2007, 2011) using uncorrected p-distances. The optimal tree 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. Details (including sequence lengths) about the specimens of *Tagora* see in Table 1; the outgroups (in the collapsed branches) are not listed in detail here. Most sequence data and BOLD's BIN Codes have been downloaded from BOLD on 17. vi. and 16. viii. 2021, a few later.

genitalia morphology, and in any case *supported by additional characters* like isolation (e.g., on islands or mountain ranges) or habitus or other characters.

We do not expect that we already have reached a complete solution (“the final one”) for the systematics of all species of the genus *Tagora* here, but as there were so many absolutely clear misinterpretations of species’ identities during history in literature and so many superficial, often just nonsensical ideas (often just plain typological interpretations based on superficial similarities in external habitus under ignorance of any further relevant details, often even without any attempt to study anything like, at least, ♂ genitalia morphology and, since the late 2000s, barcode) that we believe that our interpretation of the situation is in any case probably much more likely than most of those interpretations suggested earlier in literature.

Our preliminary analysis of the genus *Tagora* may appear as a “species-splitter’s viewpoint”, but clear morphological differences in genitalia have for about a century generally next to *always* been accepted for defining species in Lepidoptera, and the barcode also exhibits in general sufficiently large differences. For species with a low ability to “spread around” such inconspicuous speciation characteristics are generally to be expected.

It makes just not much sense for us to “put all populations into the same pot” (one species name for all, and at best subspecies for anything similar from far off the original place), as done by many earlier authors; this obscures and ignores zoogeographical effects of “local” species and the real existing diversity and makes blind against the rapid diversity decline and man-made species’ extinction everywhere on our planet: While migratory species may of course be able to return to man-made “emptied” places of their former habitats after recovery of these, stationary (“local”) species usually cannot do so and will not return and become extinct at larger geographic scales and at full species level much faster. When such “local species” or “evolutionary units” do not have a defined separate scientific name, nobody will just only *notice* their disappearance.

In general, we believe that the biological (and, as a consequence, systematic) diversity of non-migratory, non-panmictic, short-lived bombycoid species (and, of course, species in other families with similar biology), living in rather small, perhaps even local populations, especially in the understorey of tropical primary forest habitats (but surely also in comparably local other biotope types elsewhere), is usually much larger than presently expected, and specifically this diversity of “low-range” or local species is seriously and increasingly endangered by the sheer mass of growing human population (over ca. 8 billion presently!) and all overwhelming anthropogenic disturbances and destruction of biotopes and species, besides agriculture, building and construction, and including the anthropogenic climate change (just to name only a few of the prominent devastating effects of man), on this single planet we all live on.

We probably will be the last generation of entomologists to have a chance to discover, observe and describe this rapidly declining high insect diversity in the wild.

The next big extinction period since the Late Cretaceous “dino-killer” asteroid crash in the Caribbean Sea near the Yucatan coast has already begun (at all levels, marine or terrestrial, in vertebrates or invertebrates), and this time the “killer asteroid”, in fact, is our own biological species *Homo insapiens* [sic]. Since the mid-1960s to mid-1970s, when I [the author W.A.N.] was a boy or student, the Lepidoptera fauna (as well as many other groups of organisms) has/have already suffered severe decline everywhere around my housing areas in Germany, my holliday places in the southern Austrian Alps and as well at those many places in the tropics everywhere which I had visited more than once to be able to observe the process of decline, and it may be already too late to turn this all back (at least when seen from the personal viewpoint by someone who spent already nearly his full lifetime in lepidopterology).

Material and methods

Material lists of specimens used for this study see below under the taxa and localities dealt with. Morphological studies followed standard procedures. Our mtDNA COI barcodes were analysed in Guelph, Ontario, Canada. The sequence data and the BOLD BIN codes of the COI barcoding results for the present publication were downloaded on 17. v. and 16. viii. 2021 (a few data came even later, see under the species) from the BOLD website (boldsystems.org). All funding came from our private sources.

Collection abbreviations

CCGT	Collection Colin G. †TREADAWAY, formerly Limbach-Wagenschwendt, now in SMFL.
CMWM	Collection Museum †WITT, München (Munich); final deposition of Eupterotidae probably in ZSM, Munich (A. HAUSMANN, pers. comm. 2021).
CSLL	Collection Swen LÖFFLER, Lichtenstein/Sachsen, Germany, since 2020 part of CSNB.
CSNB	Collection Stefan NAUMANN, Berlin, Germany. Dedicated to the Rainer-SEEGERS-Stiftung, to be deposited in MfNB, Berlin.
CTBO	Collection Thierry BOUYER, in CMWM; final deposition of Eupterotidae presently uncertain.
CVVZ	Collection Vadim V. †ZOLOTUHIN, formerly Ulyanovsk University, present deposition unknown.
CWAN	Collection Wolfgang A. NÄSSIG, meanwhile in SMFL.
MAKB	Museum Alexander Koenig, Bonn, Germany.
MfNB	Museum für Naturkunde (former abbreviations ZMHU or MNHU), Berlin, Germany.
MNHN	Muséum national d’histoire naturelle, Paris, France.
NHMUK	The Natural History Museum, London (formerly for over a century British Museum [Natural History], which explains for the century-long established acronym BMNH), U.K.
SMFL	Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.
ZSM	Zoologische Staatssammlung München (Munich), Germany.

Other abbreviations and conventions

†	[In combination with a person's name:] indicating a [rather recently] deceased person.
‡	Invalid, misspelled (invalid spelling variant) or otherwise incorrect name in the sense of FLETCHER & NYE (1982).
bp	base pairs of the [COI mt-]DNA sequence.
BC [no.]	mtDNA COI barcode [with number].
BIN	Barcode Index Number (as of downloads on 17. v. and 16. viii. 2021); an automatically assigned identifier for genetic clusters within Bold, see RATNASHINGHAM & HEBERT (2013). (A few BINs [e.g., AEInnnn] have been calculated by BOLD and retrieved by us later than mid-August 2021.)
Fw.	Forewing[s].
GP [no.]	Genitalia dissection [with number].
HT	Holotype[s].
Hw.	Hindwing[s].
Lfw.	Length of forewing, measured from base to apex, without the width of the body.
LT	Lectotype[s].
PLT	Paralectotype[s].
PT	Paratype[s].
ST	Syntype[s].
T.l./t.l.	Type locality. (In case of old museum types, where the information between the text on labels of type specimens and within the original description differs, we list both variants of the information.)
uns.	Underside (of wings).
ups.	Upperside (of wings).

Systematic part: List of the genus *Tagora* and the described taxa included, with descriptions of 18 new species

Genus level

Tagora WALKER, 1855

Tagora: WALKER (1855b: 1188[–1190]). — Type species (by subsequent designation by MOORE 1883: 142, see FLETCHER & NYE 1982: 158): *Tagora glaucescens* WALKER, 1855. — Etymology not explained.

Type species designations for genera of Asian Eupterotidae came up about with MOORE (1883: 142), who was the earliest author to validly designate a type species for the genus *Tagora*; only ten years later, at the time of HAMPSON (1893) (or other contemporary authors, we did not specifically research for this question), type species were cited and designated already more or less regularly for most genera, at least by some authors (while others, e.g., BUTLER 1881 or COTES & SWINHOE 1887, did not make use of generic type species).

A first unified “International Code of Zoological Nomenclature” defining (besides other rules) type species and type specimen concepts was published only in 1905, and it took nearly a century, with many changes in between, until the present, much more elaborate fourth edition of the Code became valid in 1999 (ICZN 1999).

= *Mallarctus*: MELL (1930: 458), **syn. rev.** — Type species (subsequently designated by FORBES 1955: 130, see FLETCHER & NYE 1982: 96): *Tagora pandya* MOORE, 1865 [*sensu* MELL, but here provisionally accepted as the “true *pandya*”, as we do not know the correct identity of MELL's species “*pandya*”, see below]. — While *Tagora* is at present

(website of BECCALONI et al. 2005, last visited for checking this aspect 18. v. 2022) already listed as a separate genus, but without any species contained, *Mallarctus* was not yet listed separately therein in mid-May 2022; it is still listed there erroneously as synonym of *Ganisa* [sic]. — Etymology not explained.

Note 5: MELL (1930, not “1929”; for this definitively correct publication date 1930, see citation in References section) did not explicitly designate a type species for his genus *Mallarctus*, and as he included, besides *pandya* sensu MELL and “its subspecies *acheron*” (see below), a few more species in his new genus (thus excluding the case of monotypy), the type species had to be designated by someone later, i.e. in this case by FORBES (1955). However, the genus is nonetheless valid, following Art. 67.4 and 67.4.1 of ICZN (1999), because being described before 1931.

In spite of the relative superficial habitus dissimilarity of the two type species *glaucescens* (for *Tagora*) and *pandya* (for *Mallarctus*), both clearly belong to one and the same genus. This was already noticed and accepted correctly by MELL (1930) and is supported here in general and genitalia morphology and barcode.

After its description, *Mallarctus* MELL, 1930 was usually placed into synonymy with different other genera, most often with *Ganisa* WALKER, 1855 [sic, a genus belonging to a different, well-separated group at subfamily level, the “*Ganisa*-group”, see Note 3 and elsewhere here; in spite of the fact that MELL (1930: 411, 435 figs. 60–62, vs. 459 figs. 73–74) in the same paper also described and illustrated the large morphological differences between the ♂ genitalia of *Ganisa* and *Mallarctus* (= *Tagora*!], with *Tagora* already by FORBES (1955: 130) and later in an extremely broad sense with *Eupterote* HÜBNER, 1820 (by HOLLOWAY 1982: 190, then following him also NÄSSIG & OBERPRIELER 2008: 64 and KITCHING et al. 2018). See, e.g., BECCALONI et al. (2005), obviously based on compilation of unidentified older sources perhaps like STRAND (*in* SEITZ 1922) etc. without any critical checking of *original* citations — STRAND (*in* SEITZ 1922) evidently cited predominantly *secondary* sources (with all their errors) only and did *not* regularly search for the real original publications. (Special thanks to Jeremy HOLLOWAY and Ian KITCHING for providing this valuable background information on the BMNH Card Catalogue and its web version by BECCALONI et al.)

HOLLOWAY (1982: 190, 191) had synonymised *Mallarctus* with *Eupterote*; he did not deal with *Tagora* in this context, as this name was erroneously still listed as synonym of *Ganisa* in the BMNH Card Catalogue (without reference to FLETCHER & NYE 1982) at that time. In spite of general similarity of the Eupterotinae genitalia (under exclusion of the “*Ganisa*-group”), we believe that the presently still unrevised genus-complex around *Eupterote* is not so closely related to the genus-complex around *Sphingognatha* (including *Tagora*) and does not at all require to be united with it; these two just share the basic apomorphic specialization of the Eupterotinae ♂ genitalia, but not too much else. Extended DNA data supported this view later (HAMPSON et al. 2019).

There has never been published a comprehensive and competent “*Lepidopterorum Catalogus*” volume on Eupterotidae providing correct and critical citations of published original descriptions and revisions and other topics, which may explain many, if not most of the resulting errors, e.g., in the SEITZ parts authored by STRAND or other authors, in the BMNH Card Catalogue and in most other literature generally dealing with the family. Except publishing a few single papers, mostly dealing with descriptions of new species or subspecies (most usually in misidentified genera), there have also not been many authors doing real analytic “specialist’s work” at least on Asian species of the family at all during the last ca. 165 years. Most authors dealt with Eupterotidae just only as one of many families, without the necessary scrutiny in details, just describing new taxa.

Note 6: MELL (1930) was probably the first author to notice and accept the clear morphological differences, especially in ♂ genitalia and preimaginal morphology, between the present-day “true” *Tagora* (as defined by the valid designation of the type species *glaucescens* by MOORE 1883, obviously unknown to MELL) and other genera (especially *Ganisa*, which at this time harboured perhaps most of the described “true” *Tagora* species, but wildly mixed with “true” *Ganisa* and also some species of other genera). Caused by the general taxonomic-systematic chaos in the family and his ignorance of MOORE’s type species designation, MELL could not identify the correct generic association for his *glaucescens-pandya* group of species (i.e., the actual *Tagora*), but described a new genus, *Mallarctus*, for the entire group instead, harbouring the taxa *pandya*, *acheron*, *niassana* ROTHSCHILD, 1917, *pallida* BUTLER, 1881 [sic! MELL 1930 synonymized on p. 462 in error *pallida* with *glaucescens*] and *glaucescens* (see MELL 1930: 458–462). There he also delivered information on the larvae (with colour paintings on his pl. IX, figs. 1–4, reprinted here in our Figs. 62.1–4 from a scan) – which still is the only published information on preimaginal morphology of any species of the Asian genus *Tagora*! – of what he understood to be Chinese “*Mallarctus*” [= *Tagora*] “*pandya*” in a very wide concept of this [in fact only Himalayan, as we see it] species.

It does not make much sense to list here *all* the generic names under which “true” *Tagora* species have been more or less accidentally included in error at times during the last more than 165 chaotic years after WALKER described the genus, and, even more so, *all* species which have at times been erroneously included into *Tagora*. This would not bring forward systematics and phylogeny of the family Eupterotidae in any way, just in most cases being a wild collection of plain errors, misidentifications and misinterpretations and lacking of clear generic concepts.

Tagora is a genus of the subfamily Eupterotinae in Asia with the typical specialized (i.e., synapomorphic for the subfamily) ♂ genitalia of the subfamily of the “hooking in”-type as explained above in Note 3, but differs slightly in genitalia morphology (and habitus and barcode) from *Eupterote s. l.* itself and the other genera correctly included into the subfamily just like, for example, *Palirisa* WALKER, 1855, *Mellirisa* NÄSSIG & NAUMANN, 2021 (see NÄSSIG & NAUMANN 2021) or *Sphingognatha* C. & R. FELDER, 1874 s. l. (compare OBERPRIELER et al. 2003 and NÄSSIG & OBERPRIELER 2008 when separating the “*Ganisa*-group” from the subfamily Eupterotinae) and other valid genera in that subfamily. More recent DNA analyses on a

much broader DNA basis than barcoding (HAMILTON et al. 2019) also supported the view gained from genitalia and barcoding: the “*Ganisa*-group” and the Eupterotinae appear to be both monophyletic, and even the genera around *Sphingognatha* s. l. on one side and the fully unrevised *Eupterote* s. l. on the other within the Eupterotinae as well appear to be separate and apparently two “reciprocally synapomorphic” clusters of different genera, although HAMILTON et al. had a rather narrow systematic basis in their sampling.

Generally, moths of the genus *Tagora* are medium-sized Eupterotidae of reddish-brown or greenish to brownish-grey ground colour with a special pattern and colour combination unique for the genus. In both sexes the more or less triangular fw. has a broadly rounded, rectangular tornus form, with a more or less rounded outer margin, and some species have a prominent, partly bent backward, apical tip (sometimes sexually dimorphic: only in ♀♀); the hw. is rounded. All species have a dorsal wing pattern with prominent fw. and hw. postmedian line, consisting of two or three differently coloured parallel lines. The fw. and hw. antemedian lines are much reduced, but there are up to six undulate lines between wing base and postmedian lines and often a tiny creamy white patch (but no hyaline spot within *Tagora*) in the area of the discal cell of the fw. in most specimens. Underside of the reddish brown species lighter, those of the greyish ones darker than dorsal side, with a reduction of the postmedian line and without a fw. dot. Wing venation in the fw. with very short discal cell (thereby the position of the white dot very basad), vein M2 emerging almost on the upper edge of this cell, near to M1 (compare SCOBLE 1995: 54). Thorax and abdomen always in the ground colour of the entire moth. Concerning leg spurs, we found an arrangement of tibial spurs as 0-2-2 (see colour Figs. 63, 64: legs of *T. pugaevi* sp. n., resp. *T. glaucescens*) in the species where we looked for.

Male antennae generally bipectinate up to the apex, rami directed latero-ventrad, the flagellomers scaled dorsally; those of the *glaucescens* subgroup have relatively long rami, the others on average slightly shorter ones. Females also with bipectinate antennae, again with scales on dorsal part of flagellomers, with much shorter rami, nearly filiform in some species.

Male genitalia with two lateral processes of the uncus, but no central part. Valves with dorsally bent process (the lateral “hooks”), sometimes double-ended, with a small internal projection. Moving ability of the uncus and valves is, as typical for the Eupterotinae, reduced; the grip of the apparatus during copulation is not mainly caused by the usual “triple forceps” of central dorsal uncus and lateral valves like in so many Lepidoptera, but by a “hooking in” mechanism, supported by the vesica scobination obviously anchoring in the ostium bursae or begin of ductus bursae of the ♀ during copulation. LEMAIRE & MINET (1999: 331) mention a striate area in the sacculus as being typical for Eupterotinae; this is the

structure which we call in this work the ventral process of the valves (= "Vinkulum", as mentioned by MELL 1930: 458). FORBES (1955: 87) suggested whether this might be some sort of a stridulating organ, but we believe the striate surface supports the hold during copulation. The juxta and phallus are fused, the vesica is covered with acute spiculae all around in different development, often indented at the end, the form of the not fully everted vesica somehow resembling the hats of the British Queen's Guards.

Female genitalia with the usual structures, but, as far as known from the few yet known ♀♀, they differ between the different known *Tagora* species sufficiently in the form of the lamella antevaginalis and the posterior part of the ductus bursae, and, at a lower rate, in the form of the lamella postvaginalis and the length of the apophyses. Corpus bursae always without any sclerotizations, as far as known.

Almost nothing is known about the biology of *Tagora*. MELL (1930) was the first and only author who published some notes about preimaginals (see above in our "General notes on preimaginal morphology, ecology and biology ...", in Note 6 and below) with illustrations (paintings) of penultimate and ultimate (col. Figs. 62.1-4) larval instars of his "*Mallarctus pandya*", a species which we cannot safely identify at present.

We never succeeded to collect a female of *Tagora* for depositing eggs for a potential rearing.

Peter SMETACEK kindly sent us a photo taken in Arunachal Pradesh, India, of a living ♀ of most likely the true *T. pandya* in its alert position in 2020 (see col. Fig. 19). Swen LÖFFLER allowed us to use a photo of a resting living ♂ of *T. loeffleri* sp. n., from the type locality in Northern Vietnam (see col. Fig. 75).

Species level

- There are 7 earlier described taxa in the species-group which are here correctly included in *Tagora* WALKER, 1855, now belonging in our interpretation to 5 species (with 2 synonyms, as presently interpreted); we describe further 18 species here as new. At present we count a total of 23 different species in *Tagora*. We expect still some more undescribed species, and of course further research may revise the status of some of the here described new species on basis of new information, for example from preimaginal instars.
- The species are listed in the order of their branching within the COI barcode tree (Text-Fig. B), with the new species inserted accordingly; where no barcode data is known for an old or a new taxon, the species are provisionally inserted at a seemingly plausible place based on morphology and zoogeography in the systematic arrangement. This order may of course be subject to change in future, when new material comes up and can be sequenced or generally in light of other new relevant information.

- The species are identified by a running number in round brackets from (1) to (23) in front of the name, the order based mainly on the topology of the NJ barcode tree (see Text-Fig. B), just to provide some sort of order for orientation.

Apparently, there are two groups of externally rather well-separated "morphotypes" in the genus *Tagora*, which, however, do *not* correspond to the two main branches of the NJ COI barcode tree (see Text-Fig. B):

1. The "morphotype" of *pandya* and *niassana*, which counts 19 species in total (with the species-group of *pandya* counting 12 species, the species-subgroup of *niassana* counting 7 species), on average often slightly brighter in ground colour, with a less prominent double or triple postdiscal oblique fascia and with on average more falcate fw. apex (especially in females, where the apex may in some species end in some sort of a distinct small, bent tip), containing species from the Himalaya and China to Sundaland, and
2. the "morphotype" of *glaucescens*, which is on average darker brownish, especially the ♂♂, with a more prominent double or triple postdiscal oblique fascia and forewings less falcate, i.e. a more rounded fw. apex; the ♀♀, in contrast, are more variable and exhibit often a more prominent sexual dimorphism, usually brighter than their ♂♂, with some plesiomorphic and variable resemblance to the morphotypes of *pandya* and *niassana*, also sometimes with a pointed fw. apex – but it forms only a part of the branch combining the mainly Himalayan *glaucescens* species-subgroup of 4 species with the Sundanian *niassana* species-subgroup of 7 species (i.e. summing up to 11 species for the second main branch of the barcode NJ tree, see in Text-Fig. B).

The taxa of the *pandya* species-group and the *niassana* species-subgroup are externally on average quite similar and supposedly show the plesiomorphic habitus forms within *Tagora*; apparently the habitus of the *glaucescens* species-subgroup is slightly apomorphic within the genus, as based on the barcode results and external pattern, and the ♂♂ of the *glaucescens* species-subgroup obviously are evolving in their pattern faster away from the *Tagora* standard pattern than their more variable (and apparently "slower" in their evolutionary speed) ♀♀.

The three species-group and -subgroup names are based on the oldest species names described within each of the (sub-)groups. These three groups and subgroups as listed above obviously do not require any higher rank in taxonomy than just that of species-groups, respectively subgroups, because neither general nor genitalia morphology nor barcodes offer any support for a further splitting at generic level (using, e.g., MELL's taxon *Mallarctus* or new names).

In contrast, the COI barcode indicates a close grouping of the Himalayan *glaucescens* species-subgroup with the Sundanian *niassana* species-subgroup in one main branch of the genus (obviously except two Sundanian species of

the *pandya*-species group from Palawan and Java), while the *pandya* species-group is more or less overlapping in the Himalaya and Meghalaya (and in part in Sundaland), so both branches are geographically overlapping for only some part, but are mostly reciprocal geographically exclusive except in the Northeast, based on present knowledge (see Text-Fig. B and Maps). Further studies with fresh material are required to clear the detailed relationships, as the barcode information is lacking for several of the species, mainly due to age of the (museum) specimens.

For a better overall view of the differences between all species we show in Tab. 2 the typical characteristics of the species to have them available at a glance. Under the following species enumeration we give only short diagnoses, especially for the already described taxa, to avoid too many repetitive notes. The differences in genitalia between probably closely related species are mentioned in the following part under differential diagnoses.

The species-group of *Tagora pandya*

(1) *Tagora luxi*, sp. n.

(Figs. 1a, b; 2a, b; 101; Map 1 *Tagora*.)

BOLD BIN: AAU2105 (based on BC SNB 2431, 5564, EUPT-11/094 PUGAEV).

Holotype ♂: "Laos, Prov. Oudumxai, Weg zu Nam-Khat-Wasserfällen, 715 m, 20°42.815' N, 102°6.319' E, LF 8. VIII. 2009, ca. 18.30–4.45 h; Sekundärwald; Vollmond teilweise sichtbar, Wolken; (Kürzel 5); leg. et don. Harald Lux"; in SMFL; BC SNB 5564; Figs. 1a, 1b; SMFL type catalogue no. 4731.

Paratypes (2 ♂♂):

Laos: 1 ♂, N Laos, Prov. Phongsali, Phou Fa, 1650 m, Anf. xi. 2005; leg. T. IHLE, ex CSLL in CSNB; GP 2677/21 SNB; BC SNB 2431; Figs. 2a, 2b.

Thailand: 1 ♂, N.-Thailand, Mt. Doi Phahompok, 14 km NW Fang, 1700 m, 16. x. 2000, leg. local coll.; DNA Eupt-11/094; CMWM.

No ♀ specimen known.

Distribution: Laos, N. Thailand.

Misidentification in literature: "*Tagora obsoleta* TALBOT, 1926" [with erroneous original citation "D. ent. Z. Iris" from the BMNH Card Index and BECCALONI ET AL. (2005)]: KISHIDA & ZOLOTUHIN (2020: 102, pl. 42 fig. 1). We interpret their record as the here described species *T. luxi* sp. n., although their singleton was found in southern Laos, Champasak Prov., near to the eastern Thailand and Cambodia borders (in Map 1 marked with a question mark). Due to the uncertainty in determination we do not include it in the type series. See also Note 9 under *T. obsoleta*; *T. obsoleta* is not known from continental Asia, it is obviously an endemic of Borneo Island.

Etymology: Named after Dr. med. Harald Lux, Oberursel, now Berlin, who collected one of the specimens and shared with the authors his general field experience and observations on Eupteridae from his collecting at light in Laos.

Description and differential diagnosis

♂ (Figs. 1a, b; 2a, b): Fwl 43 mm in all known specimens (HT 43 mm). Fw. a little elongated, on dorsal side of light grey ground colour with dark grey markings. Thorax and abdomen in ground colour, head dark brown. Antennae 11.5 mm in length. Fw. antemedian line almost invisible, median field with a tiny creamy white patch, followed by

four crenulate dark grey lines which become more intense towards the costa. Fw. postmedian line straight, with strong dark grey, narrow yellow and very narrow outer dark grey portion. Fw. postmedian area completely in ground colour, with a very tiny central crenulate dark line. Fw. apex dark with an acute apical tip bent backward. Dorsal hw. of same colour, with a black patch along the inner margin, postmedian line a little bent, with inner dark grey and outer narrow yellow portion. Postmedian area homogenous in ground colour, with almost no markings aside of some little black dots along the veins. On ventral side of light greyish brown colour with strong dark brown ornamentation, becoming darker to the marginal zone.

Differs from *T. siama* sp. n. and *T. ihleorum* sp. n. which both occur also in northern Thailand by the different, elongated form of the fw., the stronger ornamentation, details of the postmedian line and details of the uncus and form of the 8th sternite as described below.

♂ genitalia (b&w-Figs. 101; 8th sternite Fig. a; GP 2677/21 SNB [PT]): Uncus with long and broad processi, emerging close to each other. Dorsal process of the valves strong and large, ventral process rounded. Saccus and phallus short and broad, vesica with long sclerites. 8th sternite broad, with central posterior deep furcation.

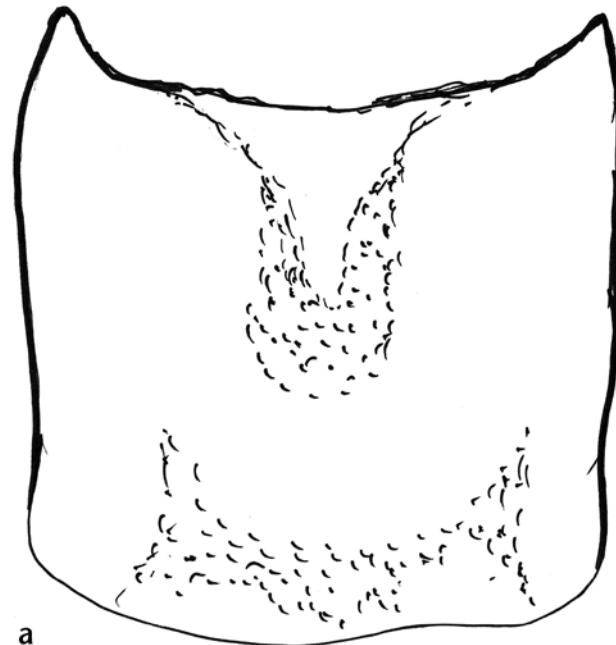


Fig. a: 8th Sternite sketch of ♂, *Tagora luxi*, GP 2677/21 SNB [PT]. — All these sternite sketches by S.N.

♀ unknown.

(2) *Tagora ihleorum*, sp. n.

(Figs. 3a, b; 102; Map 1 *Tagora*.)

BOLD BIN: AAU2102 (based on BC SNB 2432). Taken as distinct from *T. siama* sp. n. and *T. luxi* sp. n. caused by the BIN Codes and differences in ♂ genitalia apparatus and 8th tergite (see Tab. 2).

Holotype ♂: "Thailand (N), Provinz Chiang Mai, Doi Ang-khang, Fang, 1600 m, 19°54.558' N, 99°3.154' E, 9.–13. xi. 2002, leg. T. IHLE, coll. S. LÖFFLER", CSNB, designated to MFNB; barcode SNB 2432; GP 2675/21 SNB; Figs. 3a, 3b.

No paratypes.

No ♀ specimen known.

Distribution: N. Thailand.

Etymology: Named first after Thomas IHLE, Chiangmai, Thailand, who collected and kindly sent several specimens for our studies over the years; Thomas was also travel companion during some of the expeditions of the senior author to Myanmar and Thailand. The new species is also named after Siegfried IHLE, Filderstadt, Germany, not related at all to Thomas, in recognition of the long-lasting friendship with the senior author. Some of the studied Thai specimens in this work were donated by Siegfried IHLE.

Description and differential diagnosis

♂ (Figs. 3a, b): Fwl 43 mm (HT). The general appearance of the species is of ochreous grey ground colour, crenulate lines are almost invisible, main marking is the postmedian line. Thorax and abdomen in ground colour, head little darker. Antennae 11.0 mm in length. Fw. white patch in median field missing, three crenulate median lines are only slightly indicated and can be seen only gleaming from the side. Postmedian line straight, from inner side strong dark grey and tiny yellow and grey, postmedian area again without significant marking, little darker than ground colour. Dorsal hw. of same ground colour, with back patch on the inner margin, postmedian line broad dark grey, followed by yellow portion, postmedian area in ground colour, with a row of black dots. On ventral side of light reddish brown colour, ornamentation almost missing, aside from a darker brown postmedian line.

♂ genitalia (b&w-Figs. 102; 8th sternite Fig. b; GP 2675/21 SNB [HT]): Processes of the uncus long, slender and close to each other. Dorsal process of the valves strong and well-developed, ventral ones small. Saccus short and broad, phallus short and broad as well, the vesica with long sclerites. 8th sternite broad, with laterally rounded posterior tips.

♀ unknown.

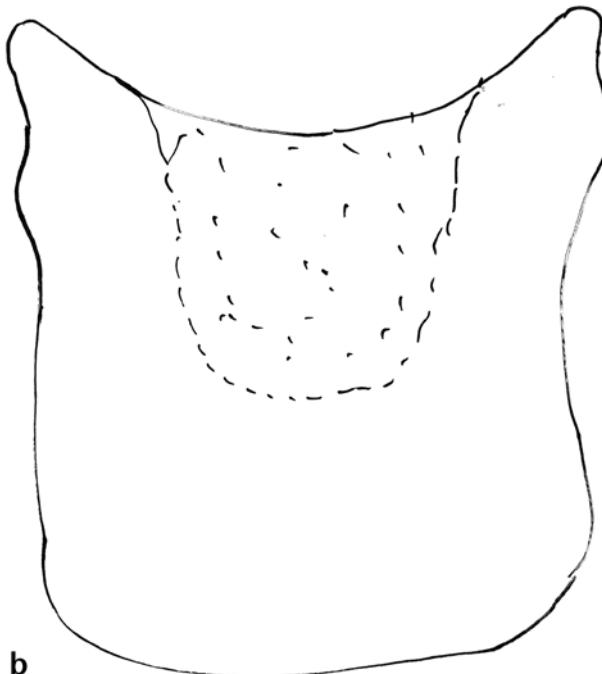


Fig. b: 8th Sternite sketch of ♂, *Tagora ihleorum*, GP 2675/21 SNB [HT].

(3) *Tagora siama*, sp. n.

(Figs. 4a, b; 5a, b; 6a, b; 103; 201; Map 1 *Tagora*.)

BOLD BIN: AAU2106 (based on BC SNB 2433, 5559).

Holotype ♂: “NW Thailand, Prov. Chiangmai, Doi Suthep N.P., Dhamma Salarn, 18°50' N, 98°52' E, 25. x. 2005, 1400 m, leg. A. SCHINTLMEISTER”, “Spende von S. NAUMANN, Berlin, 2. xi. 2007 in coll. Senckenberg”; BC SNB 5559; in SMFL; Figs. 4a, 4b; SMFL type catalogue no. 4732.

Paratypes (15 ♂♂, 2 ♀♀): N. Thailand: 2 ♂♂, Chiangmai, Doi Suthep, 1400 m, 18°48.302' N, 98°53.827' E, xii. 2000, leg. T. IHLE, ex CSLL, in CSNB; 1× GP 2676/21 SNB; Figs. 6a, 6b. 1 ♀, Chiangmai, Doi Suthep, 1400 m, 18° 48.302' N, 98°53.827' E, 26. x. 2001, leg. T. IHLE, ex CSLL, in CSNB; BC SNB 2433; Figs. 5a, 5b. – 2 ♂♂, 1 ♀, Chiang Mai, 7 km W Pa Pae, 1230 m, 21. xi. 1998, leg. T. Csővarí & L. MIKUS; GP Heterocera 11.659, 12.797 (♂♂), 12.800 (♀); CMWM. 2 ♂♂, Chiang Mai, 6 km SE Pang Faen, 1100 m, 29. xi. 1998, leg. T. Csővarí & L. MIKUS; CMWM. 1 ♂, Nan, 30 km E Pua, 1700 m, 22.–23. ix. 1999, leg. A. SZABO & Z. CZORC; GP Heterocera 12.796; CMWM. 2 ♂♂, Nan, 5 km N Bo Luang, 1000 m, 18. viii. 1999, leg. T. Csővarí & L. MIKUS; GP Heterocera 12.798, 12.799; CMWM. 1 ♂, same locality, 12. xi. 1999, leg. M. HREBLAY; CMWM. 1 ♂, Nan, 25 km N Bo Luang, 1150 m, 11. xi. 1999, leg. M. HREBLAY; CMWM. 3 ♂♂, same locality, 17. xi. 1998, leg. T. Csővarí & L. MIKUS; CMWM. 1 ♂, (NE), Phu Khieo, 800 m 3. x. 1986, CMWM.

Distribution: N. Thailand.

Etymology: Named after the old Siam kingdom, historic predecessor of modern Thailand.

Description and differential diagnosis

♂ (Figs. 4a, b; 6a, b): Fwl 42–43 mm (HT 43 mm). The species is of dark greyish brown ground colour with strong markings. Thorax and abdomen in ground colour, head darker brown. Antennae 12.0 mm long. Antemedian area and lower part of the median area grey, both separated by a crenulate median line. Creamy median patch slightly indicated, the median area with three crenulate dark lines. Postmedian line little bent, from inner side strong dark grey, tiny yellow and again grey, postmedian area in ground colour, with a slightly indicated crenulate dark grey line. Dorsal hw. of same colour, median area with three crenulate lines, postmedian line little bent, only with inner broad dark and tiny outer yellow portion. Postmedian area broad, in ground colour, with a central row of black dots along the veins. On ventral side of umbra brown colour, with strong markings: Four crenulate median lines, a strong postmedian line, fw. postmedian area with a whitish violet shade in the proximal half.

Generally *T. siama* sp. n. appears to be more colourful and with stronger markings compared to *T. ihleorum* sp. n., described above. ♂ genitalia structures of both taxa resemble each other but differ by the processes of the uncus and the posterior margin of the 8th sternite, as described below.

♂ genitalia (b&w-Figs. 103; 8th sternite Fig. c; GP 2676/21 SNB [PT]; further GPs 11.659, 12.796, 12.797, 12.798, 12.799 CMWM [PTs]): Processes of the uncus long, slender and much closer to each other than in *T. ihleorum* sp. n. Dorsal process of the valves strong, ventral one

medium-sized. Saccus short and broad, phallus broad, vesica with long sclerites. 8th abdominal sternite broad, square-like, with a rounded central sclerotization (see sternite Fig. c).

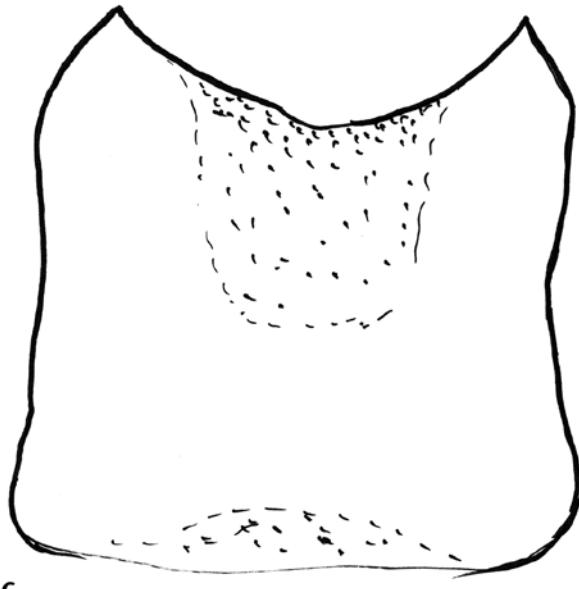


Fig. c: 8th Sternite sketch of ♂, *Tagora siama*, GP 2676/21 SNB [PT].

♀ (Figs. 5a, b): Fwl 46/48 mm. Aside from typical sexual dimorphic characters such as bigger size, larger wing surface and more narrow antennae of 15.0 mm length, the ♀♀ differ from their ♂♂ by their darker, more greyish ground colour and very dark, almost black fields of the fw. median cell and along the lower margin. The hw. postmedian line has an additional, third outer dark line.

♀ genitalia (b&w-Fig. 201; GP 12.800 MWM): Both anterior and posterior apophyses about 2.7–2.8 mm in length. Lamella antevaginalis sclerotized on its posterior margin, with central almost rectangular edge and rounded indentation in between. Lamella postvaginalis of rounded, densely sclerotized. Ductus bursae broad and strongly sclerotized in the posterior part, corpus bursae without major structure.

(4) *Tagora loeffleri*, sp. n.

(Figs. 7a, b; 8a, b; 9a, b; 10; 75; 104; 202; Map 1 *Tagora*.)

BOLD BIN: AAU2104 (based on BC SNB 2430, BC-TB 6853 [not illustrated]; the ♂ HT belongs to the same collecting series as these two specimens from N. Vietnam, Bac Kan Prov., but was not barcoded; further BC SNB 5557 [Hongkong, only 550 bp], BC SNB 5567 [N Vietnam, Tuan-Glao, only 330 bp], but both clustering with BIN: AAU2104 in BOLD's automatically calculated NJ tree, both not included in Text-Fig. B as having too small bp numbers).

Holotype ♂: “Vietnam (N), Bac Kan Prov., Ba Be Lake NP, Cao Tri env., 500 m, 6.–8. xi. 2000, leg. et in coll. S. LÖFFLER”; ♂-GP 2682/21 SNB; no barcode; in CSNB, designated to MfNB; Figs. 7a, 7b.

Paratypes (in total: 148 ♂♂, 2 ♀♀):

N. Vietnam: 1 ♂, same data as HT, ex CSLL via coll. T. BOUYER (BC-TB 6853); CMWM. – 5 ♂♂, same data as HT, leg. S. LÖFFLER, CSLL; CSNB; further 76 ♂♂, same data; CSNB (10 of which dedicated to SMFL). – 25 ♂♂, Bac Kan Prov., Banh Trach, Ba Be Lake NP, 22°24' N, 105°37' E: of these 8 ♂♂ x.

2005, 1 ♂ vii. 2006, 14 ♂♂ x. 2006, 2 ♂♂ x. 2007, leg. HOA BINH NGUYEN; CSLL; CSNB. 3 ♂♂, 1 ♀, Bac Kan Prov., Pac Nam Distr., Bac Bo, xi. 2000, leg. S. LÖFFLER, CSLL; CSNB; ♂ GP 2687, 2688/21 SNB; ♀ BC SNB 2430; Figs. 8a, 8b. 1 ♂, Bac Kan Prov., Tuan Ciao, xi. 2000, leg. S. LÖFFLER, CSLL; CSNB. 5 ♂♂, Bac Kan Prov., Xuat Hoa, 110 m, 22°4'18" N, 105°52'51" E, xi. 2010, leg. HOA BINH NGUYEN; CSLL; CSNB. – 1 ♂, Vinh Phuc Prov., Tam Dao NP, 21°27.399' N, 105°38.972' E, 950 m, ix. 2007, leg. HOA BINH NGUYEN, CSLL; CSNB. – 1 ♂, Thai Nguyen Prov., Dong Hy, Tan Long, Bac Lau, Mo Ba, Primärwald, 300 m, xi. 2008, leg. BINH, CSLL; CSNB. 5 ♂♂, same locality, x. 2009, 1 ♂, same locality, xii. 2010; CSNB. – 1 ♂, Tuan Glao, “23.35° N, 103.35° E”[?], 1200 m, 5.–10 xi. 1994, leg. SINIAEV & SIMONOV; via A. SCHINTLMEISTER; BC SNB 5567; CWAN; SMFL; Fig. 10. – 10 ♂♂, 1 ♀, Cuc Phong, 400 m, “20.15'N 105,20'E” [sic], 18. xi.–3. xii. 1992, leg. V. SINIAEV & M. SIMONOV [of these 3 ♂♂, 1 ♀ via coll. SCHINTLMEISTER]; GP Heterocera Nr. 11.657, 12.801 (♂♂) 17.294 (♀); CMWM. – 8 ♂♂, Vinh Phuc Prov., Ngoc Thanh vill., Me Linh biol. stat., 21°23' N, 105°43' E, 60 m, 11.–13. x. 2008, leg. V. ZOLOTUHIN; CMWM. – 2 ♂♂, Mai-Chau, 25 km SE Moc-Chau, 1400 m, “20,50'N 104,40'E” [sic], 14.–18. xi. 1994, leg. SINIAEV & SIMONOV; CMWM. – 1 ♂, Tam Dao, 1200 m, 1.–15. xi. 1992, leg. V. SINIAEV & M. SIMONOV; CMWM. – 1 ♂, Tam Dao, 60 km NW Hanoi, “21.34'N 105,20'E” [sic], 1200 m, 1.–15. xi. 1992, sek. Wald [sic], leg. SINIAEV & SIMONOV, ex coll. SCHINTLMEISTER; GP Heterocera 12.802; CMWM.

China: 1 ♂, Hongkong, New Territories, Sai Kung UK toll, 21. xi. 1998, leg. Alistair, via CCGT in SMFL; BC SNB 5557; Figs. 9a, 9b.

There are 3 further old specimens from Vietnam, Tam Dao, and China, Hong Kong, in MNHN Paris plus 2 specimens from “Cochin China”, Laokai and Nacham, respectively, in NHMUK London which from external habitus appear to be conspecific. Due to their general bad shape, mostly missing genitalia and without barcode results we hesitate to list them in the type series.

Distribution: N. Vietnam, S. China (Hongkong).

Misidentification in literature: Most likely this species was mentioned by LEMÉE (1950: 36) from “Ha Giang” in northern Vietnam as “*Ganisa pandya*”. The true *Tagora pandya* is a northeastern Indian-Himalayan species.

Etymology: Named for Swen LÖFFLER, Lichtenstein/Sachsen, Germany, long time travel companion in Thailand and Myanmar and good friend of the senior author. His extensive collection of Eupterotidae, assigned to CSNB, was a big effort and support in the studies and preparations of this work.

Description and differential diagnosis

♂ (Figs. 7a, b; 9a, b; 10; 75): Fwl. 34–41 mm (HT 41 mm). A medium-sized *Tagora* species, with slightly rounded nearly rectangular fw. tornus, among the four known Vietnamese species the lightest one with most reduced markings, of light greyish brown ground colour. Thorax and abdomen in ground colour. Antennae 13.5–14.0 mm in length. Fw. antemedian line reduced, crenulate, followed by 5 slightly indicated crenulate lines in the outer median area. Fw. median field with creamy white patch, fw. postmedian line composed of tiny dark brown, tiny yellow and almost invisible outer ark line, almost straight, only in apical region a little crenulate. Fw. postmedian area in ground colour, with central more or less indicated dark grey zigzag line and a row of black dots when crossing the veins. Fw. apical tip little bent backward, darker

(see Fig. 75 of a ♂ from the type locality, which shows the natural resting position with bent outward fw. tips on the background). Hw. again in light ground colour, with two slightly crenulate lines in the median area and a black patch on the inner margin. Postmedian line a little rounded, inner part dark grey, outer line narrow, yellow. Postmedian area in homogenous ground colour, with central row of black dots along the veins, sometimes connected with a tiny crenulate line. Ventral side light greyish brown, crenulate darker median lines visible, postmedian line on both fw. and hw. strong, dark greyish brown, and a little dentate.

T. loeffleri sp. n. belongs, together with *T. zolotuhini* sp. n., *T. ignatyevi* sp. n. and *T. pugaevi* sp. n., to a group of closely related species from Vietnam and southern China. Each taxon is restricted to a certain area, there is no geographical overlap known so far. All four species resemble each other more than other taxa in the genus *Tagora*, but can be separated by their ♂ genitalia structures, supported by the results of the DNA barcoding. Singletons are not easily to be separated from each other, but comparing larger series of each taxon make the differences clear (compare also Table 2). — We think that (8) *T. sinica* sp. n. (no barcode available so far), if not being part of a specifically Chinese group of so far unknown species, might possibly have affinities to these Vietnamese taxa, especially to *T. loeffleri* sp. n.

♂ genitalia (b&w-Figs. 104; 8th sternite Fig. d; GP 2687/21 [PT]; further GPs 2682/21 [HT], 2688/21 SNB; GPs 11.657, 12.801, 12.802 CMWM [PTs]): Processes of the uncus relatively long, emerging close to each other. Dorsal process of the valves strongly sclerotized. Saccus short and broad, sclerites of the vesica medium-sized. 8th sternite broad, square-like, with a central protuberance on the posterior margin.

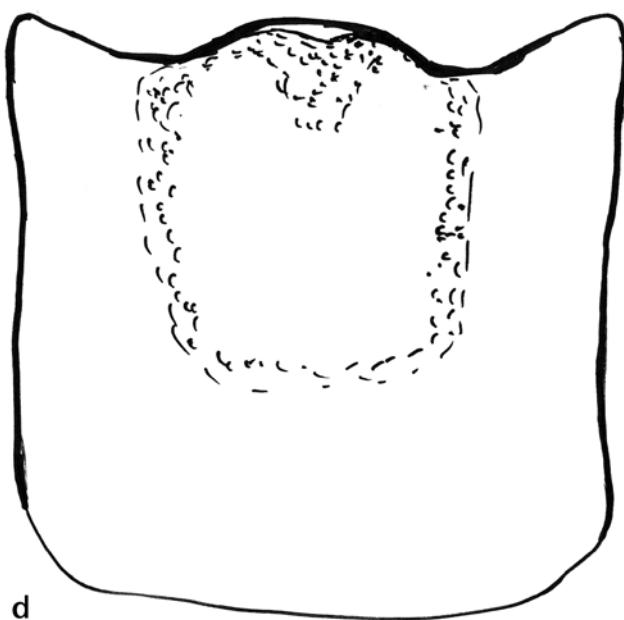


Fig. d: 8th Sternite sketch of ♂, *Tagora loeffleri*, GP 2687/21 SNB [PT].

♀ (Figs. 8a, b): Fwl 47/51 mm. Aside from typical sexual dimorphic characters such as bigger size, larger wing surface and more filiform antennae of ca 15.0 mm length the ♀ differ from their according ♂♂ by their more intense ornamentation, but ground colour is the same. Especially the crenulate inner median line of the fw. is accentuated, the hw. shows three crenulate median lines.

♀ genitalia (b&w-Fig. 202; GP 17.294 CMWM): Both anterior and posterior apophyses around 2.2 mm in length. Lamella antevaginalis strongly sclerotized, with lateral rectangular processes and a rounded indentation in between. Lamella postvaginalis with two rounded processes, densely sclerotized. Ductus bursae strongly sclerotized at its posterior end, corpus bursae very long. The two dark spots on the photo of this structure are no spiculae but just some dirt particles inside the corpus bursae.

(5) *Tagora ignatyevi*, sp. n.

(Figs. 11a, b; 105; Map 1 *Tagora*.)

BOLD BIN: ADO9232 (based on BC SNB 6094).

Holotype ♂: “Vietnam (S) [sic], Kon Tum Prov., Ngoc Linh Mt., vii. 2016, DANG NGOC VAN, Lam Dong”, in CSNB, designated to MfNB; GP 2684/21 SNB; BC SNB 6094; Figs. 11a, 11b. — The label text contains in error only “(S) = South Vietnam”; however, in fact this is South-central Vietnam, which is faunistically a somewhat different area near the border to Laos. We have, therefore, changed this spelling elsewhere to “Vietnam (SC)”.

Paratypes (in total 8 ♂♂): 1 ♂, (C) [sic], Kon Tum Prov., Ngoc Linh Mt., viii. 2016; BC SNB 6875 [no result]; in CSNB. 1 ♂, same locality, vii. 2016; in CSNB. 4 ♂♂, same locality, 1700 m, x. 2015; in CSNB [2 of these dedicated to SMFL]. 1 ♂, same locality, x. 2016; in CSNB. 1 ♂, same locality, viii. 2015; in CSNB.

No ♀ specimen known.

Distribution: South-central Vietnam.

Etymology: Named for one of the former candidates of Vadim ZOLOTUHIN working on Eupterotidae: Nikolay IGNATYEV, now living in České Budějovice, Czech Republic, to finish there his Ph.D. with a new topic, no longer related to Eupterotidae. The dedication refers to his already done preparatory work on Eupterotidae and at the same time is a gratitude for his travel companionship with the senior author in Africa.

Description and differential diagnosis

♂ (Figs. 11a, b): Fwl 39–43 mm (HT 40 mm). A compact species with relative short wings and strongest ornamentation among the known Vietnamese *Tagora* species. Fw. with almost rectangular tornus. The species is on dorsal side of intense dark greyish brown ground colour, with a little silvery shade in the postmedian areas. Thorax and abdomen in ground colour. Antennae 12.0 mm long. Fw. antemedian line strong, crenulate, followed by 4 quite intense crenulate dark lines in the outer median area, ending in the costal area. Fw. median field and beyond darkened, with a medium-sized creamy white patch. Postmedian line almost straight, inner part bent backward towards the costa in the apical area, composed by a strong inner dark grey, central yellow and outer narrow dark grey line. Postmedian area in the medial part sil-

very grey with white scales along the veins, marginal half in ground colour, with central intense dark zigzag line, marginal fringes little darker. Apical tip strong, bent backward. Hw. median area with two almost invisible crenulate lines, ending at the inner margin with one dark patch; postmedian line little rounded with strong inner dark and narrow yellow lines, postmedian area broad, lighter grey, with tiny dentate submarginal line, patches where veins cross this line, the veins covered with white scales. On ventral side yellowish to orange brown, the submarginal area more greyish. In the median area 5 crenulate lines on both fw. and hw, the postmedian line dark brown, on the fw. concave, on the hw. dentate.

T. ignatyevi sp. n. is known from the western mountain areas of South-central Vietnam, whereas *T. pugaevi* sp. n., described below, occurs only in the coastal cordillera. Populations of both taxa are separated by lowlands of Central Vietnam.

♂ genitalia (b&w-Figs. 105; 8th sternite Fig. e; GP 2684/ 21 SNB [PT]): Processes of the uncus long, emerging close to each other. Dorsal process of the valves and dorsal part of the ventral process strongly sclerotized, Saccus short and broad. Vesica with medium-sized sclerites. 8th sternite slightly elongate, without lateral projections.

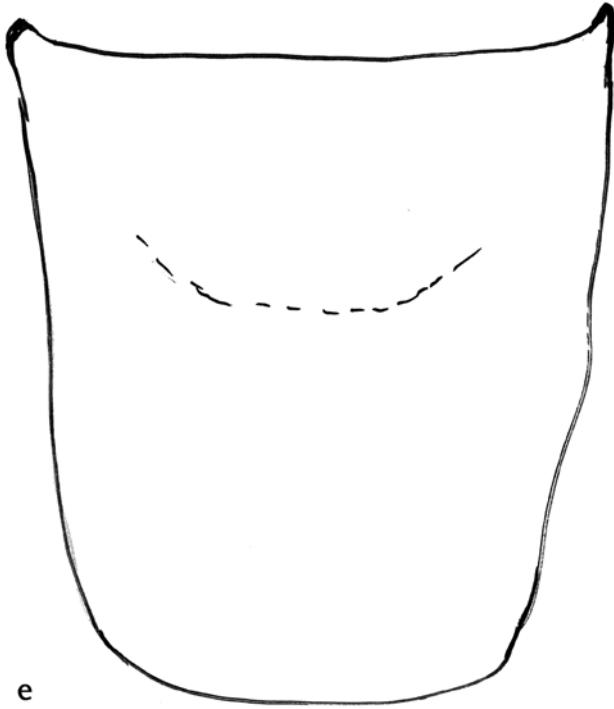


Fig. e: 8th Sternite sketch of ♂, *Tagora ignatyevi*, GP 2684/21 SNB [PT].

♀ unknown.

(6) *Tagora pugaevi*, sp. n.

(Figs. 12a–c; 106; 203; Map 1 *Tagora*.)

BOLD BIN: AEI6692 (based on BC SNB 6774; 6878; 7044).

Holotype ♂: "Vietnam (C), Quang Ngai Prov., Bato Mt., 950 m, x. 2014, leg. LE LUONG THANH", in CSNB, designated to MfNB; GP 2686/21 SNB; BC SNB 6878; Figs. 12a, 12b.

Paratypes (in total 19 ♂♂, 2 ♀♀): 2 ♂♂, same locality as HT, 900 m, xi. 2015; in CSNB. – 4 ♂♂, Vietnam (C), Quang Nam

Prov., Tay Giang District, Axan Mt., 1300 m, xi. 2018, leg. local collector; BC SNB 6835 [no result]; via CSLL in CSNB. 2 ♀♀, same locality, ix. 2017, xi. 2017; GP 2715/21 SNB; BC SNB 6774; in CSNB. 6 ♂♂, same locality, dates: 1 ♂ ix. 2017, 1 ♂ vii. 2020, 4 ♂♂ ix. 2020 [2 of these dedicated to SMFL]; 1 ♂ of those with BC SNB 7044; 1 ♂ of those with leg preparation, see Fig. 63; in CSNB. – 1 ♂, Da Nang Prov., Ba Na Mt., 1450 m, vi. 2013; GP 2683/21 SNB; via CSLL in CSNB. – 5 ♂♂, (C), Nghe An Prov., Pu Mat NP, Thac Kem, 18°50' N, 104°48' E, 24.–28. ix. 2008, leg. V. ZOLOTUHIN, in CMWM. 1 ♂, same data, but Phuc Son village, 18,49'N 104,58'E [sic], 29. ix.–3. x. 2008, leg. V. ZOLOTUHIN, in CMWM.

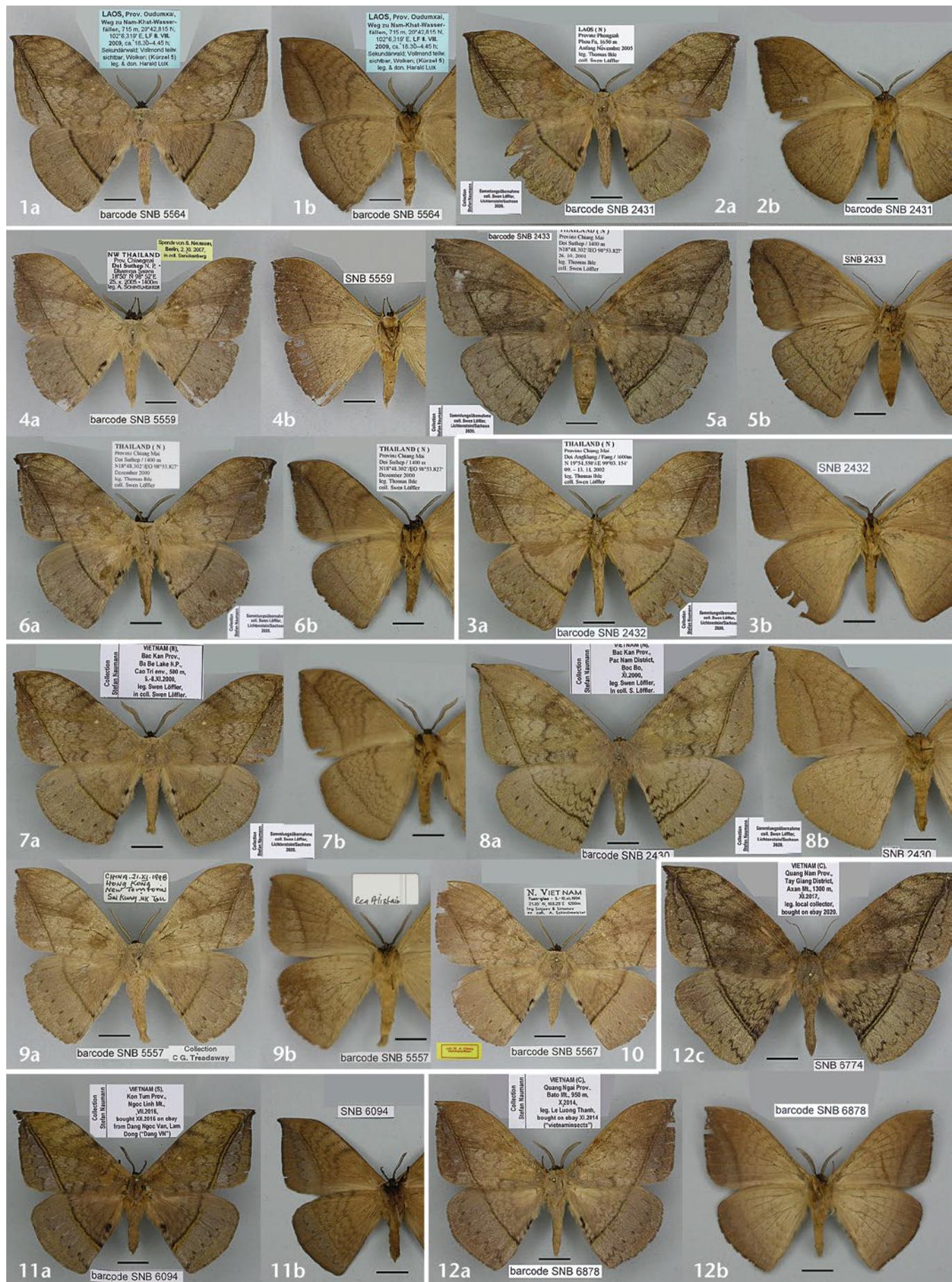
Distribution: Central Vietnam.

Etymology: Named for one of the former candidates of Vadim ZOLOTUHIN working on Eupterotidae, Sergei PUGAEV, now living in Moscow, Russia. He is no longer working on Eupterotidae. The dedication refers to his already done preparatory work on Eupterotidae.

Description and differential diagnosis

♂ (Figs. 12a, 12b): Fwl 38–40 mm (HT 39 mm). On average the smallest of the Vietnamese *Tagora* species, with a quare-like fw. with rounded tornus. The dorsal side is of dark brownish grey ground colour with silvery shade and reduced ornamentation. Thorax and abdomen in ground colour. Antennae 12.5–13.0 mm long. Fw. antemedian line almost invisible, median area with four more or less visible crenulate dark lines. Median field with creamy white patch, followed by a darker grey portion towards the postmedian line. Postmedian line almost straight, with inner narrow dark grey, central yellow and outer grey portion. Fw. apex with small apical tip, postmedian area in ground colour. Dorsal hw. with three crenulate, almost invisible median lines, ending with dark patches along the inner margin. Postmedian line little rounded, only consisting of a broad dark line. Postmedian area broad, in ground colour, with a tiny crenulate line and row of dark patches along the veins. Ventral side greyish

Species-group of *Tagora pandya*. — Figs. 1–12: *Tagora*: types, other specimens and illustrations. If not indicated otherwise: a = ups., b = uns. [i. and ii. show ups. and uns. of the same label]; most of all photos (on all plates) taken (if not stated otherwise) by S.N. — Figs. 1–2: (1) *T. luxi* sp. n., BIN: AAU2105. Figs. 1a, 1b: HT ♂, Laos, Oudumxai, way to Nam Khat waterfalls, 715 m, at light 8. viii. 2009, ca. 18.30–4.45 h; SMFL, BC SNB 5564. Figs. 2a, 2b: PT ♂, N Laos, Phongsali, Phou Fa, 1650 m, early xi. 2005; in CSNB; BC SNB 2431. — Figs. 3a, 3b: (2) *T. ihleorum* sp. n., HT ♂, N Thailand, Chiang Mai, Doi Angkhang, Fang, 1600 m, 9.–13. xi. 2002, CSNB, BC SNB 2432, BIN: AAU2102. — Figs. 4–6: (3) *T. siama* sp. n.: Figs. 4a, b: HT ♂, NW Thailand, Chiangmai, Doi Suthep, 1400 m, 25. x. 2005, SMFL, BC SNB 5559, BIN: AAU2106. Figs. 5a, 5b: PT ♀, same locality, 26. x. 2001, CSNB, BC SNB 2433. Figs. 6a, 6b: PT ♂, same locality, xii. 2000, CSNB, no BC. — Figs. 7–10: (4) *T. loeffleri* sp. n. Figs. 7a, 7b: HT ♂, N. Vietnam, Ba Be Lake N.P., Cao Tri env., 500 m, 6.–8. xi. 2000, CSNB, no BC. Figs. 8a, 8b: PT ♀, N. Vietnam, Pac Nam Distr., Bac Bo, xi. 2000, CSNB; BC SNB 2430, BIN: AAU2104. Figs. 9a, 9b: PT ♂, China, Hongkong, N.T., CCGT in SMFL, BC SNB 5557. Fig. 10: N. Vietnam, Tuan Giao, 1200 m, 5.–10. xi. 1994, CWAN in SMFL, BC SNB 5567. — Figs. 11a, 11b: (5) *T. ignatyevi* sp. n., HT ♂, SC Vietnam, Kon Tum Prov., Ngoc Linh Mt., vii. 2016, CSNB; BIN: ADO9232; BC SNB 6094. — Figs. 12a–c: (6) *T. pugaevi* sp. n. Figs. 12a, 12b: HT ♂, C. Vietnam, Quang Ngai, Bato Mt., 950 m, x. 2014, CSNB; BIN: AEI6692; BC SNB 6878. Fig. 12c: PT ♀, Vietnam (C), Quang Nam Prov., Tay Giang District, Axan Mt., 1300 m, xi. 2017; BC SNB 6774; in CSNB. — Scale bars 1 cm (= approx. 60% natural size).



brown, marginal zone darker. Median area of both fw. and hw. with five intense crenulate lines, postmedian line dark brown, that of the fw. concave, on the hw. convex.

♂ genitalia (b&w-Figs. 106; 8th sternite Fig. f; 2686/21 SNB [HT]; further GPs 2683/21, 2715/21 SNB [PTs]): Processes of the uncus rather short, widely separated from each other at their base. Dorsal process of the valves triangular, small, strongly sclerotized, ventral process rounded. Saccus short and broad, phallus medium-sized, with long sclerites. 8th sternite broad, with relatively long lateral tips and central indentation on the posterior margin.

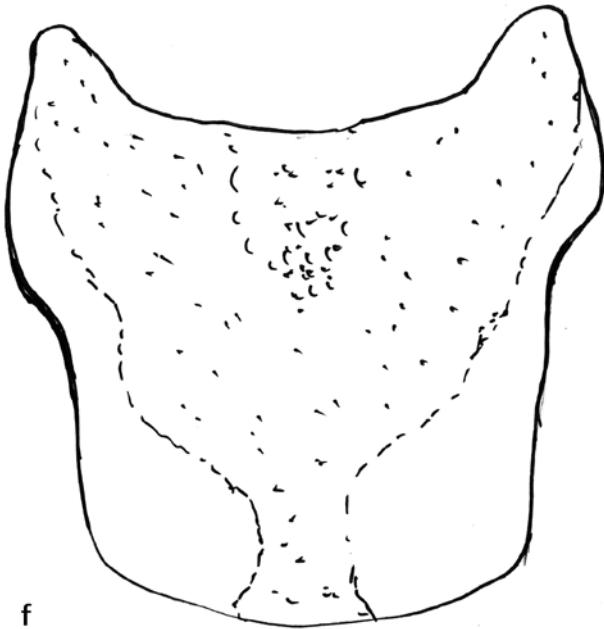


Fig. f: 8th Sternite sketch of ♂, *Tagora pugaevi*, GP 2683/21 SNB [PT].

♀ (Fig. 12c): Fwl 46/49 mm. Aside from typical sexual dimorphic characters such as bigger size, larger wing surface and more narrow antennae of ca 14.0 mm length, the ♀♀ differ from their ♂♂ by their more intense ornamentation, little darker brown colour and an intense dark brown area around the fw. white central patch. The inner crenulate median fw. line is accentuated, the hw. shows three strong crenulate median lines, and both fw. and hw. postmedian areas show a strong dark brown crenulate vertical line.

♀ genitalia (b&w-Fig. 203; GP 2715/21 SNB [PT]): Anterior apophyses about 2.3 mm in length, posterior ones about 2.0 mm. Lamella antevaginalis strongly sclerotized marginally, with two apical tips and broad rounded indentation in between. Lamella postvaginalis with two rounded longitudinal processes, densely sclerotized. Ductus bursae broad and sclerotized in the posterior part, corpus bursae without major structure.

(7) *Tagora zolotuhini*, sp. n.

(Figs. 13a, b; 14; 107; Map 1 *Tagora*.)

BOLD BIN: AEI6693 (based on BC SNB 6876, 6877).

Holotype ♂: "Vietnam (S), Lam Dong, Bao Loc, 900 m, x. 2016, leg. DANG NGOC VAN", BC SNB 6876; CSNB, designated to MfNB; Figs. 13a, 13b.

Paratypes (in total 10 ♂♂): all Vietnam (S), Lam Dong Prov.: 1 ♂, same data as HT, but ix. 2014; in CSNB. – 1 ♂, Lac Luong Distr., Bidoup Nui Ba NP, 10. x. 2015, leg. VA VAN NHON; GP 2679/21 SNB; BC SNB 6877; in CSNB; Fig. 14. 3 ♂♂ [1 of those dedicated to SMFL], same data; in CSNB. 2 ♂♂ [1 of those dedicated to SMFL], same data, 1550 m, x. 2014, leg. LE LUONG THANH; in CSNB. – 2 ♂♂, Da Lat, vi. & xi. 2015, leg. DANG NGOC VAN; 1× BC SNB 5919 [no result]; 1× GP 2680/19 SNB; in CSNB. 1 ♂, Di Linh, 900 m, x. 2013; via CSLL in CSNB.

No ♀ specimen known.

Distribution: S-Vietnam, Lam Dong Province.

Etymology: Named in memory of Vadim V. †ZOLOTUHIN, who died far too early in 2021 at the age of 53 years. Living in Ulyanovsk, Russia, he was a frequent visitor of western European museums and private collections and had a wide overview about the specimens and literature of several bombycoid and also non-bombycoid families and in combination of these interests a huge scientific output on all those. His studies on Eupterotidae were not yet finished, the projects of his doctoral candidates partially stopped, and with his many topics of interest he could not focus equally on all of them, so he left a wide field of unfinished manuscripts within this family.

Description and differential diagnosis

♂ (Figs. 13a, b; 14): Fwl 41–46 mm (HT 45 mm). Larger than the other Vietnamese species, with strong, almost black ornamentation. Fw. with almost rectangular tornus. The species is on dorsal side of dark greyish to greenish brown ground colour, with a little silvery shade. Thorax and abdomen in ground colour. Antennae of 12.5 mm in length. Fw. antemedian line reduced, crenulate, followed by four quite intense crenulate dark lines in the outer median area, ending in the costal area. Fw. median field darkened, with a tiny creamy white patch. Postmedian line straight, bent backward to the costa in the apical area, composed by a strong inner dark grey, central yellow and outer narrow dark grey line. Postmedian area in ground colour, with intense dark zigzag line, marginal fringes little darker. Hw. median area with three almost invisible crenulate lines, ending on the inner margin with three dark patches; postmedian line rounded with strong inner dark, strong yellow and very narrow outer dark lines, postmedian area broad, lighter grey, with strong dentate submarginal line. On ventral side of dark greyish brown colour, the submarginal area lighter. In the median area 5 crenulate lines on both fw. and hw, the postmedian line dark brown, on the fw. concave, on the hw. almost straight.

♂ genitalia (b&w-Figs. 107; 8th sternite Fig. g; GP 2680/21 SNB [PT]; further GP 2679/21 SNB [PT]): Processes of the uncus long and slender, emerging close to each other. Dorsal process of the valves slender and gracile, ventral process large, prominent. Saccus very broad, rounded, phallus broad, vesica with medium-sized sclerites. 8th sternite broad with short, acute posterior lateral tips.

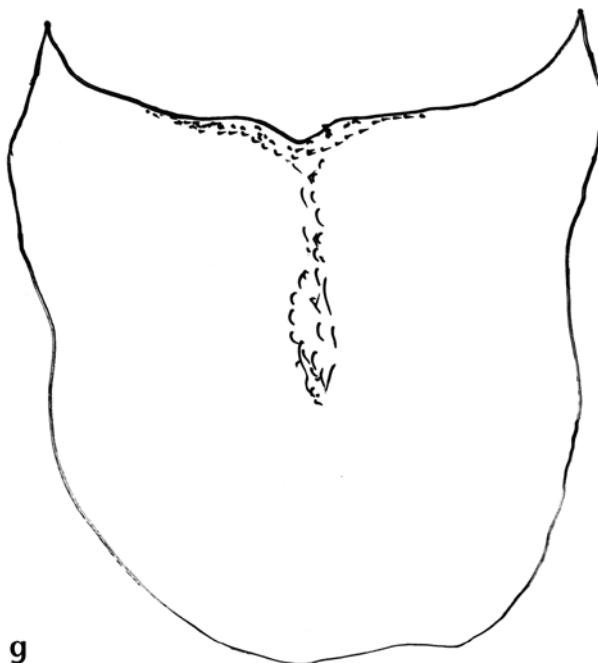


Fig. g: 8th Sternite sketch of ♂, *Tagora zolotuhini*, GP 2680/21 SNB [PT].

♀ unknown.

(8) *Tagora sinica*, sp. n.

(Figs. 20a, b; 109; Map 1 *Tagora*.)

BOLD BIN: BC and BIN not yet known. The HT did not deliver successfully any barcode sequence; the description took place according to external and genitalia characters.

Holotype ♂: China, E. Hunan, Bamianshan, Guidong, 1800 m, vii. 2001, leg. local collector, via P. KAUF[T] 2002/03 in CWAN; GP 2700/21 SNB; BC SNB 7215 [no result]; in SMFL; SMFL type catalogue no. 4733: Figs. 20a, 20b.

No paratypes.

No ♀ specimen known.

Distribution: China, Hunan.

Further, there are 2 ♂♂ and 3 ♀♀ from China in MfNB, originating from MELL's collection before 1930, on average larger than the HT of *T. sinica* sp. n. They bear no further or only cryptic locality data (like "H 294"), in part with MELL's determination labels "*Mallarctus pandya* (MOORE)". One ♂ specimen has a dried genitalia apparatus glued into a small cardboard capsule on its pin, which is not removable and, therefore, cannot reliably be compared with other genitalia. Due to all these circumstances (lacking or inaccurate data, slightly different ornamentation, no genitalia apparatus and no barcode available for comparison because too old, etc.) we cannot identify MELL's specimens reliably and do not include them into this or any other safely identified material series at present.

Possible misidentifications in literature: There was at least one *Tagora* species mentioned by Hou (*in ZHU et al. 1983: 433, no. 3108 [partim], col. pl. 152, fig. 3108 ♂*) as being distributed in "Guangxi and Zhejiang", PR China. As no genitalia were figured by him and as neither text nor colour figure give any detail about origin and real size of the figured specimen, we are unable to determine his specimens with certainty. Possibly Hou's specimen from Guangxi may belong to the here described taxon *sinica*, but the one from Zhejiang should most likely belong to a different species for zoogeographical reasons.

Etymology: The species is named after its distribution. It is so far the only named taxon in the genus solely known from China at present.

Description and differential diagnosis

♂ (Figs. 20a, b): Fwl 38 mm (HT). A relatively small species with little elongate fw. Dorsal side of light greyish brown ground colour with dark brown wing markings, thorax and abdomen also in ground colour. Head and medial part of collum dark chocolate brown. Antennae 12.5 mm in length. Fw. with crenulate antemedian line, followed by further 3 crenulate medial lines and a darker patch in the central cell. Postmedian line straight to the light apex, consisting of a broader dark brown, yellow and again tiny brown portion, submarginal area homogenous in ground colour with a central thin dentate line. Dorsal hw. similar to fw, with straight postmedian line, consisting only of proximal dark and outer yellow portion. Submarginal area as in fw, the tiny dentate central submarginal line heightened by a row of black dots along the veins. Ventral side darker, more brownish grey with stronger ornamentation, postmedian line of the fw. little convex, that of the hw. straight, but there a little dentate.

T. sinica sp. n. is a little smaller than its Vietnamese and southern Chinese relatives, and a little more intensely coloured. Not much can be said about variability, as only the HT is known. Further Chinese specimens seen cannot be attributed to *T. sinica* sp. n. with certainty. ♂ genitalia structures differ from its perhaps next relative to the south, *T. loeffleri* sp. n., by the broader and shorter processes of the uncus, the less rounded ventral process of the valves, the very broad saccus, and longer sclerites of the vesica.

♂ genitalia (b&w-Figs. 109; 8th sternite Fig. h; GP 2700/21 SNB [HT]): Processes of the uncus broad and stable, close to each other and bent a little sideward. Dorsal process of the valves strongly sclerotized, ventral process relatively straight. Saccus broad and short, phallus with long sclerites on the vesica. While the 8th sternite has a small central indentation and relatively broad lateral tips, its shape is square-like as in *T. loeffleri* sp. n.

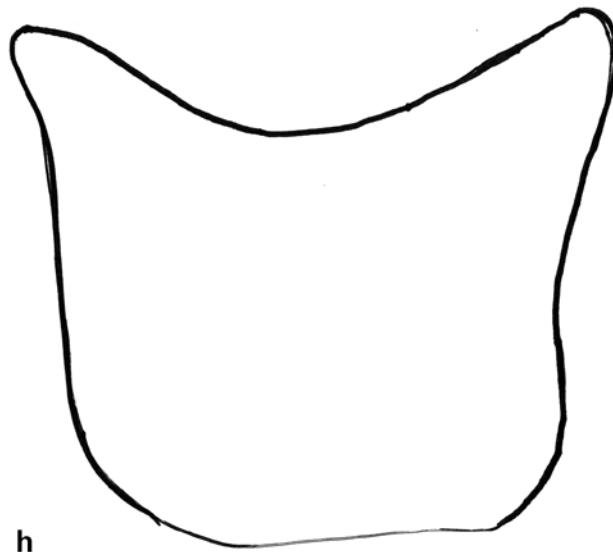
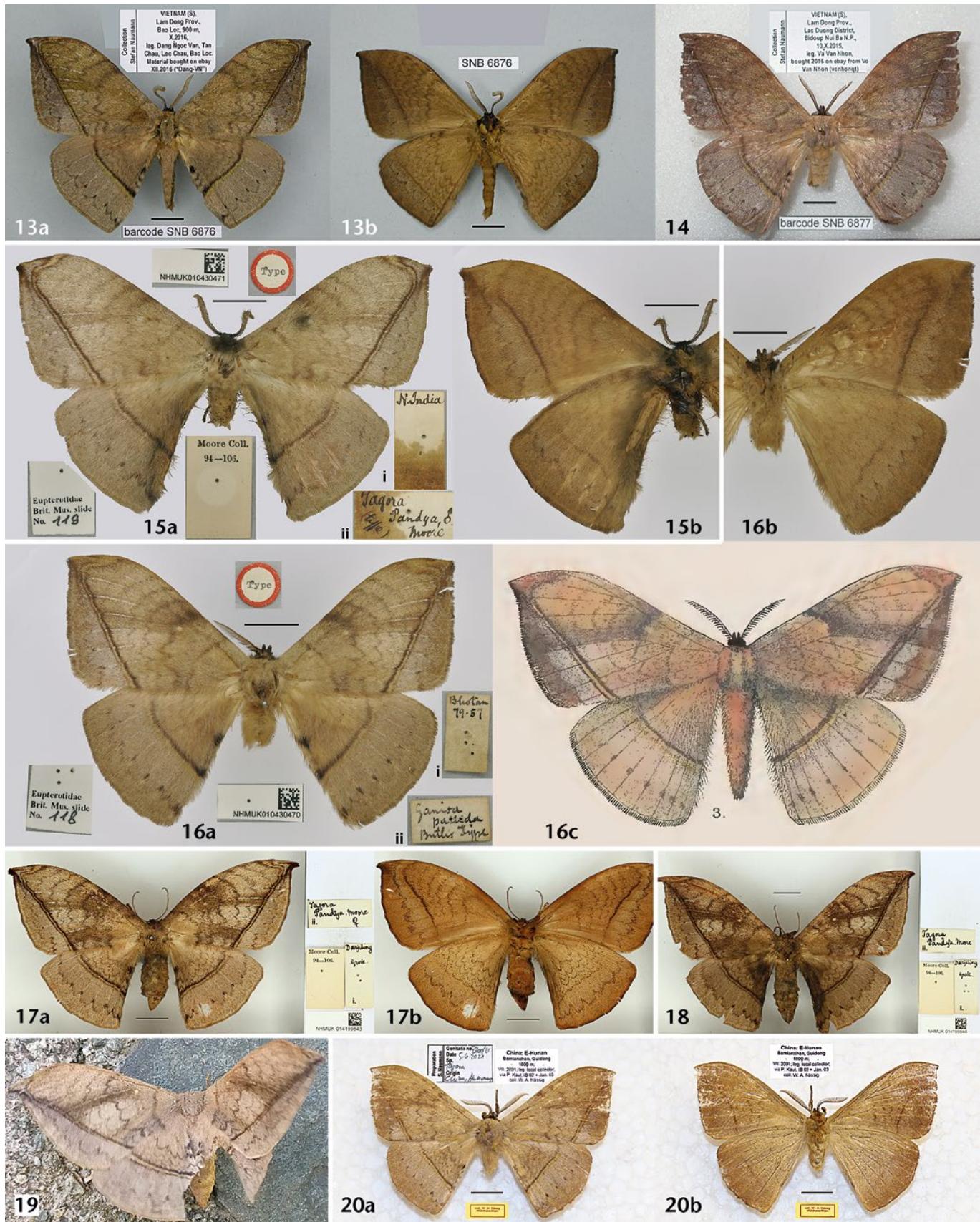
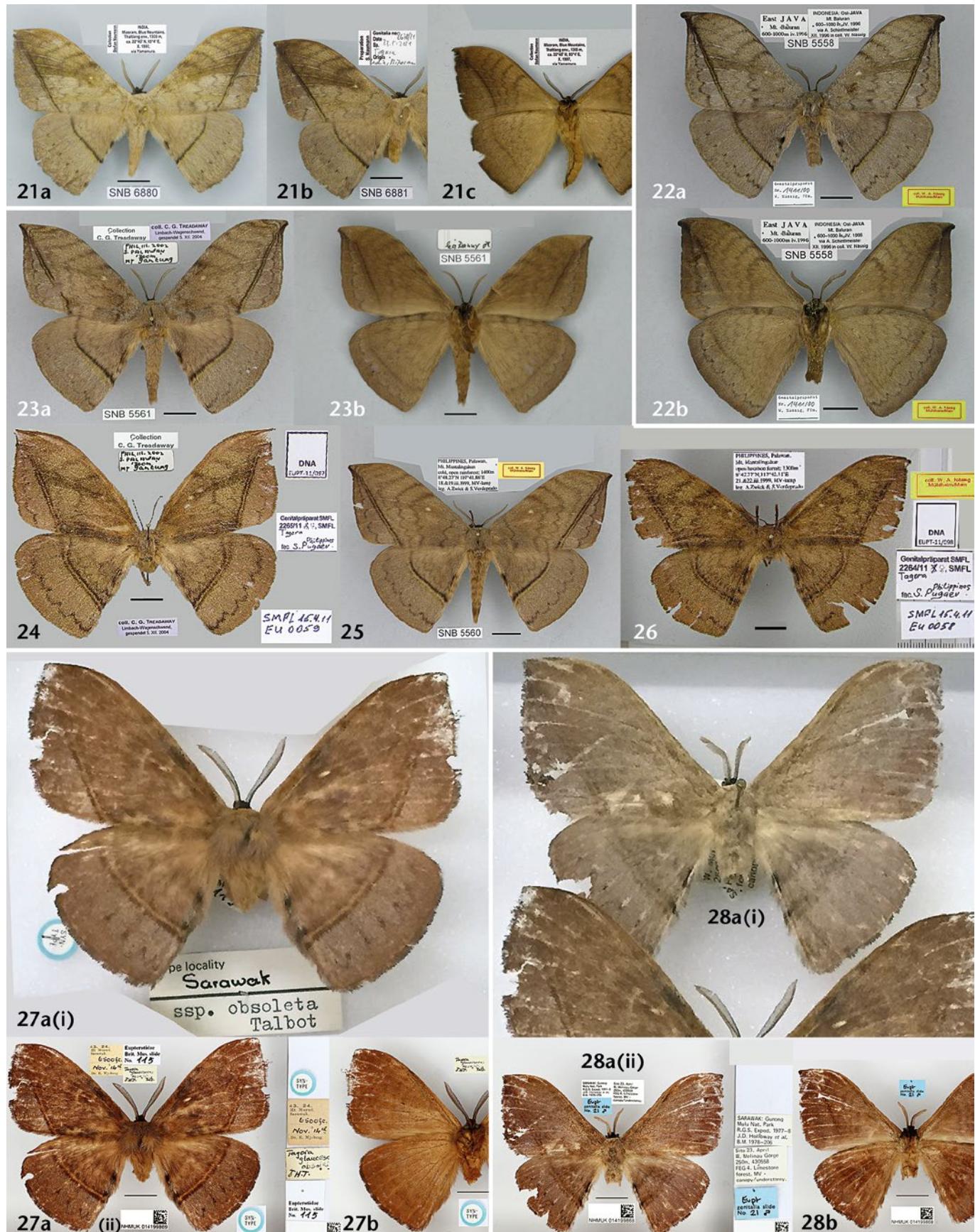


Fig. h: 8th Sternite sketch of ♂, *Tagora sinica*, GP 2700/21 SNB [HT].

♀ unknown.



Figs. 13–20: *Tagora*: types, other specimens and illustrations. — Figs. 13–14: (7) *T. zolotuhini* sp. n.; BIN: AEI6693. Figs. 13a, 13b: HT ♂, Vietnam (S), Lam Dong, Bao Loc, 900 m, x. 2016, leg. DANG NGOC VAN", BC SNB 6876; CSNB. Fig. 14: PT ♂, Vietnam (S), Lam Dong, Lac Luong Distr., Bidoup Nui Ba N.P., 10. x. 2015, leg. VA VAN NHON, BC SNB 6877; CSNB. — Figs. 15–19: (8) *T. pandya* MOORE, 1865; no barcodes, no BIN so far. Figs. 15a, b: HT ♂, *T. pandya* MOORE, 1865, in NHMUK, with labels. Figs. 16a–16c: HT ♂, *T. pallida* (BUTLER, 1881) (syn. rev. of *pandya* MOORE), in NHMUK, with labels; c = illustration by BUTLER (1881: 65, pl. XCVI fig. 3), from scan. Figs. 17a, 17b, 18: ♀, (8) *T. pandya*, "Darjiling, GROTE", in NHMUK (photos 16–18: A. GIUSTI/NHMUK, 2020/21). Fig. 19: ♀ of probably *T. pandya*, in life, in alert position, photo taken by Peter SMETACEK in Arunachal Pradesh, India, xi. 2020. — Figs. 20a, b: HT ♂, *T. sinica* sp. n.; China, E. Hunan, Bamianshan, Guidong, 1800 m, vii. 2001; GP 2700/21 SNB; BC SNB 7215 [no result]; in SMFL (photos 20a, b W.A.N.). — Figs. 21–28: further types and other specimens of *Tagora*. — Figs. 21a, b, c: (9) *T. mizoramia* sp. n., India, Mizoram, Blue Mountains, 1300 m, x. 1997; CSNB. Fig. 21a: HT ♂, BC SNB 6880; Fig. 21b, c: PT ♂, BC SNB 6881. — Fig. 22a, b: (10) *T. javana* sp. n., HT ♂, E-Java, Mt. Baluran, 600–1000 m, IV. 1996; SMFL; BC SNB 5558. — Figs. 23–26: (11) *T. treadawayi* sp. n., Philippines, Palawan. Figs. 23a, b: HT ♂, S-Palawan,



Mt. Gantung, 1300 m, III. 2002; CGGT in SMFL; BC SNB 5561. **Fig. 24:** PT ♀, same data as HT; CCGT in SMFL. **Figs. 25:** PT ♂, Mt. Mantalingahan, 1400 m, 18. & 19. III. 1999, CWAN in SMFL; BC SNB 5560. **Fig. 26:** PT ♀, Mt. Mantalingahan, 1300 m, 21. & 22. III. 1999, CWAN in SMFL. — **Species-group of *T. niassana/glaucescens*, subgroup of *niassana*.** — **Fig. 27:** (12) *T. obsoleta* TALBOT, 1926, LT ♂ (here designated), [Malaysia, Borneo.] Sarawak, Mt. Murud, 6500 ft.; Eupt. genitalia slide 115 ♂ BM; NHMUK. **Fig. 28:** ♂ specimen (no type) from later collecting, tentatively identified as *T. obsoleta*: [E. Malaysia], Sarawak, Gunung Mulu N.P., R.G.S. Exped. 1977/8, J. D. HOLLOWAY et al.; W. Melinau Gorge, 250 m, Limestone forest; Eupt. genitalia slide 21 ♂ BM; NHMUK. — **Figs. 27a(i)/28a(i)** taken from a drawer photo by H. SULAK in 2015; **27a(ii)/28a(ii), 27b/28b** by A. GIUSTI in 2020 (differing ground colour from illumination and camera settings, identical specimens). — Scale bars (where present) 1 cm (most Figs. = ca. 60% natural size). Fig. 18 = less than 60%; Figs. 15–16 = ca. 80%). — All NHMUK specimen photographs on all plates are © Trustees of the Natural History Museum London; all other photos © author resp. collection/museum; all reproduced with permission.

(9) *Tagora pandya* MOORE, 1865

(Figs. 15a, b; 16a, b, c; 17a, b; 18; 19; 76, 77; 119; Map 1 *Tagora*.)

Tagora pandya: MOORE (1865: 807; not illustrated; number and sex of specimens not provided). — The species was not originally described as “*Ganisa*” *pandya* as quoted erroneously by STRAND (*in SEITZ* 1922), in the BMNH Card Index = BECCALONI (2005), and by HOLLOWAY (1982) and probably other authors copying the data from STRAND or the BMNH Card Index; MOORE (1865) originally included it in *Tagora*, where it belongs.

This error of using *Ganisa* instead *Tagora* was either created by BUTLER (1881) or by some other contemporary or slightly earlier author (we have not specifically researched for this question), who described his “*Ganisa pallida*” without any comparison to MOORE’s *Tagora pandya* (in spite of the fact that these two look very much alike — BUTLER compared his specimen only with “*Ganisa*” *glaucescens* [sic!]), and never explicitly corrected this error.

BOLD BIN: BC and BIN not yet known. No recent material was available to us for COI barcoding, there are only the old types and other old specimens of *pandya* MOORE and *pallida* BUTLER (see below) in NHMUK and a few further old specimens in different museum collections presently not available to us and not suitable for barcoding by age anyway. Samples of more recent material from Arunachal Pradesh in northeastern India were sent to the barcoding project in Canada but did not show any results yet.

Type material: HT ♂ (labelled on pin as “type”, obviously in MOORE’s handwriting. Interpreted here as a “holotype by original designation”; else a LT designation would be necessary), in NHMUK; labels: “N. India” [on backside:] “*Tagora Pandya*, ♂”, “MOORE (type)” [handwritten, Moore]; “MOORE Coll. 94-106”; “Type” [red, round]; “Eupterotidae Brit. Mus. slide 119” [genitalia dissection label]; “NHMUK010430471” (all labels see in photos in Figs. 15a, b); see also Note 7 below. — T.I.: “N.E. Bengal. In Coll. A. E. RUSSELL; F. MOORE” (compare this text from the original description with the original labels of the type in Figs. 15a, b).

Further old material, e.g., in NHMUK or MfNB, of unclear status; also rarely in other museums, not identifiable as a possible former ST series. We illustrate here in Figs. 17–18 two ♀♀ from London, NHMUK.

Peter SMETACEK kindly sent us a photo taken in Arunachal Pradesh, India, of a living female in its alert position in 2020 (Fig. 19).

Note 7: MOORE (1865) characterized the new taxon in his description (after a list of details) as follows: “Allied to *T. patula*; but may be distinguished by its wanting the two vitreous discal spots.” When we compare the types deposited today in NHMUK, we do not find too much similarity in pattern between the HT ♀ of WALKER’s “*Tagora*” *patula* and MOORE’s HT ♂ of *T. pandya*; so this comparison just based on the (basically correct) note on hyaline spots is anyway a bit enigmatic, and MOORE never defined his use of “allied” here. We just do not understand what MOORE or BUTLER or any other author of that time really meant with such “descriptions”, as none of these authors looked for any relevant morphological details to have a prove for this “being allied” beyond both taxa being Eupterotinae. — Further, those “two vitreous discal spots” are usually only found in females of this *patula* species-group of *Sphingognatha*, the ♂♂ of most species of this group have generally just a single such spot, only some further ♂♂ from especially Myanmar may show two spots similar to the ♀♀. BUTLER’s (1881) illustrations of WALKER’s *patula* and his own “*Ganisa*” *pallida* (under full ignorance of MOORE’s taxon *pandya*!) further enhances the general confusion. — Similar confusion, supported by a poor illustration of another obviously misidentified specimen, is also to be found, e.g., in HAMPSON (1893: 46–50), who a) interpreted “*Tagora patula*” (on p. 46/47) as a member of *Tagora*, but with an illustration of a ♂ moth of a true species of *Tagora* as a ♂

of *Tagora patula*” [sic! misidentification of species; the illustration shows without doubt a *Tagora* ♂, maybe *pandya*?], while he b) lists “*Ganisa pandya* MOORE“ with synonym “*G. pallida* BUTLER” and as further species “*Ganisa glaucescens*” (on p. 50) without illustration in the wrong genus, mixed with true *Ganisa* species. However, “*Tagora*” *patula* is a member of the genus *Sphingognatha* s. l. (name-giving for the *patula* species-group of this genus) and not of *Tagora*, and it shows a different groundplan of the pattern, not at all to be confused with the typical pattern of *Tagora* if one has seen more material. — So we decided to accept the evidently only existing ♂ type specimen of MOORE’s taxon *Tagora pandya* in London as correct and illustrate it here in our Figs. 15a, b as “HT by original designation” for the time being. — Further, MOORE (1865) provides as wingspan of his specimen[s?] “Expanse 3½ to 4 inches”, which would correspond to about 9–10 cm wingspan; however, the specimen in London labelled as “type” of *pandya* MOORE (Fig. 15a) has only around 7.7 cm wingspan, while females are on average a bit larger. We have no explanation for all these discrepancies (perhaps MOORE was not too familiar with the old and new units?), but for the pandemic times being and within the present publication we accepted this specimen in London as HT.

However, this chaotic system of where to place (into which genus) which taxon, steadily changing from publication to publication, from author to author, of misidentified or misinterpreted or ignored descriptions, type specimens, type species of genera, of characters used to describe and define a taxon by the early (especially many British, but most of the other authors of those old times were not much different in this aspect) authors, the habit of regularly ignoring some earlier publications, and in addition the obvious general habit to preferably refer to later, secondary sources and not to the primary earliest original descriptions and publications explains a big part of the mayhem we have to fight still today in the family Eupterotidae.

Etymology: Not explained; perhaps based on the Pandya people of S. India, ruling in present-day Tamil Nadu state between ca. the 11th and 13th century? (Perhaps a bit strange for a Himalayan species?)

Synonymy:

= *Ganisa pallida* BUTLER, 1881: 65, pl. XCVI fig. 3 [figure from scan here shown as our Fig. 16c]; number and sex of type[s] not stated), syn. rev. — (Figs. 16a–c). — HT ♂: (labelled as such, possibly by monotypy; else a LT designation might be necessary), NHMUK; labels: “Bhotan, 79-57” [on backside:] “*Ganisa pallida* BUTLER Type” [handwritten, BUTLER]; “Type” [red, round]; “Eupterotidae Brit. Mus. slide 118” [genitalia dissection label]; “NHMUK010430470” (compare notes above and all original labels on Figs. 16a–b, 77). — T.I.: “Bhotan (LIDDERDALE)” = Bhutan. — We have no barcode data for any of these two described Himalayan taxa; the interpretation as synonyms is provisional and based mainly on habitus and ♂ genitalia morphology. [See below under Material studied.]

Etymology: Explicitly named “*pallida*” by BUTLER (1881: 65–66) following his comparison with “*Ganisa*” *glaucescens* only [sic!]. In fact, there is not any visible relevant difference in the ground colour or pattern between the average “*pandya*” and the “*pallida*” type and other samples of these old museum specimens, in contrast to *glaucescens*.

Misidentification: MELL (1930: 462) synonymized *pallida* BUTLER with *glaucescens* WALKER (“die von STRAND (*in SEITZ*, Fauna indo-australica, II, p. 425) zu *pandya* gezogene *pallida* BTLR. ist eine Form von *glaucescens* WLKR.” = “the taxon *pallida* BTL., which was synonymized with *pandya* by STRAND *in SEITZ*, is a form of *glaucescens* WLK.”; maybe MELL did not know the type specimens of all these taxa as well?).

The error of confusing the genera *Tagora* and *Ganisa* possibly began already before BUTLER's (1881) messing them up so gloriously in very idealistic colour paintings. So we cannot be sure with our speculation, but: If BUTLER (and a few other authors around his time) had not messed up these taxa and if he had compared his Bhutan specimen correctly with the conspecific taxon *Tagora pandya* of MOORE (1865) from Darjeeling, much of the nonsense of messing up *Ganisa* and *Tagora* (and more ...) might possibly had been avoided for a full century (between perhaps at least BUTLER 1881 and HOLLOWAY 1982?).

BUTLER (1881: 65–66, pl. XCVI fig. 3) did obviously not know MOORE's (1865, just 16 years before) description and specimen of *Tagora pandya*, because he did not spend *any word* to a comparison to this externally practically identical taxon. He listed a true *Ganisa* species (WALKER's *G. plana*) as well as true *Tagora* species ("*Ganisa*" *glaucescens* and his own new "*Ganisa*" "*pallida*") all under the genus name "*Ganisa*", without any differentiation; and under "*Tagora*" 3 taxa ("*Tagora*" *patula* [♂ and ♀], "*T.*" *pallida* WALKER, 1855 and, as synonym of this, *Sphingognatha asclepiades* FELDER), all of which presently are correctly classified as *Sphingognatha* s. l. – In 1881, obviously nobody yet had studied genitalia morphology or any other systematically important character in the family. Even the quite small, but visible differences in male antennae structure and other external morphological details clearly different for the genera *Ganisa* and *Tagora* were not yet noticed. – The earliest authors who obviously noticed the conspecificity of *Tagora pandya* MOORE and "*Ganisa*" *pallida* BUTLER, were seemingly SWINHOE (1892: 271) and his contemporary colleague HAMPSON (1893); however, they both used for the synonymized species again the wrong genus *Ganisa*.

Material studied (details on type material see above):

India, West Bengal: HT ♂ *Tagora pandya*: "N. India" [on back-side:] "*Tagora Pandya*, ♂", "MOORE (type)"; "MOORE Coll. 94–106"; "Type"; "Eupterotidae Brit. Mus. slide 119"; "NHMUK010430471" (T.l. according to publication: "N.E. Bengal). – 1 ♂, Darjeeling, coll. ATKINSON; *Pandya* MOORE; *Tagora pandya* MOORE [handwritten, MOORE?]; MfNB. 2 ♂♂, 2 ♀♀, Darjeeling, coll. ATKINSON; MfNB. 2 ♀♀, "*Tagora Pandya* MOORE ♀" [handwritten, MOORE?; on back-side:], "Darjiling, GROTE; MOORE Coll. 94–106; NHMUK014199843", "...844"; NHMUK. – **Sikkim:** 1 ♂, "Sikkim, DUDGEON[?]; MOORE Coll. 94–106; Eupt. genitalia slide 44 ♂ [not seen]; NHMUK014199846"; NHMUK. 1 ♀, "Sikkim, Gangtok, 6.–12. ix. [19]38, Exped. SCHÄFER; *Ganisa pandya pallida* BTLR., det. Dr. Herb. Sick"; MfNB. – **Meghalaya:** 1 ♂, "Assam, Kaziranga Wildlife res., Pan Bari, 26°45' N, 93°10' E, 100 m, 12.–21. xi. 1997, leg. SINIAEV"; GP Heterocera 11.527; CMWM. 2 ♂♂, "Meghalaya, Umran, 33 km N Shillong, '25.45'N 91.43'E" [sic], Sec. Wald, 800 m, 8.–11. XII. 1997, leg. SINIAEV & al.", CMWM. – **Arunachal Pradesh:** 7 ♂♂ [1 of those dedicated to SMFL], Dist. Passighat, 28 km from Passighat, 28.08309° N, 95.15514° E, 600 m, 14.–15. ix. 2012, leg. G. BRETSCHNEIDER; GP 2760 [Fig. 119] & 2761/22 SNB; BC SNB 2716 & 2717 [no results yet]; via CSLL in CSNB. 1 ♀, NE Arunachal Pradesh (only photo of a live specimen by P. SMETACEK in early November 2020 in the wild, sent to S.N. [Fig. 19]; regrettably not the specimen itself, so we do not have a dissection as well as a ♀ barcode.) We expect that these specimens from Arunachal Pradesh will probably turn out as *T. pandya*, as the ♂ genitalia [Fig. 119, from GP SNB 1760/22] are very much alike to these, but as long as we do not have a barcode of the other populations we cannot be sure.

Bhutan: HT ♂ *Ganisa pallida*: [Bhutan], "Bhotan, 79.57"; "*Ganisa pallida* BUTLER Type"; "Type"; "Eupterotidae Brit. Mus. slide 118"; "NHMUK010430470".

Distribution: India: West Bengal, Sikkim, Meghalaya, Arunachal Pradesh; Bhutan (NHMUK, MfNB, CMWM, CSNB).

Notes in literature: CHANDRA et al. (2019: 204) mention "*Eupterote pandya*" in their book from Sikkim, West Bengal, Assam, Megha-

laya, and, outside of present-day India, from Bhutan and Bangladesh [sic]. The only detailed locality given by them is "West Bengal, Neora valley, Suntale Khola, at 27.0104° N, 88.7899° E, 760 m, collected 6.–9. xi. 2016", and they figure a ♂ in colour on pl. 58, fig. 1, in dorsal and ventral view. This specimen fits very well with the type material of *T. pandya* (respectively *T. pallida*), and we believe it to be conspecific. – The possibly misleading note of a record from Bangladesh refers probably to notes in older literature, mentioning the taxon from "Sylhet" (or "Silhet"; today in Bangladesh); in reality it is probably not positively known from this country. Maybe that Sylhet was again just the *shipping harbour* of old material in the 19th century (probably accompanying the tea export?) written on the labels just like for some Saturniidae, compare NAUMANN & NÄSSIG (2010: 130).

Note 8: The following Asian eupterotid species taxa named "*pallida*" (a generally pretty common species name in lepidopterology!) have at times additionally been included into *Tagora*, although they did never belong there. – See here:

8A: *Jana pallida* WALKER, 1855[a: 912, no. 6, not illustrated; consisting of a mixed type series (a specimen from "Silhet", another one from Sumatra, i.e. most likely two different species)], described by WALKER in the genus *Jana* HERRICH-SCHÄFFER, [1854], placed in error into the genus *Tagora* and illustrated by BUTLER (1881: 71, pl. XCIV fig. 3) and probably in error synonymised with *Sphingognatha asclepiades* C. & R. FELDER, 1874 by BUTLER, is a different species belonging to the genus *Sphingognatha* s. l. and has nothing to do with the species of the present-day genus *Tagora* (as well as with the African genus *Jana*, which is not known from outside the African region) dealt with here.

8B: *Tagora pallida* ROTHSCHILD, 1917[: 486, not illustrated], was compared by its author to the taxon *khasiana* (MOORE, 1879[: 77, not illustrated]) (no genus cited; ROTHSCHILD possibly interpreted it as *Tagora*? In fact, it is a *Sphingognatha* [s. l.] and is too large for a *Tagora*; it measures [Lfw.] "61 mm. Expanse: 134 mm"; ROTHSCHILD's species, therefore, evidently is also belonging to the genus *Sphingognatha* s. l. and has nothing to do with the species of the present-day genus *Tagora*. – STRAND (in SEITZ 1922: 424) already noticed this homonymy under *Tagora* and created a replacement name: "*T[agora] rothschildi* nom. nov. (= *pallida* ROTHSCH., NEC WKR.)", with "*T. pallida* WKR. (= *asclepiades* FLDR.)" as next species in the row. STRAND seemingly called most of his *Sphingognatha* s. l. specimens "*Tagora*".

8C: According to the Articles of the Code (ICZN 1999), WALKER's *Jana pallida* was described in a genus other than *Tagora* (which means that it does *not* interfere as a primary homonym with the present concept of *Tagora*), and now appears to have found its correct place within *Sphingognatha* s. l. – ROTHSCHILD's *Tagora pallida* (which was a temporary junior homonym of *Ganisa pallida* BUTLER, 1881 within the genus *Tagora*, wherein the latter taxon is here replaced by its senior subjective synonym *Tagora pandya* MOORE, 1865, see above) is today also contained within *Sphingognatha* s. l. and may thus cause homonymic problems (within *Sphingognatha* s. l.) during a revision of the genus *Sphingognatha* s. l. – STRAND's replacement name might help in that case

Description and differential diagnosis

♂ (Figs. 15a, b; 16a, b, c): Fwl 39–43 mm (HT *T. pandya* 41 mm; HT *T. pallida* syn. rev. 39 mm). A medium-sized *Tagora* species, light greyish brown to grey ground colour on dorsal side. Fw. tornus a little rounded, apex only with very small tip. Thorax and abdomen in ground colour, head dark brown. Antennae 12 mm in length. Fw. antemedian line almost invisible, followed by four crenulate lines in the outer median area, the central one strongly

darkened near the costal margin. Median field between veins M1 and M3 with small white patch, along all veins a shade of white scales. Fw. postmedian line almost straight, bent backward in the apical part, proximal portion broad brownish black, followed by tiny whitish yellow and narrow dark brown line. Postmedian area in ground colour, with central tiny crenulate line. Hw. again in ground colour, median lines missing, only marking in this area are one or two black patches on the inner margin. Postmedian line little rounded, structure similar to fw, postmedian area in ground colour, with central narrow dentate line and row of small black dots along the white accentuated veins. On ventral side greyish brown colour, with four darker crenulate lines in median area and a dark postmedian line, which is a little dentate on the hw.

♂ genitalia (col. Figs. 76–77; b&w Fig. 119; 8th sternite Fig. i; B.M. Eupt. slide 119 [HT *pandya*] [Figs. 76], B.M. Eupt. slide 118 [HT *pallida*] [Figs. 77], GP 2760/22 SNB [Fig. 119]; also GP 2761/22 SNB; GP 11.527 CMWM): Processes of the uncus long, tall and straight, close to each other. Dorsal process of the valves with a triangular dorsal and ventral process, strongly sclerotized on ventral side. Saccus broad, short, of rectangular form, sometimes ending drop-like. Vesica with long sclerites almost to its posterior end. 8th sternite (Fig. i, from Arunachal Pradesh) with lateral posterior tips and inner rounded sclerotization. For comparison see also abdominal pelts (i.e., with sternite and tergite) of HTs of *pandya* and *pallida* in col. Figs. 76–77.

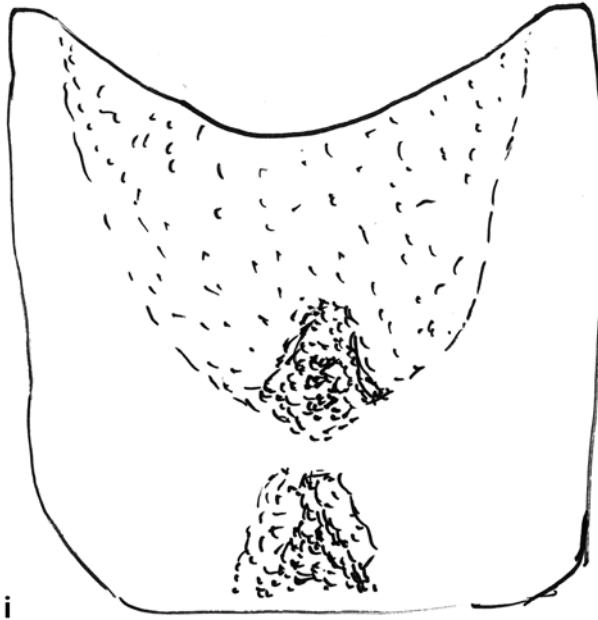


Fig. i: 8th Sternite sketch of ♂, *Tagora pandya* (from Arunachal Pradesh), GP 2760/22 SNB.

♀ (Figs. 17a, b; 18; 19): Fwl 45–50 mm. Aside from typical sexual dimorphic characters such as bigger size, larger wing surface and more narrow antennae of ca 13.0 mm length, the ♀♀ differ from their according ♂♂ by their more intense ornamentation and a greenish grey shade

on the dorsal fw. between veins M1 and M3 and additionally between veins CuA2 and 1A. Especially the inner crenulate median line of the fw. is accentuated, the hw. shows two or three crenulate lines in the median area. The ground colour is the same as in the ♂ or slightly darker.

♀ genitalia: Not examined.

It is remarkable that there are obviously only a rather few to none recent records of *Tagora pandya* (or its synonym *pallida*) from the NE Himalaya slopes and foothills in Sikkim and West Bengal since the 19th century besides the rather many old specimens in, especially, NHMUK and MfNB. Only from further in the East and Southeast (Arunachal Pradesh, Meghalaya) a few recent records are known which we expect to be true *T. pandya*. It is unknown whether *T. pandya* has already been eradicated from West Bengal or Sikkim during the 20th century or what else might be the case. — Based on our experience with other “poor fliers” of bombycoid moths, we would not expect true *T. pandya* to be found far away from the southern slopes of the NE Himalaya.

(10) *Tagora mizoramia*, sp. n.

(Figs. 21a, b, c; 108; Map 1 *Tagora*.)

Bold BIN: AEI6691, based on BC SNB 6880, 6881 with results (slightly below 658 bp, see Tab. 1).

Holotype ♂: India, Mizoram, Blue Mountains, Thaitlang env., 1300 m, ca. 22°40' N, 93°4' E, x. 1997, via YAMAMURA; BC SNB 6880; in CSNB, designated to MfNB; Fig. 21a.

Paratype (1 ♂): Same data as HT; BC SNB 6881; GP 2678/21 SNB; in CSNB; Figs. 21b, c.

No ♀ specimen known.

Distribution: India, Mizoram.

Etymology: Named for the locality of origin.

Description and differential diagnosis

♂ (Figs. 21a, b, c): Fwl 39/40 mm (HT 40 mm). A relatively small species in the genus, fw. apex of almost rectangular form, tornus a little rounded. Dorsal ground colour intense greyish brown, with strong ornamentation. Thorax and abdomen in ground colour, head very dark brown. Antennae 11.5 mm in length. Dorsal fw. antemedian line strong, dark, median field with white patch, followed by a dark grey shade up to the postmedian line, and with 4 dark grey crenulate lines. Fw. postmedian line straight up to the apex, from basal side strong dark brown, yellow and again narrow brown. Fw. postmedian area almost in homogenous ground colour, with a slightly indicated dark central crenulate line. Fw. apex with small tip. Dorsal hw. of same colour, with a black patch along the inner margin. Postmedian line straight in the lower two thirds, and rounded to the upper margin, with inner strong dark brown and outer narrow yellow portion. Postmedian area with a central row of dark brown dots along the veins. On ventral side of brown ground colour with grey proximal shade, outer margin again more brown. Median area of fw. and hw. with four crenulate lines, fw. postmedian line dark brown, concave, that of the hw. almost invisible.

δ genitalia (b&w-Figs. 108; 8th sternite Fig. j; GP 2678/21 SNB [PT]): Processes of the uncus long, tall, straight, and close to each other. Dorsal and ventral process of the valves strong. Saccus and phallus very short, vesica covered with long spiculae. 8th sternite very broad, with concave posterior margin.

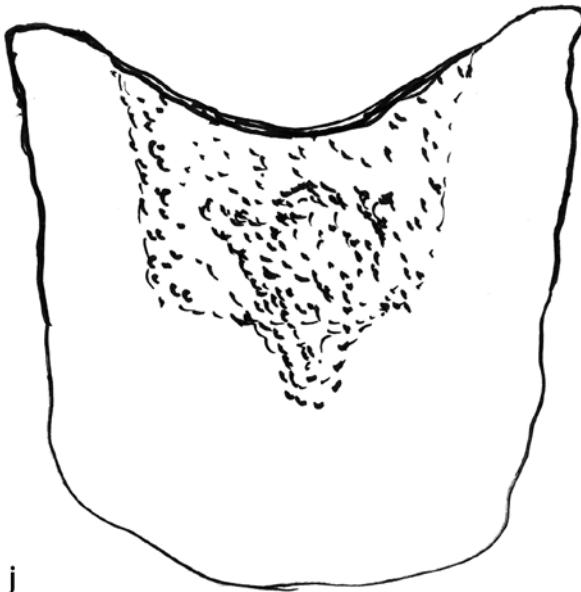


Fig. j: 8th Sternite sketch of δ , *Tagora mizorama*, GP 2678/21 SNB [PT].

\varnothing unknown.

(11) *Tagora javana*, sp. n.

(Figs. 22a, b; 118; Map 1 *Tagora*.)

BOLD BIN: ACU0026 (based on BC SNB 5558, 6949, 6950).

Holotype δ : "Indonesia, E-Java, Mt. Baluran, 600–1000 m, iv. 1996, via A. SCHINTLMEISTER"; in CWAN in SMFL; BC SNB 5558; Fig. 22a, b; SMFL type catalogue no. 4734.

Paratypes: 2 $\delta\delta$, Indonesia, W-Java, Mt. Halimun, i. 2013; via V. GOLOVIZIN; GP 2759/22 SNB; BC SNB 6949, 6950; CSNB (specimens received on 15. iii. 2022).

No \varnothing specimen known.

Distribution: Indonesia, Java.

Etymology: Named for the locality of origin, the island of Java.

Description and differential diagnosis

δ (Figs. 22a, b): Fwl 44–46 mm (HT 44 mm). One of the largest species in the genus. Dorsal side in light greenish grey ground colour with intense black and dark grey markings. Thorax and abdomen in ground colour, head dark brown. Antennae bipectinate up to the apex, 12.0 mm in length. Fw. antemedian line a strong zigzag band. There is a white dot in the median area, followed by a central mossy green field up to the postmedian line. Posterior to the white dot there are small rows of white scales along the veins and a field of 6 crenulate dark grey lines, which become quite intense around the costa. The fw. postmedian line straight, black, followed by a broad yellow and narrow black line. Apex almost black, with a strong rounded apical tip bent backward. The sub-

marginal area in ground colour, with a strong crenulate dark grey line, outer margin also dark grey. Hw. of same colour, with three crenulate median lines ending with three black patches on the inner margin. Postmedian line black and yellow, rounded to the upper margin, the submarginal area in ground colour, with a narrow dentate line with black dots when crossing the veins. Ventral side more brownish grey with strong ornamentation which becomes very dark, almost black in the fw. apical area.

T. javana sp. n. is much bigger than the two known taxa from Sumatra, and of a distinct homogenous grey colour, compared to the Bornean taxa. It is quite similar to *T. treadawayi* sp. n., described below from which it differs by its strong dark apical ornamentation, the further marginally situated crenulate median lines, the more rounded apical fw. tip, and details in genitalia (form and position of uncus processi, valve apex).

δ genitalia (Fig. 118; 8th sternite Fig. k; GP 2759/22 SNB [PT]): Uncus with two widely separated slender and short processes. Dorsal process of the valves rounded on dorsal side, on ventral side with a strong, bent sclerotized process. Ventral process of the valves broad, round, sclerotized. The juxta is broad, the saccus round and broad, bulb-like. Phallus long, vesica with medium-sized sclerites. The phallus unfortunately was lost during photography preparations and cannot be shown here. 8th sternite with two small lateral posterior tips and small indentation in central position, with sclerotisation around.

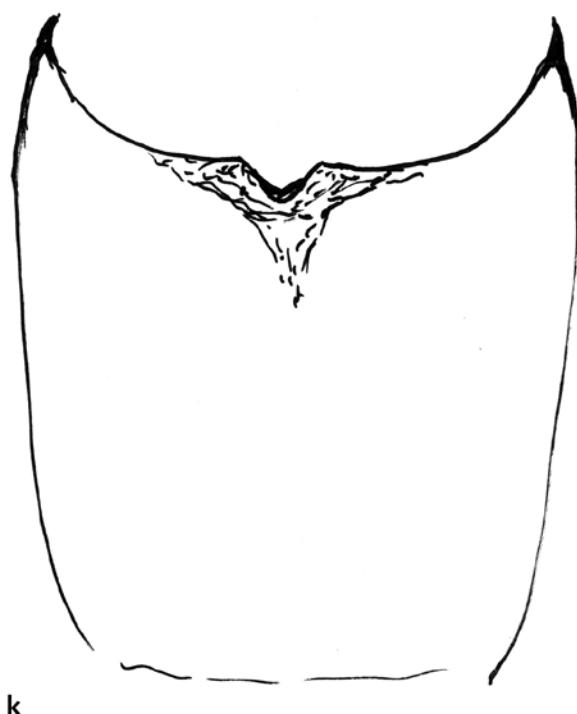


Fig. k: 8th Sternite sketch of δ , *Tagora javana*, GP 2759/22 SNB [PT].

\varnothing unknown.

(12) *Tagora treadawayi*, sp. n.

(Figs. 23a, b; 24; 25; 26; 110; Map 1 *Tagora*.)

BOLD BIN: AAY7650 (based on BC SNB 5560, 5561, DNA EUPT-11/093, 11/097, 11/098 CMWM).

Holotype ♂: “Philippines, S-Palawan, Mt. Gantung, 1300 m, leg. Danny, iii. 2002”, in coll. Colin G. TREADAWAY; donated 5. XII. 2004 to SMFL; in SMFL; BC SNB 5561; Fig. 23a, b; SMFL type catalogue no. 4735.

Paratypes (11 ♂♂, 2 ♀♀): Philippines, Palawan: 1 ♂, 1 ♀, same data as HT; GP ♀ S. PUGAEV SMFL-Nr. 2265/11 [“*Tagora hercules*”; genitalia slide not yet returned to SMFL]; ♀ DNA EUPT-11/097; ♀ SMFL 15.4.11 EU 0059; ex CCGT in SMFL; ♀ Fig. 24. 1 ♂, Napsan, Mt. Salakot, 1000 m, 27./28. IV. 1998, Spende an SMFL 5. XII. 2004; ex CCGT in SMFL. 1 ♂, Mt. Mantalingajan, 27. XI. 2000, Spende an SMFL 5. XII. 2004; GP 2706/21 SNB; ex CCGT in SMFL. – 1 ♂, Mt. Salakot, near top, 950 m, 9°42'49" N, 118°32'36" E, 25. III. 1998, 160 W MV-lamp, leg. A. ZWICK & S. VERDEPRADO; GP 1410/00 CWAN [GP tube after moving process within SMFL house not yet rediscovered]; ex CWAN in SMFL. 6 ♂♂, Mt. Mantalingajan, cold, open rainforest, 1400 m, 8°48.27' N, 117° 41.86' E, 18. & 19. III. 1999, MV-lamp, leg. A. ZWICK & S. VERDEPRADO; GP 2705/21 SNB; BC SNB 5560; CWAN in SMFL; Fig. 25; Fig. 110. 1 ♀, Mt. Mantalingajan, open bamboo forest, 1300 m, 8°47.77' N, 117° 42.11' E, 21. & 22. III. 1999, MV-lamp, leg. A. ZWICK & S. VERDEPRADO; GP ♀ S. PUGAEV SMFL-Nr. 2264/11 [genitalia slide not yet returned to SMFL]; ♀ DNA EUPT-11/098; ♀ SMFL 15. IV. 2011 EU 0058; ex CWAN in SMFL; Fig. 26. – 1 ♂, Mt. Solokot, 800 m, 9.51° N, 118.38° E, 10.-27. II. 2000, ex coll. Dr. R. BRECHLIN; “*niassana obsoleta*” [sic, misidentification]; GP Heteroc. 11.645 WITT; DNA EUPT-11/093; “Holotype ♂ Eupterotidae, *Tagora hercules*, Philippines, Palawan, des. PUGAEV 2011” [red; never described and published by the authors, invalid “pseudotype”]; CMWM.

Distribution: The Philippines, Palawan Island.

Etymology: Named for Colin G. (“Trig”) TREADAWAY, a good friend of the second author (W.A.N.), deceased 10. II. 2019 in Derby, UK, where he had moved to and lived in the house of his daughter and her husband for the last short years after the death of his wife Waldtraud. He donated the first specimens of this Palawan species to SMFL already around 2000. It was soon after the donation identified to be an undescribed species (alone just by its big size!), and also the Russian colleagues identified it as new very soon after they saw the singleton in CMWM.

Remark: This species endemic to Palawan island was intended to be described by our Russian colleagues during their work on *Tagora*. They used an evidently unpublished manuscript name (“herkules” or “hercules”, obviously based on the big size, according to the BC data of the ZOLOTUHIN group in BOLD) for the species. We did not know that and came only very recently in summer 2021 after Vadim’s death (when receiving back most of the loans of Senckenberg Frankfurt) to this information, when we had already decided to name the species *T. treadawayi*, who collected a part of the type series.

Description and differential diagnosis

♂ (Figs. 23a, b; 25): Fwl 45–46 mm (HT 45 mm). Together with *T. javana* sp. n. one of the largest species in the genus. On dorsal side of light greyish brown ground colour with weak darker grey markings. Thorax and abdomen in ground colour. Antennae 11.5 mm in length. Fw. antemedian line a weak zigzag band when available, followed by a white dot embedded in a little darkened zone in the median area. Posterior to the white dot there are

very small rows of white scales along the veins and three crenulate dark grey lines, bent backward to the costa and ending there straight. The fw. postmedian line straight, black, followed by a yellow and narrow black line. Apex almost black, with a strong acute tip bent backward. The submarginal area again in ground colour, with a crenulate dark grey line, outer margin also dark grey. Hw. of same colour, with three crenulate median lines ending with small black patches on the inner margin. Postmedian line black and yellow, rounded in the upper half, the submarginal area in ground colour, with a narrow crenulate line as in fw. Ventral side more brownish grey with darker grey ornamentation: The crenulate lines in the median area, a straight postmedian line, and a crenulate line in the submarginal area on both fw. and hw.

T. treadawayi sp. n. is quite similar to *T. javana* sp. n., described above, from which it differs in a slightly larger size on average, by less crenulate and more medially situated median lines which are bent more intense to the costal margin, the much lighter colour of the fw. apical ornamentation, on the dorsal hw. the more bent postmedian line, in general the little more brownish ground colour, and details in genitalia (form and position of uncus processi, valve apex).

♂ genitalia (b&w-Figs. 110; 8th sternite Fig. 1; GP 2705/21 SNB [PT]; further GP 11.645 CMWM [PT]): Generally an elongate structure. Processi of the uncus widely separated, very short and strongly bent. Valve processes short, saccus short and straight, with a small bulge apically. Sclerites on the vesica medium-sized. The 8th sternite very broad.

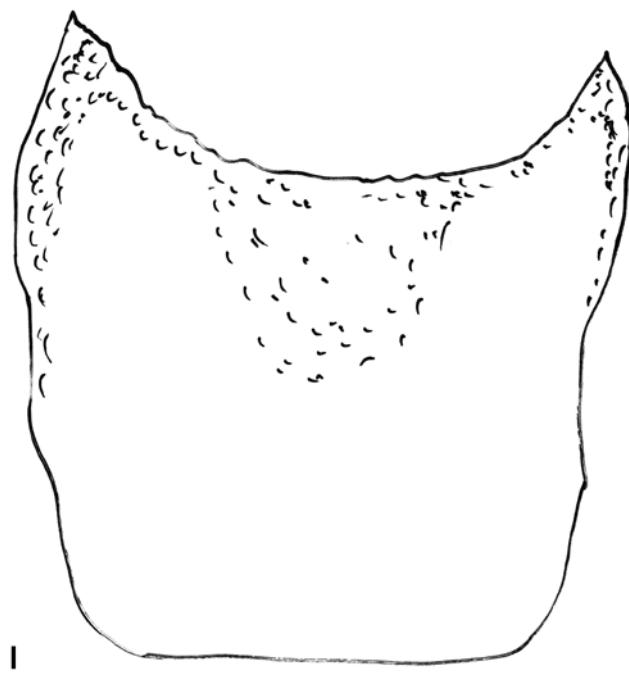


Fig. I: 8th Sternite sketch of ♂, *Tagora treadawayi*, GP 2705/21 SNB [PT]

♀ (Figs. 24; 26): Only 2 specimens known so far. Fwl 47/49 mm. ♀♀ differ from the ♂♂ by typical sexual dimorphism such as more rounded fw, little larger size, shorter rami of the bipectinate antennae and larger abdomen.

Colour and pattern as in ♂♂, but all lines darker, broader, and more intense. The darkened zone in the fw. median area is extended to the postmedian line.

♀ genitalia: Not examined (not available to us presently, still on loan by PUGAEV[?]; GP ♀ S. PUGAEV, SMFL-nos. 2264/11, 2265/11).

Species-group of *T. niassana/glaucescens*, subgroup of *niassana*

(13) *Tagora obsoleta* TALBOT, 1926

(Figs. 27a, b; 28a, b; 29; 30; 111; Map 2 *Tagora*.)

Tagora glaucescens [sic] *obsoleta*: TALBOT (1926: 144). (This species and a second eupterotid, "Sphingognatha pallida WALK.", evidently a "true" *Sphingognatha* (s. l.), were listed under family Notodontidae by TALBOT – sic.) – LT (by present designation, in NHMUK, Figs. 27).

Note 9: *Tagora obsoleta* was described by TALBOT (1926) as a subspecies of *Tagora glaucescens* WALKER [sic; author misspelled by TALBOT as "WAKL."] within the family Notodontidae [sic; still an erroneous family and even superfamily placement in 1926, over 30 years after SWINHOE (1892) and HAMPSON (1893) defining Eupterotidae as a family]. Later, HOLLOWAY (1982: 190) revised the status of *T. obsoleta*, stated correctly that it is a separate species, and combined it with the genus *Eupterote*, based on general similarity in ♂ genitalia morphology. – The card of this taxon *obsoleta* in the BMNH Card Index (also copied from there by BECCALONI et al. 2005 and 2018 in the web) by typewriting cites as original publication incorrectly "Iris, [Dresden,] 40.: 144" (a typist's repetitive error?), while there is no TALBOT publication at all in this issue of the Dresden D.E.Z. Iris journal. (There is, on the card, a further handwritten note "Ganisa", which may have caused another incorrect generic affiliation by HOLLOWAY 1987: 63–66 for the original description.) This incorrect Iris citation for the TALBOT description was also repeated without comment (meaning that evidently nobody ever noticed the error and searched for the correct citation) by, e.g., HOLLOWAY (1982: 190, 1987: 63–66). – In November 2018, Ian J. KITCHING, NHMUK, most kindly found (on a request by W.A.N.) during a search in the NHMUK Entomology Library a bound separatum of TALBOT's contribution in the Sarawak Museum Journal of 1926 and sent us a scan of the original description of the species. Ian KITCHING reported the ST in NHMUK bearing 4 labels: "1) the round pale-blue-bordered syntype label, one giving the locality data, one stating it is the male holotype of *Tagora glaucescens obsoleta*" [most likely in TALBOT's handwriting] "and one with the genitalia prep. number on it." – According to the type, *Tagora obsoleta* seems to be a smaller, dark, dull species not as splendid as (15) *T. acheron* or (16) *T. kalimantana* sp. n., nor as colourful as *T. polychroma* sp. n. (see below under (14) *T. polychroma*).

BOLD: BC and BIN unknown so far. No ST specimen of *T. obsoleta* was barcoded so far (being too old for the standard methods), and we also do not have a successful barcode from a more recent specimen. We were not able to identify any more recent specimens *safely* belonging beyond doubt to *T. obsoleta*; those specimens identified by other authors (HOLLOWAY, the ZOLOTUHIN group) to belong here apparently are quite often *T. polychroma* sp. n., described below, or *T. acheron*. The only more recent specimens which we tentatively identified as likely or possible specimens of *T. obsoleta* see in Figs. 28, 29, 30.

Type material: ST (TALBOT 1926: series of 3 ♂♂?); 1 ♂ labelled as "Syntype" (blue-bordered round BMNH label) as well as "♂ H.T." (handwritten, but not published) in NHMUK (Figs. 27, 111); here designated as lectotype of *T. obsoleta*

(deposition of the two additional STs listed by TALBOT, now automatically PLTs, unknown). – Labels: "Tagora glaucescens obsoleta TALB."; "♂ H.T."; "43.24."; "Mt. Murud, Sarawak, 6500 ft., Nov. 14th [no year], Dr. E. MJOBERG"; "Syntype" [round, blue ring]; "Eupterotidae Brit. Mus. [genitalia] slide 115"; "NHMUK014199869"; NHMUK. – Types: "October – 1 ♂, November – 2 ♂♂"; no collecting year applied in original description or on labels. – A lectotype label will be added in due course after publication to the specimen.

TALBOT stated, in the introduction on the first page, that the types are deposited in the Hill Museum, and thus the ♂ labelled as "syntype" today in NHMUK ex ROTHSCHILD's former Hill Museum in Tring may be interpreted as a real ST. We herewith designate this specimen (figured in our Figs. 27, 111) as lectotype of *Tagora obsoleta* TALBOT, 1926 to stabilize nomenclature. The whereabouts of the other two specimens listed by TALBOT (which would now automatically be PLTs) are unknown. – No ♀ ST existing.

The second specimen [Figs. 28; ♂ genitalia see HOLLOWAY 1987: fig. 76] in the same drawer above the LT is a specimen collected later by the Gng. Mulu Expedition of BMNH by J. D. HOLLOWAY et al. with separate photos of specimen and labels in Fig. 28(ii). We generally agree (without barcode, but based on genitalia similarity) that this is most likely also a specimen of *obsoleta*. Also HOLLOWAY (1987: pl. 8, fig. 12) illustrated this specimen identified as *T. obsoleta* (under "Eupterote").

Type locality: "[Borneo, Sarawak], Mt. Murud, 6000–6500 ft."

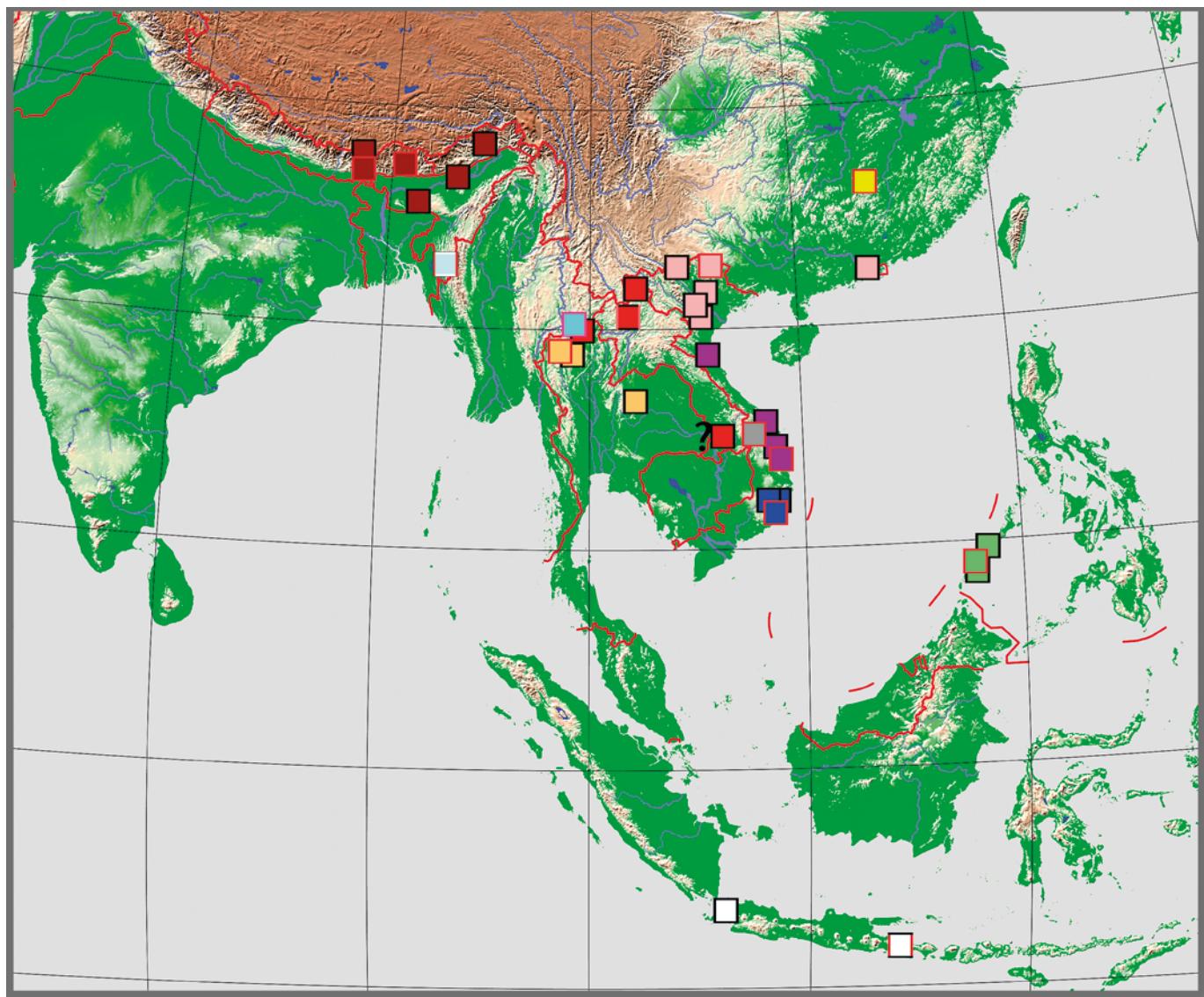
Material studied: LT ♂ (designated above): "[Borneo, Sarawak], Mt. Murud, 6000–6500 ft."; Figs. 27. – 1 ♂, [E. Malaysia], Sarawak, Gunung Mulu N.P., R.G.S. Exped. 1977/8, J. D. HOLLOWAY et al.; Site 23, W. Melinau Gorge, 250 m, 430558, FEG4, Limestone forest, MV, canopy/understorey; Eupt. genitalia slide 21 ♂ [see HOLLOWAY 1987: fig. 76]; B.M. 1978–206; in NHMUK; Figs. 28. – A further pair in CMWM may possibly also belong to *T. obsoleta*, although we do not know barcode and genitalia (tentative identification based on habitus only): 1 ♂, 1 ♀, Malaysia, Borneo/Sabah, Trus Madi, 1200 m, 1.–14. iv. 2005, leg. MARTINI, CMWM; no BC and no GP so far available; Figs. 29–30.

Distribution: E. Malaysia, Borneo: Sarawak, Sabah.

Etymology: Not explained.

Misidentification in literature: KISHIDA & ZOLOTUHIN (2020: 102) in their most recent paper on Laos Eupterotidae produced a repetition of the erroneous "Dresden Iris" citation of TALBOT's original description (see Note 9). Further, they published a misidentification for a specimen and species from Laos; their species from Laos was called "*Tagora obsoleta*". Their specimen is here identified as most likely our new species (1) *T. luxi* sp. n., see there; *T. obsoleta* is an endemic species of Borneo, not known to live on the Asian continent.

Note 10a: As generally often usual in Eupterotidae, the history of the discovery of more than one Bornean species of true *Tagora* is a bit complicated and tricky: TALBOT's *obsoleta* is the earliest described taxon specifically for Borneo; the second one is MELL's *T. acheron*, see below, but this was not recorded in the BMNH Card Index. HOLLOWAY (1976: 54; figs. 353, plate 19: 227), in ignorance of MELL's name, described *Tagora weberi* from Borneo, but obviously did not know the oldest species *T. obsoleta*; instead he compared *weberi* with an unrelated species living thousands of kilometers away ("*T. murina*" from Sri Lanka, sic!, which is in fact a *Sphingognatha* s. l.), and he listed as a "second species of *Tagora*" from Borneo the taxon "*pallida* WALKER, 1855", which as well is a species of the genus *Sphingognatha* s. l. (see Note 8a above); in fact, WALKER's (1855a: 912) "*Jana pallida*" is an artificial construction described from a mixed ST series of a specimen from "Silhet" and another specimen from Sumatra, most likely representing two different species. – Later, HOLLOWAY (1982: 190, his note 15) discove-



Map 1 *Tagora*

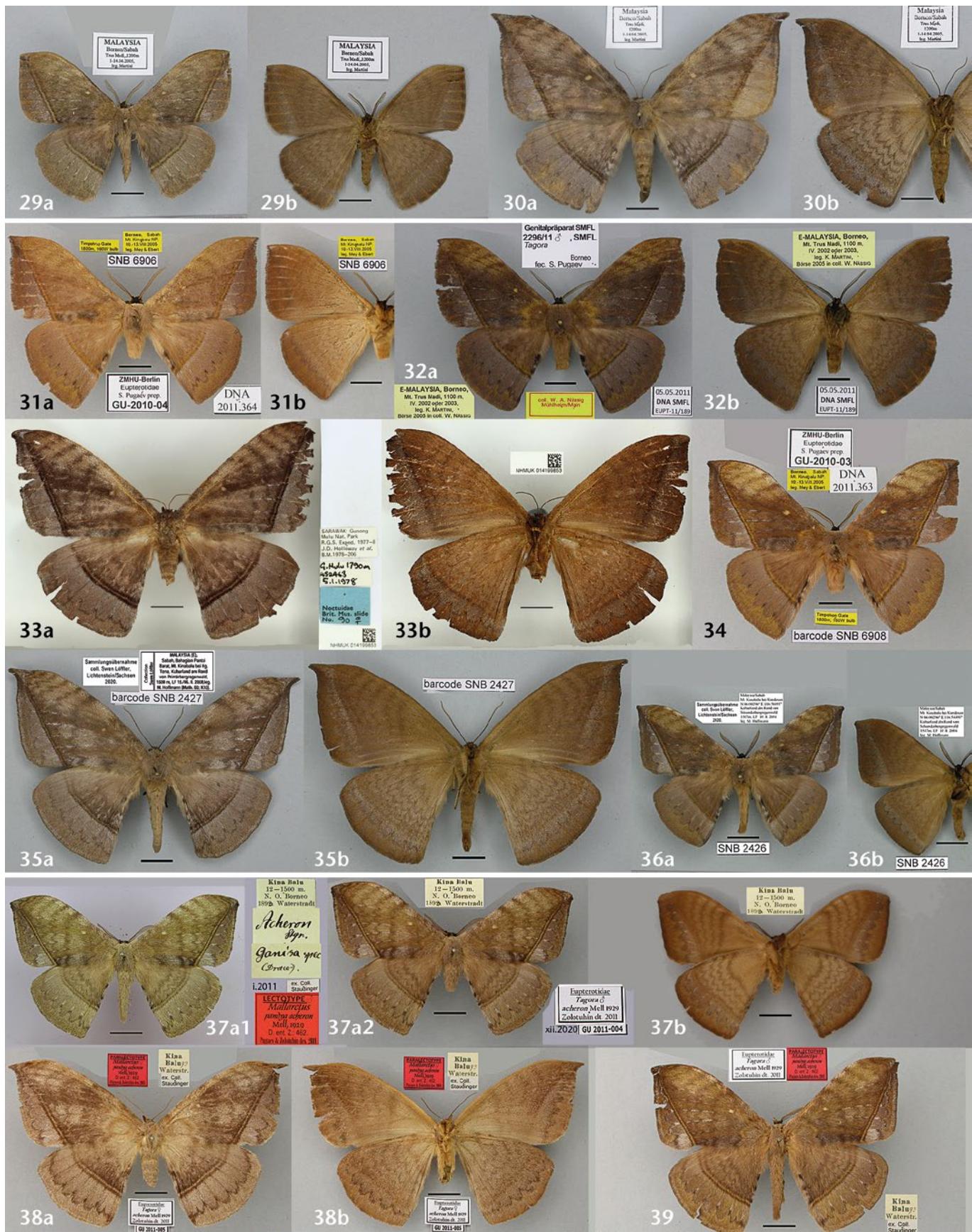
Legend for symbols in the map in the order of the checklist

- | | | |
|--|---|---|
| ■ (1) <i>Tagora luxi</i> sp. n. | ■ (5) <i>Tagora ignatyevi</i> sp. n. | ■ (9) <i>T. pandya</i> Moore, 1865 |
| ■ (2) <i>Tagora ihleorum</i> sp. n. | ■ (6) <i>Tagora pugaevi</i> sp. n. | ■ (10) <i>Tagora mizorama</i> sp. n. |
| ■ (3) <i>Tagora siama</i> sp. n. | ■ (7) <i>Tagora zolotuhini</i> sp. n. | ■ (11) <i>Tagora javana</i> sp. n. |
| ■ (4) <i>Tagora loeffleri</i> sp. n. | ■ (8) <i>Tagora sinica</i> sp. n. | ■ (12) <i>Tagora treadawayi</i> sp. n. |

Type locality symbols have a red (or half red) frame, other localities a black or white frame.

Map 1 *Tagora*: Locality data of *Tagora*, part 1. Not every symbol corresponds to one locality, localities rather closely together may be represented by one symbol only. Not all localities from labels have been found on maps. Colour symbol legend see in Map. — Basic map data by Map Creator 2.0 Personal Edition, © 2003–2007 primap software (Primap.com), modified and localities added.

Figs. 29–39: further types and other specimens of *Tagora*. — **Figs. 29–30:** 1 ♂, 1 ♀, possibly also of *T. obsoleta* (no GP, no BC available), Malaysia, Borneo, Sabah, Trus Madi, 1200 m, 1.–14. iv. 2005, leg. MARTINI, CMWM. — **Figs. 31–36:** (14) *T. polychroma* sp. n. BIN: AAU4295. **Figs. 31a, b:** HT ♂, [E. Malaysia], Borneo, Sabah, Mt. Kinabalu NP., 10.–13. viii. 2005, leg. MEY & EBERT; Timpohon Gate, 1800 m, 160 W bulb; S. PUGAEV prep. GU-2010-04; DNA 2011.364 = BC SNB 6906; in MfNB. **Figs. 32a, b:** PT ♂, E. Malaysia, Borneo, Mt. Trus Madi, 1100 m, iv. 2002 oder 2003, leg. K. MARTINI, Börse 2005 in CWAN; GP SMFL 2296/11, fec. S. PUGAEV [so far not returned to SMFL]; DNA SMFL Eupt-11/189 [PUGAEV]; in SMFL. **Figs. 33a, b:** PT ♀, Gunong Mulu Nat. Park, R.G.S. Exped 1977–8, J. D. HOLLOWAY et al., B.M. 1978–206; G. Mulu, 1790 m, 5. i. 1978; Eupt. Brit. Mus. slide 90 ♀;



NHMUK014199853; in NHMUK; photo A. GIUSTI 2020/21. **Fig. 34:** PT ♂, [E. Malaysia], Borneo, Sabah, Mt. Kinabalu NP, 10.–13. VIII. 2005, leg. MEY & EBERT; Timpohon Gate, 1800 m, 160 W bulb; S. PUGAEV prep. GU-2010-03; DNA 2011.363; BC SNB 6908; in MfNB. **Figs. 35a, b:** PT ♀, Malaysia, Sabah, Mt. Kinabalu, nr. Kg. Tena; BC SNB 2427, ex CSLL in CSNB. **Fig. 36a, b:** PT ♂, Malaysia, Sabah, Kundasan envir.; BC SNB 2426, ex CSLL in CSNB. — **Figs. 37–39:** (15) *T. acheron* (MELL, 1930); BIN: AAV7073. **Fig. 37:** LT ♂ (here designated), NE Borneo, Kina Balu, 1200–1500 m, 1893[?, illegible], WATERSTRADT, MfNB; **Fig. 37a1** is from a photo taken in 2011 by the Russian colleagues before the abdomen was removed for dissection; **Fig. 37a2** was taken 2020 by S.N.; note the slightly different ground colour due to light and photo settings; it is the same moth specimen. **Fig. 38a, b:** PLT ♀, same data. **Fig. 39:** PLT ♂, same data. — Scale bars (where present) 1 cm (Figs. = ca. 60% natural size; uns. in part slightly smaller).

red that there indeed were 2 more or less sympatric true species of the genus *Tagora* on N. Borneo and transferred both of them into *Eupterote* (together with several “true” species of this genus *Eupterote*): “*E.* obsoleta” and “*E.* niassana”, but, however, he did not specifically quote his species *Tagora weberi* in this context, so that it was a bit unclear where he placed this in 1982. — Then HOLLOWAY (1987: 63–66, illustrated in his pl. 8, figs. 12 [*obsoleta*] and 15 [*weberi*; misidentification, this illustration is not representing the same HT specimen and species as described and figured by HOLLOWAY 1976: p. 252, fig. 227 as *weberi*, but shows a specimen and genitalia of *T. polychroma* sp. n.]) again identified two different species of *Tagora* for Borneo (both again as “*Eupterote*”): *T. obsoleta* (Figs. 27a, b: LT) and *T. weberi*, later identified by him as “subspecies *weberi* of *Eupterote niassana*”. Thus, in 1987, he identified *T. obsoleta* and *T. weberi* as two different species, which is quite correct, as *weberi* is, based on the holotype specimen (Figs. 41a, b), a junior synonym of *T. acheron* MELL (see below under *T. acheron*). — However, under his concept of “*Eupterote niassana weberi*” he had united at least two different species: First specimens which Jeremy HOLLOWAY called “*weberi*” in error, i.e. specimens which are much more colourful and have apparently nothing to do with the HT of *weberi* (i.e., *T. polychroma* sp. n., see our Figs. 31–36), based on ♂ genitalia morphology and barcode, and second “true” *T. acheron* (Figs. 37–41).

Note 10b: HOLLOWAY (1987: 63–66) defined the habitat preferences of *T. obsoleta* as: “The species was originally described from Mt. Murud, Sarawak. Two specimens were taken in lowland limestone forest on G. Api during the Mulu survey” (one of which apparently is the new species *polychroma* described below, the other one is the smallest *obsoleta* specimen we have seen, see Fig. 28); “the types are from higher elevations around 2000 m”. HOLLOWAY (1987: 63–66) characterised the habitat preferences of his revised species *Eupterote niassana* ROTHSCHILD [now including, in spite of partial misidentification, the synonymised “subspecies” *weberi* HOLLOWAY] as: “The species is montane, taken from 1000–1800 m on G. Kinabalu, at 1618 m on Bukit Retak, Brunei, and in upper montane (mossy) forest at around 1800 m on G. Mulu, Sarawak”, which is not entirely correct; some specimens we have seen (CSNB, SMFL, MfNB) come from elevations below 1000 m.

Description and differential diagnosis

♂ (Figs. 27a, b; 28a, b; 29): Fwl 33–42 mm (LT 42 mm). Generally the species looks quite compact, compared to other species, with a nearly rectangular, rounded tornus of fw. with nearly straight outer margin and rectangular, very slightly tipped apex. Dorsal side of greyish brown ground colour, postmedian area with some violet-brown tinge. Thorax and abdomen in ground colour, head dark brown. Antennae 9.0–10.5 mm in length. Median area quite homogenous, with 2 crenulate lines only slightly indicated. Postmedian line straight, only apically rounded and bent backward towards the costa. Postmedian area homogenous violet brown with a silver shade. Hw. median area and postmedian line similar, the line bent, postmedian area again homogenous violet brown, in the proximal half with white scales along the veins, ending with dark patches and a crenulate dark brown line in between. On ventral side both fw. and hw. of homogenous greyish brown colour, markings reduced and almost invisible.

♂♂ of *T. obsoleta* can be separated from all other Bornean species immediately by their typical rounded wing form and the much reduced ornamentation especially on

the ventral side. On average they are smaller than their congeners on Borneo.

♂ genitalia (b&w-Figs. 111; 8th sternite Fig. m; B.M. Eupt. genit. slide 115 [LT *obsoleta*], slide 21 [other specimen, leg. JDH]: Both lateral processes of the uncus widely separated from each other, short and rounded. Dorsal process of the valves broad, almost rectangular and strongly sclerotized. Saccus long, slender and rounded at its end. Phallus short and broad, with medium-sized sclerites on the vesica. 8th sternite (see Fig. m) with rounded posterior lateral tips, centrally with two oval sclerotized zones near the posterior margin.

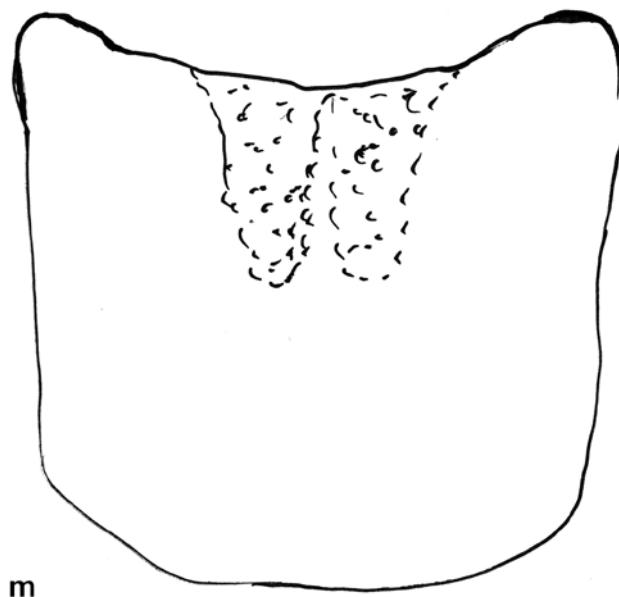


Fig. m: 8th Sternite sketch of ♂, *Tagora obsoleta*, GP B.M. genit. slide 115 [LT].

♀ (Figs. 30a, b) (based on a tentatively identified ♀ only): Fwl 49 mm. We attribute a ♀ singleton found in CMWM to *T. obsoleta* which was collected simultaneously with a more or less typical ♂ at Trus Madi, Sabah. It shares the ornamentation characters of the ♂ and shows typical sexual dimorphic characters. Without any proven barcode analysis its classification is tentative as from the same locality also the here described *T. polychroma* sp. n. is known. ♀ of this latter taxon differ by the more intense and higher number of median crenulate lines, but otherwise look very similar. The here attributed ♀ is of greyish brown colour, with three darker crenulate lines in the median area, a darker brown zone posterior to the white fw. patch, and greyish postmedian area. The fw. apical tip is elongated and acute. Hw. of same colour. Ventral side in the medial part light brown with darker brown lines, postmedian area darker, with a white shade in the proximal half.

♀ genitalia: not examined.

(14) *Tagora polychroma*, sp. n.

(Figs. 31a, b; 32a, b; 33a, b; 34; 35a, b; 36a, b; 112; 204; Map 2 *Tagora*.)

BOLD: BIN: AAU4295 (based on 8 specimens: BC SNB 2426, 2427, 2428, 6906 [= 2011.364], 6908, further from the Russian colleagues numbers EUPT-11-189, 2011.363, 2011.364 [= SNB 6906], 2011.365).

The barcode DNA sequence data PUGAEV 2011.364 (analyzed 2011, with 658 bp) and BC SNB 6906 (analyzed 2021, with 652 bp., i.e. 6 bp less) come from the same specimen, the holotype in MfNB; see also Tab. 2. Most surprising was the result of these two legs, as the two samples did not come out in the graphic NJ tree calculated with MEGA5 as direct neighbours, but with 6 bp in difference, see Text-Fig. B. The two results were achieved in 2011 and 2021, that is, 10 years later. We have not found out so far why these minor differences are existing; just caused by the 10 years' difference?

Holotype ♂: [E. Malaysia], Borneo, Sabah, Mt. Kinabalu NP, 10.-13. viii. 2005, leg. MEY & EBERT; Timpohon Gate, 1800 m, 160 W bulb; ZMHU Berlin, Eupterotidae, S. PUGAEV prep. GU-2010-04; DNA 2011.364 CMWM = BC SNB 6906; in MfNB; Figs. 31a, b.

Paratypes (15 ♂♂, 2 ♀♀), all from Borneo:

East Malaysia, Sabah, 2 ♂♂, same data as HT, S. PUGAEV Eupterotidae prep. GU-2010-03 (Fig. 34), -05; DNA 2011.363, 2011.365; BC SNB 6908, 6907; in MfNB. 1 ♂, Mt. Kinabalu, near Kundasan, 6.00296° N, 116.54491° E, Kulturland am Rand von Sekundärbergrenzenwald, 1547 m, 10. viii. 2004, leg. M. HOFFMANN; GP 2672/21 SNB; BC SNB 2426 (Fig. 36a, b); ex CSLL in CSNB. 2 ♂♂, 1 ♀♀, Sabah, Bahagian Pantai Barat, Mt. Kinabalu bei Kg. Tena, Kulturland am Rand von Primärbergrenzenwald, 1500 m, LF 15./16. ii. 2008, leg. M. HOFFMANN (Math. 08; K10); GP 2673/21, 2674/21 SNB; BC SNB 2428 [♂], 2427 [♀; Fig. 35a, b]; ex CSLL in CSNB. 1 ♂, Bahagian Pantai Barat, Mt. Kinabalu bei Kg. Tena, Kulturland am Rand von Primärbergrenzenwald, 1500 m, LF 17./18. ii. 2008, leg. M. HOFFMANN [K12]; ex CSLL in CSNB. 1 ♂, Borneo, Bahagian Pantai Barat, Mt. Kinabalu bei Kg. Tena, Kulturland am Rand von Primärbergrenzenwald, 1500 m, LF 16./17. iii. 2008, leg. M. HOFFMANN [K23]; ex CSLL in CSNB. 1 ♂, Keningau, 800 m, 10. viii. 1986, leg. MARTINI, in CMWM. 1 ♂, Mt. Trus Madi, 1100 m, iv. 2002 oder 2003, leg. K. MARTINI, Börse 2005 in CWAN; GP SMFL 2296/11, fec. S. PUGAEV [slide so far not returned to SMFL]; DNA SMFL Eupt-11/189; CWAN in SMFL; Fig. 32a, b.

East Malaysia, Sarawak: 1 ♂, Gunong Mulu Nat. Park, R.G.S. Exped 1977-8, J. D. HOLLOWAY et al., B.M. 1978-206; Site 2, January, Camp 4, Mulu, 1790 m, 452463, Lower montane (moss) forest, Acl-understorey; NHMUK014199850; in NHMUK. 1 ♂, Gunong Mulu Nat. Park, R.G.S. Exped 1977-8, J. D. HOLLOWAY et al., B.M. 1978-206; Site 4, January, Camp 4, Mulu, 1790 m, 452463, Tall I. montane (moss) forest, MV understorey; Eupterot. Brit. Mus. slide No. 60 ♂; NHMUK014199851; in NHMUK. 1 ♀, Gunong Mulu Nat. Park, R.G.S. Exped 1977-8, J. D. HOLLOWAY et al., B.M. 1978-206; G. Mulu, 1790 m, 452463, 5. i. 1978; Eupterot. Brit. Mus. slide No. 90 ♀; NHMUK014199853; in NHMUK; Figs. 33a, b.

Brunei: 1 ♂, 1618 m, Bukit Retak, Montane forest, 14. ix. [19]79, Lt. Col. M. G. ALLEN; NHMUK014199852; in NHMUK. 1 ♂, Ulu Temburong Expedition 1978, Base camp, 300 m, m.v. light 4. x. 1978, leg. T. W. HARMAN; GP Heterocera 12.808 Museum WITT, *Ganisa niassana* Roths. [sic]; CMWM. 1 ♂, Temburong, 300 m, L.P. 298, 28. iv. 1989, leg. M. G. ALLEN; CMWM. 1 ♂, Bukit Pagon Mts., montane forest, 1870 m, ii. 1982, leg. ALLEN & HARMAN; GP Heterocera 17.295, CMWM.

Distribution: N. Borneo: Sabah, Sarawak, Brunei.

Etymology: Named for the usually most colourful appearance within the genus and the generally high variability. Specimens show a wide variation of purple, violet, reddish, yellowish and dark brown colours.

Misidentifications: HOLLOWAY (1987: p. 66, pl. 8, col. fig. 15) illustrated a specimen of the then undescribed (14) *T. polychroma* sp. n. under "*Eupterote niassana weberi*" [misidentification] and listed in the text for the distribution of his "*Eupterote niassana*" the following: "Nias, Sumatra, Peninsular Malaysia, Borneo". However, this is a combination of many species: (17) *Tagora niassana* (Nias), (18) *T. diehli* and/or (19) *T. kobesi* (Sumatra), a still unidentified species from Peninsular Malaysia (Figs. 53; see paragraph "There may well be further species"), and (14) *T. polychroma* plus probably also (15) *T. acheron* from Borneo. This combination of between 4 and 6 different species of *Tagora*, in addition under the incorrect generic name "*Eupterote*", as one single species in a well-known publication and identification handbook regrettably hampers the correct identification of Sundaland (especially Bornean, but also just entirely within Sundaland) *Tagora* species at present.

Description and differential diagnosis

♂ (Figs. 31a, b; 32a, b; 34; 36a, b): Fwl 33–41 mm (HT 41.0 mm). As the name says, it is probably the most colourful species within the genus, with a wide combination of purple, violet, and dark brown colours and yellowish or whitish scales. The fw. of rectangular apex form, with a very small apical tip. Thorax and abdomen greyish brown, head almost black. Antennae 10.5–11.5 mm in length. Fw. antemedian area yellowish brown, median area mixed, with a greyish violet portion on the lower margin, medial part purple, with white patch and yellowish scales along the veins, and costa apical part greenish grey. Fw. postmedian line straight, apically rounded, from inner side narrow dark brown, broader yellow and intense dark brown. Fw. postmedian area in proximal half violet, separated by a serrate line from outer brown part. Dorsal hw. median area greyish brown, with black patches along the inner margin, postmedian line almost straight, bent to the upper margin, inner brown line almost missing. Postmedian area as in fw, with a row of black patches along the veins in central part. Ventral side of greyish brown colour, with several undulate lines in the median area and violet markings in the postmedian area.

♂♂ of *T. polychroma* sp. n. can easily be determined and separated from all other Bornean species by their on average colourful appearance. The three other known Bornean taxa are all more greyish or greenish-brown in colour and have different wing shapes. Further, they differ by their ♂ genitalia structures, as described below. The barcode differences between these 3 Bornean species, where it is known (i.e., except in *T. obsoleta*), are comparatively high (see Text-Fig. B: between nearly 4 and over 8%).

♂ genitalia (b&w-Figs. 112; 8th sternite Fig. n; GP 2673/21 SNB [PT]; further GP B.M. Eupt. slide 60 [PT]; GPs 2672/21, 2674/21 SNB [all PTs]; GPs 17.295, 12.808 [all PTs] MWM; GU-2010-03 [PT], -04 [HT], -05 [PT] MfNB): Processes of the uncus medium-sized, bent and acute. Dorsal process of the valves slender and with acute ventral tip. Ventral process short and almost rectangular, not

so rounded as in other Bornean species. Saccus long and slender. Phallus short and broad, vesica with short sclerites. Compared, e.g., with *T. kalimantana* sp. n. 8th sternite small, with laterally elongated posterior tips.

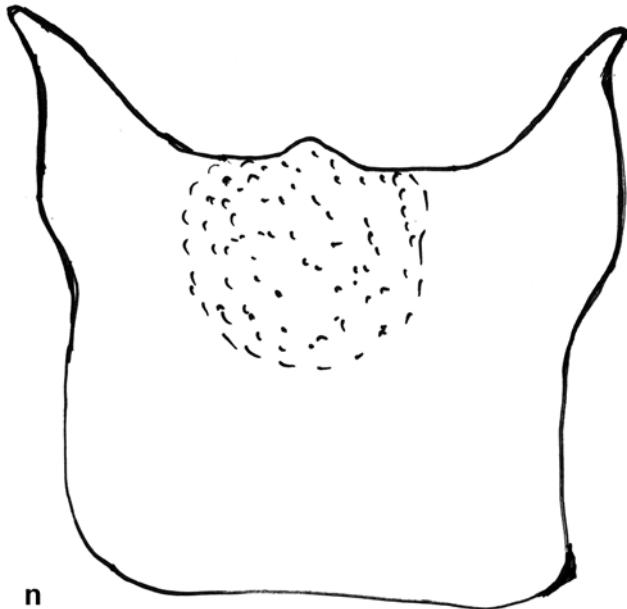


Fig. n: 8th Sternite sketch of ♂, *Tagora polychroma*, GP 2673/21 SNB [PT], (Sabah).

♀ (Figs. 33a, b; 35a, b): Fwl 48/49 mm. Aside from typical sexual dimorphic characters such as bigger size, larger wing surface and more narrow antennae, the ♀♀ differ from their ♂♂ by the more greyish brown ground colour, the intense crenulate lines in the median area and a silvery violet shade overall. The fw. apex widely elongated with an acute tip. Antennae 15.0 mm long. Ventral side in the medial part light brown with darker brown lines, postmedian area darker, with a white shade in the proximal half. It differs from the single tentatively identified ♀ of *T. obsoleta* by the more intense and darker median lines and more silvery habitus. ♀♀ of *T. acheron* are more greyish, with even darker ornamentation.

♀ genitalia (Fig. 204; B.M. Eupt. slide 90): Both anterior and posterior apophyses about 3.3 mm in length. Lamella antevaginalis strongly sclerotized, with two small triangular tips, hiding the ostium bursae. Lamella postvaginalis large, rounded, and densely sclerotized. Ductus bursae slender, corpus bursae medium-sized, without major structure.

(15) *Tagora acheron* (MELL, 1930), comb. rev.

(Figs. 37a1/a2, b; 38a, b; 39; 40a, b; 41a, b; 113; 126: 127; 205; 206; Map 2 *Tagora*.)

Mallarctus pandya acheron: MELL (1930: 462, as “[*Mallarctus*] *pandya acheron* STGR.”, because the name *acheron* was obviously STAUDINGER’s idea and handwritten by him [or WEYMER?] on a label in MfNB, but evidently unpublished; MELL explained this in the paragraph immediately following his first published proposal of the new name).

BOLD BIN: AAU2103 (based on BC SNB 2429 in CSNB and EUPT-11-095 and -096, a pair in CMWM).

Type material: LT (formally, as ruled by the Code [ICZN 1999, Art. 74.7.3], by present designation, because in and since 2011 PUGAEV & ZOLOTUHIN, who discovered the MELL specimens in MfNB and recognized the facts as first researchers since MELL, did not publish their manuscript LT designation [including PLT ♂, ♀], but only added labels to the specimens with this information, see Figs. 37[–39]). Labels of the LT: “Ganisa spec. (DRUCE)” [handwritten, WEYMER?]; “Kina Balu, 12–1500 m, NO. Borneo, 1893, WATERSTRADT”; “Acheron STGR.” [handwritten, STAUDINGER or WEYMER?]; “ex coll. STAUDINGER”; “♂ *Mallarctus pandya acheron* MELL, 1929 [sic, error in printing date], D. ent. Z.: 462, PUGAEV & ZOLOTUHIN des. 2011” [red]; “Eupterotidae, *Tagora* ♂ *acheron* MELL, 1929 [sic], ZOLOTUHIN dt. 2011”; “GU 2011-004”; [Fig. 127]; in MfNB. – An additional correct lectotype label of the present designation will be added in due course after publication of the specimen.

This present LT designation is necessary to stabilize nomenclature, as there is more than one true *Tagora* species in N. Borneo (at present we know definitively of 4 species from the entire island of Borneo so far).

Type locality: [Malaysia, Sabah,] NO Borneo, Kinabalu, 1200–1500 m, 1893 [?, illegible], WATERSTRADT.

Etymology: Not stated by MELL; probably named after the NW Greek river Acheron and/or its ancient mythological background.

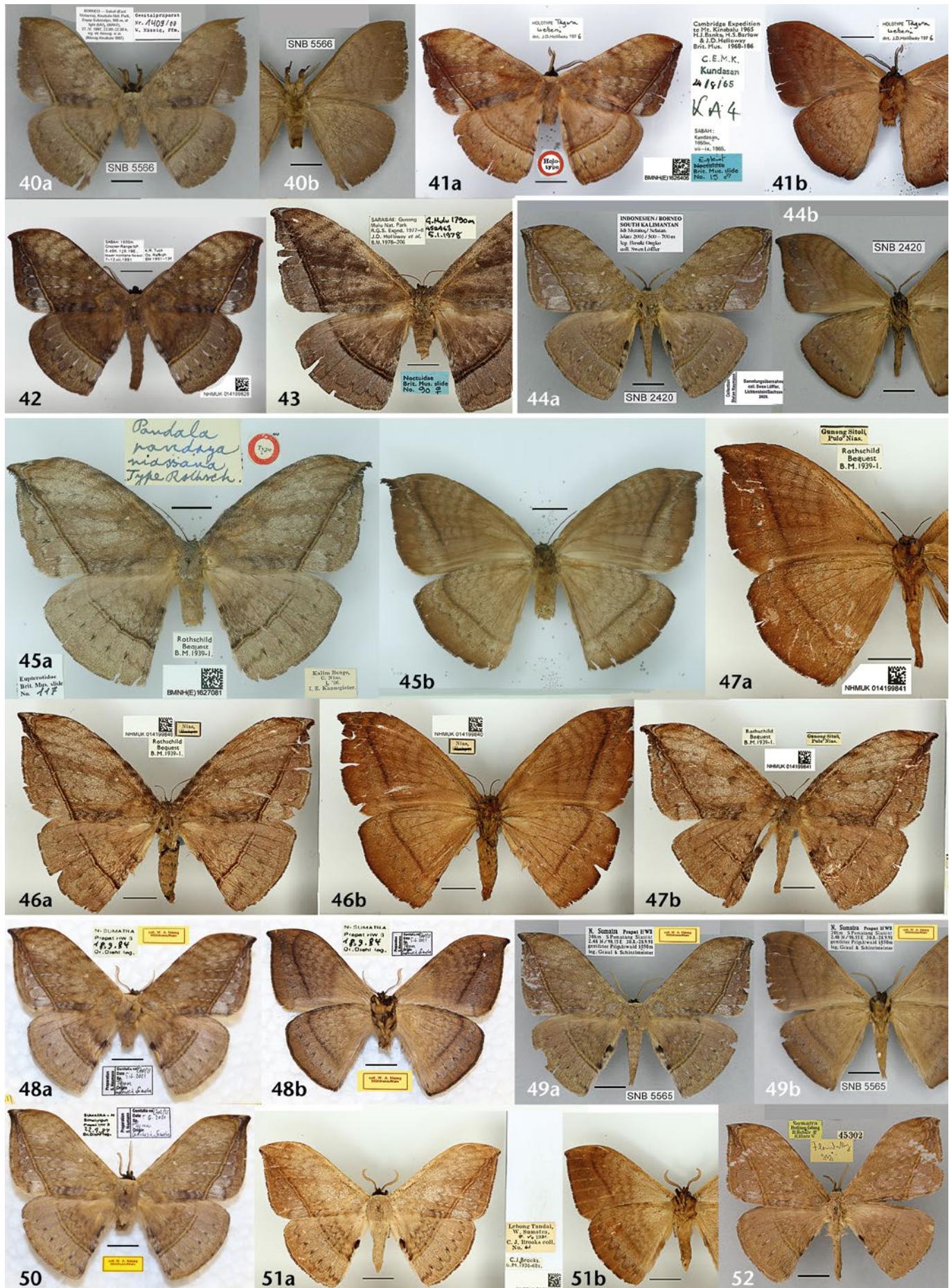
New (revised) synonymy:

= *Tagora weberi*: HOLLOWAY (1976: 54, fig. 353, pl. 19: 227), syn. n. – HT (by original designation, in NHMUK, Figs. 41a, b): “Holotype *Tagora weberi*, det. J. D. HOLLOWAY 1976; Holotype [red]; [East Malaysia], Sabah, Kundasan, 1050 m, vii.–ix. 1965; Cambridge Expedition to Mt. Kinabalu 1965, H. J. BANKS, H. S. BARLOW & J. D. HOLLOWAY, Brit. Mus. 1968-186; KA4; C.E.M.K., Kundasan, 24. viii. [19]65; Eupterot. Brit. Mus. GP slide 15 ♂ [Fig. 126; BMNH(E) 1626406]; in NHMUK. – T.I.: Sabah, Kundasan, [Mt. Kinabalu], 1050 m.

Etymology: Not stated by HOLLOWAY.

The holotype illustrated in b&w by HOLLOWAY (1976: pl. 19, fig. 227) and here in our colour Fig. 41 are the same moth specimen; in HOLLOWAY (1987: pl. 8 fig. 15) a different moth specimen is illustrated, which is no type and not conspecific with *acheron/weberi* (see above under (14) *T. polychroma* sp. n.).

Figs. 40–52: further types and other specimens of *Tagora*. — **Figs. 40–43:** (15) *T. acheron* (MELL, 1930); BIN: AAV7073. **Figs. 40a, b:** ♂, [E. Malaysia, Sabah], NO Borneo, Kinabalu NP, Sayap Substation, 900 m, at light (MV), 21. iv. 1997, 22.00–22.30 h, leg. W.A. NÄSSIG, C.H. SCHULZE et al.; GP CWAN/SMFL 1409/00; BC SNB 5566 (no result); CWAN in SMFL. **Figs. 41a, b:** HT ♂ *T. weberi* HOLLOWAY, 1976 [syn. n.]; [E. Malaysia], Sabah, Crocker Range N.P., 1050 m, 5.45° N, 116.19° E, lower montane forest; 24. viii. [19]65; leg. K.R. TUCK, Op. Raleigh, BM 1968-186; Eupt. Brit. Mus. GP slide 15 ♂; “BMNH(E) 1626406”; NHMUK. **Fig. 42:** ♂, [E. Malaysia], Sabah, Crocker Range N.P., 1500 m, 5.45° N, 116.19° E, lower montane forest; 7.–12. viii. 1991; leg. K. R. TUCK, Op. Raleigh, BM 1991-136; NMHUK014199828. **Fig. 43:** ♀, [E. Malaysia], Sarawak, Gunong Mulu N.P., R.G.S. Exped. 1977/8, J. D. HOLLOWAY et al., BM 1978-206; G. Mulu, 1790 m, 452463, 5. i. 1978; NHMUK. — **Figs. 44a, b:** HT ♂, (16) *T. kalimantana* sp. n.; Indonesia, Borneo, SE Kalimantan, Mt. Meratus, Selatan, 500–700 m, III. 2005, leg. B. ONGKO; GP 2671/21 SNB; BC SNB 2420; ex CSLL, CSNB, design. to MfNB. — **Figs. 45–47:** (17) *T. niassana* (ROTHSCHILD, 1917) [stat. rev.]. **Figs. 45a, b:** HT ♀, [Indonesia], Pulau Nias, Kalim Bungo, I. 1896 (I.Z. KANNEGIETER); Eupt. B.M. slide 117; BMNH(E)1627081; NHMUK. **Fig. 46a, b:** PT ♀, same data (Pulo [sic] Nias), NHMUK014199840; NHMUK. **Fig. 47a, b:** PT ♀, Nias, Gunong Sitoli; NHMUK014199841; NHMUK. — **Figs. 48–52:** (18) *T. diehli* sp. n. **Figs. 48a, b:** HT ♂, [Indonesia], N. Sumatra, Prapat, HW3, 18. ix. [19]84, Dr. DIEHL leg.; GP 2701/21 SNB; ex CWAN in SMFL. **Figs. 49a, b:** PT ♂, N. Sumatra, Prapat HW2, 30 km S. Pematang Siantar, 1050 m, 2°48' N, 98°55' E, 30. viii.–8. ix. 1991, leg. GRAUL & SCHINTLMEISTER; BC SBN 5565



[no result]; ex CWAN in SMFL. Fig. 50: PT ♂, N. Sumatra, Simalungun, Papat, HW3, 22. ix. [19]84, Dr. DIEHL leg.; ex CWAN in SMFL. Figs. 51a, b: PT ♂, W. Sumatra [RECTE Benkulen], Lebong Tandai, 8. v. 1921, C.J. BROOKS coll., No. 61; C.J. BROOKS B.M. 1936-681; NHMUK014199833, NHMUK. Fig. 52: PT ♂, Sumatra, Redjang-Lebong, H. KUBALE S., E. HINTZ V.; 45302; [illegible; handwritten, MELL?]; MfNB. — Scale bars 1 cm (most Figs. = ca. 60% natural size). — Photos: 45a, b: H. SULAK 2015; 46a, b, 47a, b, 51a, b: A. GIUSTI/NHMUK 2021; 48a, b, 50: W. A. N.

- = “*Eupterote niassana weberi*” [sic, partim] sensu HOLLOWAY (1987: 66 [partim]), but not the illustrated specimen in his col. pl. 8 fig. 15, which belongs to (14) *T. polychroma* sp. n.

Material studied (all [NE]-Borneo):

[E. Malaysia], Sabah: LT *acheron* (MELL, 1930) ♂, [E. Malaysia, Sabah], NO Borneo, Kina Balu, 1200–1500 m, 1893[?, label damaged], WATERSTRADT. 1 PLT ♂, 1 PLT ♀ [GU 2011-005; Fig. 206], same data, all in MfNB (Figs. 38a, b; 39). — HT *weberi* HOLLOWAY, 1976 [n. syn.] ♂, Kundasan, Cambridge Exped. to Mt. Kinabalu, 1050 m, 24. VIII. 1965; Brit. Mus. 1968-186; Eupterot. Brit. Mus. slide 15 ♂; “BMNH(E) 1626406”; in NHMUK; Fig. 41a, b. — Further: 1 ♂, NO Borneo, Kinabalu NP., Sayap-Substation, 900 m, at light (MV) (WAN7), 21. IV. 1997, 22.00–22.30 h, leg. W. A. NÄSSIG, C. H. SCHULZE et al. (NÄSSIG Kinabalu 1997); GP CWAN/SMFL 1409/00; BC SNB 5566 [no result]; CWAN in SMFL (Fig. 40). 1 ♂, Crocker Range N.P., 1500 m, 5.45° N, 116.19° E, lower montane forest; 7.–12. VIII. 1991; leg. K. R. TUCK, Op. Raleigh, BM 1991-136; NMHUK 014199828; NHMUK (Fig. 42). 1 ♂, 1 ♀, Trus Madi, 1200 m, 1.–14. IV. 2005, leg. MARTINI; ♂ GP Heterocera 11.656, CMWM; DNA Eupt-11/095; ♀ GP Heterocera 11.655 [Fig. 205], CMWM; DNA Eupt-11/096; CMWM. 1 ♂, Kinabalu NP. entrance, 6°0.182' N, 116° 32.688' E, 1509 m, 19.–28. III. 2001, leg. S. LOEF-FLER, CSLL, in CSNB; BC SNB 2429; GP 2681/21 SNB.

[E. Malaysia], Sarawak: 1 ♀, Gunong Mulu N.P., R.G.S. Exped. 1977/8, J. D. HOLLOWAY et al., BM 1978-206; G. Mulu, 1790 m, 452463, 5. I. 1978; “Noctuidae” (recte: Eupterotidae) Brit. Mus. GP 90 ♀ (Fig. 43).

Distribution: N. Borneo (Sabah, Sarawak).

Note 11: This specific taxon name *acheron* MELL, 1930 was evidently overlooked when compiling the BMNH Card Index, respectively the GLNI (BECCALONI et al. 2005); even after the big update of January 2018 it was not yet contained in the database. — V. ZOLOTUHIN and his candidates found the ST specimens of *acheron* in MfNB and kindly sent us photos already in 2011. — Within the BOLD database, ZOLOTUHIN and his candidates used sometimes a phonetic misspelling of this name: “*aheron*”. — Caused by this omission in the BMNH Card Index, Jeremy D. HOLLOWAY (1976: 54) decided, after having discovered an apparently unknown *Tagora* on Borneo, but evidently at that time in ignorance of both of the earlier described *T. obsoleta* and *T. acheron*, to describe his species discovered during his expedition as *T. weberi*. Later, and after having collected further specimens which he believed to belong to *weberi* as well, he (HOLLOWAY 1982: 192) wrote about a second species of *Tagora* from Borneo, *Tagora obsoleta* TALBOT, and combined them both as separate species within the genus *Eupterote*. Again later (HOLLOWAY 1987: 63–66) he synonymised his second species *T. weberi* with *T. niassana* (described from Nias island off the western coast of Sumatra), again in *Eupterote*. Under this name “*Eupterote niassana weberi*”, HOLLOWAY combined three different species: *T. acheron* (including the type specimen of *T. weberi*, but not all additional specimens collected later in Sarawak, Sabah and Brunei and subsumed under “*niassana weberi*” by HOLLOWAY 1987), *T. obsoleta* and a new species, described above as *T. polychroma*. In fact, none of these species is a true *Eupterote*; they all are clear members of the genera around *Sphingognatha* s. l. and belong to *Tagora*. — For the differences between *T. acheron* (with its new, revised synonym *T. weberi*) and *T. obsoleta* as well as the 3rd species, see also above under *T. obsoleta* and *T. polychroma* and also below under *T. kalimantana*, further in the paragraph under “How many *Tagora* species are there on Borneo Island?” below, and in Tab. 2.

Description and differential diagnosis

♂ (Figs. 37a1/a2, b; 39; 40a, b; 41a, b; 42): Fwl 37–41 mm (LT 38 mm). Ground colour greyish olive, with lots

of intense dark markings. The fw. with rectangularly rounded tornus and similar apex, with small apical acute tip. Thorax and abdomen in ground colour, heard darker. Antennae 11.5–12.0 mm in length, with relatively long rami. The fw. antemedian and median area with four undulate lines, in the median field a white dot, all veins in the outer median field covered with white scales. Fw. postmedian line almost straight, proximally narrow dark greyish brown, broader yellow and again medium brown. Fw. postmedian area relatively narrow, in the proximal half grey, separated from the marginal half in ground colour by a dentate dark brown line. Hw. with same colour and ornamentation, with three crenulate lines in the median area, postmedian line a little rounded, wider with more yellow parts. Hw. postmedian area broad, lighter than ground colour, the white accentuated veins ending in a row of black patches which are connected by a crenulate dark line. On ventral side reddish to greyish brown with darker brown markings, in both fw. and hw. median area with undulate dark brown lines, the postmedian line almost invisible, but the area followed by a light zone in the postmedian area. Legs in ground colour.

Differential diagnosis see mainly under the three other Bornean species.

♂ genitalia (b&w-Figs. 113, 126, 127; 8th sternite Fig. o; GP 2681/21 SNB; GU 2011-004 MfNB [LT *acheron*, Fig. 127]; B.M. Eupt. slide 15 [HT *weberi*, Fig. 126]; further GP 11.656 MWM): Processes of the uncus medium-sized, closer to each other than in *T. kalimantana* sp. n. The dorsal process of the valves strongly sclerotized, ventral process small, rounded. Saccus medium-sized, broader. The sclerites of the vesica are quite long, much longer than in *T. kalimantana* sp. n. The 8th sternite in this comparison is more rectangular and broad.

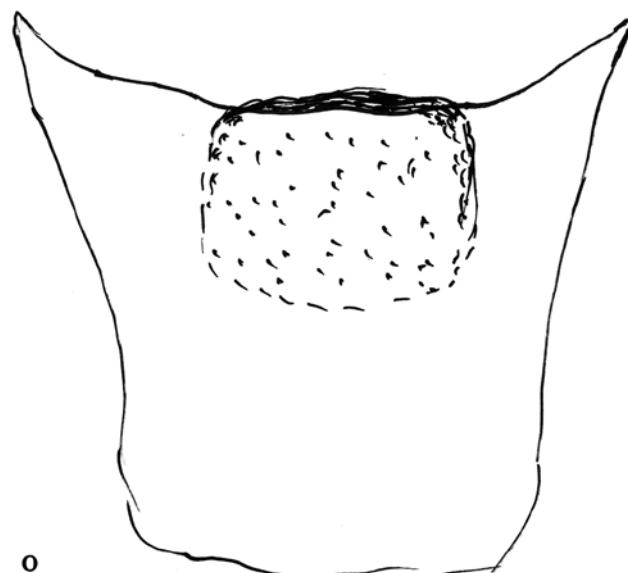


Fig. o: 8th Sternite sketch of ♂, *Tagora acheron*, GP 2681/21 SNB, (Sabah).

♀ (Figs. 38a, b; 43): Fwl in all known specimens 45 mm. Ground colour umbra brown with a violet shade, with lots of intense dark markings. Aside from typical sexual

dimorphic characters such as bigger size and abdomen, broader wing form and antennae with shorter rami the ♀♀ differ from their ♂♂ by the dark brown elements in both fw. and hw. median areas and the strong apical tip of the fw. Length of antennae 14.0 mm.

♀ genitalia (b/w Figs.: Fig. 205, GP 11.655 CMWM; Fig. 206, GU 2011-005 MfNB [PLT *acheron*]: Anterior apophyses about 2.0 mm in length, posterior ones about 2.5 mm. Lamella antevaginalis strongly sclerotized, with two relatively large triangular processes, hiding the ostium bursae. Lamella postvaginalis a lateral drop-like structure, densely sclerotized. Ductus bursae broad and sclerotized in the posterior part, corpus bursae without major structure.

(16) *Tagora kalimantana*, sp. n.

(Figs. 44a, b; 114; Map 2 *Tagora*.)

BOLD BIN: AAV7073 (based on BC SNB 2420, from the HT specimen from Kalimantan). This barcode differs by over 5% from that of its closest neighbour, *T. acheron*.

Holotype ♂: 1 ♂, Indonesia, Borneo, S. [sic] Kalimantan, Mt. Meratus, Selatan, 500–700 m, iii. 2005, leg. Basuki ONGKO; GP 2671/21 SNB; BC SNB 2420; ex CSLL, in CSNB; designated to MfNB (Figs. 44a, b).

No paratypes.

♀ unknown.

Distribution: Known only from the type locality: Indonesia, Borneo, SE Kalimantan, Mt. Meratus.

Etymology: Named for the area of origin, the Indonesian province of Kalimantan on the island of Borneo.

Description and differential diagnosis

♂ (Figs. 44a, 44b): Fwl 39 mm (HT, single specimen known). The species resembles rather closely *T. acheron* but is of slightly more greenish-grey ground colour on dorsal side with intense ornamentation. Thorax and abdomen in ground colour, head dark brown. Antennae 10.0 mm in length. The fw. antemedian and median area with 6 undulate lines, in the median field a white dot, all veins in the median field covered strongly with white scales. Fw. postmedian line almost straight, proximally broad dark greyish brown, yellow and tiny brown again. Fw. postmedian area in the proximal two thirds light grey, separated from the marginal third by a crenulate whitish line. Outer fringes separated by a tiny white line from postmedian area, apex white, with a small apical tip bent backward. Hw. with same colour and ornamentation, with three crenulate lines in the median area, postmedian line a little rounded. Hw. postmedian area lighter than ground colour, the white accentuated veins ending in a row of black patches.

On ventral side greenish to dark greyish brown with darker brown markings, in both fw. and hw. postmedian area an undulate dark brown line with black and white patches along the veins. Legs black.

T. kalimantana n. sp. differs from its closest relative, *T. acheron*, by the more greenish ground colour, the more

medially situated fw. postmedian line which has a bigger yellow portion in *T. acheron*. The antennae are smaller, with shorter rami, and on ventral side the row of black and white patches is missing in the latter. Male genitalia differ by the form of the uncus and the dorsal process of the valves, as described below. While the vesica sclerites are short in *T. kalimantana* n. sp., they are long in *T. acheron*.

♂ genitalia (b&w-Figs. 114; 8th sternite Fig. p; GP 2671/21 SNB [HT]): Processes of the uncus relatively short and small, widely separated from each other. Dorsal process of the valves with sclerotized part on ventral side. Saccus slender, phallus elongate, sclerites very short. 8th sternite broad with lateral posterior tips.

The genitalia of *T. kalimantana* sp. n. differ from those of its probably closest relative, *T. acheron*, by the shorter processes of the uncus, the shorter saccus, the short sclerites on the vesica, and the form of the 8th sternite.

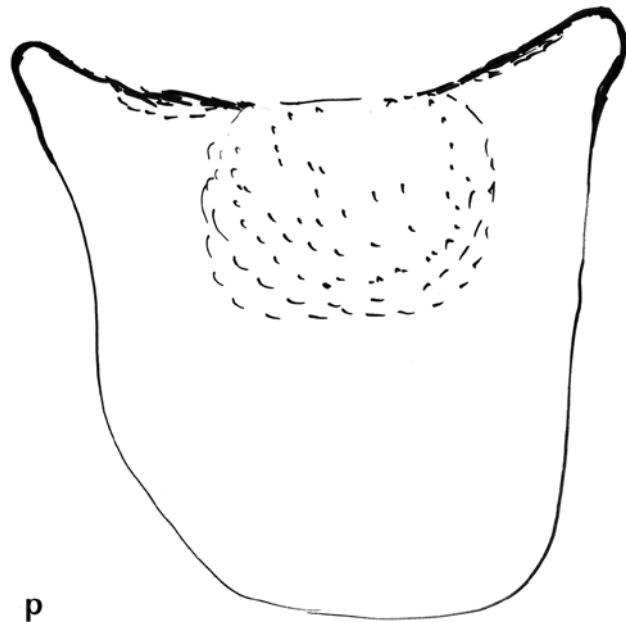


Fig. p: 8th Sternite sketch of ♂, *Tagora kalimantana*, GP 2671/21 SNB [HT], (Kalimantan).

♀ unknown.

How many *Tagora* species are there on Borneo Island?

We started our study about the Bornean species of *Tagora* on the basis of HOLLOWAY (1987), with *weberi* and *obsoleta* [correctly] being interpreted as two species, around perhaps 2000. When later, after having seen Vadim's photo of *acheron*, trying to get the older taxon *acheron* MELL to fit into this complex, we first thought that this might be a third species. The specimen from Mt. Meratus (now identified as *T. kalimantana* sp. n.) was at these early days combined with *T. acheron*, due to habitus similarity and the lack of true *acheron* BC data at that time.

The scene was further complicated by the fact that for a single specimen in SMFL (the only one successfully

delivering its barcode sequence, BC SNB 2429), we found out later that it was also the only successfully sequenced *acheron* at our access in 2011; however, this specimen was definitively mislabelled, indicating to come from "Vietnam". After we came to substantial doubt about this origin (based on habitus it did not fit into the Vietnamese series), the senior author together with the specimen's collector Swen LÖFFLER could clear the true origin of this singleton beyond doubt to be from Borneo. Only later, when we got access to the BC-data of the Russian colleagues from CMWM in 2021, we could finally clear this problem by identification of the true *acheron* barcode, which together with habitus and genitalia differences left no doubt for the corrected identification.

Also, we had to clear the identity of several old and a few more recent specimens found first in MfNB (later also in other collections), which looked at first glance much more colourful, but very similar in pattern to *acheron* (with bright, in this case yellowish instead of white scales scattered between the veins in form of a "horizontal drop" directly along the fw. costa in the apical area, see Figs.), but were on average slightly smaller and clearly more reddish-brown than *acheron* in ground colour.

Then while compiling raw data we noticed that the colour figure of *weberi* in HOLLOWAY (1987: pl. 8, fig. 15) very strongly resembled those MfNB specimens, but at that time we did not yet have a clear colour photo of the HT of *weberi* before us. Jeremy HOLLOWAY in 1987 evidently "synonymized" (without publishing so explicitly) the greyish-brown "forms" (which he called *weberi*, now identified as *acheron*) with those colourful reddish-brown "forms", now described as *polychroma* sp. n.

In fact, *T. acheron* and *T. polychroma* differ clearly in their COI barcodes (*T. acheron* is found under BIN AAU2103 based on BC SNB 2429 [CSNB] and EUPT-11-095 and -096 [CMWM], while *T. polychroma* has the BIN AAU4295 [from 8 specimens from Sabah], with about 4–6% uncorrected difference in barcode in the NJ tree between the two species, see Text-Fig. B); the differences in barcode between *T. acheron* and *T. kalimantana* is even larger. Regarding ♂ genitalia, *T. obsoleta* (from the LT, GP 115 of BMNH) shows a long, slender saccus, while *T. acheron* (from the LT, GU2011-004 by PUGAEV, in MfNB) has a short and slender saccus (in this pair of species, the sacci always are similarly slender, but have about 1.5× difference in length).

Later received detailed photos of additional specimens in NHMUK (provided by A. GIUSTI) and also, just before starting to finish this manuscript, from specimens in BOLD collected by the Russian researchers around V. V. ZOLOTUHIN provided more material to think about and support our interpretation.

So we eventually decided to interpret the situation differently from Jeremy HOLLOWAY's interpretation in 1987 and distinguish the following four species on the island of Borneo, summarised here in short:

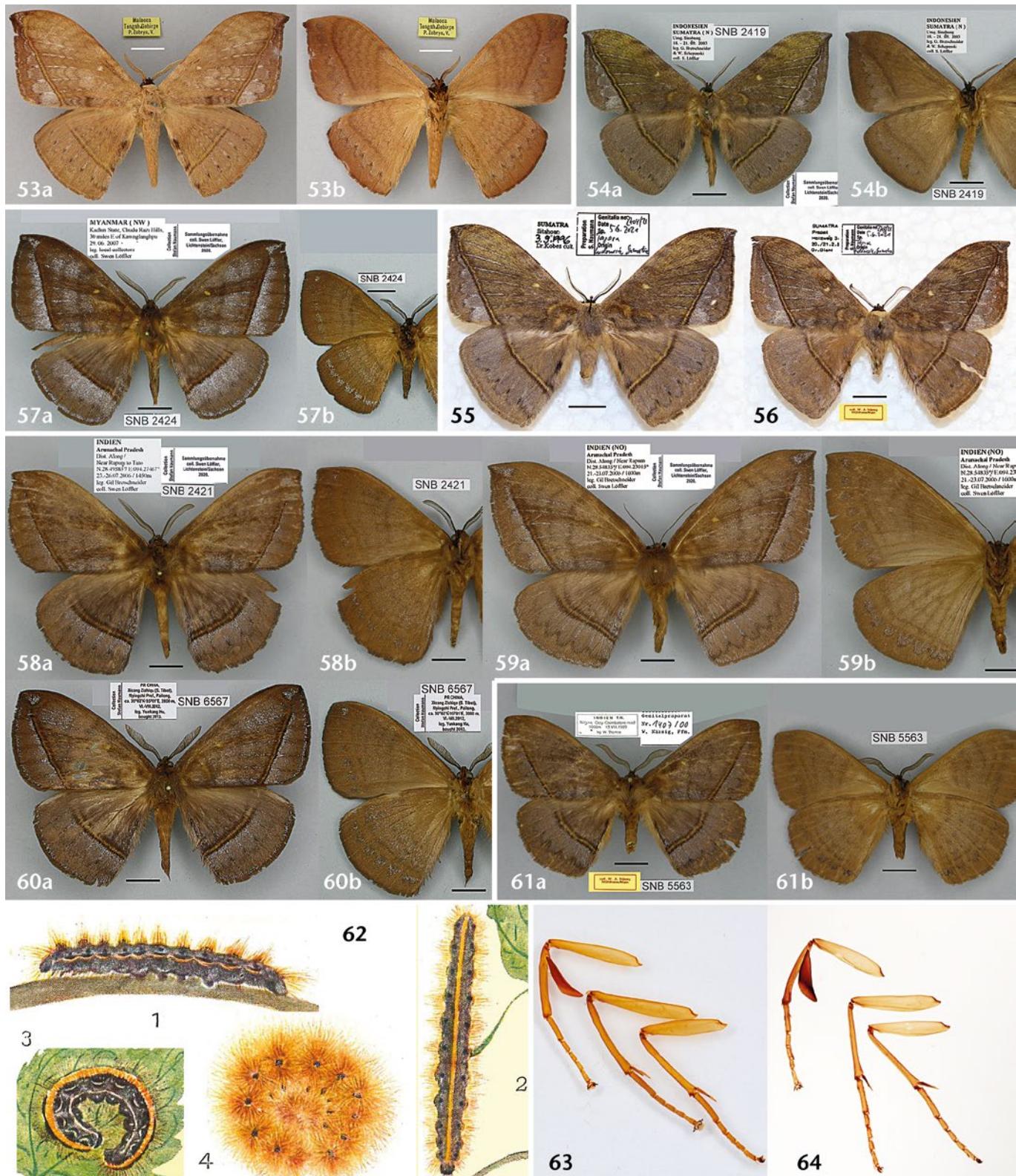
- We now think that the on average *smallest* species with more or less *monotonous greyish- or reddish-brown* ground colour without much visible pattern and most rounded wings is *T. obsoleta*, which is known mainly from Sarawak so far: from the type series "[Borneo, Sarawak], Mt. Murud, 6000–6500 ft." and likely from a specimen from [E. Malaysia], Sarawak, Gunung Mulu N.P., R.G.S. Exped. 1977/8, J. D. HOLLOWAY et al.; W. Melinau Gorge, 250 m, Limestone forest. Two specimens (a pair) from Sabah, Gunung Trus Madi, in CMWM (from which we do not have a BC and a GP) might possibly also belong here.
- The *largest, predominantly greyish* (or rarely brownish) species with a "*drop-shaped highlight of whitish scales* scattered on the fw. between the veins below the apical half of the costa, often with a somehow "splendid" appearance (known from Mt. Kinabalu, Mt. Trus Madi and Crocker Range [Sabah] and Gunung Mulu [Sarawak]) is *T. acheron* (with its synonym *weberi* from Sabah, Kundasan, [Mt. Kinabalu]).
- While the *medium-sized* species with the more *reddish-brownish* ground colour with the prominent *yellowish scales in the "drop-shaped" highlight* between the veins at the apical part of the fw. costa is a formerly undescribed 3rd Bornean species, which we describe here as *T. polychroma*; this species is known from Mt. Kinabalu, Trus Madi and Crocker Range [Sabah], from Gunong Mulu [Sarawak] and from Brunei.
- The 4th species is known only from Indonesia, SE Kalimantan, Mt. Meratus: *T. kalimantana*, based on a single male, the HT, so far only. Externally it resembles largely *T. acheron*, but shows even a larger difference in the COI barcode to the other Bornean species.

The altitudinal specialisation as published by HOLLOWAY does not appear to be so pronounced; all four species appear to have a rather broad range (and thus potentially overlap) in their altitudinal distribution, with *acheron* perhaps slightly preferring the higher places and *obsoleta* known from the lowest to nearly the highest. About ecological details of preferred habitats other than merely altitude we do not have any information at present.

(17) *Tagora niassana* (ROTHSCHILD, 1917), stat. rev. (Figs. 45a, b; 46a, b; 47; 207; Map 2 *Tagora*.)

Pandala [sic; original erroneous generic combination by ROTHSCHILD] †*pandaya* [sic, probably a misspelling of *pandy* MOORE by ROTHSCHILD?] *niassana*: ROTHSCHILD (1917: 486). – Based on present knowledge, we interpret this taxon as a distinct species *niassana*, endemic to Nias; see below; status revised. – *Pandala* WALKER, 1855a, is, in fact, a monotypic genus of the "Ganisa-group" described from Sri Lanka, very close to *Ganisa* itself; it does not belong to the subfamily Eupterotinae, its ♂ genitalia are apparently a specialized variant of *Ganisa*. It contains only one small (smaller than any known *Ganisa* species, much less than half the size of any *Tagora*) species endemic to Sri Lanka, and this is the only and also erroneous combination of a true *Tagora* species with the genus *Pandala* in literature we know of.

Note 12: It is remarkable to see how many plain misspellings (and incorrect generic combinations) ROTHSCHILD (1917) produced



Figs. 53–61: further types and other specimens of *Tagora*. — Figs. 53a, b: ♂ *Tagora* sp. indet., [West Malaysia], Malacca, Tengah-Gebirge, [no date], P. ZOBRYNS V.; MfNB [see text, paragraph "There may well be further species"]. — Figs. 54–56: (19) *T. kobesi*, sp. n.; BIN: AAV7072. Figs. 54a, b: HT ♂, Indonesia, N-Sumatra, Umg. Sinabung, 8.–21. ix. 2003, leg. G. BRETSCHNEIDER & W. SCHEPANSKI; ex CSLL in CSNB; BC SNB 2419. Fig. 55: PT ♂, Sitahoan, 3. ix. 1996, cult. Dr. KOBES; SMFL. Fig. 56: PT ♂, Prapatan, HW3, 20./21. ii. 1982, leg. Dr. DIEHL; CWAN in SMFL. — Species-group of *T. niassana/glaucescens*, subgroup of *glaucescens*. — Figs. 57a, b: (20) *T. glaucooides* sp. n., BIN: AAV7071; HT ♂, Myanmar, Kachin State, Chudu Razi Hills, 30 ml. E Kawnglanghpui, 29. vi. 2007; GP 2651/21 SNB; BC SNB 2424; ex CSLL in CSNB, design. to MfNB. — Figs. 58–60: (21) *T. rufescens* sp. n., BIN: ACG9576. Figs. 58a, b: HT ♂, India, Arunachal Pradesh, Distr. Along, nr. Rapum to Tato, 28.49583° N, 94.27467° E, 1450 m, 23.–26. vii. 2006, leg. G. BRETSCHNEIDER; ex CSLL in CSNB; BC SNB 2421; GP 2649/21 SNB; design. to MfNB. Figs. 59a, b: PT ♀, Distr. Along, near Rapum, 28.54835° N, 94.23015° E, 1600 m, 21.–23. vii. 2006, leg. G. BRETSCHNEIDER; ♀ GP 2714/21 SNB; ex CSLL in CSNB. Figs. 60a, b: PT ♂, China, S. Tibet, Nyingchi Pref., Pailong, ca. 30°2' N, 95°1' E, 2000 m, vi.–viii. 2012, leg. Yunkang Hu; CSNB; BC SNB 6567. — Figs. 61a, b: HT ♂, (23) *T. thomasi* sp. n.; no BIN; India, Tamil Nadu, Nilgiris, Ooty–Coimbatore rd., 1000 m, 13. viii. 1989, leg. W. THOMAS; GP 1407/00 CWAN/SMFL; BC SNB 5563 [no result]; ex CWAN in SMFL. — Figs. 55, 56: W.A.N. — Larvae and tibial spurs. — Figs. 62.1–62.4: Penultimate (62.1–62.3) and ultimate (62.4) larva of "*Mallarctus pandya*" sensu MELL (1930); species' identity unclear, these are the only published illustrations of *Tagora* larvae in literature. — Figs. 63 (*T. pugaevi*), 64 (*T. glaucescens*): Tibial spurs: 0–2–2. Regrettably the spurs are partly overlapping, so not always clearly visible as separate entities. — Scale bars 1 cm (most specimen Figs. = ca. 60% natural size; Fig. 57b = 50%, Figs. 63, 64 enlarged).

within this single descriptive publication in addition to the above. Just only for the Eupterotidae: #*Palerisa* [sic] (pro *Palirisa* WALKER s. l.), *Apona* #*cashmeriensis* [sic] (pro *Apona caschmirensis* KOLLAR), #*Camarunia* [sic] pro *Camerunia* AURIVILLIUS, just to name those noted at first glance. — HOLLOWAY (1987: 63–66) cited the original description of the taxon *niassana* ROTHSCILD, 1917 as “*Ganisa niassana* ROTHSCILD”, which is incorrect, but probably based on earlier errors by, e.g., STRAND (*in* SEITZ 1922) and, probably following them, in the BMNH Card Index (= BECCALONI 2005), on which HOLLOWAY likely based his citation.

BOLD BIN: BC and BIN unknown so far for the Nias species. We do not have any recent material of *Tagora* from the island of Nias at our hands, and the types in NHMUK are too old for standard COI barcoding methods. Further there are only ♀♀ types from Nias island, so that we cannot check the ♂ genitalia to compare with Sumatran ♂♂ (from where, in addition, we do not have any ♀♀ of *Tagora* at our hands for comparison).

However, as most of the larger of those islands off the West coast of Sumatra usually next to *always* harbour taxa of those non-migratory, short-lived local bombycoid species (e.g., Saturniidae or Eupterotidae) which are distinct at species-level as compared to the main island of Sumatra (or any other land mass nearby), we believe that a synonymy of *niassana* with any population from outside Nias island (or even any other of these islands on the arch to the Southwest of Sumatra; even perhaps including the Andaman and Nicobar islands?) is most unlikely. Further studies on more recent (i.e., useful for barcoding) new *Tagora* material, especially from Nias island (or other islands from this southwestern island arch of Sumatra) in comparison to Sumatra, especially of ♂♂, may be helpful here to clear this question in more detail later.

Type material: HT ♀ [by original designation] (Fig. 45a, b) “*Pandala pandaya* [sic] *niassana* Type ROTHSC.” [handwritten, ROTHSCILD]; “Kalim Bungo, C. Nias, I. [18]96, I. Z. KANNEGIERI”; “ROTHSCILD Bequest B.M. 1939-I”; “Type” [red]; “BMNH(E) 1627081” [Fig. 207]; “Eupterotidae B.M. slide 117”. — 1 ♀ PT, same data. Further 1 ♀ PT, [Pulau Nias,] Gunung Sitoli; in NHMUK (all specimens of the type series are females!); drawer photo 26. ii. 2015 of HT and 2 PTs by H. SULAK; one further ♀ PT from Kalim Bungo missing, compared to the original description. — New single photos of PTs by A. GIUSTI in 2021 (see Figs. 46a, b of the Gunung Sitoli PT specimen).

No ♂ specimen known so far.

Type locality: Indonesia, Nias Island (over 100 km off the SW coastline of Sumatra).

Material studied: Photos of the type series in NHMUK; no additional material available from Nias.

Distribution: [Indonesia], Pulau Nias, Kalim Bungo [Central Nias]; Pulau Nias, Gunung Sitoli [NE coastal district]. — At present knowledge we think that *T. niassana* is an endemic restricted to the island of Nias.

Etymology: Named after the type locality, Indonesia, Nias Island (SW of Sumatra).

Note 13: Within the same issue of *Novitates Zoologicae*, ROTHSCILD (1917) described two different species of Eupterotidae (belonging to different subfamilies and, of course, different genera, partly misidentified) under the specific names “*niassana*”: The first is the here cited #*Pandala* #*pandaya* [sic, recte: *Tagora*] *niassana* (ROTHSCILD 1917: 486, a member of the subfamily Eupterotinae, erroneously included in *Pandala*; now here correctly transferred into the genus *Tagora*); the second, just one page later, is *Pseudojana perspicufascia* *niassana* (ROTHSCILD 1917: 487, a true member of the “*Ganisa*-group”, today still correctly contained in the genus *Pseudojana* HAMPSON, 1893 s. str.). Just to clear this name duplicity here to explicitly avoid any confusion of the two in future.

Description and differential diagnosis

♂ unknown. *Tagora niassana* is the only *Tagora* species of which we have only seen ♀♀ and no ♂ so far.

♀ (Figs. 45a, b; 46a, b; 47a, b): Fwl 47–50 mm (HT 47.5 mm). Generally a relatively large species, with rectangular fw. tornus, rounded fw. apex and an elongate tip. Dorsal side in light grey ground colour with tiny dark greyish black markings. Thorax and abdomen in ground colour. Antennae 13 mm in length. Antemedian line of fw. slightly indicated, followed by some almost invisible crenulate lines, mainly visible on the costal margin. Median field between veins M1 and M3 with small white patch and coloured little darker, along all veins a shade of white scales. Fw. postmedian line almost straight, little bent in the apical part, proximal portion broad black, followed by tiny yellow and blackish line. Postmedian area with tiny black zigzag line, apex black, with strongly bent apical tip. Hw. with same pattern elements, postmedian line little rounded, followed by a row of small black patches along the veins in postmedian area. On ventral side of greyish brown colour, with 4 crenulate lines in median area, a strong dark postmedian line, and a light greyish portion in the postmedian area. Outer margin dark brown.

♀ genitalia (Fig. 207; B.M. Eupt. slide 117 [HT *niassana*]): Anterior apophyses around 3.0 mm in length, posterior ones around 3.5 mm. Lamella antevaginalis sclerotized with broad central indentation. Lamella postvaginalis of sustained triangular form, with shorter lateral flanks. Ductus bursae long, slender and thin-skinned, corpus bursae large, with a sclerotized field on ventral side.

(18) *Tagora diehli*, sp. n.

(Figs. 48a, b; 49a, b; 50; 51a, b; 52; 116, 117; Map 2 *Tagora*.)

BOLD: BC and BIN unknown so far. No recently collected material available presently for barcoding; old museum material is too old anyway, and even the specimens collected by E. DIEHL and the members of the Heterocera Sumatrana Society in the 1980s are usually already too old and did not result in any barcode sequence so far. So we decided to differentiate the two Sumatran new species mainly according to their clear differences in male genitalia (*T. diehli* sp. n., the slightly brighter species of the two new ones from Sumatra, has a long, slender saccus; *T. kobesi* sp. n., the darker of the two new species, has a shorter, distinctly broader saccus) and external habitus.

Holotype ♂: [Indonesia], N. Sumatra, Prapat, HW3 [“logging path 3”], 18. ix. [19]84, Dr. DIEHL leg.; GP 2701/21 SNB, Fig. 116; ex CWAN in SMFL; Fig. 48a, b; SMFL type catalogue no. 4736. — The locality “HW3” and other such Sumatran locality abbreviations by E. W. DIEHL are explained in DIEHL (1982).

Paratypes (17 ♂♂): Indonesia, Sumatra, North Sumatra: 1 ♂, N. Sumatra, Simalungun, Prapat, HW3, 22. ix. [19]84, Dr. DIEHL leg.; ex CWAN in SMFL; Fig. 50. 1 ♂, N. Sumatra, Prapat HW2, 30 km S. Pematang Siantar, 1050 m, gestörter Primärwald, 2°48' N, 98°55' E, 30. viii.–8. ix. 1991, leg. GRAUL & SCHINTLMEISTER; BC SBN 5565 [without result]; ex CWAN in SMFL; Figs. 49a, b. 2 ♂♂, N-Sumatra, [Prapat], HW2, 14.

ix. 1985 & 21. vi. 1989, leg. E. DIEHL; ex CWAN in SMFL. 1 ♂, N-Sumatra, Prapat, 1100 m, 7. x. 1980, leg. E. DIEHL; GP CWAN/SMFL 249/84 [GP tube after moving process within house not yet found]; ex CWAN in SMFL. 2 ♂♂, N-Sumatra, [östl.] Prapat, HW3, 2. vii. 1981, 22. ix. 1984, leg. E. DIEHL; 1 ♂-GPs 2702/21 SNB; ex CWAN in SMFL. 1 ♂, N-Sumatra, HW3, 17. vi. [no year], leg. E. DIEHL, Dr. BENDER; GP CWAN/SMFL 1408/00 [GP tube after moving process within house not yet found]; via coll. BENDER, ex CWAN in SMFL. 1 ♂, N-Sumatra, W. Dairi Mts., Sidikalang, 1150 m, 27. iv. 1981, leg. E. DIEHL; GP CWAN/SMFL 234/84 [GP tube after moving process within house not yet found]; ex CWAN in SMFL. 1 ♂, N-Sumatra, Dairi Mts., 1500 m, 7. x. 1980, leg. E. DIEHL; GP CWAN/SMFL 250/84 [GP tube after moving process within house not yet found]; ex CWAN in SMFL. — 2 ♂♂ will be donated to CSNB for MfNB. — “Western Sumatra”, [= Bengkulu]: 1 ♂, Sumatra, Redjang-Lebong, H. KUBALE S., E. HINTZ V.; 45302; [something illegible; handwritten, MELL?]; Fig. 52; MfNB. — 2 ♂♂, W. Sumatra, Lebong Tandai, 1920–1923, C. J. BROOKS, BM 1936-681; NHMUK014199836, -838; Eupt. genitalia slide 43 ♂, Fig. 117; NHMUK. 1 ♂, Lebong Tandai, 8. v. 1921, C. J. BROOKS coll., No. 61; C. J. BROOKS, BM 1936-681; NHMUK014199833; Figs. 51a, b; NHMUK. 1 ♂, Lebong Tandai, 1. ix. 1921, C. J. BROOKS coll., No. 1250; C. J. BROOKS, BM 1936-681; NHMUK014199835; NHMUK [abdomen missing]. 1 ♂, Lebong Tandai, 23.–30. ix. 1921, C. J. BROOKS coll., No. 1853; C. J. BROOKS, BM 1936-681; NHMUK014199837; NHMUK. 1 ♂, Lebong Tandai, 29. iii. 1922, C. J. BROOKS coll., No. 6401; C. J. BROOKS, BM 1936-681; NHMUK014199834; NHMUK.

All those old museum specimens from today's province Bengkulu (near a former gold mining area under Dutch government) were included into the PT series based only on ♂ genitalia morphology and general habitus, in spite of the fact that their ground colour is on average slightly brighter than that of the more recently collected specimens. We believe these old specimens must have suffered some colour change (fading) during the many decades since their collecting.

No ♀ known.

Distribution: Indonesia, Sumatra: North Sumatra, Bengkulu.

Etymology: Named in honour of the late Dr. Eduard (“Edi”) W. †DIEHL (see obituaries by SCHMIDT-KOEHL 2003 and KOBES 2004), medical doctor, working since 1961 in the Goodyear Hospital (Dolok Merangir), later in Medan, all in North Sumatra Province. He was the founding Head of the former “Heterocera Sumatrana Society e.V.” and provided the first “adventures” in tropical nocturnal collecting at light for one of the authors (W.A.N.) during about a week's visit in 1984 in Dolok Merangir.

Description and differential diagnosis

♂ (Figs. 48a, b; 49a, b; 50; 51a, b; 52): Fwl 38–42 mm (HT 41 mm). A relatively small species with acute fw. apex. Dorsal side of wings, thorax and abdomen of light greyish brown colour. Head, medial part of collum and forelegs dark brown. Antennae 11.0 mm in length. Fw. antemedian area suffused with greyish scales, a small white patch in the median area, followed by two dentate lines. Fw. postmedian line little rounded, with narrow dark, yellow and outer very narrow brown line, bent backward towards the costa apically, forming thereby a brown apical field. All veins in the marginal half of the median area covered with white scales. Proximal two thirds of the postmedian area suffused again with grey-

ish white scales, submarginal and marginal part again in ground colour. Hw. coloured as fw., the medial dentate lines ending with large black dots on the basal margin. Postmedian line little rounded, structure as in fw. The postmedian area in ground colour, with dentate line and small black dots along the veins which are basally of this line covered with white scales. On ventral side light greyish brown in the proximal half, becoming darker brown to the marginal zone. Crenulate lines in the median area slightly indicated, postmedian line rounded, dark brown, intense, the submarginal line with a crenulate whitish zone.

We added some old specimens from the collections of NHMUK and MfNB to the type series originating from Bengkulu Province in western Sumatra, some 600 km or so south of the type locality, although their identity was not proven by DNA analysis. All those specimens, originating from a gold mining area near Lebong Tandai, are morphologically similar (although a little faded, perhaps due to their age), and a genitalia preparation from NHMUK shows absolutely the same structures as those we examined within more recent material from Sumatera Utara Province.

Differential diagnoses of the two new Sumatran species see under *T. kobesi*.

♂ genitalia (b&w-Figs. 116, 117; 8th sternite Fig. q; GP 2701/21 [HT; N. Sumatra]; B.M. Eupt. GP 43 [PT, W. Sumatra]; further 2702/21 SNB [PT]): Processes of the uncus slender and delicate. Dorsal process of the valves with small knob-like structure on ventral side. Saccus long and slender, the sclerites on the vesica tiny. 8th sternite almost square-like, with a central minor sclerotization.

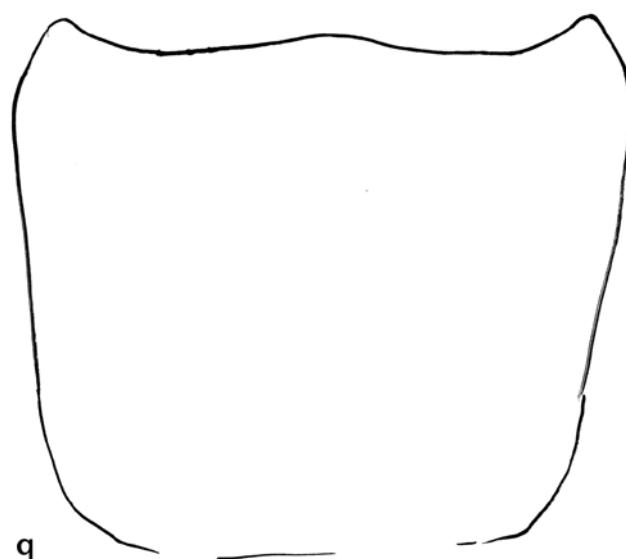


Fig. q: 8th Sternite sketch of ♂, *Tagora diehli*, GP 2701/21 SNB [HT].

♀ unknown.

(19) *Tagora kobesi*, sp. n.

(Figs. 54a, b; 55; 56; 115; Map 2 *Tagora*.)

BOLD BIN: AAV7072 (based on SNB 2419, a specimen from N. Sumatra, Mt. Sinabung near Berastagi; further specimens are also known from other localities in N. Sumatra). *T. kobesi* is the darker, more greyish new species from Sumatra.

Holotype ♂: Indonesia, N-Sumatra, Umg. Sinabung, 8.-21. ix. 2003, leg. G. BRETSCHNEIDER & W. SCHEPANSKI, CSLL in CSNB, designated to MfNB; BC SNB 2419; Figs. 54a, b.

Paratypes (11 ♂♂), all Indonesia: N. Sumatra: 5 ♂♂, same data as HT; GPs: GP 2670/21 SNB; ex CSLL in CSNB. — 1 ♂, Sitahaon, 3. ix. 1996, cult. Dr. KOBES; GP 2704/21 SNB; ex CWAN in SMFL; Fig. 55. 1 ♂, Prapat, HW3, 20./21. ii. 1982, leg. Dr. DIEHL; GP 2703/21 SNB, Fig. 115; ex CWAN in SMFL; Fig. 56. 1 ♂, N. Sumatra, Brastagi, vi. 1987, leg. S. KAGER; GP ♂ S. PUGAEV SMFL-Nr. 2263/11 = ♂ SMFL 15. iv. 11 EU 0057 (slide presently missing in SMFL, not yet returned from loan); ex CWAN in SMFL. — S. Sumatra: 2 ♂♂, 1000 m, Khota [sic] Baru [sic], 24. & 28. vii. 1979, B. TURLIN; in MNHN, Paris. The 2 old museum specimens from S. Sumatra in MNHN are included as PTs based on rather convincing habitus similarity only; there were no successful barcode analyses due to age and no dissections.

No ♀ known.

Distribution: Indonesia, Sumatra, North Sumatra; South Sumatra.

Etymology: Named in honour of the late Prof. Dr. Lutz W. R. †KOBES, Göttingen (see obituary by STÜNING et al. 2017 and background information by HOLLOWAY 2018), dentist and “Manager-in-Europe” and, after Edi DIEHL’s death, Head of the Heterocera Sumatrana Society e. V. He was (as a dentist) also supervisor of the senior author’s thesis on Lepidoptera, dealing with Saturniidae on Sulawesi island.

Description and differential diagnosis

♂ (Figs. 54a, b; 55; 56): Fwl 38–41 mm (HT 38 mm). A relatively small species with little elongate fw. apex. Dorsal side of dark olive grey ground colour with dark brown wing markings, thorax and abdomen also in ground colour. Head, medial part of collum and forelegs dark brown. Antennae 12.5–13.0 mm in length. Fw. antemedian and median area quite homogenous, a typical creamy white patch in the median area, the *Tagora*-typical crenulate lines only in the costal area visible, and all veins in the marginal half of the median area covered with white scales. Fw. postmedian line almost straight, with proximal thin black line, followed by narrow central yellow and prominent black portion. Postmedian area a little lighter than ground colour, with silvery proximal shade. Fw. apex with small apical tip. Hw. also in ground colour, with a black patch on the inner margin, postmedian line more intense than on fw, only very little rounded. Postmedian area proximal two thirds with silvery shade, marginal portion again in ground colour. Ventral side of dark greyish brown colour without any significant pattern, proximal half of the postmedian area suffused with violet scales. Outer margin dark brown.

T. kobesi sp. n. differs from the other known Sumatran species, *T. diehli* sp. n., on dorsal side by its on average darker ground colour and thereby almost invisible crenulate median lines, the more intense postmedian lines, the creamy yellow instead of white median patch of the fw,

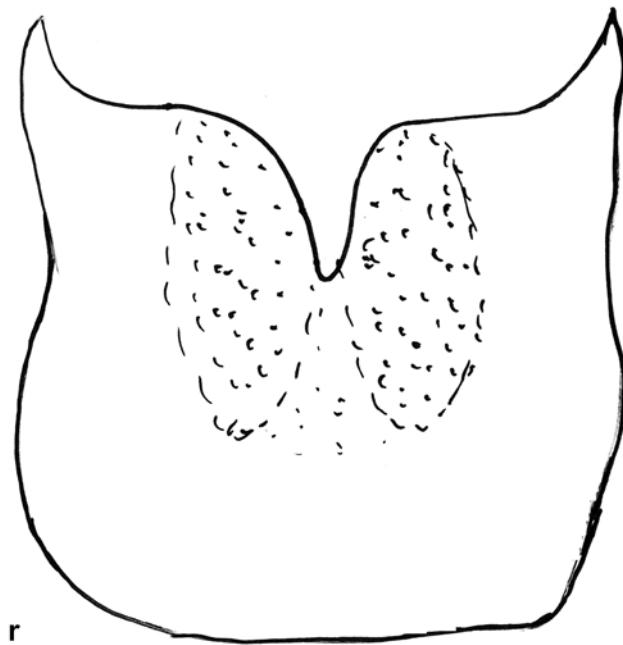
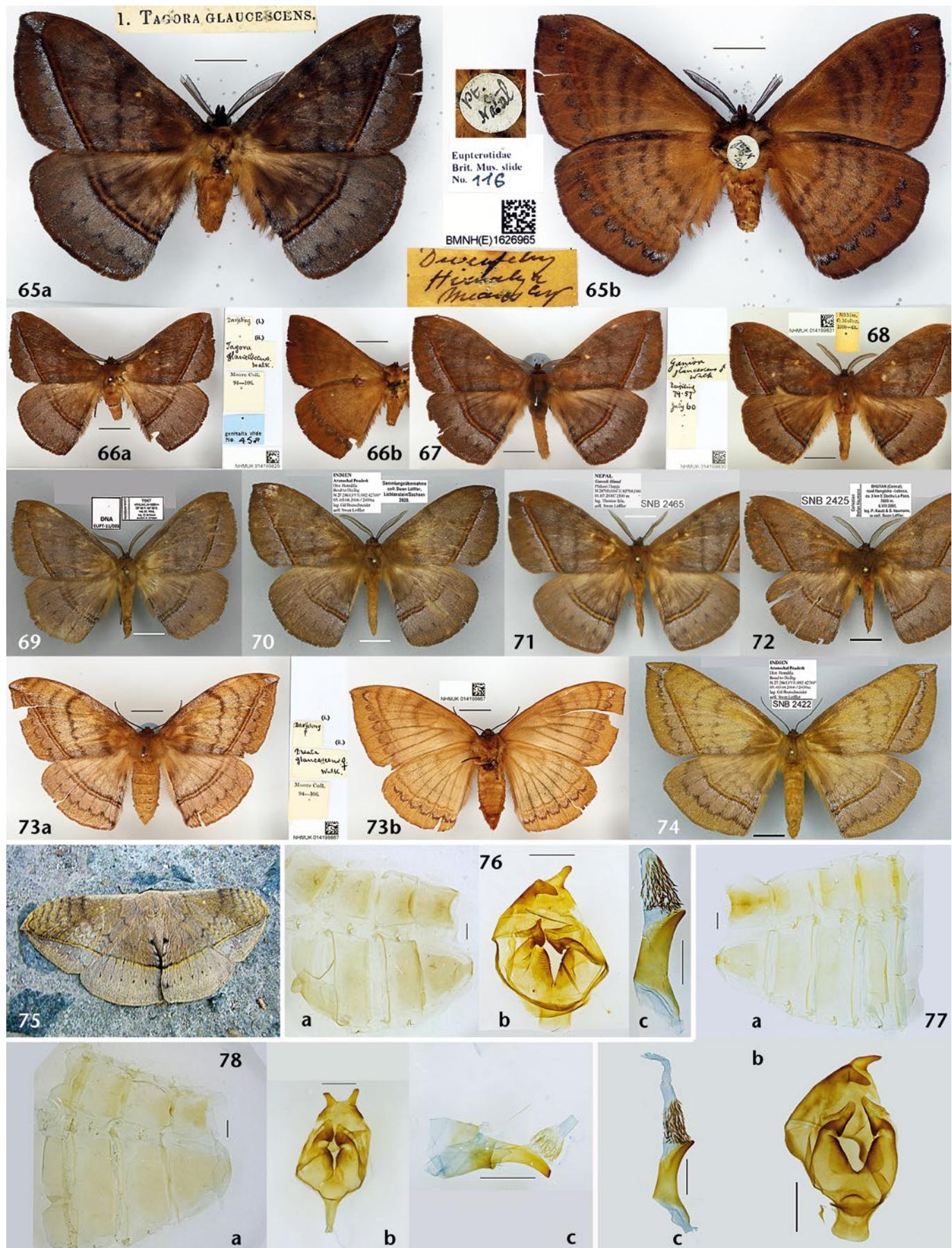


Fig. r: 8th Sternite sketch of ♂, *Tagora kobesi*, GP 2670/21 SNB [PT].

and on ventral side as well by the darker chocolate brown colour with only slightly indicated postmedian line. Male genitalia structures differ by the more slender processes of the uncus, form of the valves, the long and slender saccus, and the form of the 8th sternite, as described below. For both *T. kobesi* n. sp. and *T. diehli* n. sp. only ♂♂ are known, whereas for *T. niassana* from Nias only older (for decades) ♀♀ are available which generally do not produce barcode results at all; direct comparing of genitalia structures is impossible at present. For zoogeographical reasons we doubt that any of the two here described species can be conspecific with a taxon from the outer-arc ridge where Nias Island is situated (just 150 km off the coastline of Sumatra), and in addition to the different external morphology we think this is enough evidence to separate those taxa at species level without

Figs. 65–74: further types and other specimens of: (22) *Tagora glaucescens* WALKER, 1855, BIN AAL7623. **Figs. 65a, b:** HT ♂, India, [West Bengal], Darjeeling; Eupt. Brit. Mus. slide 116; BMNH(E) 1626965; approx. natural size (photos H. SULAK 2015). **Fig. 66a, b:** ♂ ups., “*Tagora glaucescens* WALK.” [handwritten, MOORE; on backside:] “Darjiling”; “MOORE Coll. 94-106”; “genitalia slide 45 ♂”; “NHMUK014199829”. **Fig. 67:** ♂ ups., “*Ganisa glaucescens* ♂ WALK.” [sic; on backside:] “Darjiling 79.57, July [18]60” [handwritten, BUTLER]; “NHMUK014199830”. **Fig. 68:** ♂ ups., “O. MOLLER” [sic; Möller?]; Sikkim, 1900–64; NHMUK014199831. **Fig. 69:** ♂ ups., China, Tibet, Nyalam, 28° N, 86° E, 3000 m, 4.–6. VII. 1998, leg. O. AMMOSOV, ex coll. V. SINIAEV; DNA Eupt-11/088 (determined via BC); CMWM. **Fig. 70:** ♂ ups., India, Arunachal Pradesh [W], Distr. Bomdila, road to Dirang, 27.28615° N, 92.42709° E, 2450 m, 3.–5. VIII. 2006, leg. G. BRETSCHNEIDER; ex CSLL in CSNB. **Fig. 71:** ♂ ups., Nepal, Ganesh Himal, Phikuri Danda, 28°0.054' N, 85°4.010' E, 2500 m, 1. VII. 2010, leg. T. IHLE; BC SNB 2465; ex CSLL in CSNB. **Fig. 72:** ♂ ups., Bhutan (C), road Hongtsho–Lobesa, ca. 3 km E Dochu-La-Pass, 2800 m, 6. VIII. 2005, leg. P. KAUTT & S. NAUMANN; BC SNB 2425 [incompl. result]; CSLL in CSNB. **Figs. 73a, b:** ♀, “*Dreata glaucescens* [sic!] ♀ WALK.” [handwritten, MOORE; on backside:] “Darjiling, ♀”; “MOORE Coll. 94-106”; “NHMUK014199867”; NHMUK. **Fig. 74:** ♀ ups., India, Arunachal Pradesh [W], Distr. Bomdila, road to Dirang, 27.28615° N, 92.42709° E, 2450 m, 3.–5. VIII. 2006, leg. G. BRETSCHNEIDER; ex CSLL in CSNB. — Scale bars 1 cm (most Figs. = ca. 60% natural size; Figs. 65a, b = 100%, labels enlarged). (Photos: 66, 67, 68, 73: A. GIUSTI/NHMUK 2021.)



— Fig. 75: living ♂ of *Tagora loeffleri*, in resting position, photo taken by Swen LOEFFLER in N. Vietnam, Bac Kan Prov., xi. 2000; no scale. — Figs. 76–78: Genitalia and abdominal pelt colour photos of some museum types: Figs. 76a–c: *Tagora pandya*, HT ♂, Eupt. Brit. Mus. slide 119, NHMUK010430471; a: abdominal pelt (top sternite, bottom tergite), b: entire genital without phallus (ventral view), c: phallus. Figs. 77a–c: *T. pallida*, HT ♂, Eupt. Brit. Mus. slide 118, NHMUK010430470; b: lateral view, one valve separate. Figs. 78a–c: [no type?], *T. glaucescens*, ♂, “*Tagora glaucescens* WALK.” [handwritten, MOORE; on backside:] “Darjiling”; “MOORE Coll. 94–106”; “genitalia slide 45 ♂”; “NHMUK014199829”; b: ventral view. — Scale bars 1 mm. Genitalia photos: A. GIUSTI/NHMUK 2021.

having a chance to compare genitalia and barcode at present. Geological evidence for permanent existence of a marine barrier between Sumatra and Nias is not clear in literature, but at least during the last ca. 10,000 years Nias was isolated.

♂ genitalia (b&w-Figs. 115; 8th sternite Fig. r; GP 2670/21 [PT]; further GPs 2703/21, 2704/21 SNB [PTs]): Processes of the uncus tiny, short and widely separated from each other. Dorsal process of the valves with a central protuberance on ventral side, ventral process small. The saccus short and rounded, the vesica is small and has short sclerites. 8th sternite of the abdominal pelt with two lateral acute tips and indentation in between, and two fields of higher sclerotization in the central posterior part. Genitalia structures of *T. kobesi* sp. n differ from the other Sumatran species, *T. diehli* sp. n., described above, by their short and rounded saccus, the form of the dorsal process of the valves, and by the significant form of the 8th sternite.

♀ unknown.

Remark. The ♂ PT illustrated in Fig. 55 shows as label “cult. Dr. KOBES”, which means that Lutz KOBES should have reared the specimen. However, we do not know of any rearing report with larval descriptions and illustrations published, nor have we seen any photos of preimaginal instars. We also do not know whether there are more details about such a rearing in Lutz KOBES’ collection, which is said to be in ZSM (STÜNING et al. 2017).

Species-group of *T. niassana/glaucescens*, subgroup of *T. glaucescens*

(20) *Tagora glaucooides*, sp. n.

(Figs. 57a, b; 120; Map 2 Tagora.)

BOLD BIN: AAV7071 (based on SNB BC 2424).

Holotype ♂: Myanmar, Kachin State, Chudu Razi Hills, 30 ml. E Kawnglanghpui, 29. vi. 2007, leg. local collectors; ex CSLL in CSNB, designated to MfNB; GP 2651/21 SNB [Fig. 120]; BC SNB 2424.

No paratypes.

Distribution: Known only from the type locality in Myanmar, Kachin, Chudu Razi Hills.

Etymology: Named for the general similarity to *T. glaucescens*.

Description and differential diagnosis

♂ (Figs. 57a, b): Fwl 40 mm (HT). The ground colour is a darker violet-brown, suffused with lots of silvery white scales on all dorsal wings. Head darker brown, thorax and abdomen in ground colour. Antennae 13 mm long. Fw. outer margin rounded, with rectangular apex. Fw. antemedian and median area in ground colour, with three vertical brown lines, a darkened central discal cell, and creamy yellow patch therein. Fw. postmedian line almost straight, apically bent backward towards the costa, consisting of a median orange and outer dark brown line, followed by a broad silver shade in the postmedian area. Postmedian submarginal line missing. The hw. coloured as fw., postmedian line almost straight. On both dorsal fw. and hw. median area, proximal half of the postme-

dian area with apical patch, and a tiny line in the submarginal area with lots of silvery white scales. Ventral side dark chocolate brown, both fw. and hw. with four medial vertical lines, postmedian line consisting of a row of white semicircles situated between the veins. Outer margin in ground colour, not prominent.

♂ genitalia (b&w-Figs. 120; GP 2651/21 SNB [HT]): Generally a smaller genitalia structure than that of *T. glaucescens*, *T. thomasi* sp. n. or *T. rufescens* sp. n. Processes of the uncus tall and acute, a little more separated from each other than in the other species, the margin between both processi a little rounded, prominent. The dorsal process of the valves with a small acute triangular projection, directed into ventrad direction. The saccus is slender, but shorter than in *T. glaucescens* or *T. rufescens* sp. n., the phallus short, slender and almost straight, with sclerites only in the proximal part of the vesica. The 8th sternite with no significant structures remembered (the abdominal pelt got lost during photographing, therefore the 8th sternite here not illustrated).

T. glaucooides sp. n. immediately can be recognized by its typical combination of dark purple brown colour with overall silvery white shades on all wings. The ♂ genitalia structures are the smallest one in the subgroup of *T. glaucescens* and differ in details from the other taxa as described above.

♀ unknown.

(21) *Tagora rufescens*, sp. n.

(Figs. 58a, b; 59a, b; 60a, b; 121; 210; Map 2 Tagora.)

BOLD BIN: ACG9576 (BC SNB 2421 [658 bp] from India, eastern Arunachal Pradesh, Along Distr., Rapum.) – This BC data clusters together with BC SNB 6567 from China, Tibet, which has only 407 bp and does thus not fulfill the requirements of the BOLD barcode and BIN and, therefore, was not used in Text-Fig. B. As this BC sequence from Tibet keys out, however, together with the Rapum specimen on the same branch and only very slightly differing from the Arunachal Pradesh specimen BC SNB 2421 within BOLD’s automatically produced NJ-tree, these populations are most probably the same species and dealt with as such here. – A similar distribution pattern was also found for *Antheraea discata* NAUMANN & LÖFFLER, 2015 (Saturniidae; NAUMANN & LÖFFLER 2015: 16) or *Tibetanja tagoroides* NAUMANN, NÄSSIG & ROUGERIE, 2020 (Eupterotidae; NAUMANN et al. 2020: 152); see also below under “Misidentifications in literature”.

Holotype ♂: India, Arunachal Pradesh, Distr. Along, nr. Rapum to Tato, 28.49583° N, 94.27467° E, 1450 m, 23.–26. vii. 2006, leg. G. BRETSCHNEIDER; ex CSLL in CSNB, designated to MfNB [Figs. 58a, b]; GP 2649/21 [Fig. 121] SNB.

Paratypes (15 ♂♂, 2 ♀♀):

India, Arunachal Pradesh: 1 ♂, same data as HT; ex CSLL in CSNB. 5 ♂♂ [2 of those dedicated to SMFL], Dist. Along, near Rapum, 28.53176° N, 94.24941° E, 2000 m, 6.–12. vii. 2010, leg. G. BRETSCHNEIDER; ex CSLL in CSNB. 2 ♂♂, Dist. Along, near Rapum, 2000 m, 28.53176° N, 94.23941° E, 2000 m, 19.–21. vii. 2006, leg. G. BRETSCHNEIDER; ex CSLL in CSNB. 1 ♂, 1 ♀, Dist. Along, near Rapum, 28.54835° N, 94.23015° E, 1600 m, 21.–23. vii. 2006, leg. G. BRETSCHNEIDER; ♀ GP 2714/21 SNB, Fig. 210; ex CSLL in CSNB. 1 ♂, Dist. Daporjo, 15 km from Nacho, 28.40291° N, 93.74295° E, 800 m, 27.–29. vii. 2006, leg.

G. BRETSCHNEIDER, ex CSLL in CSNB; Figs. 59a, b.

China, S. Tibet (Xizang Zizhiq): 1 ♂, Nyingchi Pref., Pailong, ca. 30°2' N, 95°1' E, 2000 m, vi.-viii. 2012, leg. Yunkang Hu; CSNB; BC SNB 6567 [only 407 bp]; Figs. 60a, b. 1 ♂, Motuo (Metok) Co., Duoxiongla valley, NW Beibeng, Ani Quiao Bridge, 1500 m, ca. 29°19' N, 95°7' E, 1500 m, vi.-viii. 2012, leg. Yunkang Hu; GP 2650/21 SNB; BC SNB 6879 [no result]; CSNB. 2 ♂♂, Nyingchi Pref., Yarlong Tsang-poo river valley, Men Dong, 29°53' N, 95°6' E, 2200 m, vi.-viii. 2012, leg. Yungkang Hu, bought 2013; CSNB. 1 ♂, Cona Co., Shannan Dist., Lebu valley, Simuzha env., ca. 27°49' N, 91°45' E, 2400 m, 16. vii. 2017, leg. Yunkang Hu, bought x. 2020; CSNB. – 1 ♀, Tibet, Motuo, Hanmi, 2200 m, viii. 2012, CMWM.

Distribution: Thus far known from India (eastern Arunachal Pradesh) and China (southern central Tibet), close to the Indian border.

Misidentifications in literature: The species was mentioned by Hou in ZHU & WANG (1983: 433, no. 3111 [partim] as “*Ganisa glaucescens*”, a male was figured on his colour plate 152, which we determine as the here described *T. rufescens* sp. n. Hou also mentioned “*Ganisa*” *glaucescens* from Sikkim, which is in fact the true *T. glaucescens* (not figured by him).

In our publication on *Tibetanja tagoroides* gen. et sp. n. (NAUMANN et al. 2020) we had not yet identified *T. rufescens* safely (because of the short barcode sequence of only 407 bp of the specimen illustrated) as a new species and so the ♂ specimen illustrated in our figs. 4a and 4b of 2020 was named “*Tagora glaucescens*”, but see above: the specimen with BC SNB 6765 is here listed as a PT of *T. rufescens*.

Etymology: Named to express the slightly more reddish or violet dorsal hue of the fresh male moth specimens especially from Tibet, compared to *T. glaucescens*.

Description and differential diagnosis

♂ (Figs. 58a, b; 60a, b): Fwl 38–45 mm (HT 43 mm). Ground colour on dorsal side as in the related *T. glaucescens*, of dark chocolate brown in fresh specimens, older specimens fading to more greyish violet brown. Head darker brown, thorax and abdomen in ground colour. Antennae 15.0 mm long. Fw. outer margin rounded, with almost rectangular apex. Antemedian and median area almost homogenous in ground colour, the patch in the median field much reduced, in most specimens invisible. Fw. postmedian line little rounded, apically bent backward towards the costa, consisting of intense dark brown, orange and again dark brown lines, followed by a silver shade in the proximal postmedian area. Outer margin broad and dark brown, fw. apex with a silvery violet patch. Dorsal hw. coloured as fw, postmedian line rounded. Ventral side lighter, homogenous dark reddish brown, both fw. and hw. with two or three medial lines, postmedian line almost invisible, dark brown. Outer margin darker.

♂ genitalia (b&w-Figs. 121; GP 2649 [HT]; further 2650/21 SNB [PT]): Processes of the uncus long and acute, wider separated from each other than in *T. glaucescens*. Dorsal process of the vales with triangular ventral projection and marginal indentation, ventral process rounded. The saccus is long, slender and rounded at its end. Phallus short and slender, sclerites only in proximal

part of the vesica. The 8th abdominal segment (sternite and tergite) was rotten and got destroyed through preparation.

♀ (Figs. 59a, b): Fwl 44/52 mm, a little larger than ♂♂ and a little lighter, more reddish brown colour on dorsal side. Fw. with three broad dark brown crenulate lines, ending rounded in the grey costa. Postmedian line with more intense inner orange part, the fw. apex with a small apical tip. Fw. and hw. postmedian area with crenulate black line, in the fw. a violet apical patch. Ventral side almost of same colour as on dorsal side, with same pattern as the ♂♂.

T. rufescens sp. n. differs on average from *T. glaucescens* by the bigger size, the almost missing medial patch of the fw. and the more intense silver shade on the proximal dorsal postmedian area which is intermediate between that of *T. glaucescens* and *T. glaucoidea* sp. n., described above. ♀♀ are much darker than those of *T. glaucescens*, with less ornamentation, and show less sexual dimorphism than the latter species.

♀ genitalia (b&w-Fig. 210; GP 2714/21 SNB [PT]): Anterior apophyses 3 mm long, posterior ones shorter, around 2.5 mm long (not exactly visible on photo). Lamella antevaginalis sclerotized, with two trapezoid processes and small indentation in between, hiding the ostium bursae. Lamella postvaginalis longer than in *T. glaucescens*, rectangular with rounded margin, dorsal margin slightly sclerotized. Ductus and corpus bursae not visible in the available dissection due to slightly rotten condition of the abdomen.

(22) *Tagora glaucescens* WALKER, 1855

(Figs. 65a, b; 66a, b; 67; 68; 69; 70; 71; 72; 73a, b; 74; 78; 123, 124, 125; 208; 209; Map 2 *Tagora*.)

Tagora glaucescens: WALKER (1855b: 1188, not illustrated). – However, again not originally described by WALKER as “*Ganisa*” *glaucescens* as quoted erroneously by many later sources, e.g., STRAND (in SEITZ 1922), in the BMNH Card Index = BECCALONI (2005) or by HOLLOWAY (1982), etc.

The old specimens from BMNH/NHMUK (“ex coll. MOORE” etc.) and other old museum material sometimes show handwritten labels with surprising determinations: “*Ganisa glaucescens*”, “*Dreata glaucescens*”, “*Sphingognatha glaucescens*”, etc.

BOLD BIN: AAL7623. See Text-Fig. B: This BIN code is valid for specimens from Nepal (BC SNB 2465, 2466; Figs. 71) in the West over India: Sikkim (BC-TB6755) and India: West Bengal, to India: western Arunachal Pradesh [Bomdila Distr., “road to Dirang”] (BC SNB 2422, Figs. 74) in the East. A single specimen from Bhutan (barcode SNB 2425) was not successfully sequenced, but most likely will also fit in. Another barcode analysis from a ♀ from S-Tibet, close to the Nepalese border post (Zhangma, 2300 m, BC SNB 2423, CSLL in CSNB) did not result in any sequence data.

Type material: HT ♂ (by monotypy): “Darjeeling”. – See the two different locality labels in Fig. 65: A. [On the small circular locality label on the pin, just below the body and sticking to the specimen, top]: “Pt. Natal” in South Africa, an old name for Durban (R. OBERPRIELER, pers. comm. to W.A.N.), now in Kwa Zulu-Natal, which surely is a mislabelling, as no species of the genus was ever found in Africa. B. [On the

rectangular brown label, bottom; handwritten, hardly decipherable:] "Darjeling, Himalaya, ???" [sic, illegible]; "Eupterotidae Brit. Mus. slide 116"; "BMNH(E) 1626965", in NHMUK.

Note 14: This HT specimen of *glaucescens*, today found in NHMUK, clearly is a typical Himalayan member of *Tagora glaucescens* (and no true *Tagora* species has ever been found in Africa!). So this label "Pt. Natal" in South Africa must be a secondary mislabelling, maybe a "re-used" label for glueing the specimen to the pin or something similar.

Type locality: "Himalaya" (WALKER 1855b: 1188); "Darjeeling" (MOORE 1865: 807).

Ten years later, MOORE (1865: 807; in this publication, Eupterotidae were contained in "Liparidae" = Lymantriidae [sic]) wrote for *T. glaucescens* "Darjeeling" as origin, and with a little imagination one can decipher this on the handwritten brownish rectangular label (see Fig. 65 centre, bottom), so this locality might quite well be correct. There are also specimens from Darjeeling and Sikkim, collected in the 1980ies by the late Werner THOMAS, in CWAN in SMFL, which externally fit very well with WALKER's specimen.

Material studied:

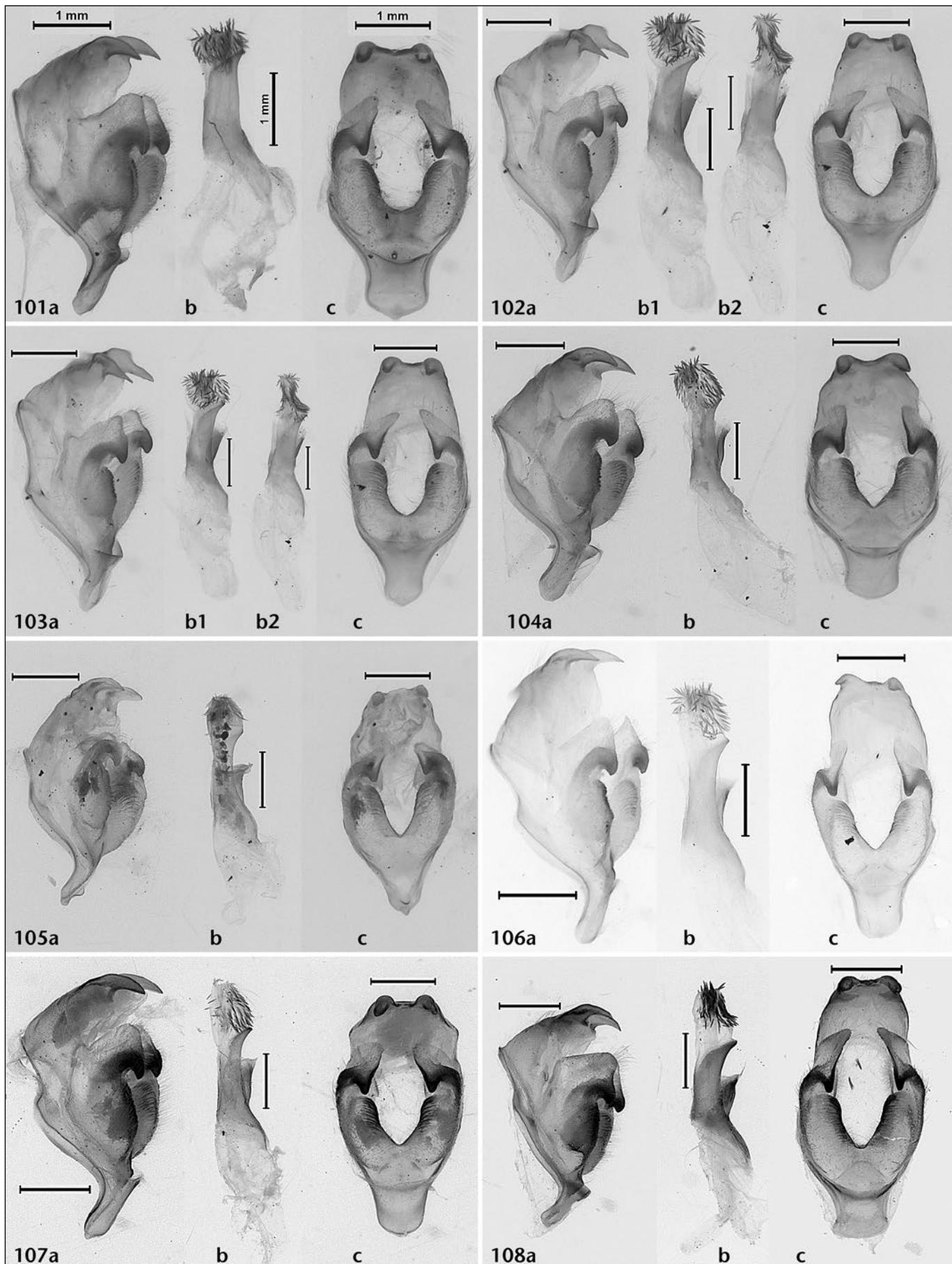
India, West Bengal: 1 ♂ HT (see above). 1 ♂, "*Tagora glaucescens* WALK." [handwritten, MOORE; on backside:] "Darjiling"; "MOORE Coll. 94-106"; "genitalia slide 45 ♂"; "NHMUK014199829" [Figs. 78]. 1 ♂, "*Ganisa* [sic] *glaucescens* ♂ WALK." [on backside:] "Darjiling 79.57, July [18]60" [handwritten, BUTLER?]; "NHMUK014199830". 1 ♀, "*Dreata* [sic] *glaucescens* ♀ var. WALK." [on backside:] "Darjiling 79.57" [handwritten, BUTLER?]; "NHMUK014199870". 1 ♀, "*Ganisa* [sic] *glaucescens* ♀ WALK." [on backside] "Darjiling 79.57" [handwritten, BUTLER?]; NHMUK014199871. 1 ♀, "*Dreata* [sic] *glaucescens* WALK. ♀" [handwritten, MOORE; on backside:] "Darjiling, ♀"; "MOORE Coll. 94-106"; "NHMUK014199867"; all these NHMUK. — 2 ♂♂, 4 ♀♀, Darjeeling, 2000 m, 2 ♂♂, 3 ♀♀ = 3.-8. viii. 1989, 1 ♀ = E. vi.-M. vii. 1989, leg. S. TAMANG, via W. THOMAS; CWAN in SMFL. 2 ♂♂, Darjeeling, Ghoom, 2100 m, 8.-9. vii. 1986, leg. W. THOMAS; CWAN in SMFL. 2 ♂♂, 1 ♀, Darjeeling, Himafalls, 2000 m; 1 ♂, 8. vii. 1986; 1 ♂, 1 ♀, 4. viii. 1989, leg. W. THOMAS. 4 ♂♂, Darjeeling, Mangpu-rd., ca. 1800 m, 22. vii. 1989; leg. W. THOMAS. 1 ♂, 1 ♀, Darjeeling, Tigerhill, 2400 m, 1 ♂ 23.-25. vii. 1989, 1 ♀, 18. vi. 1990; leg. S. TAMANG, via W. THOMAS. 1 ♂, 1 ♀, Darjeeling, 3-Miles-Village, 1900 m, 29. vi. 1986; leg. W. THOMAS; ♂ BC SNB 5562 [no result]; all these ex CWAN in SMFL. — 1 ♂, Darjeeling, Tigerhill, 2400 m, 3. vii. 1986, leg. W. THOMAS; CMWM. — 2 ♂♂, Darjeeling, ATKINSON. 1 ♂, Darjeeling, June, FRUHSTORFER leg.; coll. WEYMER; *Ganisa rufescens* [sic]; *Ganisa* [sic] *glaucescens*; [dried genitalia on pin not removable]; all these MFNB. — 2 ♂♂, *Ganisa glaucescens* (WALKER); Darjiling; Muséum Paris 1940, coll. J. AUNEAU. 3 ♂♂, Darjiling; 1920-1932, coll. L. + J. DE JOANNIS, Muséum Paris. 1 ♂, *Ganisa glaucescens* Wlk.; Darjeeling, Sikkim [sic]; 1920-1932, coll. L. + J. DE JOANNIS, Muséum Paris. 2 ♂♂, Darjeling, VERSCHRAEGEN, 1904; 1920-1932, coll. L. + J. DE JOANNIS, Muséum Paris; all these MNHN. — **India, Sikkim**, 1 ♂, O. MOLLER [sic], 1900-64; NHMUK014199831. 1 ♂, Sikkim [sic], vii. 1909, F. MOLLER, 1910-140; NHMUK014199832; both NHMUK. — 1 ♂, "*Sphingognatha*" [sic!] *glaucescens*, Sikkim, coll. G. MUHL. 1 ♂, 1 ♀, Sikkim, [illegible], coll. A. SEITZ; all 3 SMFL. 4 ♂♂, 1 ♀, Pemayangtse, 2000 m, 2 ♂♂, 23.-31. vii. 1989, 2 ♂♂, 1 ♀, 23.-28. vii. 1990; leg. W. THOMAS; all these via CWAN in SMFL. — 2 ♂♂, Khecheopalni Lake, 1800 m, 15.-22. vi. 2008, leg. E. KUČERA; BC TB6754 [incomplete result], 6755. 3 ♂♂, 1 ♀, Mt. Kanchenjunga SE, 27°30' N, 88°20' E, 2000 m, 22.-31. vii. 1995, leg. AFONIN & SINIAEV; ♂-GPs Heterocera Nr. 12.806, 12.807, ♀-GP Heterocera 12.809 [Fig. 208], CMWM; ♀ DNA Eupt-11/090. 1 ♂, Pemayangtse, 1900 m, 22. vii. 1995, leg. E. AFONIN & V. SINIAEV, ex coll. SCHINTLMEISTER; DNA Eupt-11/089; all these CMWM. — 1 ♂, Gangtok, 15. vi. [19]38, Exp. SCHÄFER; *Ganisa* [sic] *glaucescens*, det. Dr. Herb. Sick. 1 ♂, Gangtok, Gilkusha, 9.-12. ix. [19]39, Exp. SCHÄFER. 5 ♂♂, Gangtok, 15. vi. [19]38, Exp. SCHÄFER. 1 ♂, Gangtok, Afafan[?], 6. vii. [19]39 [handwritten, MELL];

all these MFNB. 2 ♂♂, Muséum Paris, HARWAND 1890; in MNHN. — **India, Arunachal Pradesh** [W]: 1 ♂, 1 ♀, District Bomdila, road to Dirang, 27.28615° N, 92.42709° E, 2450 m, 3.-5. viii. 2006, leg. G. BRETSCHNEIDER; ♂ GP 2648/21 SNB; ♀ BC SNB 2422; ex CSLL in CSNB.

Nepal: 8 ♂♂, Ganesh Himal, Phikuri Danda, 28°0.054' N, 85° 4.010' E, 2500 m, 1. vii. 2010, leg. T. IHLE; GP 2647/21 SNB [b&w-Figs. 124] [with 3 legs on separate slide]; BC SNB 2465, 2466; ex CSLL in CSNB. — 3 ♂♂, Solu Khumbu Himal, 20 km SE Jiri, Bhandar, 2125 m, 6. vii. 1993, leg. M. HREBLAY & G. CSORBA. 3 ♂♂, Solu Khumbu Himal, 10 km S Lukla, Bupse, 2300 m, 3. vii. 1993, leg. M. HREBLAY & G. CSORBA. 1 ♂, Godavari, Mt. Phulchouki, ca 30 km S Kathmandu, v.-vi. 1991, 1850 m, ex coll. A. SCHINTLMEISTER. 1 ♂, Phulchoki, 1950 m, 15. viii. 1982, leg. Lt. Col. M. G. ALLEN. 1 ♂, 2 ♀♀, Phulchoki, oak-laurel forest, 2000-2500 m, 29. vi. 1990, leg. Col. M. G. ALLEN. 1 ♂, Jiri, 1400 m, 20. vii. 1991, leg. Col. M. G. ALLEN. 1 ♂, Sun Kosi Tal, Kodari, 2000 m, 18.-19. viii. 1971, leg. DE FREINA, CMWM; GP Heterocera 11.526, Mus. WITT. 1 ♂, Nepal (E), Milke Danda, 1 km NE Gupha Pass, 2790 m, 1. viii. 2000, leg. Csővarí & HREBLAY; DNA Eupt-11/087. 10 ♀♀, Nepal (E), Surke Danda, 1 km NE Lai Kharka, 2140 m, 4. viii. 2000, leg. Csővarí & HREBLAY. 3 ♀♀, Surke Danda, 1 km W Kesawa, 2080 m, 5. viii. 2000, leg. Csővarí & HREBLAY. 41 ♀♀, Nepal (E), Deorali Danda, 1 km N Yamphudin, 2000 m, 7. viii. 2000, leg. Csővarí & HREBLAY; GP Heterocera 17.293 [Fig. 209] CMWM; DNA 2011.79 [incomplete result], Eupt. 11-091. 1 ♀, Milke Danda, Gursa, 2100 m, 22. vii. 2000, leg. Csővarí & HREBLAY. 1 ♂, Milke Danda, Gursa, 2100 m, 3. vii. 1998, leg. M. HREBLAY & B. BENEDEK; GP Heterocera Nr. 12.804 Mus. WITT. 1 ♀, Surke Danda, 2 km NW Suketar, 2560 m, 15. vi. 1998, leg. M. HREBLAY & B. BENEDEK; CMWM. 4 ♂♂, 1 ♀, Nepal (E), Surke Danda, 1 km W Kesawa, 2000 m, 16.-17. vi. 1998, leg. M. HREBLAY & B. BENEDEK; DNA Eupt-11/092; CMWM. 2 ♀♀, Deorali Danda, Anpan, 1900 m, 18. vi. 1998, leg. M. HREBLAY & B. BENEDEK; CMWM. 9 ♂♂, Deorali Danda, 1 km N Yamphudin, 2000 m, 19. vi. 1998, leg. M. HREBLAY & B. BENEDEK; CMWM. 2 ♂♂, Kanchenjunga Himal, Khambachen, 4150 m, 28. vi. 1998, leg. M. HREBLAY & B. BENEDEK; CMWM. 4 ♂♂, Nepal (W), 13 km N Dailekh, 2645 m, 30. vii. 1996, leg. M. HREBLAY & B. SZIN. 1 ♂, 1 ♀, Annapurna Himal, valley of Kali Ghandaki, near Ghasa, 83°39.5' E, 28°36' N, 21. vii. 1995, leg. M. LASZLO & G. RONKAY. 1 ♂, 1 ♀, Annapurna Himal, valley of Kali Ghandaki, near Tatopani, 83°39' E, 28°29' N, 22. vii. 1995, leg. M. LASZLO & G. RONKAY. 16 ♂♂, 1 ♀, Annapurna Himal, 1 km NW Chitra, 83°41' E, 28°25.5' N, 2300 m, 23. vii. 1995, leg. G. M. LASZLO & G. RONKAY; ♂ GP Heterocera 12.805 CMWM. 3 ♀♀, Annapurna Himal, Banthanti village, 83°43' E, 28°22.5' N, 2500 m, 25. vii. 1995, leg. G. M. LASZLO & G. RONKAY. 1 ♂, Annapurna Himal, Bagarchhap, 84°20' E, 28°32' N, 2200 m, 9. vi. 1996, leg. HREBLAY & SZABOKY. 4 ♂♂, Nepal (E), Jyaudra Danda, Amjilassa, 2450 m, 30. vi. 1998, leg. M. HREBLAY & B. BENEDEK; GP Heterocera 12.803 CMWM. 1 ♂, 2 ♀♀, Kakani, secondary pine & oak forest, 2070 m, ♂ 28. vii. 1989, ♀♀ 7. viii. 1982 & 12. vii. 1990, leg. Col. M. G. ALLEN. 3 ♂♂, Godaveri, 1550-1700 m, mixed forest, 1. vii. 1990, leg. Col. M. G. ALLEN. 3 ♂♂, Nepal (E), Dhankuta, 1700 m, 30. vi.-1. vii. 1991, leg. Col. M. G. ALLEN; all these in CMWM.

Bhutan (C): 2 ♂♂, road Hongtsho-Lobesa, ca. 3 km E Dochu-La-Pass, 2800 m, 6. viii. 2005, leg. P. KAUTT & S. NAUMANN; BC SNB 2425 [incomplete result]; CSLL in CSNB. 1 ♂, Samdrup Jongkhar,

Figs. 101-108: ♂ genitalia of the following *Tagora* spp.: **Figs. 101:** (1) *T. luxi*, PT, N Laos, Prov. Phongsali, Phou Fa, 1650 m, Anf. xi. 2005; leg. T. IHLE, CSLL in CSNB; GP 2677/21 SNB; **a:** genitalia, lateral view; **b:** phallus, **c:** genitalia, ventral view. — **Figs. 102:** (2) *T. ihleorum*, HT, Thailand (N), Prov. Chiang Mai, Doi Angkhang, Fang, 1600 m, 9.-13. xi. 2002, leg. T. IHLE, CSLL, in CSNB; GP 2675/21 SNB; **b1, b2:** two different views of phallus. — **Figs. 103:** (3) *T. siama*, PT, N. Thailand, Chiangmai, Doi Suthep, 1400 m, xii. 2000, leg. T. IHLE, CSLL, in CSNB; GP 2676/21 SNB. — **Figs. 104:** (4) *T. loeffleri*, HT, Vietnam (N), Bac Kan Prov., Ba Be Lake NP, Cao Tri env., 500 m, 6.-8. xi. 2000, leg. S. LOEFFLER, CSLL, in CSNB;



GP 2682/21 SNB. — Figs. 105: (5) *T. ignatyevi*, HT, Vietnam (SC), Kon Tum Prov., Ngoc Linh Mt., vii. 2016, DANG NGOC VAN, Lam Dong, CSNB; GP 2684/21 SNB. — Figs. 106: (6) *T. pugaevi*, HT, Vietnam (C), Quang Ngai Prov., Bato Mt., 950 m, x. 2014, leg. LE LUONG THANH, CSNB; GP 2686/21 SNB. — Figs. 107: (7) *T. zolotuhini*, PT, Vietnam (S), Lam Dong Prov., Da Lat, vi. & xi. 2015, leg. DANG NGOC VAN, CSNB; GP 2680/19 SNB. — Fig. 108: (10) *T. mizoramia*, PT, India, Mizoram, Blue Mountains, Thaltlang env., 1300 m; CSNB; GP 2678/21 SNB. — Scale bars 1 mm (not to the same scale). — Photos: N. IGNATYEV.

Morong, 2273 m, 26.56 / 91.33 [sic], 20. vii. 2009, leg. V. SINIAEV; BC Eupt-DR-02 [with wrong coordinates from the BOLD website, this locality would be in the Indian lowlands near Guwahati]; coll. ZOLOTUHIN. 1 ♀, Mongar, Thebong, 27.17 / 91.2 [sic], 2273 m, 19. vii. 2009, leg. V. SINIAEV; BC Eupt-DR-06; coll. ZOLOTUHIN.

China, Tibet, 2 ♂♂ (determined via BC), Nyalam, 28° N, 86° E, 3000 m, 4.-6. vii. 1998, leg. O. AMMOSOV, ex coll. V. SINIAEV; 1 ♂ GP Heterocera 17.292 CMWM [b&w-Fig. 125]; 1 ♂ DNA Eupt-11-088; all in CMWM. — 1 ♀, Tibet (SW), Zhangmu, 2300 m, 20. vii. 2000, leg. L. BIEBER & V. MAJOR; BC SNB 2423 [no result]; ex CSLL in CSNB.

Notes in literature: DIERL (1975: 122) mentioned the taxon as "*Mallarctus*" *glaucescens* already for the first time from Bhutan. — Hou in ZHU & WANG (1983: 433, no. 3111 [partim]) reported "*Ganisa*" *glaucescens* from Sikkim.

Distribution: Southern slopes and foothills of the NE Himalaya from Nepal and China: SW-Tibet over India: West Bengal and Sikkim, then to Bhutan and again to India, western Arunachal Pradesh.

Etymology: Not stated; probably based on the colouration.

Tagora glaucescens is apparently the most common species of the genus in collections and museums. It is most common in the NE Himalaya slopes and foothills, but close relatives were recently also found in northeastern India, in Tibet, and to the East in Myanmar: Kachin, and the late Werner †THOMAS discovered a closely related and quite similar species also in the Nilgiris in S. India in 1989 (see below).

Description and differential diagnosis

♂ (Figs. 65a, b; 66a, b; 67; 68; 69; 70; 71; 72): Fwl 33–44 mm (HT 41 mm). It was the only known species in the *glaucescens* subgroup with more or less dark chocolate brown ground colour before our revision. The ground colour is typical for fresh specimens, fading to a darker greyish violet-brown in older and much flown specimens. Head almost black, thorax and abdomen in ground colour. Antennae 13.5–14.0 mm long. Fw. outer margin rounded, with rectangular apex. Antemedian and median area almost homogenous in ground colour, only markings are a central pale yellow „discoidal“ patch and, in fresh specimens, two slightly indicated vertical dark grey lines. Fw. postmedian line very little rounded, apically bent backward towards the costa, consisting of intense dark brown, orange and again dark brown lines, followed by a violet silver shade in the postmedian area. In the centre of this postmedian area a tiny dentate black line. Fw. apex with a violet patch. Dorsal hw. coloured as fw., postmedian line rounded. Ventral side lighter, reddish brown, both fw. and hw. with up to four medial lines, postmedian line consisting of a row of blackish semicircles situated between the veins, with inner white scales. Outer margin dark grey.

♂ genitalia (col. Figs. 78a, b, c; b&w-Figs. 123, 124, 125; 8th sternite Fig. s; GP B.M. Eupt. slide 116 [HT T. *glaucescens*, Figs. 123]; GPs 2647/21 SNB [Figs. 124], 17.292 CMWM [Fig. 125]; B.M. Eupt. slide 45 [col. Figs. 78]; further 2648/21 SNB; GPs 11.526, 12.803, 12.804, 12.805, 12.806, 12.807, CMWM): Uncus with long acute processes which are close to each other. Dorsal process of the valves with triangular projection to ventral side, ventral process rounded. The saccus long, slender, with a somewhat rectangular end, not rounded. Phallus short,

vesica with sclerites only on the proximal part. 8th sternite with triangular, rounded sclerotization and lateral posterior tips, see Fig. s.

Genitalia of *T. glaucescens* differ from those of *T. rufescens* sp. n. by their in general smaller size, the different form of the valves, the shorter and more central processes of the uncus, the shorter and slender saccus, the smaller vesica which is indented from dorsal side in *T. rufescens* sp. n.

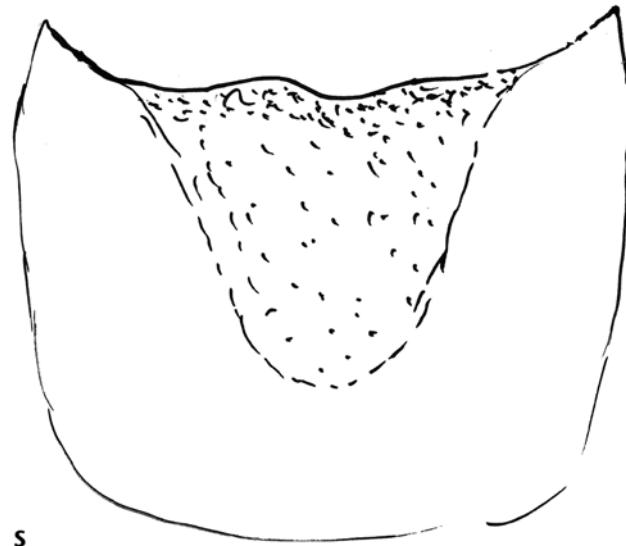


Fig. s: 8th Sternite sketch of ♂, *Tagora glaucescens*, GP Eupt. Brit. Mus. slide 116 [HT].

♀ (Figs. 73a, b; 74): Fwl 41–46 mm, a little larger than ♂♂ and usually of much lighter, more orange brown colour and resembling much more the other species in the *pandya*-group and the *niassana*-subgroup of the genus than their own males. Fw. with two broad grey crenulate lines, ending rounded in the grey costa. Postmedian line with more intense inner orange part, the fw. apex with a small apical tip. Fw. and hw. postmedian area with crenulate black line. Ventral side also lighter than in ♂♂, but in general with same pattern.

♀ genitalia (b&w Figs. 208; 209: GPs 12.809 [Fig. 208], 17.293 [Fig. 209], both CMWM): Both anterior and posterior apophyses around 2.3–2.5 mm in length. Lamella antevaginalis sclerotized, with two close triangular processes with rounded tip and small indentation in between, hiding the ostium bursae. Lamella postvaginalis long, rectangular with rounded margin, dorsal margin sclerotized. Ductus bursae slender and thin-skinned, corpus bursae without major structure.

(23) *Tagora thomasi*, sp. n.

(Figs. 61a, b; 122; Map 2 *Tagora*.)

BOLD: BC and BIN unknown so far. No recent material available presently for barcoding. The two specimens collected by W. THOMAS in 1989 are already too old and did not result in a barcode sequence, and we decided to describe the taxon after the male genitalia (see diagnosis and Table 2) and due to the geographical distance between the Himalaya and the Nilgiris.

Holotype ♂: India, Tamil Nadu, Nilgiris, Ooty-Coimbatore rd., 1000 m, 13. VIII. 1989, leg. W. THOMAS; GP 1407/00 WAN [GP tube after moving process within the museum not yet rediscovered]; BC SNB 5563 [without result]; ex CWAN in SMFL; Figs. 61a, b; SMFL type catalogue no. 4737.

Paratype (1 ♂): same data like HT; GP 2699/21 SNB [Fig. 122].

♀ unknown.

Distribution: Only known from the type locality: India, Tamil Nadu, Nilgiris, Ooty-Coimbatore road.

Etymology: Named in honour of the late Werner THOMAS who was so far the only collector to find this member of the species-subgroup of *T. glaucescens* in South India, in the Nilgiris, during his single visit there.

Description and differential diagnosis

♂ (Figs. 61a, b): Fw 38.5/39 mm (HT 38.5 mm). The so far only known two specimens are a little smaller than those of *T. glaucescens* on average. Head dark brown, thorax and abdomen in dark chocolate brown ground colour. Antennae 13 mm long. In both specimens fw. intensively suffused in the medial area and the proximal half of the postmedian area with bluish white scales. Fw. outer margin rounded, the apex a little bent backward. Antemedian and median area almost homogenous in ground colour, only markings are a small central pale yellow patch and two slightly indicated vertical dark grey lines. Fw. postmedian line little rounded, apically bent backward towards the costa, consisting of intense dark brown, orange and again intense dark brown lines, followed by a broad silvery violet shade in the postmedian area. In the centre of this postmedian area a tiny dentate black line. Dorsal hw. coloured as fw, postmedian line rounded, the postmedian area with intense inner bluish white portion. Ventral side lighter, orange brown, both fw. and hw. with up to four medial lines, postmedian line consisting of a row of bluish brown triangles situated between the veins, with inner white scales. Outer margin a little darker than rest of the wing.

In general *T. thomasi* sp. n. has more bluish-white scales

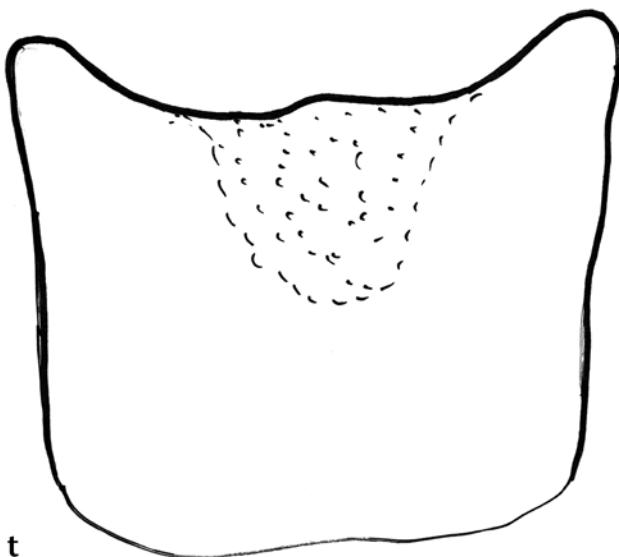


Fig. t: 8th Sternite sketch of ♂, *Tagora thomasi*, GP 2699/21 SNB [PT].

on its dorsal side of the wings, compared to its probably closest relative *T. glaucescens*, on ventral side the postmedian line is more a row of triangles than semicircles.

♂ genitalia (b&w-Figs. 122; 8th sternite Fig. t; GP 2699/21 SNB [PT]): Uncus with short and widely separated processes. The dorsal process of the valves almost rectangular, with small spikes on its inner margin, the ventral process (= sacculus) is short. The saccus is long and slender, rounded at its end. The phallus is short, broad, compact, the vesica with only few sclerites. The 8th sternite is relatively broad.

In the ♂ genitalia the uncus of the here described taxon differs by its shorter processes which are widely separated from each other. The dorsal process of the valves has a different, rectangular form. The phallus is broader, the vesica covered only with much less sclerites. The 8th sternite has a different form.

♀ unknown.

There may well be further species

We expect more than the two so far recorded and presently identified species in China (the northern Vietnamese *T. loeffleri*, ranging into South China, and the singleton from Hunan described here as *T. sinica*, lacking a successful BC analysis). In addition, we do not know the correct identity of those specimens listed by MELL (1930) as “*Mallarctus pandya*” from China and for most part preserved in MfNB (and too old for standard barcoding). These specimens in MfNB ex coll. MELL are without detailed data; they are clearly larger than our specimen from Hunan, with a more brownish-beige ground colour (slightly faded by time?), possibly explaining why MELL called them “*pandya*”. The identity of the specimen from Zhejiang figured by HOU (in ZHU et al. 1983: 433, no. 3108 [partim], col. pl. 152, fig. 3108 ♂) is also still unclear. Also larger islands like Taiwan or Hainan might possibly deliver new species.

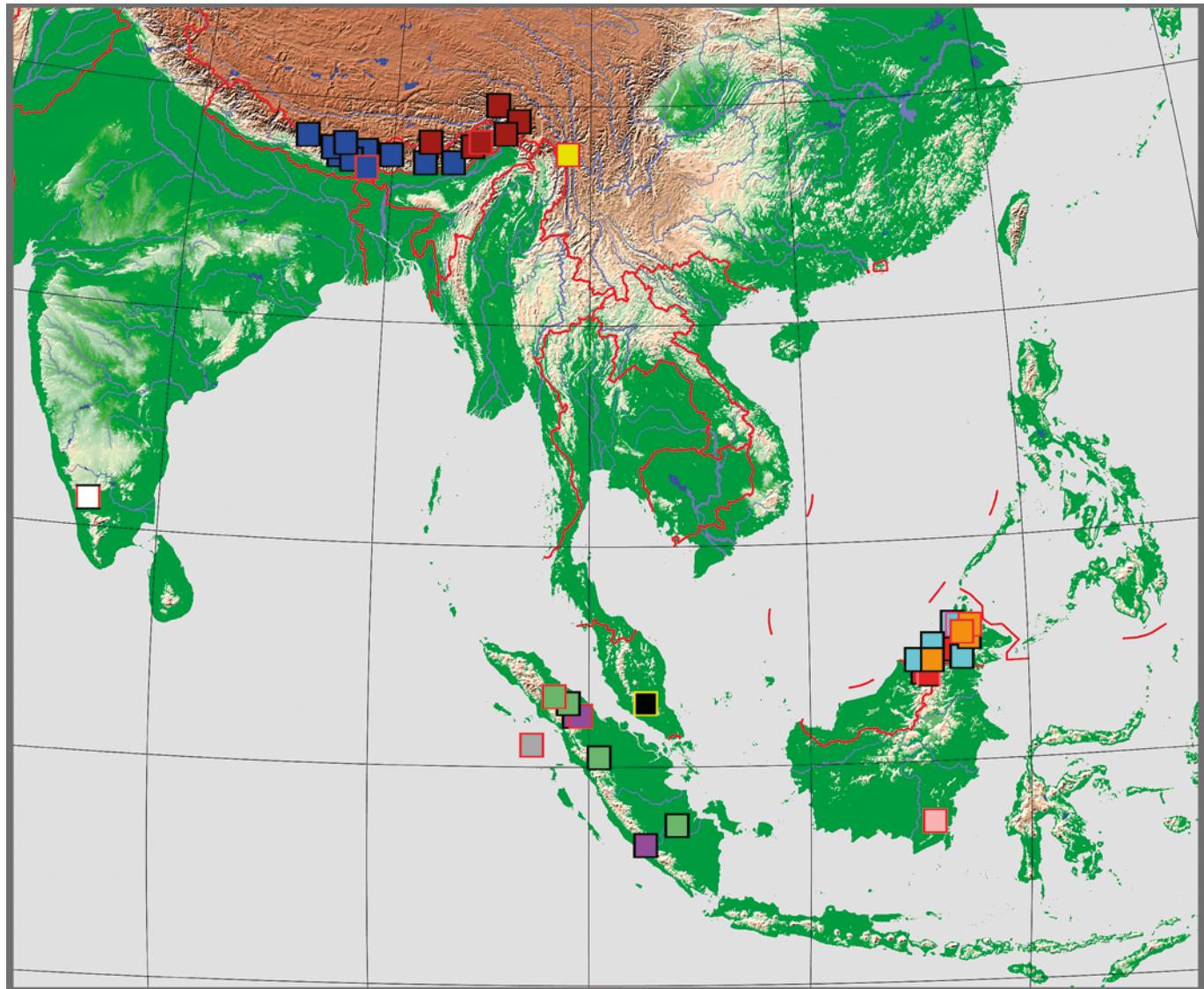
South India or Sri Lanka may be potentially interesting areas (though less likely on basis of present knowledge) to look for *Tagora*.

Peninsular Malaysia: In MfNB there is also one single ♂ from “Malacca, Tengah-Gebirge” [i.e. Peninsular West Malaysia, Melaka, central mountain chain] (see col. Figs. 53a, b; Map 2), which is an old specimen, thus not usable for a standard barcode analysis, and cannot safely be determined. It shows some external similarity to *T. diehli* sp. n., but not sufficiently to include it into the PT list. This single specimen is the only[!] *Tagora* specimen known to us from entire Peninsular Malaysia south of the isthmus of Kra. There is a need to get fresh material from the peninsula for safe identification.

And, of course, further species, which are presently unknown, may be expected from other places. Our experience with material from new localities, where nobody had collected before, was always a high percentage of

undescribed species of many genera of Eupterotidae (or also Saturniidae). For example, there are many additional islands on the Sunda Shelf from where no *Tagora* are known at present. We do not expect *Tagora* on basis of present experience to be found on islands to the East

of the Wallace Line. The islands west (in addition to Nias) or northwest of Sumatra (Nicobars, Andamans?) have never been checked for the genus. We do not really expect species from east of Borneo (e.g., Sulawesi island or any Philippine islands beyond Palawan).



Map 2 *Tagora*

Legend for symbols in the map in the order of the checklist

█ (13) *T. obsoleta* Talb., 1926 █ (17) *T. niassana* (Rothsch., 1917) █ (21) *Tagora rufescens* sp. n.

█ (14) *T. polychroma* sp. n. █ (18) *Tagora diehli* sp. n. █ (22) *T. glaucescens* Walker, 1855

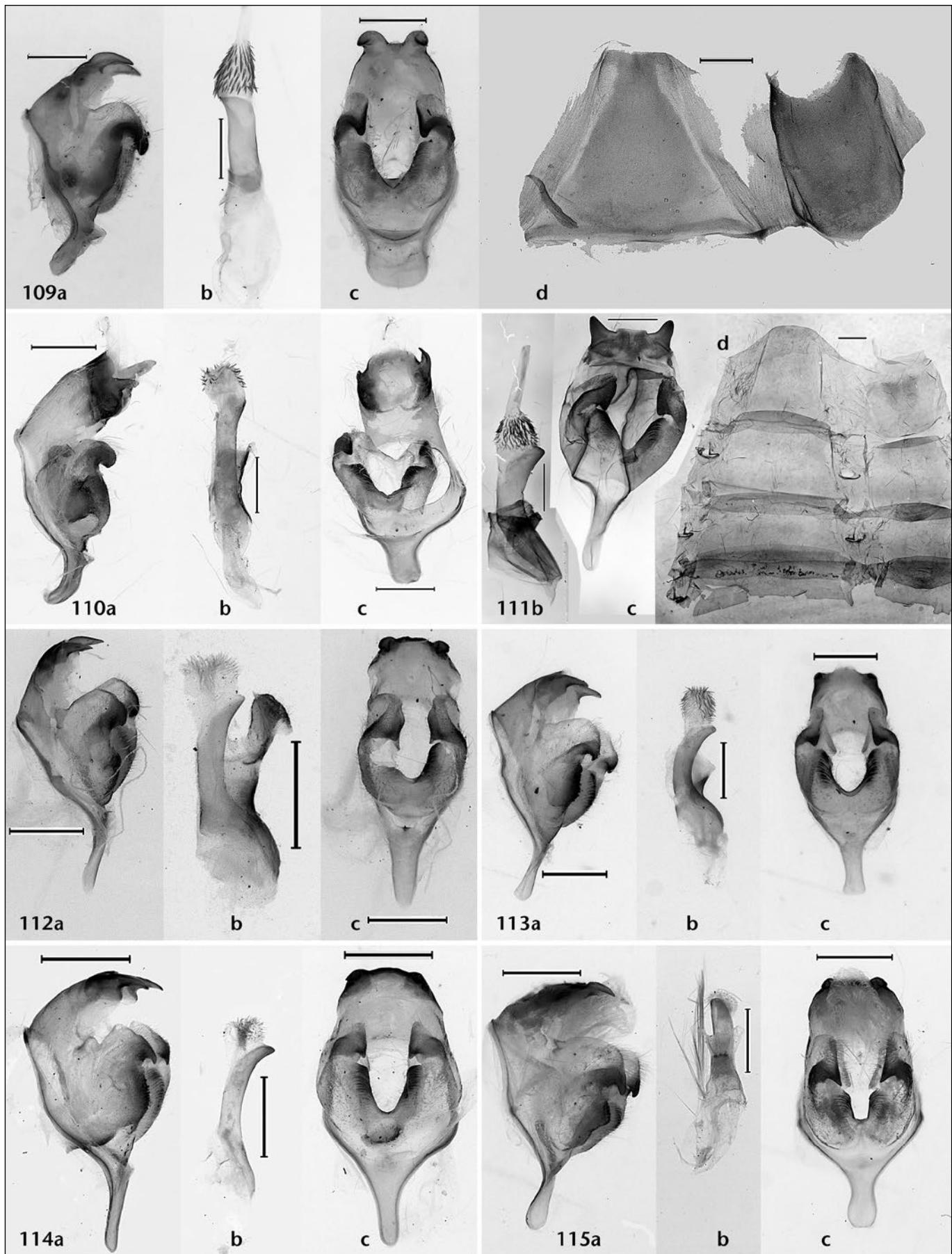
█ (15) *T. acheron* (Mell, 1930) █ (19) *Tagora kobesi* sp. n. █ (23) *Tagora thomasi* sp. n.

█ (16) *T. kalimantana* sp. n. █ (20) *Tagora glaucooides* sp. n. █ undescribed sp. West Malaysia

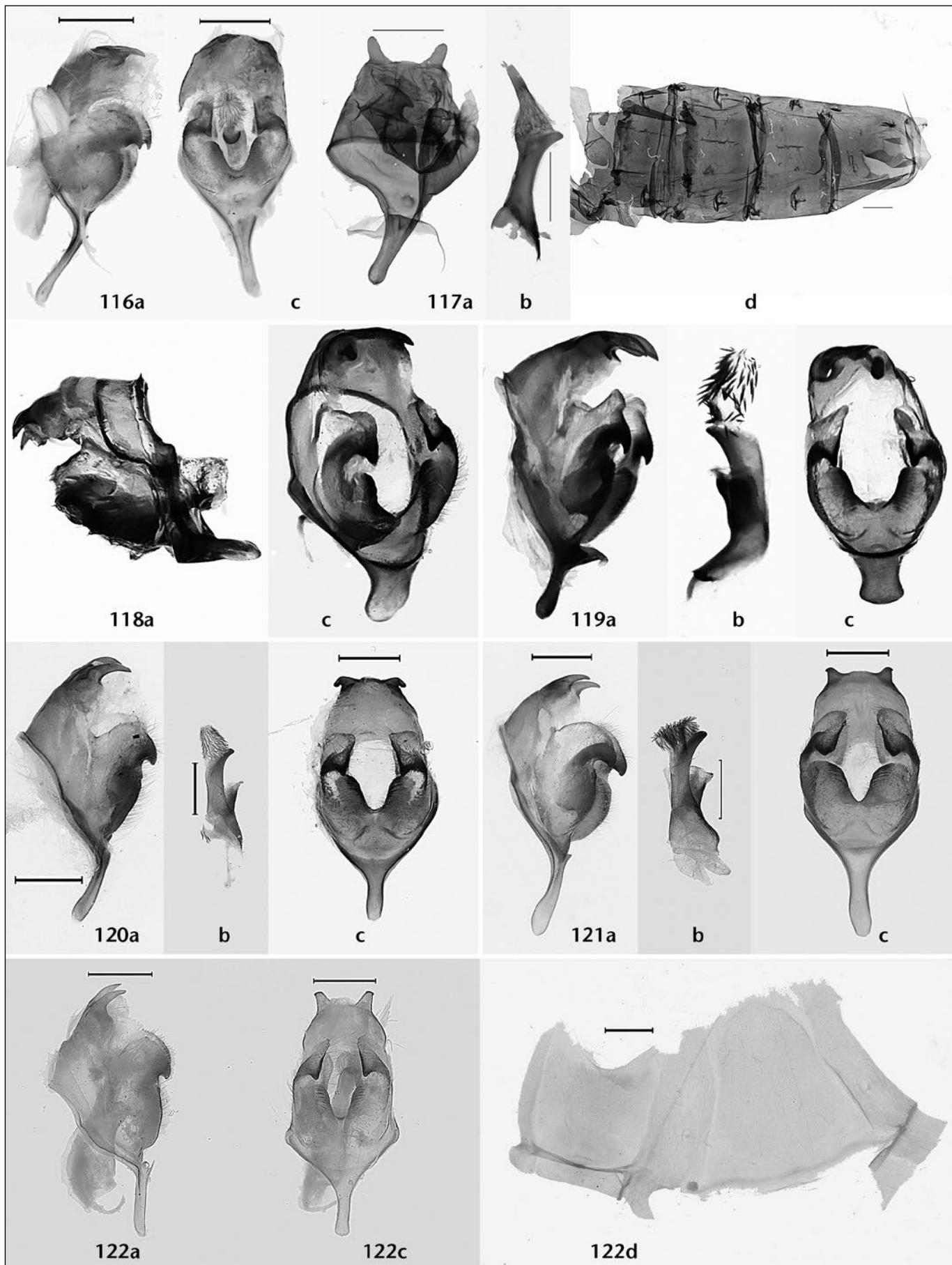
Type locality symbols have a red (or half red) frame, other localities a black frame.

Map 2 *Tagora*: Locality data of *Tagora*, part 2. Not every symbol corresponds to one locality, localities rather closely together may be represented by one symbol only. Not all localities from labels have been found on maps. Colour symbol legend see in Map. — Basic map data by Map Creator 2.0 Personal Edition, © 2003–2007 primap software (Primap.com), modified and localities added.

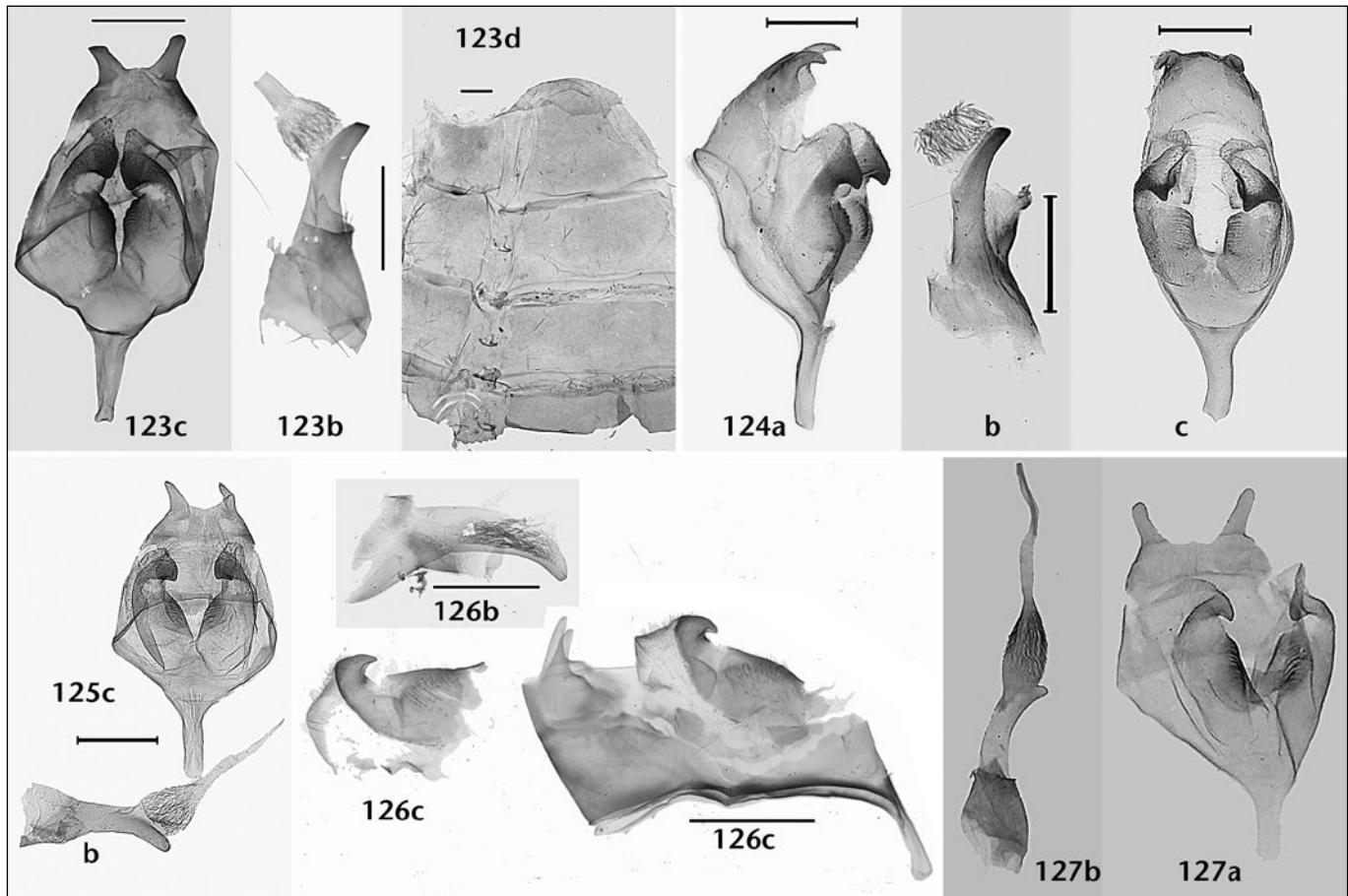
Figs. 109–115: ♂ genitalia of the following *Tagora* spp.: Figs. 109: (8) *T. sinica*, HT, China, E. Hunan, Bamianshan, Guidong, 1800 m, vii. 2001; CWAN, SMFL; GP 2700/21 SNB; a: genitalia, lateral view; b: phallus; c: genitalia, ventral view; d: abdominal pelt (tergites left, sternites right). — Fig. 110: (12) *T. treadawayi*, PT, Philippines, Palawan, Mt. Mantalingahan, 1400 m, 18. & 19. iii. 1999, leg. A. ZWICK & S. VERDEPRADO; GP 2705/21 SNB; CWAN in SMFL. — Fig. 111 [d: abdominal pelt (tergites left, sternites right)]: (13) *T. obsoleta*, LT, Mt. Murud, Sarawak, 6500 ft., Nov. 14th [no year], Dr. E.



MJÖBERG; Eupt. Brit.Mus. [genit.] slide 115; NHMUK014199869; NHMUK. **Fig. 112:** (14) *T. polychroma*, PT, Borneo [E Malaysia, Sabah], Bahagian Pantai Barat, Mt. Kinabalu bei Kg. Tena, 1500 m, LF 15./16. II. 2008, leg. M. HOFFMANN; CSLL in CSNB; GP 2673/21 SNB. — **Fig. 113:** (15) *T. acheron*, Borneo [E Malaysia, Sabah], Kinabalu NP. entrance, 1509 m, 19.–28. III. 2001, leg. S. LOEFFLER; CSLL, in CSNB; GP 2681/21 SNB. — **Fig. 114:** (16) *T. kalimantana*, HT, Borneo [Indonesia, S. Kalimantan], Mt. Meratus, 500–700 m, III. 2005, leg. B. ONGKO; GP 2671/21 SNB. — **Fig. 115:** (19) *T. kobesi*, PT, Sumatra, [Indonesia, N. Sumatra], Prapat, HW3, 20./21. II. 1982, leg. Dr. DIEHL; CWAN, SMFL; GP 2703/21 SNB. — Scale bars 1 mm (not to the same scale). — Photos: 111: A. GIUSTI, NHMUK; others: N. IGNATYEV.

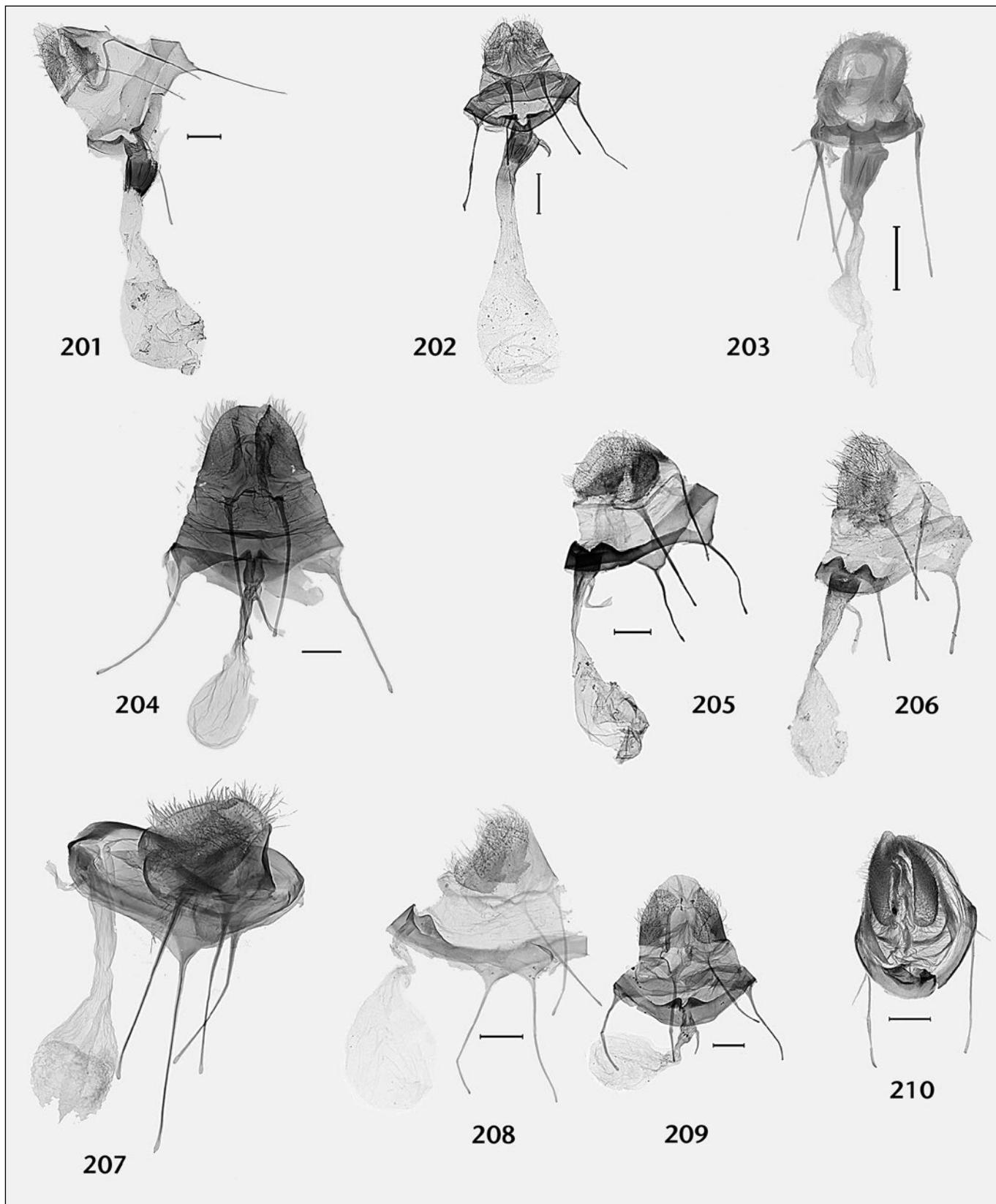


Figs. 116–122: ♂ genitalia of the following *Tagora* spp.: Figs. 116–117: (18) *T. diehli*, [Indonesia], Sumatra, 2 ♂♂. Fig. 116: HT, N. Sumatra, Prapat, HW3 ["logging path 3"], 18. ix. [19]84, Dr. DIEHL leg.; GP 2701/21 SNB (a: lateral, c: ventral [both with phallus not extracted]); CWAN, SMFL. Fig. 117: [PT], W. Sumatra, Lebong Tandai, 1920–1923, C. J. BROOKS, BM 1936-681; NHMUK014199838; Eupt. genit. slide 43 ♂; NHMUK (a: semiventral, b: phallus, d: abdominal pelt, ventral view [sternites]). — Figs. 118: PT (11) *T. javana*, [Indonesia], W-Java, Mt. Halimun, I. 2013; GP 2759/22 SNB; CSNB [phallus lost]. — Figs. 119: (9) *T. pandya*, India, Arunachal Prad., Dist. Passighat, 28 km to Passighat, 600 m, 14.–15. ix. 2012, leg. G. BRETSCHNEIDER;



GP 2760/22 SNB; via CSLL in CSNB]. — **Figs. 120:** HT (20) *T. glaucooides*, Myanmar, Kachin State, Chudu Razi Hills, 30 ml. E Kawnglanghpui, 29. vi. 2007, leg. local collectors; GP 2651/21 SNB; via CSLL in CSNB. — **Figs. 121:** HT (21) *T. rufescens*, India, Arunachal Pradesh, Distr. Along, nr. Rapum to Tato, 1450 m, 23.–26. vii. 2006, leg. G. BRETSCHNEIDER; GP 2649/21 SNB; via CSLL in CSNB. — **Figs. 122:** PT (23) *T. thomasi*, India, Tamil Nadu, Nilgiris, Ooty–Coimbatore rd., 1000 m, 13. viii. 1989, leg. W. THOMAS; GP 2699/21 SNB; CWAN in SMFL (a: lateral, c: ventral [both with phallus not extracted], d: abdominal pelt [sternite left side, tergite right]). — Scale bars (where present) 1 mm (not to the same scale). — Photos: 116, 120–122: N. IGNATYEV; 117: A. GIUSTI, NHMUK; 118, 119: S. NAUMANN.

Figs. 123–125: ♂ genitalia of (22) *Tagora glaucoescens*: **Figs. 123:** HT, India, [West Bengal], Darjeeling; Eupt. B.M. slide 116; BMNH(E) 1626965 (c: ventral, b: phallus, d: abdominal pelt [left side sternites, right tergites]); NHMUK. **Figs. 124:** Nepal, Ganesh Himal, Phikuri Danda, 2500 m, 1. vii. 2010, leg. T. IHLE; GP 2647/21 SNB; ex CSLL in CSNB. **Fig. 125:** China, Tibet, Nyalam, 3000 m, 4.–6. vii. 1998, leg. O. AMMOSOV, via coll. V. SINIAEV; GP Heterocera 17.292 CMWM; [ventral + phallus combined]. — **Figs. 126–127:** (15) *T. acheron*: **Fig. 126:** HT *weberi*: Holotype *Tagora weberi*, det. J.D. HOLLOWAY 1976; [East Malaysia], Sabah, Kundasan, 1050 m, vii.–ix. 1965; Cambridge Expedition to Mt. Kinabalu 1965, H.J. BANKS, H.S. BARLOW & J.D. HOLLOWAY, B.M. 1968-186; KA4; C.E.M.K., Kundasan, 24. viii. [19]65; Eupterot. B.M. GP slide 15 ♂ (one valve broken off), BMNH(E) 1626406; NHMUK. **Fig. 127:** LT *acheron*: [E. Malaysia, Sabah], NO Borneo, Kina Balu, 1200–1500 m, 1893[?], WATERSTRADT; GU 2011-004; MfNB. — Scale bars (where present) 1 mm (not to the same scale). — Photos: 123, 126: A. GIUSTI, NHMUK; 127: V. ZOLOTUHIN; others: N. IGNATYEV.



Figs. 201–210: ♀ genitalia of the following *Tagora* spp.: **Fig. 201:** PT (3) *T. siama*: N. Thailand, Chiang Mai, 7 km W Pa Pae, 1230 m, 21. xi. 1998, leg. T. Csővári & L. Mikus; GP Heterocera 12.800 (♀); CMWM. — **Fig. 202:** PT (4) *T. loeffleri*: N. Vietnam, Cuc Phong, 400 m, 18. xi.–3. xii. 1992, leg. V. SINIAEV & M. SIMONOV; GP Heterocera 17.294 (♀); CMWM. — **Fig. 203:** PT (6) *T. pugaevi*: C. Vietnam, Quang Nam Prov., Tay Giang District, Axan Mt., 1300 m, leg. local collector, ix./xi. 2017; GP 2715/21 SNB; CSNB. — **Fig. 204:** PT (14) *T. polychroma*: Sarawak, Gunong Mulu N.P., R.G.S. Exped 1977-8, J.D. HOLLOWAY et al., B.M. 1978-206; G. Mulu, 1790 m, 452463, 5. i. 1978; Eupterot. B.M. slide No. 90 ♀; NHMUK014199853; NHMUK. — **Fig. 205–206:** (15) *T. acheron*: **Fig. 205:** Sabah, Trus Madi, 1200 m, 1.–14. iv. 2005, leg. MARTINI; ♀ GP Heterocera 11.655, CMWM. **Fig. 206:** PLT *acheron*: [E. Malaysia, Sabah], NO Borneo, Kina Balu, 1200–1500 m, 1893[?, label damaged], WATERSTRADT; PLT ♀; GU 2011-005; MfNB. — **Fig. 207:** HT ♀ (17) *T. niassana*: [Indonesia, Nias], Kalim Bungo, C. Nias, I. [18]96, I. Z. KANNEGIETER; ROTHSCHILD Bequest B.M. 1939-I; BMNH(E) 1627081; Eupterot. B.M. slide 117. — **Fig. 208–209:** (22) *T. glaucescens*: **Fig. 208:** India, Sikkim, Mt. Kanchenjunga SE, 2000 m, 22.–31. vii. 1995, leg. AFONIN & SINIAEV; ♀-GP Heteroc. 12.809, CMWM. **Fig. 209:** Nepal (E), Deorali Danda, 1 km N Yamphudin, 2000 m, 7. viii. 2000, leg. Csővári & HREBLAY; ♀-GP Heteroc. 17.293, CMWM. — **Fig. 210:** PT ♀ (21) *T. rufescens*: India, Arunachal Pradesh, Dist. Along, near Rapum, 1600 m, 21.–23. vii. 2006, leg. G. BRETSCHNEIDER; GP 2714/21 SNB; CSLL, in CSNB, — Scale bars (where present) 1 mm (not to the same scale). — Photos: 204, 207: A. GIUSTI; all other: N. IGNATYEV.

Tab. 2, page 1: pandya-group. — “BC + BIN unknown” = No BC and no BIN available presently. — 12/13 ♀♀ and 1 ♂ plus 6 BIN codes of the 23 species are unknown.

Species of <i>Tagora</i>	(1) <i>Tagora luxi</i>	(2) <i>Tagora ihleorum</i>	(3) <i>Tagora siama</i>	(4) <i>Tagora loeffleri</i>	(5) <i>Tagora ignatyevi</i>	(6) <i>Tagora pugaevi</i>	(7) <i>Tagora zolotuhini</i>	(8) <i>Tagora sinica</i>
BIN Character	BIN: AAU2105	BIN: AAU2102	BIN: AAU2106	BIN: AAU2104	BIN: ADO9232	BIN: AEI6692	BIN: AEI6693	BC + BIN unknown
Fwl. ♂♂	43 mm	43 mm	42–43 mm	34–41 mm	39–43 mm	38–40 mm	41–46 mm	38 mm
Fwl. ♀♀	♀ unknown	♀ unknown	46/48 mm	47/51 mm	♀ unknown	46/49 mm	♀ unknown	♀ unknown
Dorsal colour	light grey, with dark grey ornamentation	ochreous grey, lines almost invisible	dark greyish brown, strong lines	homogenous light greyish brown, dark grey ornamentation	dark greyish brown, strong lines	dark brownish grey, reduced lines	dark greyish to greenish brown, strong lines	light greyish brown ground colour with dark brown pattern
Ventral colour	light greyish brown, strong ornamentation	light reddish brown, ornamentation almost missing	umbra brown, strong ornamentation	light greyish brown, only with median lines visible	yellowish brown, marginal zone more greyish	greyish brown, marginal zone darker grey	dark greyish brown, submarginal area little lighter	darker than ups, more brownish grey
Fw. dorsal postmedian lines	straight, strong dark grey, narrow yellow, very narrow dark grey	straight, strong dark grey, whitish yellow, grey	little bent, strong dark grey, yellow, grey	tiny dark brown, tiny yellow and almost invisible outer line	almost straight, strong dark grey, yellow, dark grey	almost straight, narrow dark grey, yellow, grey	straight, strong dark grey, yellow, narrow dark grey	straight to apex, with broader proximal dark portion, yellow, tiny dark brown
Fw. dorsal submarginal area	almost completely in ground colour	darker than ground colour	in ground colour	in ground colour, more or less indicated dark grey zigzag line	in ground colour, proximally suffused with violet scales	in ground colour, with central dentate black line	in ground colour, with intense dark zigzag line	homogenous, light ground colour, with thin dentate line in center
Hw. dorsal postmedian lines	dark grey, narrow yellow	dark grey, broad yellowish	dark grey, narrow yellow	a little rounded, broad dark grey, narrow yellow	rounded, broad dark grey, narrow yellow	very little rounded, just broad dark grey	rounded, dark brown, yellow, very narrow dark	almost straight, proximal dark and outer yellow portion
Hw. dorsal submarginal area	almost completely in ground colour	in ground colour, with row of black dots	in ground colour, with row of black dots	in ground colour, with central row of black spots along the veins	in ground colour with central row of black spots along the veins	in ground colour, with slightly indicated dentate line, black dots along veins	broad, more greyish than ground colour, dentate dark submarginal line	broad, homogenous light ground colour; a row of small black patches along veins
Ventral postmedian line	fw. concave, hw. rounded	much reduced, almost invisible	dark brown, strong	dark greyish brown, a little dentate	dark brown, fw. concave, hw. dentate	dark brown, fw. concave, hw. convex	dark brown, fw. concave, hw. almost straight	brown, fw convex, hw almost straight, but little dentate
♂ genitalia: uncus	long broad processes, relatively close to each other	long slender processes, close to each other	long slender processes, very close to each other	relatively long processes, close to each other	processes long, close to each other	processes rather short, widely separated from each other	processes long and slender, close to each other	broad stable processes, relatively close to each other, bent sideward
♂ genitalia: valves	strong large dorsal processes, rounded ventral ones	strong dorsal process, small ventral one	strong dorsal process, medium ventral one	dorsal process strongly sclerotized	dorsal and dorsal part of the ventral process strongly sclerotized	dors. process triangular, small, sclerotized, ventr. process rounded, apical sclerotisation	dorsal process slender, small, ventral process large, rounded	dorsal process strongly sclerotized, ventral process straight, less rounded than other species
♂ genitalia: saccus	short, broad	short, broad	short, broad	short, broad	short, broad	short, broad	very broad, rounded	broad, nearly square-like
♂ genitalia: phallus	short, broad, long sclerites	broad, vesica large with long sclerites	broad, vesica with long sclerites	medium-sized sclerites	medium-sized sclerites	medium-sized, long sclerites	medium-sized sclerites	vesica sclerites large
8 th sternite of abdominal pelt	broad sternite with central furcation	broad sternite, laterally rounded tips	broad, square-like, round central indentation	broad sternite with central protuberance	square-like sternite	broad sternite, two long lateral processes, central indentation	broad sternite, tiny lateral processes	broad, rectangular, round central indentation, lateral tips

Tab. 2, page 2: *pandya*-group ((9)–(12)); *niassana/glaucescens*-group, subgroup of *niassana* ((13)–(16)).

Species of <i>Tagora</i>	(9) <i>Tagora pandya</i>	(10) <i>Tagora mizorama</i>	(11) <i>Tagora avana</i>	(12) <i>Tagora treadawayi</i>	(13) <i>Tagora obsoleta</i>	(14) <i>Tagora polychroma</i>	(15) <i>Tagora acheron</i>	(16) <i>Tagora kalimantana</i>
BIN Character	BC + BIN unknown	BIN: AEI6691	BIN: ACU0026	BIN: AAY7650	BC + BIN unknown	BIN: AAU4295	BIN: AAU2103	BIN: AAV7073
Fwl. ♂♂	39–43 mm	39/40 mm	44–46 mm	45–46 mm	33–42 mm	33–41 mm	37–41 mm	39 mm
Fwl. ♀♀	45–50 mm	♀ unknown	♀ unknown	47/49 mm	(?)49 mm	48/49 mm	45 mm	♀ unknown
Dorsal colour	light greyish, weak lines, in ♀♀ little stronger ornamentation	greyish brown, relatively strong ornamentation	light greenish grey, almost black ornamentation, white scales along fw. veins	greyish brown, lines aside postmedian weak	rather rounded fw; greyish brown ground colour, postmedian more violet brown	colourful, reddish brown, violet, greenish grey; yellowish scales along veins at fw. apex, white scales at hw. arrowhead dots at veins	♂♂ greyish olive, with lots of markings; ♀ umbra brown with violet shade, markings with same structure	1 specimen: very similar to <i>T. acheron</i> , but more greenish, with lots of white scales along the veins of both fw. and hw
Ventral colour	greyish brown with strong brown ornamentation	brownish with grey proximal shade	light greenish grey with strong ornamentation	light brown, dark greyish brown ornamentation	homogenous greyish brown	greyish brown with violet markings in postmedian area	♂+♀ reddish to greyish brown, several curved lines	greenish to dark greyish brown with darker markings, legs black
Fw. dorsal postmedian lines	straight, bent backward apically; strong, blackish brown, whitish yellow, narrow dark brown	straight, strong dark brown, yellow, narrow brown	almost straight; blackish brown, apical part black; broad yellow; narrow black	straight, double dark grey, yellowish in between	little bent, broad darker brown, yellow, darker brown	apically rounded, else straight; proximally narrow dark brown, broad yellow, intense dark brown	almost straight, narrow dark brown, broader yellow, medium dark brown	almost straight, proximally broad, yellow, dark brown
Fw. dorsal submarginal area	light grey with tiny dentate dark brown line	homogenous greyish brown	in ground colour, with intense dentate line	in ground colour	homogenous violet brown	proximal half violet, separated by serrate line from the outer brown part	proximal half grey, separated from marginal half in ground colour by dentate line	proximal two thirds light grey, marginal part in ground colour, bordered marginally by white line
Hw. dorsal postmedian lines	little rounded, structure as in fw.	rounded to upper margin, broad dark brown, narrow yellow	very little rounded; blackish, yellow	dark grey, yellowish	rounded, structure as fw	almost straight, little bent near margin; diffuse, yellow, dark brown	little rounded, colour as fw, but a little wider	very little rounded, structure as fw
Hw. dorsal submarginal area	light grey, with narrow dentate line	homogenous greyish brown, with row of dark brown dots along the veins	homogenous light grey, narrow dentate line; black dots along the veins	in ground colour, with wavy dark grey line	homogenous violet brown, with a row of dark patches along the whitish veins	as in fw, with a row of black patches along the whitish veins	greyish, lighter than ground colour; row of white and black patches along veins, connected by dentate line	greyish brown, lighter than ground colour, a row of large white and dark patches along veins
Ventral postmedian line	dark brown, fw. little concave, hw. dentate	dark brown on fw, concave; on hw. almost invisible.	fw. and hw. almost straight, only slightly indicated	dark greyish brown	not visible, but the only known specimen is a little worn	almost invisible, bordered by violet portion of postmedian area	almost invisible, more indicated by light zone in postmedian area	fw. dark brown, bent backward apically to the costa; hw. invisible
♂ genitalia: uncus	long, tall, straight, close processes	processes long, broad, rounded, bases close to each other	processes widely separated, slender, short	processes widely separated to lateral side, short, bent	short rounded processes, widely separated, dorsal plate in between	processes medium-sized, bent, acute	medium-sized and medium-long processes	short processes, widely separated
♂ genitalia: valves	dors. process hammer-like, dors. + ventr. projection; ventr. process strongly sclerotized, little serrate	dorsal and ventral process strong	rounded dorsal process with strong ventral projection, ventral process broad	small dorsal + ventral processes; in general very longitudinally extended genitalia structure	dorsal process broad, almost rectangular, strongly sclerotized	dorsal process slender, acute ventral tip; ventral process short, almost rectangular	dorsal process triangular, ventral process small, rounded	dorsal process with small sclerotized ventral part
♂ genitalia: saccus	very broad, short, rectangular	very broad, short	round, broad, bulb-like	short, straight, with small bulge	long and slender, rounded	long and slender	medium-long, slender	slender
♂ genitalia: phallus	short, long vesica, long sclerites	very short, long vesica, long sclerites	Long, medium-sized sclerites	medium-sized sclerites	broad, short, medium-sized sclerites on vesica	short and broad, short sclerites	medium-sized, sclerites very long	elongate, sclerites short
8 th sternite of abdominal pelt	almost triangular, 2 lateral posteriorly rounded projections	very broad sternite, concave furcation	Small lateral posterior tips, central indentation	very broad sternite	very small sclerotized part, a little triangular	small, with two laterally elongated tips	broad, rectangular, with two lateral tips	sternite broad with lateral tips

Tab. 2, page 3: *niassana/glaucescens*-group, subgroup of *niassana* ((17)–(19)); subgroup of *glaucescens* ((20)–(23)).

Species of <i>Tagora</i>	(17) <i>Tagora niassana</i>	(18) <i>Tagora diehli</i>	(19) <i>Tagora kobesi</i>	(20) <i>Tagora glaucooides</i>	(21) <i>Tagora rufescens</i>	(22) <i>Tagora glaucescens</i>	(23) <i>Tagora thomasi</i>
BIN Character	BC + BIN unknown	BC + BIN unknown	BIN: AAV7072	BIN: AAV7071	BIN: ACG9576	BIN: AAL7623	BC + BIN unknown
Fwl. ♂♂	♂ unknown	38–42 mm	38–41 mm	40 mm	38–45 mm	33–44 mm	38.5/39 mm
Fwl. ♀♀	47–50 mm	♀ unknown	♀ unknown	♀ unknown	44/52 mm	41–46 mm	♀ unknown
Dorsal colour	light grey, greyish black markings and white scales along the veins	light greyish brown, black portion near basal margin, 2 dentate lines in median area, postmedian area whitish	dark greenish grey with white scales along veins in fw, postmedian area more greyish	dark brown suffused with lots of silver scales	fresh ♂♂ dark chocolate brown, suffused with silver scales; fresh ♀♀ little lighter, reddish brown	fresh ♂♂ dark chocolate brown; fresh ♀♀ light reddish to ochreous brown	dark chocolate brown suffused with some bluish white scales
Ventral colour	greyish brown with dark brown markings, 4 dentate lines in median area	light greyish brown in proximal half, darker brown in posterior half	homogenous greyish brown, postmedian darker brown, proximal postmedian area with violet scales	dark reddish chocolate brown	♂♂ dark chocolate brown, ♀♀ similar to dorsal side	♂♂ dark reddish brown, ♀♀ similar to dorsal side	dark reddish brown, almost no markings aside of postmedian line
Fw. dorsal postmedian lines	almost straight, apically little bent; proximally broad black, narrow yellow, black	a little rounded, bent backward apically; narrow dark brown, yellow, brown	almost straight, proximally thin black line, narrow yellow, prominent black	straight, inner orange, marginally dark brown portion, wide silvery white portion in postmedian area	little rounded, intense dark brown, orange, again brown, tiny silver shade in postmedian area	almost straight, intense dark brown, yellow, black, with silver shade in postmedian area	little rounded, tiny dark brown, orange, wider brown; small bluish white shade in postmedian area
Fw. dorsal submarginal area	interrupted irregular black line	light grey, marginal third in ground colour	proximal half greyish white, with dentate central line	broad proximal silver shade, no submarginal line	in ground colour, silver shade proximally	small silver shade, central tiny dentate line	broad silver violet shade, central black dentate line
Hw. dorsal postmedian lines	little rounded, structure as fw	little rounded, structure as fw	almost straight, structure as fw	almost straight, colour as in fw, with brown proximal shade	rounded, colour as fw	little rounded, coloured as fw	rounded, colour as fw, with wide bluish white shade in postmedian area
Hw. dorsal submarginal area	a row of small black patches along veins	greyish brown, with dentate line and small back dots along veins	proximal two thirds greyish white, marginal portion ground colour	row of tiny black lines along veins	row of black lines along veins	tiny, dentate, blackish	tiny, dentate
Ventral postmedian line	almost straight, brown, bent at costal margin	rounded, dark brown, dentate white submarginal band	almost straight, broad dark brown	row of white semicircles between the veins	only slightly indicated as row of darker and white scales	row of black semicircles with inner white scales	row of dark triangles between veins
♂ genitalia: uncus	(no ♂ genitalia available)	slender, delicate processes	short, small processes, widely separated	tall acute processes, a little separated, margin in between rounded	tall acute processes, wider separated than in <i>T. glaucescens</i>	Long acute processes, little separated from each other	short processes, relative widely separated
♂ genitalia: valves	(no ♂ genitalia available)	dorsal process with small ventral knob	dorsal process with ventral central protuberance, ventral process small	dorsal process with triangularly acute ventral projection, ventral process short, rounded	dorsal process with triangular ventral projection, marginal indentation, ventral process rounded	dorsal process with triangular ventral projection, ventral process rounded, with sclerotized margin	dorsal process rectangular with small spikes on margin, ventral process short
♂ genitalia: saccus	(no ♂ genitalia available)	long, slender	short, rounded	slender, shorter than in <i>T. glaucescens</i> or <i>T. rufescens</i>	long, slender, bulbous and rounded at its end	long, slender, with rectangular end	long, slender
♂ genitalia: phallus	(no ♂ genitalia available)	tiny sclerites	small vesica, short sclerites	short, slender, almost straight, vesica with proximal sclerites	short, slender, sclerites only on proximal part of vesica	short, slender, with sclerites only on the proximal part of vesica	short, broad, with few sclerites
8 th sternite of abdominal pelt	(no ♂ genitalia available)	almost square-like, medium sclerotisation	central deep indentation, two lateral tips	abdominal pelt decayed, destroyed during prep.	abdominal pelt decayed, destroyed during prep.	little triangular, lateral short process	relatively broad sternite

Checklist of the revised genus *Tagora*

According to our present knowledge, the genus *Tagora* WALKER, 1855 consists of 23 separate species (7 of which had been described earlier, with 2 of them being synonyms summing up to 5 already described species) and 18 new species as identified by us.

Tagora WALKER, 1855

Tagora: WALKER (1855b: 1188[–1190]). — Type species (by subsequent designation by MOORE 1883: 142, see FLETCHER & NYE 1982: 158): *Tagora glaucescens* WALKER, 1855.

= *Mallarctus*: MELL (1930: 458), **syn. rev.** — Type species (subsequently designated by FORBES 1955: 130, see FLETCHER & NYE 1982: 96): *Tagora pandya* MOORE, 1865 [*sensu* MELL].

Species-group of *T. pandya*

(1) *Tagora luxi*, sp. n.

BOLD BIN: AAU2105 (based on BC SNB 2431, 5564, EUPT-11-094). — L.t.: Laos, Oudumxai. Distribution: Laos, N. Thailand. HT ♂ in SMFL. — ♀ so far unknown.

(2) *Tagora ihleorum*, sp. n.

BOLD BIN: AAU2102 (based on BC SNB 2432). — L.t.: Thailand, Chiang Mai. Distribution: N. Thailand. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

(3) *Tagora siama*, sp. n.

BOLD BIN: AAU2106 (based on BC SNB 2433, 5559). — L.t.: Thailand, Chiang Mai, Doi Suthep. Distribution: N. Thailand. HT ♂ in SMFL.

(4) *Tagora loeffleri*, sp. n.

BOLD BIN: AAU2104 (based on BC SNB 2430, BC-TB 6853). — L.t.: Vietnam (N), Bac Kan Prov. Distribution: N. Vietnam, SE China. HT ♂ in CSNB, designated to MfNB.

(5) *Tagora ignatyevi*, sp. n.

BOLD BIN: ADO9232 (based on BC SNB 6094). — L.t.: Vietnam (SC), Kon Tum Prov. Distribution: SC Vietnam. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

(6) *Tagora pugaevi*, sp. n.

BOLD BIN: AEI6692 (based on BC SNB 6878, 7044). — L.t.: Vietnam (C), Quang Ngai Prov. Distribution: C. Vietnam. HT ♂ in CSNB, designated to MfNB.

(7) *Tagora zolotuhini*, sp. n.

BOLD BIN: AEI6693 (based on BC SNB 6876, 6877). — L.t.: Vietnam (S), Lam Dong. Distribution: S. Vietnam. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

(8) *Tagora sinica*, sp. n.

BOLD: BC and BIN not yet known (BC SNB 7215 without result so far). — L.t.: China, E. Hunan. HT ♂ in SMFL. — ♀ so far unknown.

(9) *Tagora pandya* MOORE, 1865

Tagora pandya MOORE, 1865(: 807).

BOLD: BC and BIN not yet known (too old, no recent material available). — L.t.: “N.E. Bengal”. Distribution: SE Himalaya foothills [NE India (West Bengal, Sikkim, Meghalaya, Arunachal Pradesh), Bhutan]. HT ♂ in NHMUK.

= *Ganisa* [sic] *pallida* BUTLER, 1881(: 65, pl. XCVI fig. 3), **syn. rev.** — L.t.: “Bhotan” = Bhutan. HT ♂ in NHMUK.

(10) *Tagora mizorama*, sp. n.

BOLD BIN: AEI6691 (based on BC SNB 6880, 6881). — L.t.: India, Mizoram, Blue Mountains. Distribution: only known from Lt. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

(11) *Tagora javana*, sp. n.

BOLD BIN: ACU0026 (based on BC SNB 5558, 6949, 6950). — L.t. E-Java. Distribution: Indonesia, Java. HT ♂ in SMFL. — ♀ so far unknown.

(12) *Tagora treadawayi*, sp. n.

BOLD BIN: AAY7650 (based on SNB 5560, 5561, DNA EUPT-11/093, 11/097, 11/098 CMWM). — L.t. S-Palawan, Mt. Gantung. Distribution: Philippines, Palawan island. HT ♂ in SMFL.

Species-group of *T. niassana/glaucescens*, subgroup of *niassana*

(13) *Tagora obsoleta* TALBOT, 1926

Tagora glaucescens [sic] *obsoleta*: TALBOT (1926: 144).

BOLD: BC and BIN unknown so far. — L.t.: “[Borneo, Sarawak]”. Distribution: E. Malaysia, N. Borneo (Sarawak, Mt. Murud; Gng. Mulu). — LT ♂ (here designated) in NHMUK. — ♀ so far not safely identified.

(14) *Tagora polychroma*, sp. n.

BOLD BIN: AAU4295 (based on 9 specimens: BC SNB 2426, 2427, 2428, 6906, 6908, EUPT-11-189, 2011.363, 2011.364, 2011.365). — L.t.: E. Malaysia, Borneo: Sabah, Mt. Kinabalu NP. Distribution: N. Borneo: Sabah, Sarawak, Brunei. HT ♂ in MfNB. — ♀ so far unknown.

(15) *Tagora acheron* (MELL, 1930), comb. rev.

Mallarctus [sic] *pandya acheron* MELL (1930: 462).

BOLD BIN: AAU2103 (from BC SNB 2429, EUPT-11-095, 11096). — L.t.: [Malaysia, Sabah,] “NO Borneo, Kina Balu”. Distribution: N. Borneo: Sabah, Sarawak. LT ♂ (here designated) in MfNB.

= *Tagora weberi* HOLLOWAY (1976: 54, fig. 353, pl. 19: 227), **syn. n.** — L.t.: Borneo, Sabah, Kundasan. Distribution: N. Borneo. HT ♂ in NHMUK.

(16) *Tagora kalimantana*, sp. n.

BOLD BIN: AAV7073 (based on BC SNB 2420). — L.t. & distribution: Indonesia, SE Kalimantan, Mt. Meratus. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

(17) *Tagora niassana* (ROTHSCHILD, 1917), stat. rev.

Pandala [sic] ≠ *pandaya* [sic] *niassana* ROTHSCHILD (1917: 486).

BOLD: BC and BIN unknown so far. — L.t.: Indonesia, “Nias, Kalim Bungo”. Distribution: Nias Island. HT ♀ in NHMUK. — ♂ so far unknown.

(18) *Tagora diehli*, sp. n.

BOLD: BC and BIN unknown so far. — L.t.: Indonesia, N. Sumatra, Prapat. Distribution: N. and W. Sumatra. HT ♂ in SMFL. — ♀ so far unknown.

(19) *Tagora kobesi*, sp. n.

BOLD BIN: AAV7072 (based on SNB 2419). — L.t. Indonesia, N. Sumatra, Prapat. Distribution: Indonesia, N. Sumatra; West Sumatra. HT ♂ in CSNB, designated to MfNB. — ♀ so far unknown.

Species-group of *T. niassana/glaucescens*, subgroup of *T. glaucescens*

(20) *Tagora glaucoidea*, sp. n.

BOLD BIN: AAV7071 (based on SNB BC 2424). — L.t. & Distribution: Myanmar, Kachin State, Chudu Razi Hills. HT ♂ in CSNB, designated to MFNB. — ♀ so far unknown.

(21) *Tagora rufescens*, sp. n.

BOLD BIN: ACG9576 (based on BC SNB 2421). — L.t.: India, Arunachal Pradesh, Distribution: India: Arunachal Pradesh; China: Tibet. — HT ♂ in CSNB, designated to MFNB.

(22) *Tagora glaucescens* WALKER, 1855

Tagora glaucescens WALKER (1855b: 1188).

BOLD BIN: AAL7623 (SNB 2465, 2466, BC-TB 6755, SNB 2422). — L.t.: "Himalaya" [WALKER], "Darjeeling" [MOORE 1865]; Distribution: Southern slopes and foothills of the NE Himalaya from Nepal over India: West Bengal, Sikkim; China: Tibet; and Bhutan to western Arunachal Pradesh; HT ♂ (by monotypy) in NHMUK.

(23) *Tagora thomasi*, sp. n.

BOLD: BC and BIN unknown so far. — L.t. & Distribution: India, Tamil Nadu, Nilgiris. HT ♂ in SMFL. — ♀ so far unknown.

Acknowledgements

Information, literature, field experience, photos, technical support and original material were provided over the last years by many different persons. We would like to thank the following colleagues in institutions: Alessandro GIUSTI, Jeremy D. HOLLOWAY and Ian J. KITCHING in NHMUK London; Théo LÉGER, Wolfram MEY and Viola RICHTER in MfN Berlin; Rodolphe ROUGERIE in MNHN Paris; Dieter STÜNING, formerly MAK Bonn; Axel HAUSMANN and Ulf BUCHSBAUM in ZSM, Munich; Andreas ZWICK in CSIRO, Canberra; and the late Colin G. †TREADAWAY and Massimo TERRAGNI in SMFL, Frankfurt am Main. The former team of the late Vadim V. †ZOLOTUHIN (then Ulyanovsk) made kindly all information about their earlier studies on the genus available to us, mainly resulting from the extensive collection of the late Thomas J. †WITT (CMWM) and from SMFL, but also from the private collection of Vadim †ZOLOTUHIN which is kept at the moment by Julia VOLKOVA (Ulyanovsk State University) to clean it from dermestids. Nikolay IGNATYEV (České Budějovice) helped a lot with searching for material in Museum WITT in Tengstrasse, München, preparing and photographing genitalia structures, and he and Sergei PUGAEV (Moscow), the two former Eupterotidae candidates of V. ZOLOTUHIN, allowed us to use the earlier results. Harald SULAK (CMWM and Weiden) kindly arranged a loan of the *Tagora* collection from CMWM and provided photos. Alexey M. PROZOROV (USTTB, Bamako, Mali) together with Rodolphe ROUGERIE made the older DNA barcoding results of other researchers available to us.

Many thanks to Swen LÖFFLER (Lichtenstein/Sachsen) for presenting his collection to the senior author. Swen had accumulated a huge Eupterotidae collection during his entomological activity, which is a big chance to study the family with relatively recent material. The following

other private persons helped a lot with presenting and discussing material, field experience and/or photos to us: Gil BRETSCHNEIDER (Lichtenstein/Sachsen, Germany); Siegfried IHLE (Filderstadt, Germany); Thomas IHLE (Chiangmai, Thailand); the late Stefan †KAGER (then Nürnberg, Germany); the late Lutz †KOBES (then Göttingen, Germany); Harald Lux (first Oberursel, later Berlin, Germany); Tomas MELICHAR (Příbram, Czech Republic); Peter SMETACEK (Bhimtal, India); the late Colin G. †TREADAWAY (then Limbach-Wagenschwend, Germany, respectively Derby, UK; his collection is after his moving to UK now in SMFL Frankfurt am Main); and the late Werner †THOMAS (then Langgöns, Germany, who in the 1980s travelled a lot in India and laid the basis for the Indian Saturniidae, Brahmaeidae and Eupterotidae collection in CWAN, now in SMFL).

All NHMUK drawer, specimen or genitalia photographs are © Trustees of the Natural History Museum London, reproduced with permission. Thanks a lot to Alessandro GIUSTI for his great assistance with a lot of photos, and also to Harald SULAK for earlier drawer photos from the museum in London. Thanks also to the other institutions for allowing us to publish the photos of specimens and preparations under their curation (© by the respective institutions).

References

- BECCALONI, G., SCOBLE, M., KITCHING, I. J., SIMONSEN, T., ROBINSON, G. S., PITKIN, B., HINE, A., & LYAL, C. (2005–2018): The Global Lepidoptera Names Index. — URL: www.nhm.ac.uk/our-science/data/lepinindex/search. — Database last updated 1. 2018, with small further corrections after that date (last accessed: 18. v. 2022).
- BUTLER, A. G. (1881): Illustrations of typical specimens of Lepidoptera Heterocera in the collection of the British Museum, Part V. — London (Trustees of the BMNH), xii + 74 pp., pls. LXXVIII-C.
- (1882): Descriptions of new species of heterocerous Lepidoptera from Madagascar. — Cistula entomologica, London, 3 (26): 1–27.
- CHANDRA, K., KUMAR, V., SINGH, N., RAHA, A., & SANYAL, A. K. (2019): Assemblages of Lepidoptera in Indian Himalaya through long term monitoring plots. — Kolkata (Zoological Survey of India), vii + 457 pp.
- COTES, E. C., & SWINHOE, C. (1887): A catalogue of the moths of India, Pt. II, Bombyces. — Calcutta (Trustees of the Indian Museum), pp. 41–256.
- DIEHL, E. W. (1980 [1982]): Die Sphingiden Sumatras. Ergebnisse einer fast 20jährigen Sammeltätigkeit im Raum um Medan (Nord-Sumatra). — Heterocera Sumatrana, Göttingen, 1: vi + 97 pp.
- DIERL, W. (1975): Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Einige Familien der „bombycomorphen“ Lepidoptera. — Entomologica Basilensis, Basel, 1: 119–134.
- FLETCHER, D. S., & NYE, I. W. B. (1982): Volume 4, Bombycoidea, Mimallonioidea, Castnioidae, Sesioidae, Coccoidea, Sphingidae, Zygaenoidea. — In: NYE, I. W. B. (ed.), The generic names of moths of the world. — London (Trustees of the BMNH), frontispiece, xiv + 192 pp.

- FORBES, W. T. M. (1955): The subdivision of the Eupterotidae (Lepidoptera). — *Tijdschrift voor Entomologie*, Leiden, **98** (2): 85–132.
- HAMILTON, C. A., ST. LAURENT, R. A., DEXTER, K., KITCHING, I. J., BREINHOLT, J. W., ZWICK, A., TIMMERMANS, M. J. T. N., BARBER, J. R., & KAWAHARA, A. Y. (2019): Phylogenomics resolves major relationships and reveals significant diversification rate shifts in the evolution of silk moths and relatives. — *BMC Evolutionary Biology* [online journal], **19**: 182 [doi.org/10.1186/s12862-019-1505-1].
- HAMPSON, G. F. (1893 [*NEC* “1892”]): The fauna of British India, including Ceylon and Burma. Moths, vol. 1. — London (Taylor & Francis), xxiii + 527 pp.
- HOLLOWAY, J. D. (1976): Moths of Borneo with special reference to Mount Kinabalu. — Kuala Lumpur (Malayan Nature Society, Sabah Foundation), 264 pp.
- (1982): Taxonomic appendix. — Pp. 174–253 plus genitalia drawings in: BARLOW, H. S., An introduction to the moths of South East Asia. — Kuala Lumpur (the author), ix + 305 pp, 50 col. pls.
- (1987): The moths of Borneo, part 3, [internal title: Superfamily Bombycoidea], Lasiocampidae, Eupterotidae, Bombycidae, Brahmaeidae, Saturniidae, Sphingidae. — Kuala Lumpur (Southdene Sdn. Bhd.), 200 pp., 18 b.&w. pls., 20 col. pls.
- (2018): Lutz Kobes and Heterocera Sumatrana – an appreciation. — *Mitteilungen der Münchener Entomologischen Gesellschaft*, München/Munich, **108**: 31–38.
- , KIBBY, G., & PEGGIE, D. (2001): The families of Malesian moths and butterflies (Fauna Malesiana Handbook 3). — Leiden, Boston, Köln (Brill), xi + 455 pp.
- HOU T. (1983): Eupterotidae. — Pp. 431–433, col. pls. 149–152 in: ZHU H.-F., WANG L., HOU T. & ZHANG B. (eds.), *Iconographia Heterocerorum Sinicorum*, IV. — Beijing (Science Press), pp. i–ii, 391–484, col. pls. 119–152 [in Chinese].
- ICZN [INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE, ed.] (1999): International Code of Zoological Nomenclature, fourth edition, adopted by the International Union of Biological Sciences. — London (International Trust for Zoological Nomenclature, NHMUK), xxix + 306 pp. — *The Code can also be found in the WWW under iczn.org, including actual amendments.*
- KIRBY, W. F. (1892): A synonymic catalogue of Lepidoptera Heterocera (moths). Vol. I, Sphinges and Bombyces. — London (Gurney & Jackson), Berlin (R. Friedländer), 951 pp.
- [*Remark: The BHL pdf copy (ex lib. W. SCHAUER) is bound together with: STRECKER, H. (1899), Index of species to KIRBY’s synonymic catalogue of Lepidoptera Heterocera, vol. I, Sphinges and Bombyces. — Reading (PA., USA), 45 pp.*]
- KISHIDA, Y., & ZOLOTUHIN, V. V. (2020): Eupterotidae. — Pp. 101–103, pls. 41–43 in: KISHIDA, Y. (ed.), Moths of Laos, Part 1. — Tinea, Tokyo, **25** (*Suppl. 2*), pp. 1–224, col. pls. 1–94.
- KITCHING, I. J., ROUGERIE, R., ZWICK, A., HAMILTON, C. A., ST. LAURENT, R. A., NAUMANN, S., BALLESTEROS MEJIA, L., KAWAHARA, A. Y. (2018): A global checklist of the Bombycoidea (Insecta: Lepidoptera). — *Biodiversity Data Journal*, Sofia, **6**: e22236 [DOI: doi.org/10.3897/BDJ.6.e22236], with the systematic namelists to be found in a table in “Supplementary material 1” (in Excel format).
- KOBES, L. W. R. (2004): Obituary Dr. med. Eduard W. DIEHL, 12th February 1917–18th August 2003. — *Heterocera Sumatrana*, Göttingen, **12** (4): 185–187.
- LEMAIRE, C., & MINET, J. (1999): 18. The Bombycoidea and their relatives, pp. 321–353 in: KRISTENSEN, N. P. [ed.], *Handbuch der Zoologie. Handbook of zoology. Volume IV. Arthropoda: Insecta. Part 35. Lepidoptera, moths and butterflies. Volume 1. Evolution, systematics, and biogeography*. — Berlin, New York (Walter de Gruyter), x + 491 pp.
- LEMÉE, A. (with contributions by W. H. T. TAMS) (1950): Contribution à l’étude des lépidoptères du Haut-Tonkin (Nord-Vietnam) et de Saïgon. — Paris (Lechevalier), London (Wheldon & Wesley), 82 pp., 1 pl.
- MELL, R. (1930 [*NEC* “1929”]): Beiträge zur Fauna sinica. V. Die Brahmaeiden und Eupterotiden Chinas. — *Deutsche Entomologische Zeitschrift*, Berlin, **1929** (5): 337–494, pls. III–XII. [URL: www.zobodat.at/pdf/Deutsche-Ent-Zeitschrift_1929_0337-0494.pdf, downloaded 11. v. 2018.]
- [*Remark: For the correct publication date, see the date imprint on the envelope of Heft V (= 5), not visible in the Zobodat PDF copy of the DEZ, but in originally bound volumes including these envelopes in some libraries. “1929” is the volume number, but the last (= 5th) part of the volume was printed and published only in 1930.*]
- MOORE, F. (1865): 12. On the lepidopterous insects of Bengal. — *Proceedings of the Zoological Society of London*, London, **1865**: 755–823, pls. XLI–XLIII.
- (1877): Descriptions of Ceylon Lepidoptera. — *The Annals and Magazine of Natural History, including Zoology, Botany, and Geology*, London, (4) **20** (118): 339–348.
- (1879): Descriptions of Indian Lepidoptera Heterocera from the collection of the late Mr. W. S. ATKINSON. — Pp. 5–88 in: HEWITSON, W. C., & MOORE, F. [with an Introduction by A. GROTE], *Descriptions of Indian Lepidoptera from the collection of the late Mr. W. S. ATKINSON, part 1*. — Calcutta (Asian Society of Bengal), xi + 88 pp.
- (1883 [*“1882–83”*]): Family Lasiocampidae. — Pp. 137–152 in: *The Lepidoptera of Ceylon*, vol. 2. — London (L. Reeve & Co.), viii + 162 pp., pls. 72–143.
- NÄSSIG, W. A. (2000): A new and remarkable species of *Eupterote* from the mountains of West Sumatra (Lepidoptera: Eupterotidae). — *Heterocera Sumatrana*, Göttingen, **12** (2): 67–77.
- , IGNATYEV, N. N., & WITT, T. J. (2009): Two new species of the genus *Ganisa* WALKER, 1855 from Sulawesi and Flores, Indonesia (Lepidoptera: Eupterotidae). — *Entomofauna, Ansfelden*, **30** (25): 453–464.
- , & NAUMANN, S. (2021): Revisional notes on *Palirisa lineosa* (WALKER, 1855) and its closest relatives, with the description of seven new species and the separation of the new genus *Mellirisa* gen. n. (Lepidoptera: Eupterotidae, Eupterotinae). — *Nachrichten des Entomologischen Vereins Apollo*, Frankfurt am Main, N.F. **42** (1/2): 51–73.
- , & OBERPRIELER, R. G. (2007): The nomenclature of the family Eupterotidae (Bombycoidea). — *Nota lepidopterologica*, Dresden, **30** (2): 315–327.
- , & — (2008): An annotated catalogue of the genera of Eupterotidae (Insecta, Lepidoptera, Bombycoidea). — *Senckenbergiana biologica*, Frankfurt am Main, **88** (1): 53–80. — Errata et addenda: *Senckenbergiana biologica*, Frankfurt am Main, **88** (2): 124 (with separate additional Corrigenda).
- , & SCHULZE, C. H. (2007): A second species with diurnal males of the genus *Eupterote* from Indonesia: *Eupterote* (*Eupterote*) *splendens* sp. n. from Sulawesi (Insecta, Lepidoptera, Bombycoidea, Eupterotidae). — *Senckenbergiana biologica*, Frankfurt am Main, **87** (2): 189–194.
- , & SPEIDEL, W. (2007): On the authorships of the Lepidoptera atlas of the “Reise der Novara”, with a list of the Bombycoidea [s. l.] therein described (Insecta, Lepidoptera, Bombycoidea). — *Senckenbergiana biologica*, Frankfurt am Main, **87** (1): 63–74.

- NAUMANN, S., & LÖFFLER, S. (2015): A new species of the genus *Antheraea* HÜBNER, 1819 ("1816") from Tibet (Lepidoptera: Saturniidae). — The European Entomologist, Příbram (CZ), **7** (1): 15–26.
- , & NÄSSIG, W. A. (2010): Two species in *Saturnia* (*Rinaca zuleika* HOPE, 1843 (Lepidoptera: Saturniidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **31** (3): 127–143.
- , —, & ROUGERIE, R. (2020): *Tibetanja tagoroides* gen. et sp. n., a new genus and species from Tibet (Lepidoptera, Eupterotidae). — Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. **41** (3/4): 147–153.
- OBERPRIELER, R. G., NÄSSIG, W. A., & EDWARDS, E. D. (2003): *Ebbepterote*, a new genus for the Australian *Eupterote expansa* (T. P. LUCAS), with a revised classification of the family Eupterotidae (Lepidoptera). — Invertebrate Systematics, Canberra, **17**: 99–110.
- RATNASHINGHAM, S., & HEBERT, P. D. N. (2013): A DNA-based registry for all animal species: The Barcode Index Number (BIN) system. — PLoS ONE **8** (8): e66213; doi: 10.1371/journal.pone.0066213.
- ROTHSCHILD, W. Lord (1917): Some new moths of the families Arctiidae and Eupterotidae. — Novitates Zoologicae, Tring, **24**: 475–492.
- SAITOU, N., & NEI, M. (1987): The neighbor-joining method: A new method for reconstructing phylogenetic trees. — Molecular Biology and Evolution, Oxford, **4**: 406–425.
- SCHMIDT-KOEHL, W. (2003): In Memoriam Dr. Eduard W. DIEHL (1917–2003), Erinnerungen an seine Saarbrücker Jahre. — Abhandlungen der Delattinia, Saarbrücken, **29**: 5–8.
- SCOBLE, M. J. (1995): The lepidoptera: Form, function, and diversity. — London & New York (The Natural History Museum in association with Oxford University Press), xi + 404 pp., 4 col. pls.
- SEITZ, A. [family introduction], & STRAND, E. [systematic text] (1922): 10. Familie: Eupterotidae. — Pp. 417–432, pls. 31, 36, 37, 56B, 57 in: SEITZ, A. (1911–1933, ed.), Die Gross-Schmetterlinge der Erde. Eine systematische Bearbeitung der bis jetzt bekannten Gross-Schmetterlinge. Band **10**, Die indo-australischen Spinner und Schwärmer. — Stuttgart (A. Kernen), IX + 909 pp. text, VII pp. + 104 col. pls.
- STÜNING, D., HAUSMANN, A., & WIERIG, E. (2017): In Memoriam Lutz KOBES (* 26.08.1933, † 21.07.2016). — Nachrichtenblatt der Bayerischen Entomologen, München, **66** (1/2): 34–40.
- SWINHOE, C. (1892): Catalogue of eastern and australian Lepidoptera Heterocera in the collection of the Oxford University Museum, part 1, Sphinges and Bombyces. — Oxford (Clarendon), viii + 324 pp., 8 pls.
- TALBOT, G. (1926): X. — On some families of Heterocera collected in Sarawak. — Sarawak Museum Journal, Kuching, **3** (pt. 2) (9): 129–146.
- TAMURA, K., DUDLEY, J., NEI, M., & KUMAR, S. (2007): MEGA4: Molecular Evolutionary Genetics Analysis (MEGA) software version 4.0. — Molecular Biology and Evolution, Oxford, **24**: 1596–1599.
- , PETERSON, D., PETERSON, N., STECHER, G., NEI, M., & KUMAR, S. (2011): MEGA5: Molecular evolutionary genetics analysis using maximum likelihood, evolutionary distance, and maximum parsimony methods. — Molecular Biology and Evolution, Oxford, **28** (10): 2731–2739.
- WALKER, F. (1855a): List of the specimens of lepidopterous insects in the collection of the British Museum, Part 4; Lepidoptera Heterocera. — London (Trustees of the BMNH), [3 pp. +] pp. 777–976.
- (1855b): List of the specimens of lepidopterous insects in the collection of the British Museum, Part 5; Lepidoptera Heterocera. — London (Trustees of the BMNH), [3 pp. +] pp. 977–1257.
- ZOLOTUHIN, V. V., PUGAEV, S. N., & TRAN THIEU DU (2020): A review of *Apha floralis* species group (Lepidoptera: Eupterotidae). — Acta Biologica Sibirica, Sofia, **6**: 611–635 (doi.org/10.3897/abs.6.e59529).
- ZWICK, A. (2008): Molecular phylogeny of Anthelidae and other bombycoid taxa (Lepidoptera: Bombycoidea). — Systematic Entomology, London, **33**: 190–209.
- , REGIER, J. C., MITTER, C., & CUMMINGS, M. P. (2011): Increased gene sampling yields robust support for higher-level clades within Bombycoidea (Lepidoptera). — Systematic Entomology, London, **36**: 31–43.

Systematic index (scientific names)

Legend

bold page numbers = important chapters

normal page numbers = just somewhere in text

bold Italics (mostly in *Tagora*) = illustrations (Figs.), maps, graphics, notes etc.

Compare also the Checklist of all species on pp. 58–59.

Generic names in *Tagora*

Mallarctus 1, 3, 6 [syn. of *Tagora*]; 11 [generic chapter; synonym of *Tagora*]; 12, 13, 21, 34; 39 [larval painting “*Mallarctus pandya*” sensu MELL]; 48, 49; 58 [checklist]

Tagora nearly on every single page; main important chapters: 11 [generic chapter]; 58 [checklist]

Specific names in *Tagora*

acheron 6, 11, 12, 29; 31 [Figs. 37–39]; 33 [misidentification]; 32, 33; 34 [taxon chapter; description]; 35 [Figs. 40–43]; 36; 37 [species on Borneo]; 38; 50 [map 2]; 51 [B&W-Figs. 113, male genitalia]; 53 [B&W-Figs. 126 {HT *weberi*}], 127 {LT *acheron*}, male genitalia]; 54 [B&W-Figs. 205–206, female genitalia]; 58 [checklist]

“*aheron*” 36 [misspelling of *acheron*]

diehli 6; 33 [misidentification]; 34; 35 [Figs. 48–52]; 40 [taxon chapter; description]; 41, 42, 44, 49; 50 [map 2]; 52 [B&W-Figs. 116–117, male genitalia]; 58 [checklist]

glaucescens 1, 2, 3, 6, 7; 11 [type species *Tagora*]; 12, 13, 24; 24 [misidentification with *pandya*]; 25; 29 [misidentification with *obsoleta*]; 39 [Fig. 64; dissections of legs]; 42, 43 [Figs. 65–74, Figs. 78: male genitalia]; 44; 45 [taxon chapter], 46, 48, 49; 50 [map 2]; 53 [B&W-Figs. 123–125, male genitalia]; 54 [B&W-Figs. 208–209, female genitalia]; 58, 59 [checklist]

“*Ganisa*” *glaucescens* 45, 46 [wrong combination], 48 [wrong combination]

glaucoides 39 [Figs. 57]; 44 [taxon chapter; description]; 45; 50 [map 2]; 52 [B&W-Figs. 120, male genitalia]; 59 [checklist]

ignatyevi 17 [taxon chapter; description]; 18; 19 [Figs. 11]; 30 [map 1]; 47 [B&W-Figs. 105, male genitalia]; 58 [checklist]

iheorum 14 [taxon chapter; description]; 15; 18, 19 [Figs. 3]; 30 [map 1]; 46, 47 [B&W-Figs. 102, male genitalia]; 58 [checklist]

[indetermined species from Peninsular Malaysia]: 39 [Figs. 53]; 49 [in chapter “There may well be further species”]; 50 [map 2]

javana 22 [Figs. 22]; 27 [taxon chapter; description]; 28; 30 [map 1]; 52 [B&W-Figs. 118, male genitalia]; 58 [checklist]

kalimantana

29, 34; 35 [Figs. 44]; 36; 37 [taxon chapter; description]; 37 [species on Borneo], 38; 50 [map 2]; 51 [B&W-Figs. 114, male genitalia]; 58 [checklist]

kobesi

33 [misidentification]; 39 [Figs. 54–56]; 40, 41; 42 [taxon chapter; description]; 44; 50 [map 2]; 51 [B&W-Figs. 115, male genitalia]; 58 [checklist]

loeffleri

13 [referring to Fig. 75, living moth]; 16 [taxon chapter; description]; 17, 18; 19 [Figs. 7–10]; 21; 30 [map 1]; 43 [Fig. 75, living moth; also on title page]; 46, 47 [B&W-Figs. 104, male genitalia]; 49; 54 [B&W-Figs. 202, female genitalia]; 58 [checklist]

luxi

14 [taxon chapter; description]; 14 [misidentification as *Tagora obsoleta*]; 18, 19 [Figs. 1–2]; 29, 30 [map 1]; 46, 47 [B&W-Figs. 101, male genitalia]; 58 [checklist]

mizorama

22, 23 [Figs. 21a–c]; 26 [taxon chapter; description]; 27, 30 [map 1]; 42; 47 [B&W-Figs. 108, male genitalia]; 58 [checklist]

niassana

6, 7, 12, 13; 28 [misidentification]; 32, 33, 34, 35 [Figs. 45–47]; 36 [misidentification]; 38 [taxon chapter], 40, 42, 48; 50 [map 2]; 54 [B&W-Figs. 207, HT, female genitalia]; 58 [checklist]

obsoleta

6, 7; 14 [misidentification, recte *luxi*]; 23 [Figs. 27–28]; 28 [misidentification]; 29 [taxon chapter]; 29 [misidentification as ssp. of *glaucescens*]; 30, 31 [Figs. 29–30, identity slightly in doubt]; 33 [misidentification]; 34; 36 [note]; 37 [species on Borneo], 38; 50 [map 2]; 51 [B&W-Figs. 111, male genitalia]; 58 [checklist]

pallida

12 [erroneous synonymy]; 22 [Figs. 16; syn. of *pandya*]; 24 [taxon chapter; synonym of *pandya*], 25; 26; 29 [note]; 43 [Figs. 77, HT *pallida*, syn. of *pandya*]; 58 [checklist]

“*pandya*”

38 [misspelling of *pandya*], 40; 58 [checklist; misspelling]

pandya

2, 3, 6; 11 [type species *Mallarctus*, syn. of *Tagora*]; 12; 12 [note]; 13 [referring to Fig. 19, living moth], 14; 16 [misidentification, recte *loeffleri*]; 21; 21 [doubtful identity for China]; 22 [Figs. 15, 17–19]; 24 [taxon chapter; misidentification; notes], 25, 26; 30 [map 1]; 34 [“*Mallarctus pandya acheron*”]; 43 [Figs. 76, HT *pandya*, and 77, HT *pallida*, syn. of *pandya*]; 49 [doubtful identity for China]; 52 [B&W-Figs. 119, male genitalia]; 58 [checklist]

“*Eupterote*” *pandya*

25 [wrong combination]

“*Mallarctus pandya*” sensu MELL 21 [doubtful identity for China]; 39 [Figs. 62, colour drawings of penultimate and ultimate larva]

polychroma

6, 29, 30; 31 [Figs. 31–36]; 32; 33 [taxon chapter; description]; 33 [misidentification]; 34; 36 [misidentification; note]; 37 [species on Borneo]; 50 [map 2]; 52 [B&W-Figs. 112, male genitalia]; 53, 54 [B&W-Figs. 204, female genitalia]; 59 [checklist]

<i>pugaevi</i>	12, 17, 18; 18 [taxon chapter; description]; 19 [Figs. 12]; 20; 30 [map 1]; 39 [Fig. 63; dissections of legs]; 47 [B&W-Figs. 106, male genitalia]; 54 [B&W-Figs. 203, female genitalia]; 58 [checklist]	<i>Eupterote s. latiss.</i> 3, 4
<i>rufescens</i>	39 [Figs. 58–60]; 44 , 44 [taxon chapter; description]; 45 , 45 [misidentifications]; 48 ; 50 [map 2]; 52 [B&W-Figs. 121, male genitalia]; 54 [B&W-Figs. 210, female genitalia]; 59 [checklist]	<i>Eupterotinae</i> 1, 2; 3 [note]; 4, 5, 6, 7, 11, 12, 24, 38, 40
<i>siamica</i>	14; 15 [taxon chapter; description], 16; 18, 19 [Figs. 4–6]; 30 [map 1]; 46 , 47 [B&W-Figs. 103, male genitalia]; 54 [B&W-Figs. 201, female genitalia]; 58 [checklist]	<i>Ganisa</i> 2, 3, 4, 5, 6, 11, 12, 24, 25, 29 [note], 38
<i>sinica</i>	17; 21 [taxon chapter; description]; 22 [Figs. 20a–b]; 30 [map 1]; 49 ; 51 [B&W-Figs. 109, male genitalia]; 58 [checklist]	“Ganisa-group” 2; 3 [note]; 6, 11, 12, 38, 40
<i>thomasi</i>	39 [Figs. 61]; 44 , 48 [taxon chapter; description], 49 ; 50 [map 2]; 52 [B&W-Figs. 122, male genitalia]; 59 [checklist]	<i>Mellirisa</i> 4 [Text-Fig. A]; 6, 12
<i>treadawayi</i>	23 [Figs. 23–26]; 27 , 28 [taxon chapter; description]; 30 [map 1]; 50 , 51 [B&W-Figs. 110, male genitalia]; 58 [checklist]	<i>Palirisa</i> 4 [Text-Fig. A]; 6, 7, 12, 40
<i>weberi</i>	2, 6 [erroneous synonymy], 29 [misidentification; note]; 32, 33 [misidentification, wrong combination, note], 34 [taxon chapter; revised synonym of <i>acheron</i>]; 35 [Figs. 41, HT <i>weberi</i> = rev. syn. of <i>acheron</i>]; 35 ; 36 [misidentification; note]; 37 , 38 ; 53 [B&W-Figs. 126, HT <i>weberi</i> = rev. syn. of <i>acheron</i> ; rev. syn. of <i>acheron</i>]; 58 [checklist]	<i>Pandala</i> 38, 40, 58 [wrong combination in original description]
<i>zolotuhini</i>	17; 20 [taxon chapter; description], 21 ; 22 [Figs. 13–14]; 30 [map 1]; 47 [B&W-Figs. 107, male genitalia]; 58 [checklist]	<i>patula</i> -group [short for <i>patula</i> species-group] 1
Other names of taxa that are misplaced in or wrongly combined with <i>Tagora</i> (not complete)		<i>patula</i> species-group 3, 5, 24
Genera and higher		<i>Sphingognatha</i> 1, 3, 4, 5, 11, 12, 24, 25, 29, 45, 46
<i>Antheraea</i>	7 [Saturniidae], 44 [Saturniidae]	<i>Sphingognatha s. l.</i> 1, 3; 4 [Text-Fig. A]; 4, 5, 12, 24, 25, 29, 36
<i>Apha</i>	5	
<i>Eupterote</i>	1, 3, 4 [Text-Fig. A]; 4, 5, 6, 11, 29, 32 [note], 33 [misidentifications], 36 [misidentification, note]	
<i>Eupterote s. l.</i>	4 [Text-Fig. A]; 4, 5, 12	
		Species
		“ <i>Ganisa</i> sp.” 34 [misidentification, wrong combination]
		“ <i>Ganisa</i> ” <i>glaucescens</i> 24, 25 [wrong combination], 42, 43 [Fig. 67, wrong combination]
		“ <i>Ganisa</i> ” <i>niassana</i> 40 [wrong combination]
		“ <i>Ganisa</i> ” <i>pandya</i> 16 [misidentification, wrong combination]
		“ <i>Ganisa</i> ” <i>pandya</i> 24, 25, 33 [wrong combination]
		<i>Ganisa plana</i> 2
		<i>Ganisa postica</i> 2
		“ <i>Ganisa</i> ” <i>#rufescens</i> 46 [wrong combination; misidentification, unpublished name by FRUHSTORFER or WEYMER, on label for a Darjeeling specimen in coll. ATKINSON in MfNB]
		<i>Ganisa similis</i> 2
		“ <i>Jana</i> ” <i>pallida</i> 25 [wrong combination]
		<i>Sphingognatha asclepiades</i> 25
		<i>Sphingognatha [s.l.] pallida</i> 29
		“ <i>Tagora</i> ” <i>amaena</i> 1 [wrong combination]
		“ <i>Tagora</i> ” <i>murina</i> 1; 2, 29 [wrong combination, misidentification]
		“ <i>Tagora</i> ” <i>pallida</i> 25 [wrong combination]
		“ <i>Tagora</i> ” <i>patula</i> 1, 3 [wrong combination]
		“ <i>Tagora</i> ” <i>rothschildi</i> 25 [replacement name; wrong combination]
		<i>Tibetanja tagoroides</i> 45