International Journal of Agricultural and Applied Sciences, June 2025, 6(1): 30-33
https://www.agetds.com/ijaas
ISSN: 2582-8053
https://doi.org/10.52804/ijaas2025.615

Research Article

OPEN ACCESS

New record of two moth species in the states of Maharashtra and Tamil Nadu, India

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(Received: 05/02/2025; Revised: 10/04/2025; Accepted: 25/04/2025; Published: 20/06/2025)

ABSTRACT
In this study was reported two new moth species *Deuterocopus socotranus* (Rabel, 1907) and *Tabidia aculealis* (Walker, 1866), intra the states of India. These two species are non-endemic to Indian fauna and originate from different countries. In these two species, reported in different regions of Maharashtra (*Deuterocopus socotranus*) and Tamil Nadu (*Tabidia aculealis*). Identifications were obtained through photographs and readily accessible literature. The present study was discussed with description, distribution, pests of the host plants and observations.
Keywords: Crambidae, Pterophoridae, Invasive, Moth, New record

INTRODUCTION

The estimated number of insects on Earth is about 10 quintillion. A total of close to 160,000 moth species worldwide, whereas the number of butterfly species is only 17,500. Moths constitute a wide assemblage of insects; although numerous species are advantageous, some are considered pests due to developing offspring (caterpillars) inflicting considerable harm to vegetation, especially in agriculture, horticulture, and forestry. Certain moth species are significant pests against host plants (Nieminen, 1996). Host plants specifically refer to the preference of moth species for targeted plants that allow them to complete their life cycle (Abarca et al., 2014).

Crambidae family moths are massive, diversified, and widespread groups. There are 11,500 species under 15 subfamilies, and 1000 genera globally (Henaish and EI-Metwaly, 2023). *Tabidia aculealis* larvae (caterpillars) feed on *Ipomoea batatas* (Nair, 1986; Krombein, 1996; Present study). This species was reported from localities in Indonesia and Sula (Reddy and Murthy, 2021), previously from Meghalaya in India (Reddy and Murthy, 2021).

Pterophoridae, commonly called T-plume moths. They cause damage in the agricultural fields. Other larvae of Pterophoridae species are known to pest several plants (Gielis, 2000b; Matthews and Lott, 2005; Sidhu et al., 2010; Matthews et al., 2018; Vijayan, 2024). *Deuterocopus socotranus* larvae are a well-known pest for Vitaceae (*Cissus quadrangularis*) and Verbenaceae (*Vitex quadrangular*) plant flowers (Pathania et al., 2021). The present study identified Vitaceae (*Cayratia trifolia* & *Vitis lanata*) in Malvan taluk, Maharashtra.

Knowledge about these two (*Deuterocopus socotranus* and *Tabidia aculealis*) moth species is limited to studies in India. New records were the primary focus of the current study. This study deals with the description, observation and discussion of plant host species. It's base data for helping future researchers identify Crambidae and Pterophoridae species groups in this study region.

MATERIALS AND METHODS

Description of the study area

Study area 1

Malwan (new name Malvan), this taluk is situated in the southernmost district of Sindhudurg, Maharashtra. The study location is situated at 16° 3' 46.494" N and 73° 27' 24.4044" E (Figure 1a). Sindhudurg is a very famous district in Maharashtra. This is an administrative district of the Konkan division in India. Recently Konkan district of Sindhudurg was carved from the former Ratnagiri district. This place is 450 km away from Mumbai. The annual temperature ranges between 17 to 31°C (62.6-87.8°F), humidity is 65-95%. Rainfall around the year is 91.53 inches (2325mm).

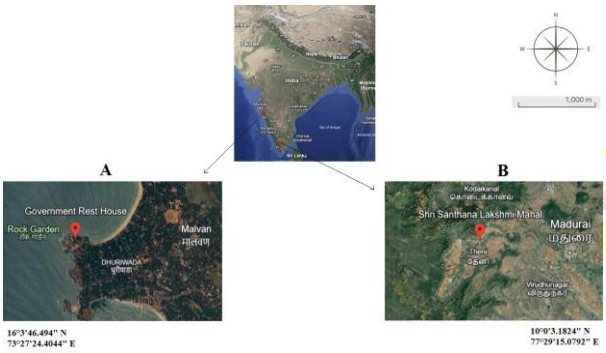
Study area 2

A valley town is situated in the state of Tamil Nadu, foothills of the Western Ghats. Present research investigation occurring in 10° 0' 3.1824" N and 77° 29' 15.0792" E (Figure 1b). Theni district is one of the famous tourist parts in Tamil Nadu. It's well protected by scenic hill rocks, and 70 km away from district of Madurai. This district covers a huge amount of forest lands and is home to a variety of fauna and flora. Approximately 33.7% land is covered by the forest range. The annual temperature ranges between 15 to 38°C (59-100.4°F), humidity 65-78%. Rainfall around the year is 36.22 inches (920mm). Salubrious climate is

quite famous for this district, because of the lakes and hills.

Data collection

A pilot survey was conducted two different seasons. *Deuterocopus socotranus* was collected from the pre-monsoon season (June 6, 2024) in Malvan, Maharashtra. *Tabidia aculealis* collected from the monsoon season (November 24, 2024) in Theni, Tamil Nadu. Data collection methods based on Vijayan and Anbalagan (2023). Identification based on (Vijayan et al., 2023; Vijayan, 2024) and using the available literature and already-published articles.



Figures 1a, b. This map depicts the locations where the investigation was conducted.

Figure 2. *Deuterocopus socotranus*: A) Dorsal view of the brown with white markings, with creamy scales at the base, B) Ventral view of the ventral side imperceptive pale brown to whitish, and C) Frontal view of the eyes and proboscis.

GENERAL FEATURES

Genus - *Deuterocopus*: This species belongs to the family Pterophoridae. Adult head is slightly oblique and shortened, which has bears of coiled, long proboscis. Pterophoridae family species have a smooth-scaled head, ocelli and chaetosemata absent, palpus slender labial, a cleft of forewings, venous scales on are underside along the veins Cu_2 and M_3, the hindwing cleft is double. Usually, this species group has wings narrower and when they are resting on the walls, plants or trees, it's look like T-shaped. Sometimes this plume moth is called T-moth. Dorsal spines are lacking the abdomen. Generally, lacking maxillary palpus, which are present in family Macropiratidae.

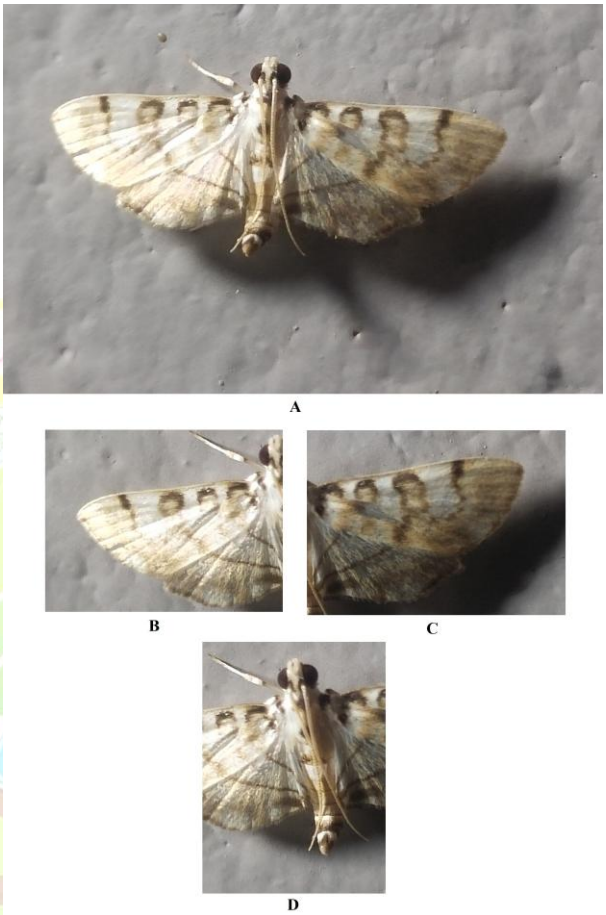


Figure 3. *Tabidia aculealis*: A) Dorsal view of the full moth, B) Left and right wings with postmedial line discontinuously curved from 3/5 of costal margin to 3/5 of posterior margin, extending outward between M2and CuA1 in U shape, and C) Thorax pale brown and abdomen 3-5 segments greyish-black, anal segment with basal half greyish black.

Genus - *Tabidia*: in this moth family of Crambidae. Adult frons is rounded. Curved and upturned labial palp, acuminate, 3rd portion of the palp long segment. Maxillary palp filiform and minute. Forewing CuA_1, M_2, and M_3 posterior angle separation from discal cell, Rs_4 up straight and very well separate from Rs_{2+3}, R_1 close to Rs_{2+3}. Hindwings resemble to forewing.

DESCRIPTION

***Deuterocopus socotranus* Rabel, 1907 (Plate I, Figure 2a, b, c)**

Description of *Deuterocopus socotranus*:

The body length of the adult is 1.8 cm (18 mm). The adult head is slightly oblique and shortened, which has

bears of coiled long proboscis. Antenna pale whitish with inappreciable brown, end of the three black spots found inversely. Maxillary palpus absent. Wings are feathery. Wingspan size is 15 mm. Adult moth forewings are brown. Hindwings are brown and bases are orange. Forewings larger than hindwings, a cleft of forewings, venous scales are underside along the vein Cu_2 and M_3, hindwing cleft is double. Resting posture with the wings extended laterally and narrow rolling up. The abdomen dorsal side is brown with white markings, with creamy scales at the base of the thorax extending to the first abdominal segment, ventral side imperceptive pale brown to whitish.

Specimen examined: One unknown adult, Malvan, Maharashtra, India, 6. vi.2024 coll. Dr. S. Vijayan

Distribution: Maharashtra, Western part of India (Present study), Burma, India, Indonesia, New Guinea, Sri Lanka, and Sula.

Remarks: Adult moth hibernates and there are several overlapping generations. Although they eat a wide range of plants, the larvae are especially fond of bindweed species. *Cayratia trifolia*, *Cissus quadrangularis*, *Vitex quadrangular*, and *Vitis lanata* are more common food plants.

***Tabidia aculealis* Walker, 1866 (Plate II, Figure 3a, b, c)**

Description of *Tabidia aculealis*:

Body length of the adult 2.4 cm (24 mm). Body pale yellowish white, mixed with pale whitish ochreous or blackish brown scales dorsally. Adult very small head and is elliptical. Antenna yellowish white except scape tinged with fuscous laterally. Labial palp is white except 2nd segment tinged with fuscous distally. Maxillary palps are leaner and white. Thorax pale brown. Metathorax modest, brown to pale whitish brown. Patagium and tegula yellowish white, slightly pale yellow at the base. Wingspan size is 18 mm. Fore and hind wings yellowish white, along veins pale ochreous. Forewing orbicular stigma blackish brown, and postmedial line discontinuously curved from 3/5 of costal margin to 3/5 of posterior margin, extending outward between M2and CuA1 in U shape, with apex angle, anal angle and 1/2 of outer margin light brown. Abdomen white, four basal segments tinged with greyish black dorsally, in the type specimen, basal two segments of dorsal abdomen tinged with a few greyish-black, 3-5 segments greyish-black, anal segment with basal half greyish black.

Specimen examined: One unknown adult, Theni, Tamil Nadu, India, 24. xi.2024 coll. Dr. S. Vijayan

Distribution: Tamil Nadu, Southern part of India (Present study), India, Indonesia, Java, Sri Lanka, and Sula.

Remarks: It has numerous generations that overlap, and adult moths hibernate. Although they eat specifically sweet potato plants, the larvae are especially fond of *Ipomoea batatas*.

CONCLUSION

Certain host plants in agricultural environments are seriously harmed by plume moths. This result most closely resembles that of Vijayan (2024). E.g. *Deuterocopus socotranus* serious pest against *Cayratia trifolia* and *Vitis lanata*. The current investigation identifies another moth pest, *Tabidia aculealis*. It's pest of sweet potato plants; the larvae are especially fond of *Ipomoea batatas*. Evidence-based reports have already been published (Krombein, 1996; Nair, 1986). Consequently, additional biological, molecular, and parasitological research is required in this survey area.

CONFLICT OF INTEREST

The author here declares that there is no conflict of interest in the publication of this article.

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Citation: Suruliyandi Vijayan 2025. New record of two moth species in the states of Maharashtra and Tamil Nadu, India. *International Journal of Agricultural and Applied Sciences*, 6(1): 30-33. https://doi.org/10.52804/ijaas2025.615