

First records of two non-indigenous tineid species from St Helena Island (Tineioidea: Tineidae)

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Abstract: The author reports the first records of two non-indigenous Tineidae species which were found on St Helena: *Amphixystis siccata* (Meyrick, 1910) and *Setomorpha rutella* Zeller, 1852. Moths and habitats of both species and the male and female genitalia of *A. siccata* are illustrated here.

Key words: Tineidae, non-indigenous species, *Amphixystis*, *Setomorpha*, St Helena Island

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INTRODUCTION

St Helena, a small and remote island in the Atlantic Ocean, more than 1,000 miles from the African Coast, shares a common fate with other remote islands: the indigenous fauna has lost many species, but many others have been introduced over the centuries by humans. Some of them have economic importance, but the majority have found their own niche and do not influence the others. In a recent publication, Key *et al.* (2021) mention about 60 endemic Lepidoptera species for St Helena and a total number of 140 species. Some of them might be indigenous, but most of them seem to be introduced.

For Tineidae, Key *et al.* (2021) list *Opogona sacchari* (Boyer, 1856), *O. omoscopia* (Meyrick, 1893), *Monopis crocicapitella* (Clemens, 1860) and the *Tinea pellionella*-complex as introduced species. They also inform about the occurrence of an *Amphixystis* (probably *A. siccata*) on St Helena, but a reliable identification remains unconfirmed.

METHODS AND MATERIALS

The study is based on material collected in 2017 and 2018 on St Helena. Some photos taken on the island are included in the list of records. The specimens from St Helena were compared with the lectotype of *Oinophila siccata* Meyrick, 1910 stored in the Collection of The Natural History Museum (NHMUK) in London.

Genital dissections were made following Robinson (1976), stained in Chlorazol Black and embedded in Euparal. The male genitalia were compared with illustrations of those of *O. siccata* given in Bippus (2016).

Two specimens of *Amphixystis* (see material studied chapter) were sequenced for the standard “barcoding” region of the mitochondrial COI gene by the Canadian

Center for DNA Barcoding (CCDB) in Guelph, following the protocols described by Ivanova *et al.* (2006) and Dewaard *et al.* (2008). The data are held in the BOLD database system and available for analysis (Ratnasingham & Hebert 2007) under process ID LEPDE351-18 and LEPDE385-18. The BIN is mentioned further below. For the species, all 658 bp of the sequenced region were obtained.

For description and comparison, the specimens were studied under a Zeiss-Stemi stereo-microscope. The drawings were prepared by using a prism for a ROW Rathenow Optics monocular microscope. All photos were processed using the Adobe Photoshop software.

The specimens are stored in the following collections:
MNVD Museum für Naturkunde und Vorgeschichte Dessau, Germany
NHMUK Natural History Museum, London, UK
SDEI Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany

For description and comparison, the specimens were studied under a Zeiss-Stemi stereo-microscope. The genitalia of all taxa were dissected according to the method of Robinson (1976), stained with Chlorazol Black and embedded in Euparal. The drawings were prepared by using a prism for a ROW Rathenow Optics monocular microscope. All photos were processed using Adobe Photoshop software.

RESULTS

Newly recorded species

Amphixystis siccata (Meyrick, 1910)

Material studied (Figs 1, 2, 4, 5)

Lectotype of *Amphixystis siccata* (Fig. 2): 1 ex. [abdomen missing], “Mauritius, NM. 08”, “*Oinophila siccata* 2/2 Meyr., Meyrick det., in Meyrick Coll.”, “NHMUK010304529”, “Lectotype [round label with violet edge]”. In coll. NHMUK.

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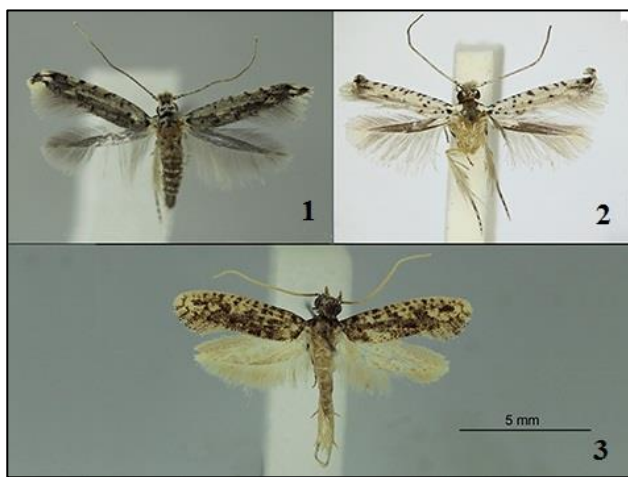
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St Helena Island: Sandy Bay Valley, Ebony Cottage, 3 ♂♂ (1 ♂ barcoding MNVD-11449-A05, gen. slide 3937, Karisch) 1 ♀ (gen. slide 3944, Karisch) 03.iii.2017, T. Karisch (SDEI, MNVD); Joan Hill, Man and Horse cliffs, 1 ♀ (barcoding MNVD-11448-F06) 27.II.2017, T. Karisch (SDEI). BIN (BOLD): ADR9744.

Further observations

St Helena Island: Sapper Way, 1 ex. 12.x.1023, on *Hibiscus* plant; 1 ex. 26.ii.2014, on *Pittosporum viridiflorum* Sims; 1 ex. 15.iii.2014, on *Hibiscus* plant, L. Fowler; Between Head O'wain Clinic to Burnt Rock road, 1 ex. 25.v.2014, on tree bark, L. Fowler; Burnt Rock, 1 ex. 22.vi.2014, on tree bark; 1 ex. 20.viii.2014, on soil (Fig. 6); 1 ex. 09.i.2015, on house wall, L. Fowler; Millennium Forest, 1 ex. 12.x.2016, on *Commidendrum robustum* (Roxb.) DC., L. Fowler.



Figures 1–3 Adults: *Amphixystis siccata* 1. ♂ (St. Helena); 2. *A. siccata* ♂ Lectotype (Mauritius); 3. *Setomorpha rutella* ♂ (St. Helena)

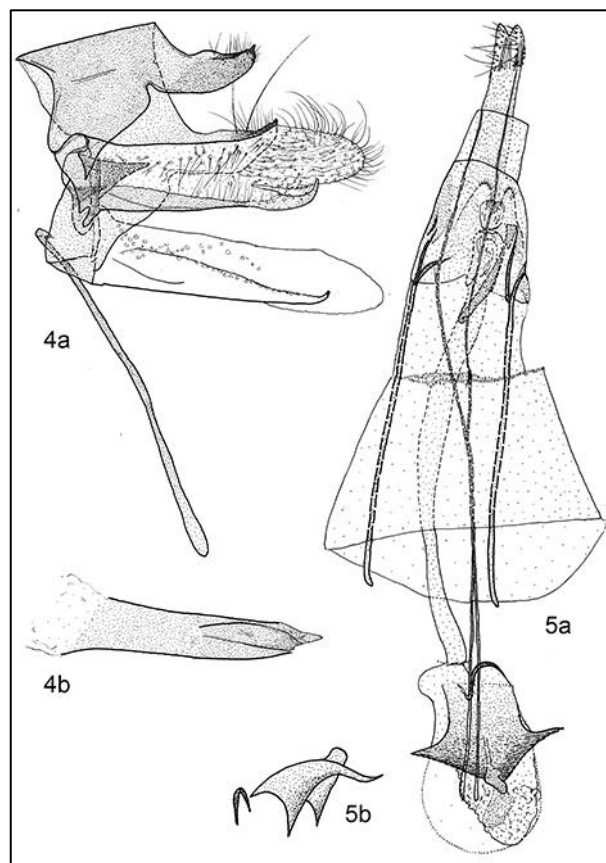
Amphixystis siccata was described by Meyrick (1910) from Mauritius from two specimens. There is a lectotype specimen in the collection of the NHMUK, probably labelled by Robinson, as he published a photo of this specimen with the note “lectotype” in his book (Robinson 2009: fig. 99). Unfortunately this specimen (Fig. 2) has lost the abdomen, so it was not possible to directly compare the genitalia with the specimens from St Helena.

In 2016 M. Bippus published a paper about several Microlepidoptera from La Réunion, neighbouring island to Mauritius. He also found an *Amphixystis* species, which he identified as *A. siccata*, and with which he synonymised *A. reunionella* Guillermet, 2011, also described from La Réunion.

Because both authors have given illustrations of the moth and the genitalia (male and female in Bippus 2016 – although very small, female in Guillermet 2011) I was able to verify the assumption, that the specimens from St Helena could also belong to *A. siccata*. Unfortunately, *A. siccata* was not listed in the database of BOLD and consequently a search for the barcodes does not yield a hit either.

The specimens from St Helena (Figs. 1–3) show the black dots and lines on the forewing, which are typical for *A. siccata* (Fig. 2). However, there is a slight variability. Sometimes the whitish ground colour of the forewing is

more or less grey dusted, when the lines and dots are difficult to discern.



Figures 4 & 5 – *A. siccata*, gen. slide 3937. 4a: ♂-genitalia, 4b: aedeagus. – *A. siccata*, gen. slide 3944. 5a: ♀-genitalia, 5b: signum (lateral view).

Male genitalia (Figs 4a, b)

With the characteristic, strongly sclerotised socii, the comparatively long and narrow valva and a projecting sacculus, in this species forming a curved tooth; saccus very long, rod-like, as described in Robinson & Tuck (1997) as typical for *Amphixystis* species, and illustrated in Bippus (2016) for *A. siccata*. The stout aedeagus (Fig. 4b) also matches the illustration in Bippus (2016).

Female genitalia (Figs 5a, b)

The main character of the female genitalia of *A. siccata* is the broad signum with the two pointed, curved, manta ray-like lateral wings and the clasp-like curved sclerotisation at the beginning of the corpus bursae (fig. 5 b).

Distribution

As far as known *A. siccata* is distributed on the islands of La Réunion and Mauritius in the Indian Ocean East of Madagascar. It was beyond the scope of this paper to study all described species, but it is possible, that the very similar *A. polystrigella* (Legrand, 1965) from Mahé Island (Seychelles) is also synonymous with *A. siccata*.

Host plants

Not much is known about the host plants of *Amphixystis* in the Aethiopia, but Robinson (2009) mentioned, that *A. polystrigella* was bred from decaying husks of *Lodoicea maldivica* (J. F. Gmel.) Pers. (Coco de Mer, Palmae) and *A. anchiala* (Meyrick, 1909) (Madagascar) was reared

from dead stems of *Euphorbia resinifera* O. Berg. Therefore it may be assumed that the larvae of *A. siccata* also feed on decaying plant material. However, the answer to the question “how could *A. siccata* have reached the island of St Helena ?” remains open.

Habitat

The records of *A. siccata* on St Helena are mainly from man-made habitats, such as plantations and gardens, and the ruderal tertiary vegetation following the destruction of secondary habitats by grazing goats. The species is established in areas at low and middle altitude.



Figure 6 – Live photo *A. siccata*, Burnt Rock, on soil (L. Fowler).



Figure 7 – *Opuntia* plants and former garden land, an example of habitat for *A. siccata* on St Helena (T. Fowler)

***Setomorpha rutella* Zeller, 1852**

Material studied (Figs 3 & 8)

St Helena: Jamestown, Cole’s Courtyard, on wall (Fig. 8), 1 ♂ 10.iii.2017; id., 2 ♂♂ (1 ♂ gen. slide 3614, Karisch) 12.iii.2017; id., 1 ♀ 15.iii.2017, id., 1 ♂ 02.iv.2018, T. Karisch (MNVD, SDEI).

Tenerife: Sta. Cruz, 1 ♂ (gen. slide B. M. Microlep. 8057) 25.i.1907 (NHMUK); Orotava, 1 ♀ S. D. Compton (NHMUK).

Habitat

In and around Cole’s Courtyard in the upper centre of Jamestown (between Side Path and “the Run”) several

imagines of a so far unknown Tineidae had been found sitting on the walls outside the buildings (Fig. 8) or inside the bathroom. This is a very urban area (Fig. 9), and it was expected that this would be an introduced species rather than an endemic one.



Figure 8 – Live photo *S. rutella*, wall at Cole’s courtyard, Jamestown (T. Karisch)



Figure 9 – Habitat of *S. rutella* in Cole’s courtyard, Jamestown: ensemble of buildings and walls with a Mango tree in the middle (T. Karisch)

Determination

Comparison with the material in the Collection of the NHMUK and with existing illustrations of the male genitalia (e. g. Gates Clarke, 1969) revealed that the specimens are *Setomorpha rutella* Zeller, 1852.

Distribution

This species was described from the Limpopo and Orange rivers in South Africa and it is widespread in tropical Africa (De Prins & De Prins 2022: Sierra Leone, Central Africa, Democratic Republic Congo, South Africa and the Islands of Silhouette, Mahé, La Réunion and Mauritius in the Indian Ocean). It is known under the name “Tobacco Moth” from various other regions in the Tropics (e. g. Indonesia – Snellen 1884; Australia: Queensland and New South Wales; Französisch Polynesien und Neukaledonien – MNHN&OFB 2022; United States and Cuba – Moth Photographers Group 2022) and has been even introduced to the Canary Isles and the UK (Lepiforum 2022).

Trophic resources

The larvae of *S. rutella* are detritus feeders and usually not of economic importance. However, Lim (1975) found out experimentally, that *S. rutella* could be an intermediate host of a gastrointestinal parasitic Nematode of fowl.

The discovery of *S. rutella* on St. Helena is not surprising and is another example in a series of former introductions of Tineidae.

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