METAMORPHOSIS

LEPIDOPTERISTS' SOCIETY OF AFRICA

Volume 35: 21–24

ISSN 1018–6490 (PRINT)
ISSN 2307–5031 (ONLINE)

Ithome concolorella (Chambers, 1875) on Ascension Island (Lepidoptera: Cosmopterigidae: Chrysopeleiinae)

Published online: 27 November 2024
DOI: https://dx.doi.org/10.4314/met.v35i1.5

Timm Karisch
Museum für Naturkunde und Vorgeschichte Dessau, Askanische Straße 32, D-06842 Dessau, Germany; Senckenberg Deutsches Entomologisches Institut, Eberswalder Straße 90, D-15374 Müncheberg. Email: Timm.Karisch@dessau-rosslau.de

Abstract: The author reports on the occurrence of *Ithome concolorella* on Ascension Island. Although it is a relatively recent introduction, the species has spread quickly over all parts of the island, with highest abundances recorded in lower and mid altitudes. Larvae have not yet been found, but it is assumed that they feed on introduced plant species, such as Mexican Thorn, *Prosopis juliflora* and Horse Tamarind, *Leucaena leucocephala*.

Key words: Alien species, genitalia, *Leucaena*, *Prosopis*, South Atlantic island
Citation: Karisch, T. 2024. *Ithome concolorella* (Chambers, 1875) on Ascension Island (Lepidoptera: Cosmopterigidae: Chrysopeleiinae). *Metamorphosis* **35**: 21–24.
Peer reviewed

INTRODUCTION

Ascension Island is a remote island in the Atlantic Ocean, mid-way between Africa and South America. The closest land is St Helena Island, approximately 1,300 km to the southeast. The African continent is about 1,600 km away (Liberian coast), whereas the distance to South America (Coast of Brazil near Recife) is more than 2,200 km.

Ascension is a relatively young island, rising from the sea around 1 million years ago. The mountains are formed by lava, containing heavier trachyte and rhyolite. The surrounding hills are often composed of ash. Despite the subtropical climate, with a precipitation ranging from 160 mm near the coast (Wideawake airfield) to about 500 – 650 mm at the Green Mountains, the indigenous vegetation is poor. Seven species of endemic or possibly endemic ferns and three of endemic vascular plants are known. Lambdon, Sim & Stroud (2024) mentioned 32 species of plants which could be native.

While the endemic vegetation is poor, there is a rich flora of introduced species. The highest peak of the island, the Green Mountain (859 m), was in the centre of a project initiated by Joseph Hooker in the mid-19th century to green the island to improve the quality of the soil and to increase the rainfall to secure a better water availability. The experiment was successful and left a green island in the centre (Ashmole & Ashmole 2000). The more recent introduction of Mexican Thorn, *Prosopis juliflora* (Sw.) DC., led to an increasing coverage of the drier, lower altitudes with green shrubs. Only a few remaining areas in the west and at the Letterbox Peninsula still reflect the barren grounds of the time before the 19th century.

Received: 22 October 2024
Accepted: 08 November 2024

Robinson & Kirke (1990) conducted a review of the Lepidoptera fauna of the island, which up till then had been sporadically studied. Since then, no coordinated field work on moths was undertaken until 2021, when the DPLUS135 project started (Darwin Initiative 2024). As part of this project, Dr Adam Sharp (Ascension Island Government, now University of Hong Kong) collected moths from many locations across the island by using malaise, light and sticky traps over a period of two years and stored them in ethanol. Recently, in 2023 the author had the opportunity of a four-week field work trip to the island to collect moths in several habitats across the island.

METHODS AND MATERIALS

The examinations were based on material which was collected by the author in 2017 and 2023. The material was collected using a light trap. A 125 W Mercury Vapour bulb or a standard size LEPI-LED were used, operated by a generator or power bank.

The material is stored in the following institutions:

MNVD: Museum für Naturkunde und Vorgeschichte Dessau, Germany
NHMUK: The Natural History Museum London, U.K.
SDEI: Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany

Material studied:

SE Travellers Hill, Spoon Crater, Eastern slope, sparse grassland with scattered low guava, *Psidium guajava* L., 7°578.581' S, 14°21.973' W, 1 ♂ 2 ♀ (1 ♀ gen.-slide 4246) 15.xi.2013, leg. T. Karisch (MNVD, SDEI);
Two Boats, Jams Accommodation, village with ornamental shrubs, 7°56'7.5" S, 14°21'56.0" W, 3 ♂♂ (1 ♂ gen.-slide 4243) 4 ♀♀ (2 ♀♀ gen.-slide 4144, 4245) 14.xi.2023, 1 ♂ 2 ♀♀ 13.xi.2023, leg. T. Karisch (NHMUK, SDEI);
Two Boats, SE-edge of the village, 1 ♂ (barcoding, sample MNVD-11448-H08) 19.ii.2017, leg. T. Karisch (MNVD);

SE Travellers Hill, Grazing Valley, low guava shrubs with lichen covered rocks, 7°57.551' S, 14°21.855' W, 1 ♂ 3 ♀♀ 15.xi.2023, leg. T. Karisch (MNVD, NHMUK, SDEI);
Green Mountain, 100 m W Red Lion, on street above horseshoe ramp, with banana, *Leucaena*, many ferns and *Rubus rosifolius* Sm., 7°56.983' S, 14°21.538' W, 3 ♂♂ 1 ♀ 08.xii.2023, leg. T. Karisch (SDEI);
2.5 km NNE Georgetown, Comfortless Cove, 100 m N, rocks and barren ground with *Nicotiana*, 7°54'34.9" S, 14°21'10.4" W, 1 ♂ (gen.-slide 4228) 1 ♀ (gen. slide 4229) 22.xi.2023, leg. T. Karisch (SDEI).

Some specimens have been dissected following the procedure mentioned by Robinson (1976). The genitalia are embedded in Euparal. Genitalia were photographed using a Zeiss Axioscope 5 microscope with Axiocam 305 colour camera. Photos of the moths were taken using a Canon Eos 600D with 100 mm Macro in the laboratory, and an Olympus Tough TG-7 in the field; the latter was also used to photograph the different habitats surveyed.

Figures 1 & 2 – Specimens of *I. concolorella*, Grazing Valley; **1 –** sitting on a stone; **2 –** resting on a leaf of Guava (photos: T. Karisch, 2023)

Figure 3 – Typical habitat of *I. concolorella* between the foot of Cross Hill (foreground) and Cat Hill (background, right) with shrubs of Mexican Thorn (photo: T. Karisch, 2023).

One specimen (sample MNVD-11448-H08) was barcoded by the Center for Biodiversity Genomics, University of Guelph, Canada, using standard procedures (de Waard et al. 2008). The sequence obtained was the maximum possible base pair at 658.

RESULTS

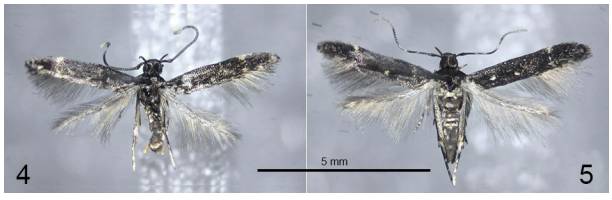
On February 19th, 2017, Howard Mendel (NHMUK) and the author conducted a light trap at the Eastern edge of Two Boats in the centre of the island. During this light trapping, the author found more than 30 specimens of a tiny black moth with some white dots on the forewings. He collected three specimens. Another specimen he observed on a wall below the Old Marine Barracks on Green Mountain on February 19th, 2017.

In 2023, this species was far more abundant than in 2017. Specimens were seen at a range of different localities (n = 17) and habitats on Ascension Island; at some localities over 500 specimens were recorded (average = 174 (range 1 to 1000) (Table 1).

The observations show that the moth is distributed widely over the island, except for the southernmost parts and the letterbox peninsula in the east. In the northern and northwestern parts (Figs. 1, 2, 3) of Ascension Island, this species was the most common moth among a very few other moth species. With the exception of the southeastern parts of the island (East of junction to Scout's Camp, crest N of old NASA-building), shrubs of *P. juliflora* (lower altitudes) and/or *L. leucocephala* (higher altitudes) exist at all places where the tiny black moth was found. *Acacia farnesiana* (L.) Wight & Arn. grows on the northern and western foothills of the Green Mountain (Lambdon, Sim & Stroud 2024).

As mentioned above, a specimen collected in 2017 was barcoded. The barcode did not correlate with any described species covered by the BOLD database. With the help of David Lees (NHMUK), it was possible to assign the sequence to a species of the genus *Ithome* Chambers, 1875 which is distributed in America.

As the genetic study did not successfully lead to an identified species, genitalia dissection was undertaken to compare the genitalia of the specimens from Ascension Island with illustrations of North American species by using Hodges (1962) and Hodges (1978).



Figures 4 & 5 – Adults of *I. concolorella*. **4 –** Male; **5 –** Female (photos: T. Karisch, 2024).

The comparison of external morphology (Figs. 1, 2, 4, 5) and genitalia (Figs. 6, 7) with illustrations given in Hodges (1962, 1978) and the Moth Photographers Group (2024) identified the species from Ascension Island as *Ithome concolorella* (Chambers, 1875). The male genitalia (Fig. 6) are characterised by the asymmetric valvae, with a thorny end of the left and with no bulge of the right one. The

female genitalia (Fig. 7) of *I. concolorella* have the ostium bursae positioned in the middle of sternum VII.

Figure 6 – Male genitalia of *I. concolorella* (photo: MNVD, 2024).

Figure 7 – Female genitalia of *I. concolorella*. The arrow shows the position of ostium bursae (photo: MNVD, 2024).

As it could be an introduction from North America, the webpage of the Moth Photographers Group (2023) and the Hosts Database (Robinson et al. 2023) were studied on the island. According to the given information, *Ithome* species could feed on *Acacia*, *Leucaena* or *Prosopis*, which are introduced trees or shrubs on Ascension Island. An attempt was undertaken to rear *I. concolorella*. Flowers and some young pods of *L. leucocephala* were collected along the Mountain Road and stored in a big bowl. Unfortunately, no larvae were found during a period of about two weeks. The search for larvae on flowers and young pods of *P. juliflora* and *A. farnesiana* was also unsuccessful; there were very few flowers or young pods on plants during the time of the 2023 field surveys. As there was high activity of adults of *I. concolorella* during the author's stay on the island, it is possible that the females had just started to lay eggs on the first flowers or buds of Mexican Thorn, as they usually do (Hodges 1978).

CONCLUSION

Ithome concolorella (Chambers, 1875) (Chambers 1875: 55f., as *Elachista*) is a very interesting recent introduction to Ascension Island, which is likely related to one (or more) introduced tree species on the island. Despite a seemingly large population, *I. concolorella* does not have a visible effect on the growing population of *P. juliflora*. As it is not known if there are specific predators or parasitoids of *I. concolorella* on the island, it could play a significant future role in the control of the invasive Mexican Thorn on Ascension Island.

ACKNOWLEDGEMENTS

The author thanks Dr Tiffany Simpson, Ascension Island Government, Head of Conservation Department, and Dr Adam Sharp, University of Hong Kong, for organising the stay on Ascension and issuing the relevant permissions. Dr Phil Lambdon, Ascension Island Government, Conservation Department, is thanked for his invaluable help in identifying the plant species and to find localities for the moth search. The author is also grateful to Dr David Lees, The Natural History Museum London, who brought the identification of the unknown species a great step forward, and to Howard Mendel, Ipswich, for introducing the island's nature in 2017. Brianne St. Jacques, Center for Biodiversity Genomics, University of Guelph, is thanked for her patience to answer numerous questions in connection with the barcoding. Finally, thanks go to Amy-Jayne Dutton, Kingsley, and Dr Jonathan Colville, Cape Town, for checking and improving the English language of the manuscript.

LITERATURE CITED

ASHMOLE, P. & ASHMOLE, M. 2000. *St Helena and Ascension Island: a natural history*. Anthony Nelsen, Oswestry, 475 pp.

CHAMBERS, V. T. 1875. Tineina from Texas. *The Canadian Entomologist* **VII**: 51–56.

DARWIN INITIATIVE. 2024. Accessed November 2024. https://www.darwininitiative.org.uk/project/DPLUS135

DE WAARD, J.R., IVANOVA, N.V., HAJIBABAEI, M. & HEBERT, P.D.N. 2008. Assembling DNA barcodes: Analytical Protocols, pp. 275–293. *In*: CRISTOFRE, M. [ed.] *Methods in Molecular Biology: Environmental Genetics*. Humana Press, Totowa.

HODGES, R.W. 1962. The genus *Ithome* in North America north of Mexico (Walshiidae). *Journal of the Lepidopterist's Society* **15** (2): 81–89.

HODGES, R.W. 1978. Vol. 6.1. Gelechiodea: Cosmopterigidae. *In*: DOMINICK, R.B. *et al.* [eds.] *The moths of America north of Mexico*. E. W. Classey, London, 166 pp., 6 pls.

LAMBDON, P., SIM, J. & STROUD, S. 2024. *Flowering Plants & Ferns of Ascension Island*. Pisces Publications, Newbury. 442 pp.

MOTH PHOTOGRAPHERS GROUP 2023. http://mothphotographersgroup.msstate.edu. Accessed: November 2023, October 2024.

ROBINSON, G.S. 1976. The preparation of slides of Lepidoptera genitalia with special reference to the Microlepidoptera. *Entomologist's Gazette* **27**: 127–132.

ROBINSON, G.S., ACKERY, P.R., KITCHING, I, & BECCALONI, G.W. 2023. *HOSTS – a Database of the World's Lepidopteran Hostplants*. The Natural History Museum, London. Downloaded: October 2023. https://doi.org./10.5519/havt50xw.

ROBINSON, G.S. & KIRKE, CH. 1990. Lepidoptera of Ascension Island – a review. *Journal of Natural History* **24**: 199–235.

Table 1 – List of localities and numbers of specimens sampled at light traps during 2023 field work.

Collection date	Locality	No. of specimens	Habitat/host plant
Nov 13th	Two Boats, Jams Accommodation, 7°56'07.6" S 14°21'56.0" W	> 200	village with ornamental shrubs
Nov 14th	Two Boats, Jams Accommodation, 7°56'07.6" S 14°21'56.0" W	> 200	village with ornamental shrubs
Nov 15th	Grazing Valley, 7°57.551' S 14°21.855' W	> 1000	low guava shrubs with lichen covered rocks (Figs. 1, 2)
Nov 15th	Spoon Crater, Eastern slope, 7°57.581' S 14°21.973' W	> 500	sparse grassland with scattered low guava
Nov 16th	Red Lion, wall about 50 m E, 7°56'58.3" S 14°21'5.1" W	approx. 80	park and garden, ruderal vegetation
Nov 17th	Georgetown, foot of Cross Hill, 7°56'4.2" S 14°28'8.6" W	6	grassland with scattered *Prosopis juliflora*
Nov. 17th	Georgetown, S of street S of Cross Hill, 7°56'6" S 14°24'9" W	32	grassland with scattered *Prosopis juliflora* (Fig. 3)
Nov 18th	Cricket Valley, southern crest N of old NASA-building, 7°57'12.78" S 14°19'45.48" W	1	scattered *Juniperus bermudiana* L. and guava on lichen covered stones and rocks
Nov 19th	Green Mountain, street at path to Middleton, 7°56'50.40" S 14°21'22.14" W	approx. 350	shrubs of *Leucaena leucocephala* (Lam.) De Wit-shrubs and *Eucalyptus*
Nov 20th	Mountain Red Hill, W of Gravel Bend, 7°58'11.58" S 14°21'21.71" W	4	lichen covered scree and sparse guava
Nov 22nd	Comfortless Cove, 100 m N, 7°54'34.9" S 14°21'10.4" W	> 400	rocks and barren ground with *Nicotiana glauca* Graham
Dec 03rd	NASA-road 200 m E of junction to Scout's Camp, 7°57'19.32" S 14°19'58.74" W	1	Juniperus-guava, *Lantana camara* L.-shrubs
Dec 04th	NASA-road down sharp bend near Palmers, 7°57'47.16" S 14°20'58.18" W	22	scattered *J. bermudiana*-guava, *L. camara*-shrubs
Dec 04th	NASA-road up sharp bend near Palmers, 7°57'44.34" S 14°20'59.95" W	3	lichen covered rocks and guava
Dec 05th	Green Mountain, Cronk's path E of Mulberry Ravine, 7°56'53.94" S 14°20'41.16" W	19	rocky slope with scarce *J. bermudiana* and guava
Dec 05th	Green Mountain, Rupert's near Garden Cottage up junction to Cronk's, 7°56'57.42" S 14°20'58.62" W	> 50	mixed forest and clearing
Dec 06th	1.5 km ENE Two Boats, 20 m NNE-Bay-Road, 7°55'42.66" S 14°21'14.4" W	> 140	open *Casuarina equisetifolia* L.-forest around ravine
Dec 06th	1.6 km SW Ariane Station, gut, 7°55'28.74" S 14°20'32.28" W	approx. 180	*N. glauca-Tecoma stans* (L.) Juss. ex Kunth-shrubs
Dec 08th	Green Mountain, W Red Lion, up Horseshoe ramp, 7°56'58.98" S 14°21'7.5" W	> 120	banana, *Leucaena*, many ferns, *Rubus rosifolius* Sm.