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Rediscovery of crepuscular moth *Mimeusemia ceylonica* Hampson, 1893 (Noctuidae: Agaristinae) after 127 years and its distribution in India

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ABSTRACT

Mimeusemia ceylonica (Hampson, 1893) is a moth species belonging to the subfamily Agaristinae and family Noctuidae and was first illustrated and described by Hampson in 1893 from Sri Lanka from the collections of moths in the British museum. The species has been rediscovered after 127 years during a moth survey conducted in the year 2020 at the Agasthyamalai Community-based Conservation Centre (ACCC) situated in the buffer zone of Kalakad Mundanthurai Tiger Reserve (KMTR), Tirunelveli district. The species has been photographed for the first time, before that only illustration of the species was available in the literature. This is the first record of the species from Tamil Nadu, India.

Keywords: Mimeusemia ceylonica, rediscovery moth, tamilnadu, tirunelveli, kmtr

1. INTRODUCTION

Arthropods are the most successful animal groups on earth. About 90% of the forest biomass is comprised of the class Insecta (Fatimah & Catherine, 2002). Lepidoptera is more diverse and the second largest order in the class Insecta (Benton, 1995). About 1,80,000 species of moths belonging to 126 families are recorded worldwide (Capinera, 2008) and among them, about 12,000 species of moths are known from India (Chandra & Nema, 2007). The family Noctuidae is the largest in the Lepidoptera order with more than 25, 000 species of moths recorded worldwide (Shubhalaxmi, 2018); the species of this family are dominant and economically important because of the damage it causes to various agricultural, horticultural and plantation crop as a pest (Kriti et al., 2014). The genus *Mimeusemia* Butler 1875 has 18 species of moths (Anonymous, 2022) and it has a wide range of distribution from Japan, India, Ceylon and Burma. There are five species of moths recorded from India belonging to this genus namely *Mimeusemia basalis* Walker, 1854, *M. peshwa* Moore 1858, *M. postica* Walker 1862, *M. ceylonica* Hampson 1893 and *M. albicilia* Hampson 1894 by Hampson & George

Francis. The species *M. ceylonica* Hampson, 1893 has been previously reported only from *Thirukonamalai* (Triconmali) in Sri Lanka (Ceylon) where it was collected by Major Yerbury and deposited in the British Museum. The *Thirukonamalai* is the type locality of the species (Hampson, 1893, 1901). There is no report of the species after this record from other parts of the world.

Study Area

This study on moths was done in the Agasthymalai Community Conservation Centre (ACCC), Manimuthar, Tirunelveli, Tamil Nadu. The centre is located in the foot hills of the Western Ghats adjacent to the Kalakad Mundanthurai Tiger Reserve (KMTR). ACCC is surrounded by agricultural land such as paddy fields and coconut plantation and lies between 8°39'21.5"N 77°26'52.7"E. The ACCC receives an average annual rainfall of about 1134 mm with more rain during the North-east monsoon than the South-west monsoon as it lies in the eastern slope of the Western Ghats. The minimum temperature in the area is about 16°C and the maximum temperature reaches up to 43°C. We had an opportunistic record of this moth species from Vallanadu Blackbuck Sanctuary lies between 8°43'07.1"N 77°52'27.8"E, it covers an area of 6142 hectares and was established in 1989 to protect the blackbuck, an antelope species found in the region. The terrain of the sanctuary is hilly and ranges in elevation from 50-550 meters above sea level. The climate is tropical, with an average temperature of 30 degrees Celsius. The area receives an annual rainfall of around 1000-1500 mm.

2. MATERIALS AND METHODS

Since November 2018 until the present, two days have been set out each month for moth monitoring. Moths were surveyed using light trap consisting of a 160W mercury vapour bulb hung before a white cotton sheet measuring 3 x 5 feet in dimension, stretched between two poles. The bulb was illuminated depending upon sunset between 6 to 6:30 PM and the mercury bulb was kept on till 4 AM. The moth species and other organisms visiting the screen were recorded by taking photographs using Nikon Coolpix P7800 and Canon 700d cameras. Field notes were taken to record the morphological details of moth species. The temperature data was collected using HOBO and ibutton. The rainfall data was collected using the scientific rain gauge. The wingspan of the moth measured using the ImageJ software.

3. RESULTS

Superfamily**:** Noctuoidea Latreille, 1809
Family: Noctuidae Latreille, 1809
Subfamily: Agaristinae Boisduval, 1833
Genus: *Mimeusemia* Butler, 1875

Based on the literature (Hampson, 1894) the subfamily Agaristinae are day-flying or crepuscular moths of bright colors with stout bodies, simple antennae dilated distally and the terminal joint of the palpi naked. Proboscis present. Legs with two pairs of spurs. Frenum present. Forewing long; hindwing rather broad (Moore, 1882). The larvae with lateral tufts of hair and long scattered hairs and pupa in a slight cocoon beneath the surface of the earth. In the genus *Mimeusemia* Butler (1875) the fore wing with vein 10 anastomosing with 8 and 9 to form the areole.

***Mimeusemia ceylonica* Hampson, 1893**

This was recorded for the first time at ACCC on 11 October 2020 at 20:02 h with a temperature minimum of 27.69°C and maximum of 32.03°C. It has wingspan about 35 mm. During the first record, no rain was recorded. The second time was recorded on 05 November 2021 at 19:08 h with a temperature minimum of 24.11°C and a maximum of 33.1°C. It has wingspan about 40mm. During the second record, the site received 4 mm of rain. Only a single individual was recorded during both periods and it is interesting to note that the records were made during the north-east monsoon season only. We opportunistically had a chance to see this species third time at Vallanadu Blackbuck Sanctuary on 05 November 2022 at 20:40 h. But we did not find this species at ACCC on 2022.

Species description (figure 1)

Head and thorax black-brown; palpi at base and edge of 2nd joint, frons and vertex of head pale yellow; patagia with yellow patches; pectus and legs orange, fore and mid tibiae with black spots, the tarsi banded with black; abdomen orange, with basal triangular black patch including the dorsal crests; sublateral yellowish-white antemedial spot in and below the cell; a medial point on subcostal nervure and an oblique patch from discal fold in cell to sub median fold; an oblique somewhat lunulate patch beyond the cell between veins 8 and 3; diffused silvery-blue streaks of scales below basal half of costa and above vein 1; a spot in middle of cell

and discoidal bar; a postmedial line, interrupted in places, curved from costa to vein3, then strongly retracted; termen irrorated with silvery blue; cilia more or less white at apex and tornus. Hind wing with an orange patch on inner area, extending to beyond middle and at base to the costa; a somewhat quadrate yellowish-white spot beyond the cell, between veins 7 and 3; cilia more or less white-tipped at apex. exp. 44mm (Hampson, 1901).

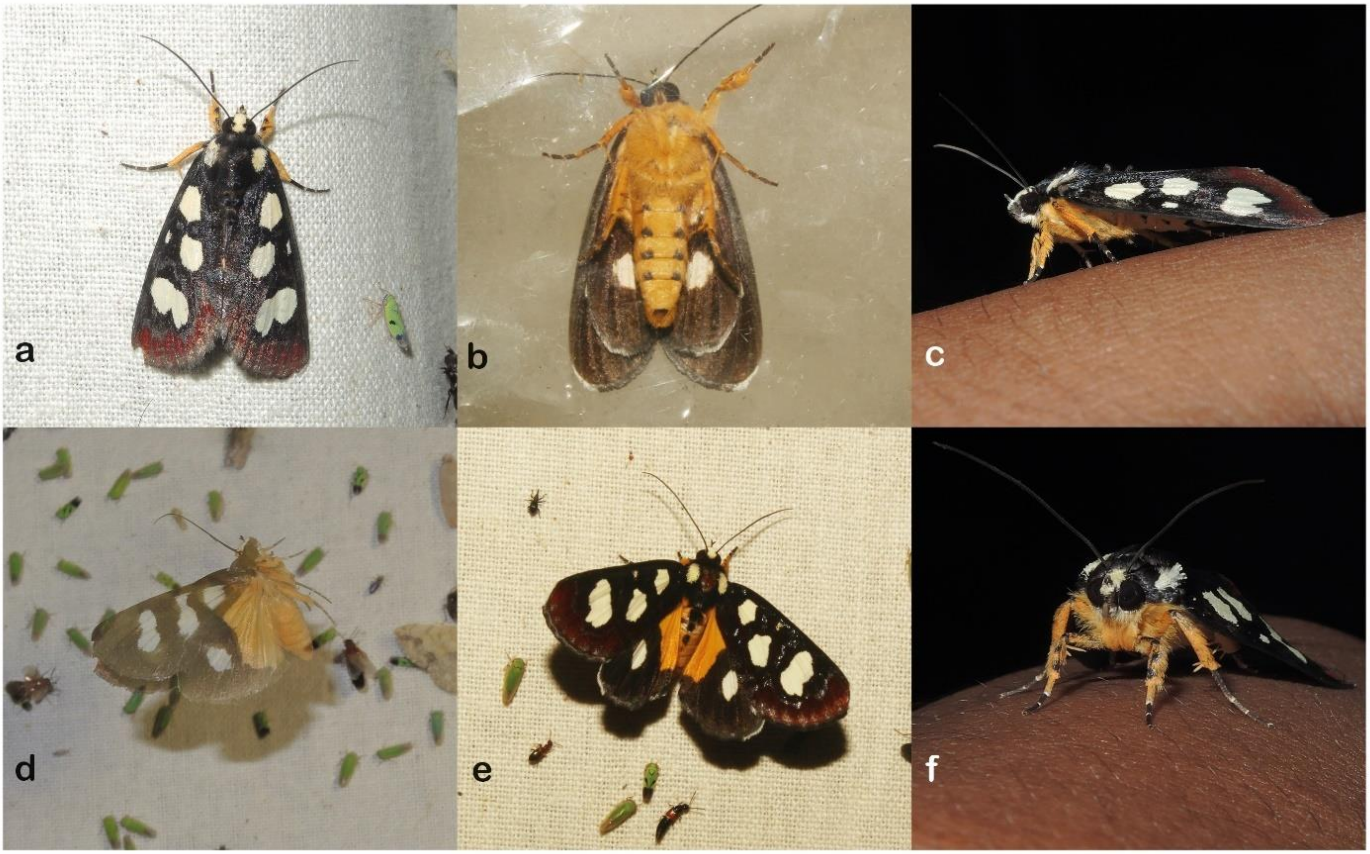

Figure 1 a. Upperside – closed (Dorsal view), b. Underside - closed (Ventral view), c. Side (Lateral view), d. Underside during flight - opened, e. Upperside – opened, f. Front view

Mimeusemia ceylonica differs from *M.peshwa* in the vertex of thorax being black; abdomen orange, with the basal segments black above; the fore wing with a small yellow spot at the upper angle of the cell. exp: 41 mm (Hampson, 1894). Male: Allied to *M. peshwa*. Fore wing with the pale-yellow sub basal spot larger and extending well below the median nervure; a distinct spot on the subcostal nervure just beyond the middle of the cell; the marginal area bright chestnut. Hind wing with the bright yellow basal patch extending nearer the anal angle; the pale-yellow spot on the disk smaller. Thorax with the tegulae pale yellow, but with no streak on the vertex; abdomen without the black segmental bands (Hampson, 1893).

Earlier distribution

Sri Lanka; *Thirukonamalai*

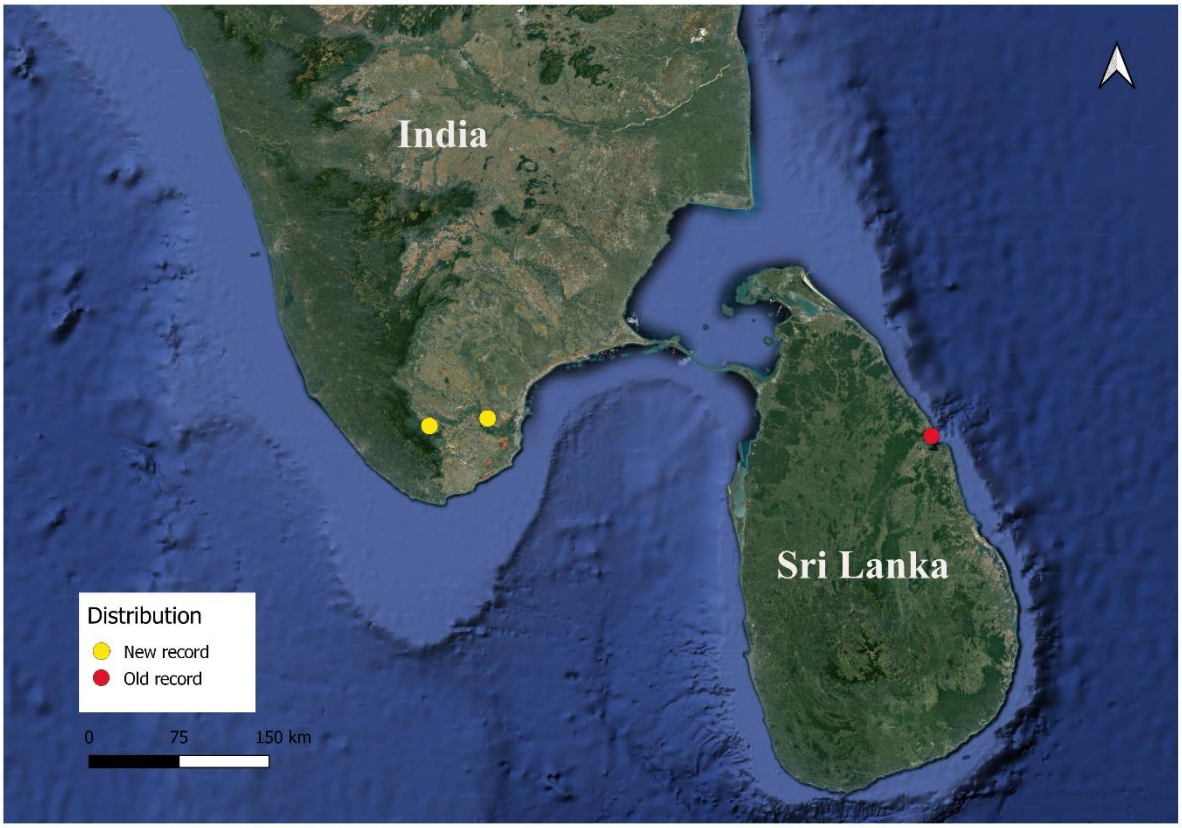

Figure 2 Distribution map of *Mimeusemia ceylonica*

4. DISCUSSION

This is the first record to India. The type locality of this species is *Thirukonamalai* in Sri Lanka, after the first record nobody recorded even from the type locality *Thirukonamalai*. And this is the first record from India. The data is deficient about the life history of this species. We could not try to do the genitalia dissection because we recorded only a single individual of this species during survey.

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Authors' Contributions

The first record of moths observed by 1st and 2nd authors. The second and third observations by 1st author. A literature review and communication with other experts were done by 1st author. Manuscript preparation, editing, and verification by 1st and 2nd authors.

Ethical approval

Animal ethical guidelines are followed in the study for species observation and identification. No specimens were collected.

Informed consent

Not applicable

Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Anonymous. *Mimeusemia* Butler, 1875 2022. https://www.gbif.org /fr/species/1763713 accessed 13 March 2022.
2. Anonymous. *Mimeusemia* Butler, 1875. In Sondhi S, Sondhi Y, Roy P, Kunte K (Chief Editors). Butterflies of India. Published by the Indian Foundation for Butterflies 2023; 3.41. URL: https://www.mothsofindia.org/mimeusemia, accessed 2023/01/13.
3. Benton TG. Biodiversity and Biogeography of Henderson Island insects. Biol J Linn Soc 1995; 56(1-2):245-259.
4. Capinera JL. Butterflies and moths. Encyclopedia of Entomology. Springer 2008; 4(2):626–672.
5. Chandra K, Nema DK. Insecta: Lepidoptera: Heterocera (Moths). In: Director ZSI, India. (Eds.), Fauna of Madhya Pradesh (including Chhattisgarh), State Fauna Series, Rec Zool Surv India 2007; 15(Part-l):47–418.
6. Fatimah A, Catherine AK. The larger moths (Lepidoptera: Heterocera) of the Crocker Range National Park, Sabah: A preliminary checklist. ASEAN Review of Biodiversity and Environmental Conservation 2002; 18:1-14.
7. Hampson GF. Catalog of Phalaenidae moths in the collection of the British Museum 1901; 3:611. f. 266.
8. Hampson GF. Illustrations of typical Specimens of Lepidoptera Heterocera in the Collection of the British Museum 9; Taylor & Francis, London 1893; 89, pl. 15 pl. 157, f. 24.
9. Hampson GF. The Fauna of British India including Ceylon and Burma. Moths, Taylor & Francis, London 1894; 2:609.
10. Kriti JS, Dar MA, Khan ZH. Biological and taxonomic study of agriculturally important noctuid pests of Kashmir. World J Agric Res 2014; 2(2):82-87.
11. Moore F. The Lepidoptera of Ceylon. L. Reeve & Company 1882; 1:2.
12. Powell JA, Mitter C, Farrell B. Evolution of larval food preferences in Lepidoptera in Handbook of Zoology, N Kristensen, Ed. (de Gruyter, Berlin, Germany) 1998; 403–422.
13. Shubhalaxmi V. Field Guide to Indian Moths, Birdwing Publishers, India 2018; 1:(Vi+461).