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# Six new species of the genus Tumicla Wallengren, 1863 (Lepidoptera: Erebidae: Arctiinae: Lithosiini)

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# Six new species of the genus *Tumicla* Wallengren, 1863 (Lepidoptera: Erebidae: Arctiinae: Lithosiini)

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#### Abstract

The present paper contains the descriptions of six new species of the genus *Tumicla* Wallengren, 1863: *T. usa* sp. n. (NE Tanzania), *T. chuquelae* sp. n. (C Mozambique), *T. pringlei* sp. n. (NE Tanzania), *T. mutinondo* sp. n. (NE Zambia), *T. turlini* sp. n. (Rwanda) and *T. fisheri* sp. n. (NW Zambia). The hitherto unknown male of *T. smithi* Volynkin & László, 2019 is illustrated and described. 23 colour and 24 black and white diagnostic figures are included.

Key words: taxonomy, Nudariina, Sub-Saharan Africa, Afrotropics, Mozambique, Rwanda, Tanzania, Zambia.

#### Introduction

The 33 species of the genus *Tumicla* (*=Asuroides* Durante, 2008) are widely distributed in Sub-Saharan Africa, the overwhelming majority of which have been described in the last two decades (Kühne 2007; Durante 2008; Volynkin & László 2018, 2019). As this genus contains a high number of cryptic species, it is likely that many more species await description in historic as well as more recent collections.

Within the Lithosiini collections of the African Natural History Research Trust, Leominster, the Natural History Museum, London, the Bavarian State Collection of Zoology, Munich, and the Hungarian Natural History Museum, Budapest, six unidentified species of *Tumicla* collected in Zambia, Tanzania, Rwanda and northern Mozambique were found. After comparing the genitalia structures of these species with others in the genus, they proved to express distinctive characters and are described herein as species new to science. Additionally, the illustration and diagnosis of the hitherto unknown male of *T. smithi* Volynkin & László, 2019 is provided in this paper.

### Material and methods

Abbreviations of the depositories used: ANHRT = African Natural History Research Trust, Leominster, UK; HNHM = Hungarian Natural History Museum (Budapest, Hungary); NHMUK (formerly BMNH) = Natural History Museum, London, UK; ZSM = Bavarian State Collection of Zoology (Zoologische Staatssammlung München), Munich, Germany.

The genitalia were dissected and mounted in euparal on microscope slides. The photos of adults were taken using a Nikon D3100/AF-S camera equipped with a Nikkor, 18–55 mm lens. The photos of genitalia were taken by the same camera attached to a microscope with an LM-scope adapter. All pictures were processed using the Adobe Photoshop CC 2018 software.

#### **Systematics**

*Tumicla usa* sp. n.

(Figs 1, 2, 24, 34, 35)

**Type material. Holotype** (Figs 2, 34): female, "Africa, Tanzania, USA River 3900 ft., 28.IX.1965, leg. Dr. J. Szunyoghy", gen. slide No.: AV5721 (HNHM).

**Paratypes**. **TANZANIA**: 1 male, 1 female, with the same locality and collector as the holotype but, IX.–II-1965-66, gen. slides Nos.: AV5720 (male) and AV5996 (female) (HNHM).

Diagnosis. The forewing length is 10 mm in the male and 14–16 mm in females. The new species (Figs 1, 2) is very similar externally to Tumicla mbeghai Volynkin & László, 2019 (Figs 3, 4) in its coloration and forewing markings but distinguished by its considerably smaller size. The male genital capsule of T. usa (Fig. 24) is nearly identical to that of T. mbeghai (Fig. 25) but differs in its noticeably wider valva and slightly larger vinculum. Compared to Tumicla elephantina Volynkin & László, 2019 (Fig. 26), the male genital capsule of T. usa has a more robust vinculum and a distally wider valva with a more dentate dorsal margin distally. The aedeagus of the new species is markedly thicker and somewhat shorter than in T. mbeghai and is nearly identical to that of T. elephantina. The vesica of T. usa is similar to that of T. mbeghai but is longer, its distal diverticulum is considerably shorter and the cornutus is slightly curved medially (whereas it is straight in T. mbeghai). The vesica of T. usa bears only a single cornutus, whereas that of T. elephantina is armed with two cornuti of different lengths. Additionally, the vesica of the new species is slightly shorter and distally narrower and its distal diverticulum is shorter but basally wider in comparison to those structures in T. elephantina. The female genitalia of T. usa (Figs 34, 35) differ from those of T. mbeghai (Fig. 36) more conspicuously than in the male genitalia and are easily recognized by their wider and longer ductus bursae. The posterior section of the corpus bursae of T. usa is shorter and narrower than in T. mbeghai and its right lateral protrusion is reduced to a small, rounded sclerotized plate, whereas this structure is represented by an elongate conical membranous process with a sclerotized plate at its base in T. *mbeghai*. The anterior section of the corpus bursae of T. usa is much smaller than that of T. *mbeghai*. The female genitalia of the new species differ from those of T. chuquelae (Fig. 37) and T. elephantina (Fig. 38) by their markedly longer and wider ductus bursae and the reduced right lateral protrusion of the posterior section of the corpus bursae. Additionally, in T. usa, the left margin of the posterior section of the corpus bursae and the base of the appendix bursae are more heavily sclerotized than in T. chuauelae and T. elephantina. The appendix bursae and the anterior section of the corpus bursae of the new species are considerably smaller than those of the related species.

**Distribution**. The new species is currently known only from the lower slopes of Mount Meru, Arusha Region in northeastern Tanzania.

Etymology. The species name refers to its type locality, the town of Usa River in Tanzania.

*Tumicla chuquelae* sp. n. (Figs 5, 37)

**Type material. Holotype** (Figs 5, 37): female, "Mozambique, 630m, Manica Province, Chimanimani National Reserve, Moribane Forest, Ndzou Camp (Moist Forest), 19°44'01.4"S, 33°20'15.1"E, 3–5.viii.2018,

MV Light Trap, László, G., Miles, W., Vetina, A. leg., ANHRT:2018.30", unique number: ANHRT 00047089, gen. slide No.: AV4929 (ANHRT).

**Diagnosis**. The forewing length is 14 mm in the female holotype. *Tunicla chuquelae* (Fig. 5) is the closest relative of *T. elephantina* (Fig. 6), from which it differs externally by its pale yellow forewing ground color (which varies from brick red to honey in *T. elephantina*). The hindwing of *T. chuquelae* is pale yellow (carrot red in *T. elephantina*) lacking blackish streaks at its apex which are characteristic in *T. elephantina*. The female genitalia of *T. chuquelae* (Fig. 37) differ from those of *T. elephantina* (Fig. 38) in their slightly shorter apophyses anteriores and posteriores, the somewhat wider ostium bursae and the markedly narrower posterior section of the corpus bursae bearing considerably shorter left and right lateral protrusions. In addition, the ventral surface of the ductus bursae is smooth in the new species, whereas it is slightly wrinkled in *T. elephantina*.

The male is unknown.

**Distribution**. The new species is known only from its type locality in central Mozambique. The holotype was collected in a moist forest on the western slopes of the Chimanimani Mountains.

**Etymology**. The new species is dedicated to Dr Lucilia Chuquela, director of the Museu de História Natural de Maputo, expressing our gratitude for the fruitful collaboration between her institution and the ANHRT.

*Tumicla pringlei* sp. n. (Figs 7, 8, 27, 39)

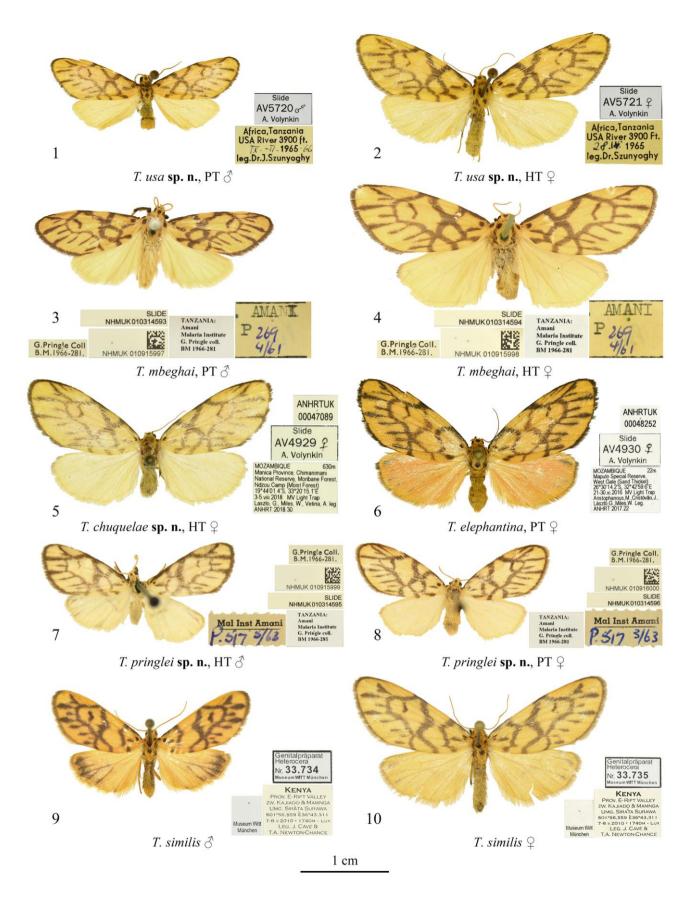
**Type material. Holotype** (Figs 7, 27): male, "Tanzania: Amani, Malaria Institute, G. Pringle coll., BM 1966-281" / "Mal Inst Amani P. 517 5/63" / "G. Pringle coll. BM 1966-281" / QR-code label with unique number NHMUK 010915999, gen. slide No.: NHMUK010314595 (prepared by Volynkin) (NHMUK).

**Paratypes. TANZANIA**: 1 female, with the same data as the holotype, NHMUK unique number: 010916000, gen. slide No.: NHMUK010314596 (prepared by Volynkin); 1 female, Tanzania: Amani, Malaria Institute, G. Pringle coll., BM 1966-281, Mal Inst Amani P. 517 8/63; 1 female without abdomen, same data but Mal Inst Amani P. 517 7/64 (NHMUK).

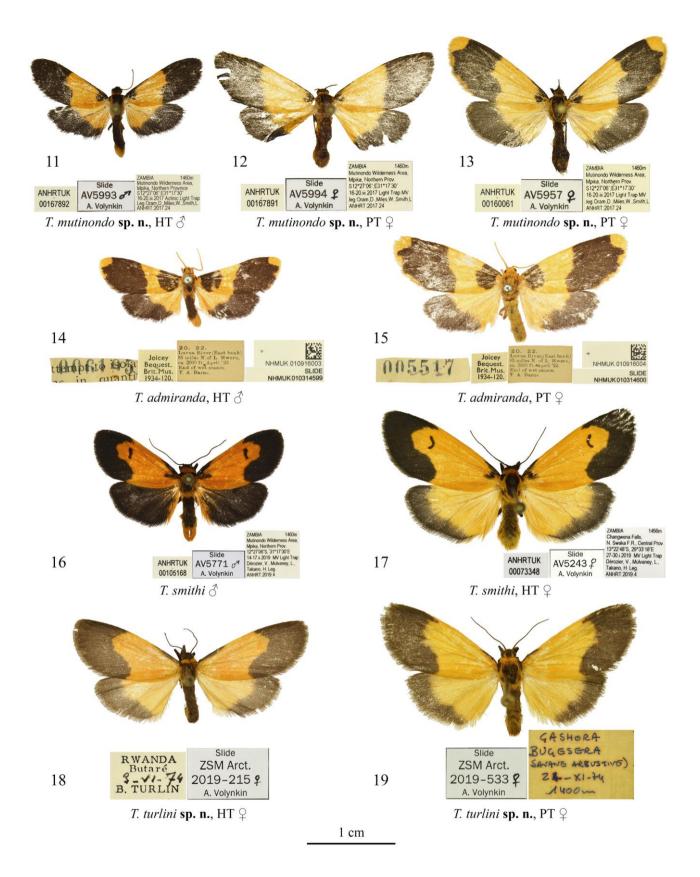
**Diagnosis**. The forewing length is 10.5 mm in the male holotype and 11–11.5 mm in females. In its coloration and forewing markings, T. pringlei (Figs 7, 8) is reminiscent of T. usa, T. mbeghai, T. chuquelae, T. elephantina (Figs 1-6) and females of T. similis (Figs 9-10) but easily recognized by its considerably smaller size, less elongate forewing and more rounded forewing apex. The male genitalia of T. pringlei (Fig. 27) are most similar to those of T. similis (Fig. 28) but easily distinguished by a number of diagnostic features as follows: in the male genital capsule of T. pringlei, the uncus is thicker and evenly curved (it is straight medially and curved distally in T. similis), the juxta is much smaller than that of T. similis and the vinculum is shorter and U-shaped (it is longer and V-shaped in T. similis). The valva of the new species is dilated medially but tapered distally whereas that of T. similis is evenly dilated distally. The distal section of the valva of T. pringlei bears two or three large triangular protrusions dorsally and one tiny protrusion ventrally, while the distal section of the valva of T. similis is irregularly dentate dorsally with short triangular protrusions but lacking any ventral protrusions. The sacculus of the new species is conspicuously narrower and shorter than in T. similis. The aedeagus of T. pringlei is considerably wider than in T. similis lacking a distal carinal process. The vesica of the new species is markedly wider than in T. similis, having a hook-like dorsal diverticulum scobinated apically, whereas the vesica of T. similis has two short but wide membranous diverticula. The ground plan of the female genitalia of T. pringlei (Fig. 39) is reminiscent of T. similis (Fig. 40), but in the new species the ostium and ductus bursae are markedly wider. The posterior section of the corpus bursae of the new species is considerably longer and wider than that of its congener. Additionally, the appendix bursae of T. pringlei is longer and curved apically whereas that of T. similis is very short and broadly conical.

**Distribution**. The new species is currently only known from the East Usambara Mountains in northeastern Tanzania.

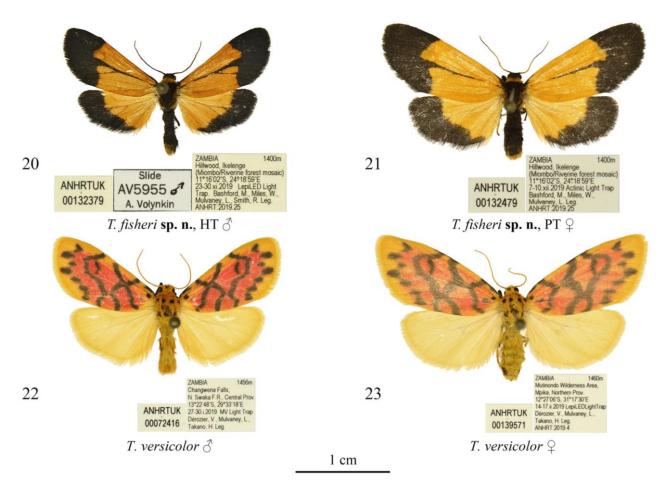
**Etymology**. The new species is named after the collector of its type series, Dr Gerry Pringle, former director of the Malaria Institute in Amani, Tanzania.



**Figures 1–10.** *Tumicla* spp., adults. Depositories of the specimens: 1 and 2 in HNHM; 3, 4, 7 and 8 in NHMUK (©); 5 and 6 in ANHRT; 9 and 10 in MWM/ZSM.



Figures 11–19. *Tumicla* spp., adults. Depositories of the specimens: 11–13, 16 and 17 in ANHRT; 14 and 15 in NHMUK (©); 18 and 19 in ZSM.



Figures 20–23. Tumicla spp., adults. The specimens are deposited in ANHRT.

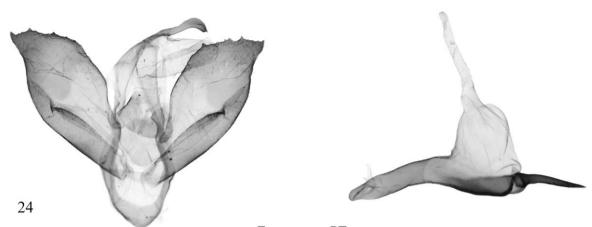
*Tumicla mutinondo* sp. n. (Figs 11–13, 29, 42, 43)

**Type material. Holotype** (Figs 11, 29): male, "Zambia, 1460m, Mutinondo Wilderness Area, Mpika, Northern Province, 12°27'06", E31°17'30", 16–20.iii.2017, Actinic Light Trap, leg. Oram, D., Miles, W., Smith, L., ANHRT:2017.24", unique number: ANHRT 00167892, gen. slide No.: AV5993 (ANHRT).

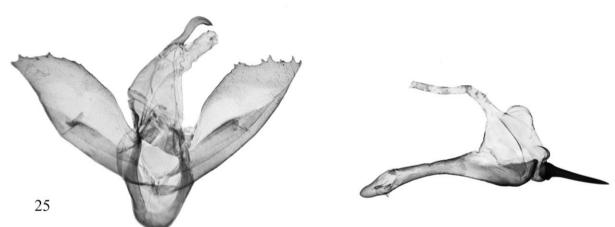
**Paratypes**. **ZAMBIA**: 2 females with the same data as the holotype, but MV Light Trap, unique numbers: ANHRT 00160061, 00167891, gen. slides Nos.: AV5957 and AV5994 (ANHRT).

**Remark.** The females of *T. mutinondo* display two forms: the typical one (Fig. 12) is similar to the male holotype (Fig. 11) with a uniformly black distal half of the forewing with a gently curved postmedial line, while the other (Fig. 13) has an orange forewing apex and terminal area with a strongly undulating postmedial line. Despite the conspicuous external differences, these two forms have identical genitalia (Figs 42, 43).

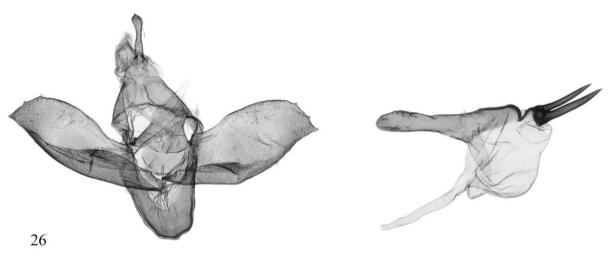
**Diagnosis**. The forewing length is 10 mm in the male holotype and 12.5–13 mm in females. The new species (Figs 11–13) is similar externally to *T. admiranda* Volynkin & László, 2019 (Figs 14, 15) but distinguished by the blackish antennae, head and medial section of the thorax (orange in *T. admiranda*), the blackish abdomen (dark brown in *T. admiranda*) and the blackish basal and distal areas of the forewing and distal area of the hindwing (dark brown in *T. admiranda*). Additionally, the blackish basal area of the forewing of *T. mutinondo* is much smaller than in *T. admiranda*, more rounded and present only in the dorsal half of the subbasal area fusing with a blackish costal stripe. In *T. admiranda* the narrow basal area is orange, followed by an extensive dark brownish, distally evenly rounded basal area occupying the whole subbasal and antemedial areas and reaching the anal margin. The male genitalia of *T. mutinondo* (Figs 29) are reminiscent of *T. smithi* (Fig. 30) and *T. admiranda* (Fig. 31). The male genital capsule of the new species is most similar to that of *T. smithi* but differs in its shorter valva with a narrower apical process and a wider and



*T. usa* sp. n., PT NE Tanzania, Arusha Region, slide AV5720



*T. mbeghai*, **PT** NE Tanzania, Usambara Mts., Amani, slide NHMUK010314593 Volynkin



*T. elephantina*, HT S Mozambique, Maputo Special Reserve, slide AV3365

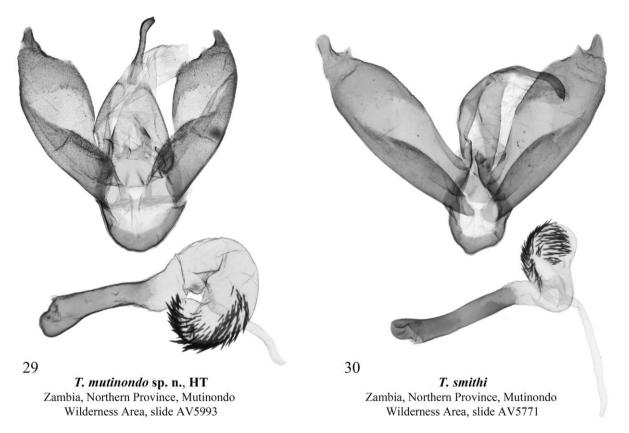
Figures 24–26. *Tumicla* spp., male genitalia. Depositories of the specimens: 24 in HNHM; 25 in NHMUK (©); 26 in ANHRT.



*T. pringlei* sp. n., HT NE Tanzania, Usambara Mts., Amani, slide NHMUK010314593



*T. similis* Kenya, Kajiado County, Rift Valley, slide MWM 33734



Figures 27–30. *Tumicla* spp., male genitalia. Depositories of the specimens: 27 in NHMUK (©); 28 in MWM/ZSM; 29 and 30 in ANHRT.

more heavily setose sacculus. Additionally, the vinculum of the new species is considerably longer and wider than in *T. smithi*. Compared to *T. admiranda*, the male genital capsule of *T. mutinondo* has a conspicuously narrower and more or less straight tegumen, which is strongly curved ventrally in its congener. The apical

process of the valva of T. mutinondo is wider and curved dorsally, whereas it is narrower and directed distally in T. admiranda. Additionally, in T. mutinondo, the uncus is considerably narrower and less curved and the sacculus is much wider and more heavily setose than in T. admiranda. The aedeagus of the new species is somewhat shorter and thicker than in T. smithi but considerably longer and thicker than in T. admiranda. The vesica of T. mutinondo is thicker and longer than in T. smithi, bearing a considerably longer and wider cluster of larger spine-like cornuti, Compared to T. admiranda, the vesica of the new species is markedly longer and thicker bearing a more extensive cluster of thicker cornuti which cover only the distal two thirds of the main vesica chamber (in T. admiranda the cornuti field covers the whole length of the chamber). The female genitalia of T. mutinondo (Figs 42, 43) are reminiscent of T. smithi (Fig. 44) but differ by their shorter apophyses anteriores, the markedly shorter ductus bursae and the weakly sclerotized left margin of the posterior section of the corpus bursae (whereas in T. smithi the posterior section of the corpus bursae is evenly sclerotized). The female genitalia of T. mutinondo can easily be distinguished from those of T. admiranda (Fig. 46) by the absence of both an inner pocket-like protrusion of the 8<sup>th</sup> sternite and postvaginal plate, the considerably longer and narrower ductus bursae and the structure of the posterior section of the corpus bursae (longer and evenly sclerotized except for its left margin in T. mutinondo, and shorter with a short and narrow sclerotized area latero-posteriorly only in T. admiranda). Additionally, the anterior section of the corpus bursae of T. mutinondo is more membranous and without a signum bursae, whereas in *T. admiranda* it is membranous, with a signum bursae that is weakly scobinated.

**Distribution**. The species is only known from its type series which was collected in the pristine Miombo woodlands of Mutinondo Wilderness Area in the Muchinga Mountains, northeast Zambia.

Etymology. The species is named after its type locality.

*Tumicla smithi* Volynkin & László, 2019 (Figs 16, 17, 30, 44)

*Tumicla smithi* Volynkin & László, 2019, *Zootaxa*, **4668** (3): 433, figs 23, 24, 44 (Type locality: Zambia, Changwena Falls, 13°22'48''S, 29°33'18''E).

**Type material examined. Holotype** (Figs 17, 44): female, "Zambia, 1456m, Changwena Falls, N. Swaka F.R., Central Prov., 13°22'48"S, 29°33'18"E, 27–30.I.2019, MV Light Trap, Dérozier, V., Mulvaney, L., Takano, H. Leg. ANHRT:2019.4", unique number: ANHRTUK 00073348, slide No.: AV5243 (ANHRT).

**Paratypes**: 3 females, with the same data as the holotype, unique numbers: ANHRTUK 00072417, 00072418, 00072419 (ANHRT).

Additional material examined. 1 male, Zambia, 1460m, Mutinondo Wilderness Area, Mpika, Northern Prov., 12°27'06"S, 31°17'30"E, 14–17.II.2019, MV Light Trap, Dérozier, V., Mulvaney, L., Takano, H. leg., ANHRT:2019.4, unique number: ANHRTUK 00105168, gen. slide No.: AV5771 (ANHRT).

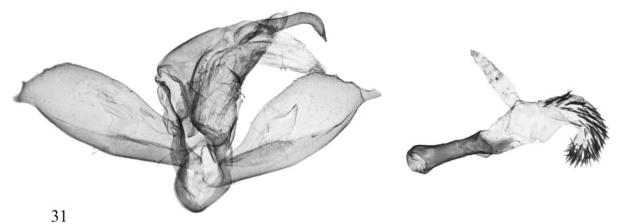
**Diagnosis of male**. The forewing length is 11 mm. The male of *T. smithi* (Fig. 16) is smaller (forewing length of females is 14.5-15 mm) and has a similar forewing pattern to that of the female (Fig. 17) but with a darker ground color. The hindwing of the male specimen is almost entirely black with only a narrow area of orange at the base and along the anal margin, whereas in the females the hindwing is pale orange with a black terminal area. The male of *T. smithi* differs from those of other similar species by its black hindwing and the presence of the large semilunar discal marking on the forewing. The male genitalia of *T. smithi* (Fig. 30) are most similar to those of *T. mutinondo* (Fig. 29) and the differences are discussed above under the latter species.

**Distribution**. To date, the species is only known from two localities in the Central and Muchinga Provinces of Zambia.

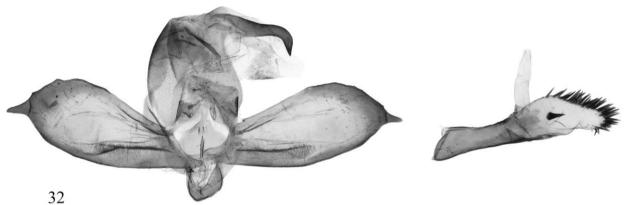
*Tumicla turlini* **sp. n.** (Figs 18, 19, 41)

**Type material. Holotype** (Figs 18, 41): female, "Rwanda, Butaré, 3-VI-[19]74, B. Turlin", gen. slide No.: ZSM Arct. 2019-215 (prepared by Volynkin) (ZSM).

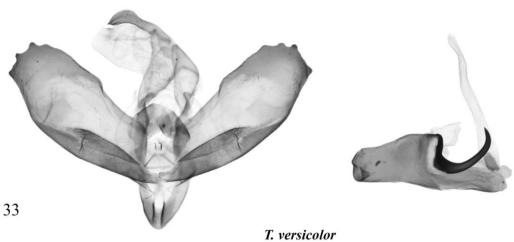
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*T. admiranda*, HT SE D.R. of Congo, Haut-Katanga Prov. slide NHMUK010314599 Volynkin

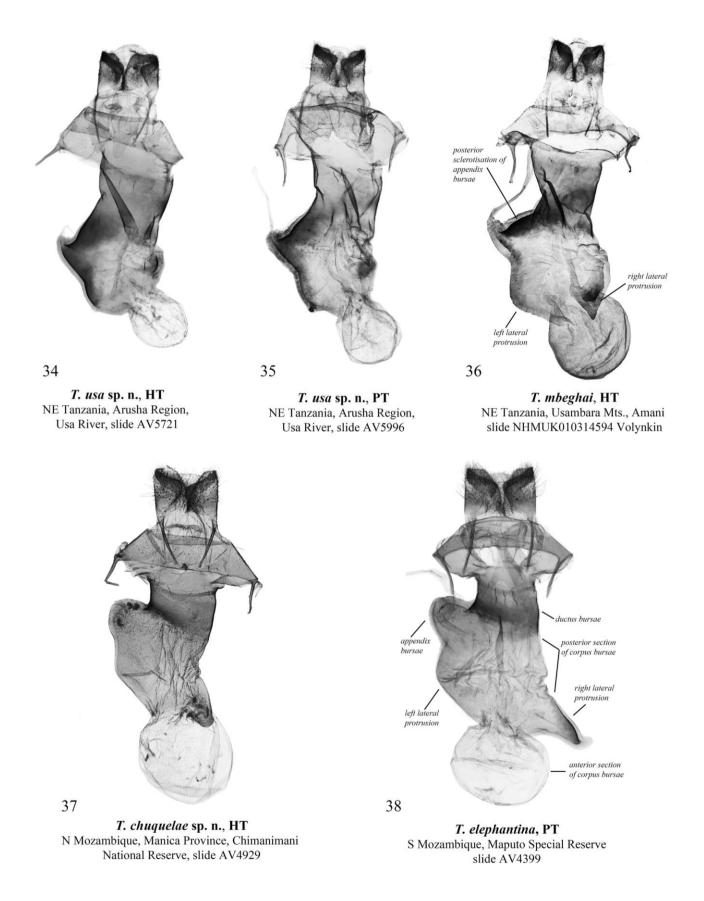


*T. fisheri* sp. n., HT NW Zambia, Hillwood, Ikelenge, slide AV5955



Zambia, Muchinga Prov., Mukulizi, slide AV5814

Figures 31–33. Tumicla spp., male genitalia. Depositories of the specimens: 31 in NHMUK (©); 32 and 33 in ANHRT.



**Figures 34–38.** *Tumicla* spp., female genitalia. Depositories of the specimens: 34 and 35 in HNHM; 36 in NHMUK (©); 37 and 38 in ANHRT.



*T. pringlei* sp. n., PT NE Tanzania, Usambara Mts, Amani, slide NHMUK010314596 Volynkin

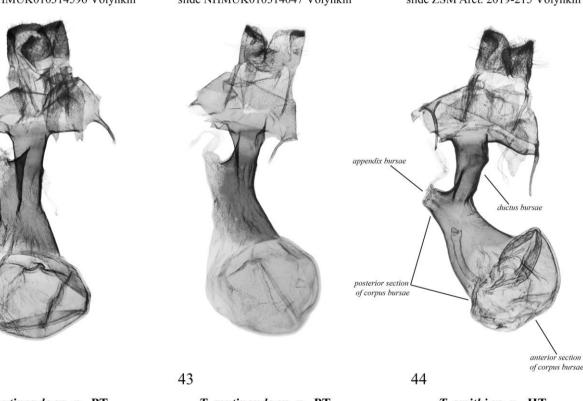






41

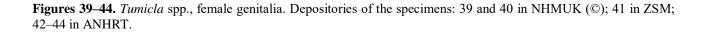
*T. turlini* sp. n., HT Rwanda, Butare, slide ZSM Arct. 2019-215 Volynkin



*T. mutinondo* sp. n., PT Zambia, Northern Province, Mutinondo Wilderness Area, slide AV5994

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*T. mutinondo* sp. n., PT Zambia, Northern Province, Mutinondo Wilderness Area, slide AV5957 *T. smithi* sp. n., HT Zambia, Central Province, Changwena Falls, slide AV5243



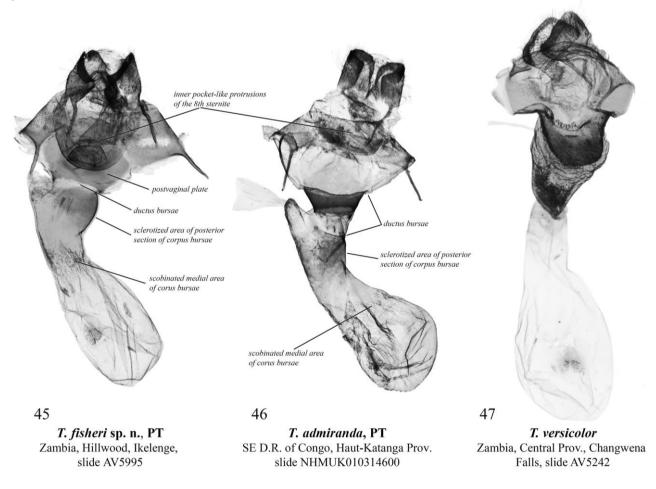
**Paratype: RWANDA**: female, Gashora Bugesera, savane arbustive [shrubby savanna], 24.xi.[19]74, 1400m, gen. slide No.: ZSM Arct. 2019-533 (prepared by Volynkin) (ZSM).

**Diagnosis**. The forewing length is 13.5–14.5 mm in the females. The female of *T. turlini* (Figs 18, 19) is externally most similar to *T. smithi* (Fig. 17) but differs in the absence of the discal spot and the black longitudinal basal dash. The female genitalia of the new species (Fig. 41) are reminiscent of those of *T. smithi* (Fig. 44) and *T. mutinondo* (Figs 42, 43), but can easily be distinguished by their considerably shorter ductus bursae, the conspicuously wider posterior section and smaller anterior section of the corpus bursae as well as the much shorter appendix bursae. Additionally, compared to *T. smithi*, the posterior section of the corpus bursae of *T. turlini* is more widely protruding in its left margin and evenly sclerotized while in *T. mutinondo* the left margin is membranous.

The male is unknown.

**Distribution**. The new species is known only from Rwanda, the type specimens having been collected in a savannah habitat.

**Etymology**. The species is named after the renowned French lepidopterist and collector of its type specimens, Dr Bernard Turlin.



**Figures 45–47.** *Tumicla* spp., female genitalia. Depositories of the specimens: 45 and 47 in ANHRT; 46 in NHMUK (©).

*Tumicla fisheri* **sp. n.** (Figs 20, 21, 32, 45)

**Type material. Holotype** (Figs 20, 32): male, "Zambia, 1400m, Hillwood, Ikelenge (Miombo/Riverine forest mosaic), 11°06'02"S, 24°18'59"E, 23–30.xi.2019, LepiLED Light Trap, Bashford, M., Miles, W., Mulvaney, L., Smith, R. leg., ANHRT:2019.25", unique number ANHRT 00132379, gen. slide No.: AV5955 (ANHRT).

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**Paratypes. ZAMBIA**: 7 males, 5 females, with the same data as the holotype, unique numbers: ANHRTUK 00107622, 00132326, 00132346, 00132347, 00132378, 00132380, 00132459, 00132460, 00132461, 00132479, 00132480, 00132609, gen. slides Nos.: AV5956, AV5995 (females) (ANHRT).

**Diagnosis**. The forewing length is 11–12 mm in males and 13–14 mm in females. The new species (Figs 20, 21) is easily recognized by the presence of a conspicuous black streak running along the Cu vein between the forewing base and the black outer forewing area and dilated between veins  $M_2$  and  $M_3$ , which is unique in this genus. The male genital capsule of T. fisheri (Fig. 32) is similar to that of T. admiranda (Fig. 33), but the uncus is somewhat longer and basally wider and the apical process of the valva is narrower than those of T. admiranda. The aedeagus of the new species is slightly shorter and wider than that of T. admiranda. The main chamber of the vesica of T. fisheri is relatively short, directed distally, bearing a dense row of numerous spine-like cornuti dorsally and apically, whereas that of T. admiranda is longer, strongly curved ventrally and almost entirely covered in spine-like cornuti, Additionally, the vesica of T. fisheri bears an isolated thorn-like cornutus laterally in its subbasal section which is absent in T. admiranda. In the female genitalia, the inner pocket-like protrusion of the 8<sup>th</sup> sternite of *T. fisheri* is longer and thicker compared to *T*. admiranda. A similar structure is also found in Tumicla versicolor Kühne, 2007, a species which is fundamentally different from T. fisheri in its habitus and genitalia structures (Figs 22, 23, 33, 47). The new species has a strongly reduced ductus bursae consisting of a very short membranous section only, whereas in T. admiranda the ductus bursae is well-developed and subdivided into a wide funnel-like sclerotized posterior section (antrum) and an asymmetrical membranous anterior section. The sclerotized area of the posterior section of the corpus bursae of T. fisheri is wider with an evenly arcuate convex right margin, whereas in *T. admiranda*, it is narrower with a nearly straight right margin. The scobinated medial belt-like area of the corpus bursae is longer in T. fisheri compared to T. admiranda.

Distribution. The species is only known from the vicinity of Ikelenge in northwestern Zambia.

**Etymology**. This species is named after Mr Peter Fisher of Hillwood Farm, Ikelenge, the type locality of the new species, who together with his family have carefully managed and conserved the forests and grasslands of this incredibly biodiverse region of Africa.

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