

First record of *Pyralis farinalis* Linnaeus, 1758 from India (Pyralidae: Pyralinae)

Muzafar Riyaz & Savarimuthu Ignacimuthu

Abstract

In the present report, we highlight the first occurrence of *Pyralis farinalis* Linnaeus, 1758 (Pyraloidea: Pyralidae) from India. The specimen was collected from Tehsil Herman, district of Shopian in Kashmir valley, which is situated at the foothills of Pir Panjal Mountain range-Northwestern Himalayas, India; it is 50 km away from Srinagar, Kashmir.

Keyword: Lepidoptera, Pyralidae, *Pyralis farinalis*, new record, India.

Primer registro de *Pyralis farinalis* Linnaeus, 1758 de la India (Pyralidae: Pyralinae)

Resumen

En el presente informe, destacamos la primera aparición de *Pyralis farinalis* Linnaeus, 1758 (Pyraloidea: Pyralidae) de la India. El espécimen se capturó en Tehsil Herman, distrito de Shopian en el valle de Cachemira, que está situado en las estribaciones de la cordillera de Pir Panjal, Himalaya noroccidental, India; está a 50 km de Srinagar, Cachemira.

Palabra clave: Lepidoptera, Pyralidae, *Pyralis farinalis*, nuevo registro, India.

Introduction

In India, the work on superfamily Pyraloidea was initiated by Hampson (1896) that included the distribution and taxonomy of 1,136 species. Up to date, a number of authors from India and across the globe have occasionally reported and described many new species and new records from the superfamily Pyraloidea (Rao & Sivaperuman, 2021; Singh et al. 2020; Mathew, 2006; Raha et al. 2017; Murthy et al. 2015). A catalogue of Indian Pyraloidea was published recently, and it included 1,695 described species of Pyraloidea moths distributed among 509 genera (Singh et al. 2022). The family Pyralidae has a total of 518 species distributed over 182 genera; of these, 171 species spread across 47 genera are assigned to the subfamily Pyralinae in India. There are more than ten species that belong to each of the five genera *Endotricha* Zeller, 1847, *Hypsopygia* Hübner, [1825], *Pyralis* Linnaeus, 1758, *Sacada* Walker, 1852, and *Stemmatophora* Guenée, 1845, with *Hypsopygia* (24 species) being the most diverse in the Pyralinae family. In addition, the genus *Pyralis* comprises of 17 species reported across the country with no species records from Jammu and Kashmir. In the Indian subcontinent, the region of Northeast India is home to the greatest variety of Pyralinae, followed by the West and Northwest Himalayas, and then the Central Himalayas (Singh et al. 2022).

Pyralis farinalis Linnaeus, 1758 (Pyralidae: Pyralinae) is a genus that belongs to superfamily

Pyraloidea. The species was first scientifically described by Linnaeus in 1758 as type species of the genus *Pyralis* Linnaeus, 1758 (Linnaeus, 1758). The species was synonymized by Zeller, 1847 as *Asopia domesticalis*. The species was further synonymized by several authors (Nuss et al. 2003–2018). Based on Munroe & Solis in Kristensen (1999), the genus *Pyralis* is classified within the family Pyralidae and subfamily Pyralinae.

Materials and Methods

The single adult male *Pyralis farinalis* (Figures 2-3) was photographed and collected inside the household on 20-VI-2022 at an elevation of 1,596m in Tehsil Herman (33°42'18"N, 74°56'23"E), district Shopian, Kashmir Division (Jammu & Kashmir Union Territory), India (Figure 1). The sample was collected during night hours with the use of a headlamp (ProTac HL Headlamp) and cotton-wrapped ethyl acetate vials. Photographs of the species were obtained with a smart phone (Xiaomi Redmi Note 8 Pro) equipped with a 20 mm macro lens. The specimen was acquired by the author in the course of his exploration on the unique insect life in the Kashmir Valley of India, and further taxonomic studies, such as the removal and preparation of the genitalia, were accompanied. For several minutes, the specimen's abdomen was cleaned after treated with KOH at 135°C, and the genitalia was then prepared. After being rinsed with distilled water, the genitalia was placed in glycerin and preserved for further analysis. With a total annual precipitation of 660 mm and an average temperature of 25 degrees Celsius, the region is primarily rural and has an extensive range of agricultural areas (Riyaz et al. 2021; 2022; Riyaz & Reshi, 2021; Shiekh & Mishra, 2023). The specimen and its genitalia have been deposited in the insect museum of Xavier Research Foundation, St. Xavier's College, Palayamkottai, India, with voucher numbers XRF-KMR-253 and XRF-KMR-GS-276.

The species was properly identified by examining the morphological features of the male specimen as well as the genitalia of the animal using a number of online platforms, such as; (<https://www.gbif.org/species/1872901>, <https://www.nhm.ac.uk/our-science/data/butmoth/search/GenusDetails.dsml?NUMBER=25251.0>, <https://britishlepidoptera.weebly.com/072-pyralis-farinalis-meal-moth.html>) and relevant literature (Solis & Shaffer, 1999; Kato, 1977; Payne, 1925).

Results and Discussion

Wingspan 22 mm. Forewings are elongate triangular, dividing into two sections by a pair of white lines, the distal line of which is wavy and the basal line of which curves in an arc; the area between the lines is light yellowish-brown; areas outside the distal line and inside the basal line are dark brown. Hind wing is broad, rounded, and pale brown, with two undulating white lines crossing it; the distal half of the wing has several dark spots. Adults frequently rest with the uppermost point of their abdomen at a right angle to their bodies (Figures 2-3).

After examining the genitalia, we observed Uncus equal width throughout or less narrow than the base; flat or spatulate, ventrally with spine clusters absent; tegumen highly sclerotized; vinculum well developed; juxta simple, seldo extensively sclerotized; Uncus short and broad; Valvae simple; ventral surface of valva bearing hairlike setae not arranged in radiating rows, costal setae absent; vesica of aedeagus with clusters of spinelike cornuti, vesica spined, reflexed with heavy sclerotization (Figure 4).

The species is cosmopolitan in distribution (Poltavsky et al. 2018) and largely distributed in Europe and North America (<https://www.gbif.org/species/1872901>) (Figure 5). Moreover, the species is a pest of stored food plants, especially milled plant products (Curtis & Landolt, 1992). The authors speculate that the northern parts of the Jammu division (J&K UT, India) are where this species is most likely to be found. This is based on prior observations with comparable habitats, and it is proposed that this area includes all of Kashmir. The authors of the investigation believe that there is a good chance that the species might be found in the northern regions of Pakistan, Afghanistan, Turkmenistan, and Iran since these countries link to the current site. Based on current monitoring and prior locations, the IUCN Red List review of this species on the GeoCAT website determined that the species was of Least

Concern (LC), and its area of occurrence was assessed to be 166,367,999.798 km². This evidence is remarkable and significant since it gives the first reliable proof of *Pyralis farinalis* Linnaeus, 1758 inhabiting the Indian subcontinent. With respect to the political confines of India, this culminates in a notable range extension for the species.

Acknowledgement

Authors are thankful to IDEAWILD (USA) for providing field equipment and St. Xavier's College, Palayamkottai for extended support and guidance.

References

- Curtis, C. E., & Landolt, P. J. (1992). Development and life history of *Pyralis farinalis* L. (Lepidoptera: Pyralidae) on an artificial diet. *Journal of Stored Products Research*, 28(3), 171-177. [https://doi.org/10.1016/0022-474X\(92\)90037-Q](https://doi.org/10.1016/0022-474X(92)90037-Q)
- Hampson, G. F. (1896). Moths. In *The Fauna of British India, including Ceylon and Burma*. (Vol. 4). Taylor & Francis.
- Katoi, M. I. A. (1977). Brief morphological characteristics of *Pyralis farinalis*. *Rastit Zashit*.
- Linnaeus, C. (1758). *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Laurentii Salvii*. Holmiae.
- Mathew, G. (2006). An inventory of Indian Pyralids (Lepidoptera: Pyralidae) [Journal]. *Zoos' Print Journal*, 21(5), 2245-2258. <https://doi.org/10.11609/JoTT.ZPJ.667.2245-58>
- Munroe, E. G., & Solis, M. A. (1999). Pyraloidea (pp. 233-256). In N. P. Kristensen (Ed.), *Lepidoptera, Moths and Butterflies, Evolution, Systematics and Biogeography*. Walter de Gruyter.
- Murthy, M. S., Nagaraj, S. K., & Prabhuraj, A. (2015). Agriculturally important Pyraloidea (Lepidoptera) of India: Key to subfamilies, current taxonomic status, and a preliminary checklist. *Entomon*, 40(1), 23-62.
- Nuss, M., Landry, B., Mally, R., Vegliante, F., Tränkner, A., Bauer, F., Hayden, J., Segerer, A., Schouten, R., Li, H., Trofimova, T., Solis, M. A., De Prins, J., & Speidel, W. (2003-22). *Global Information System on Pyraloidea*. <https://www.pyraloidea.org>
- Payne, N. M. (1925). *Pyralis farinalis* Linn. (Lepidoptera)-An Alfalfa Hay Work in Kansas. *Journal of Economic Entomology*, 18(1), 224-227. <https://doi.org/10.1093/jee/18.1.224>
- Raha, A., Sanyal, A. K., Majumder, A., & Chandra, K. (2017). An inventory of Pyraloidea Latreille, 1809 (Lepidoptera: Heterocera) from Chhattisgarh. *National Journal of Life Science*, 14(1), 41-45.
- Rao, B. S. K., & Sivaperuman, C. (2021). New records of pyraloid moths (Lepidoptera: Pyraloidea) in the Andaman and Nicobar Islands, India. *Zoosystematica Rossica*, 30(2), 215-221. <https://doi.org/10.31610/zst/2021.30.2.215>
- Riyaz, M., & Reshi, M. A. (2021). First record of *Myrmeleon trivialis* (Gerstaecker, 1885) (Neuroptera: Myrmeleontidae) from the J and K UT (Kashmir Valley, India). *Egyptian Academic Journal of Biological Sciences à Entomology*, 14(3), 59-64. <https://doi.org/10.21608/eajbsa.2021.193051>
- Riyaz, M., & Sivasankaran, K. (2022). First record of *Xanthia (Cirrha) icteritia* (Hufnagel, 1766) (Noctuidae: Xyleninae) from India. *Journal of Threatened Taxa*, 14(8), 21745-21748. <https://doi.org/10.11609/jott.7846.14.8.21745-21748>
- Riyaz, M., Mathew, P., Shiekh, T., Ignacimuthu, S., & Sivasankaran, K. (2021). First record of the Afghan Poplar Hawkmoth *Laothoe witti* Eitschberger et al., 1998 (Sphingidae: Smerinthinae) from India: A notable range extension for the genus. *Journal of Threatened Taxa*, 13(7), 18943-18946. <https://doi.org/10.11609/jott.6400.13.7.18943-18946>
- Sheikh, T., & Mishra, S. (2023). First photographic record of *Ypthima sakra* Moore, 1857-from Jammu and Kashmir Union territory, India (Lepidoptera: Nymphalidae). *SHILAP Revista de lepidopterología*, 51(201), 55-58. <https://doi.org/10.57065/shilap.435>
- Singh, N., Kirti, J. S., Ranjan, R., Chandra, K., & Speidel, W. (2020). On the taxonomy of the genus *Sacada* Walker, 1862 from India, with descriptions of a new genus and two new species (Pyralinae, Pyralidae, Lepidoptera). *ZooKeys*, 962, 139-163. <https://doi.org/10.3897/zookeys.962.51194>
- Singh, N., Ranjan, R., Talukdar, A., Joshi, R., Kirti, J. S., Chandra, K., & Mally, R. (2022). A catalogue of Indian Pyraloidea (Lepidoptera). *Zootaxa*, 5197(1), 1-423. <https://doi.org/10.11646/zootaxa.5197.1.1>

- Solis, M. A., & Shaffer, M. (1999). Contribution towards the study of the Pyralinae (Pyralidae): Historical review, morphology, and nomenclature. *Journal of the Lepidopterists' Society*, 53(1), 1-10.
- Zeller, P. C. (1847). Bemerkungen über die auf einer Reise nach Italien und Sicilien beobachteten Schmetterlingsarten. *Isis von Oken*, 1847, 121-910.

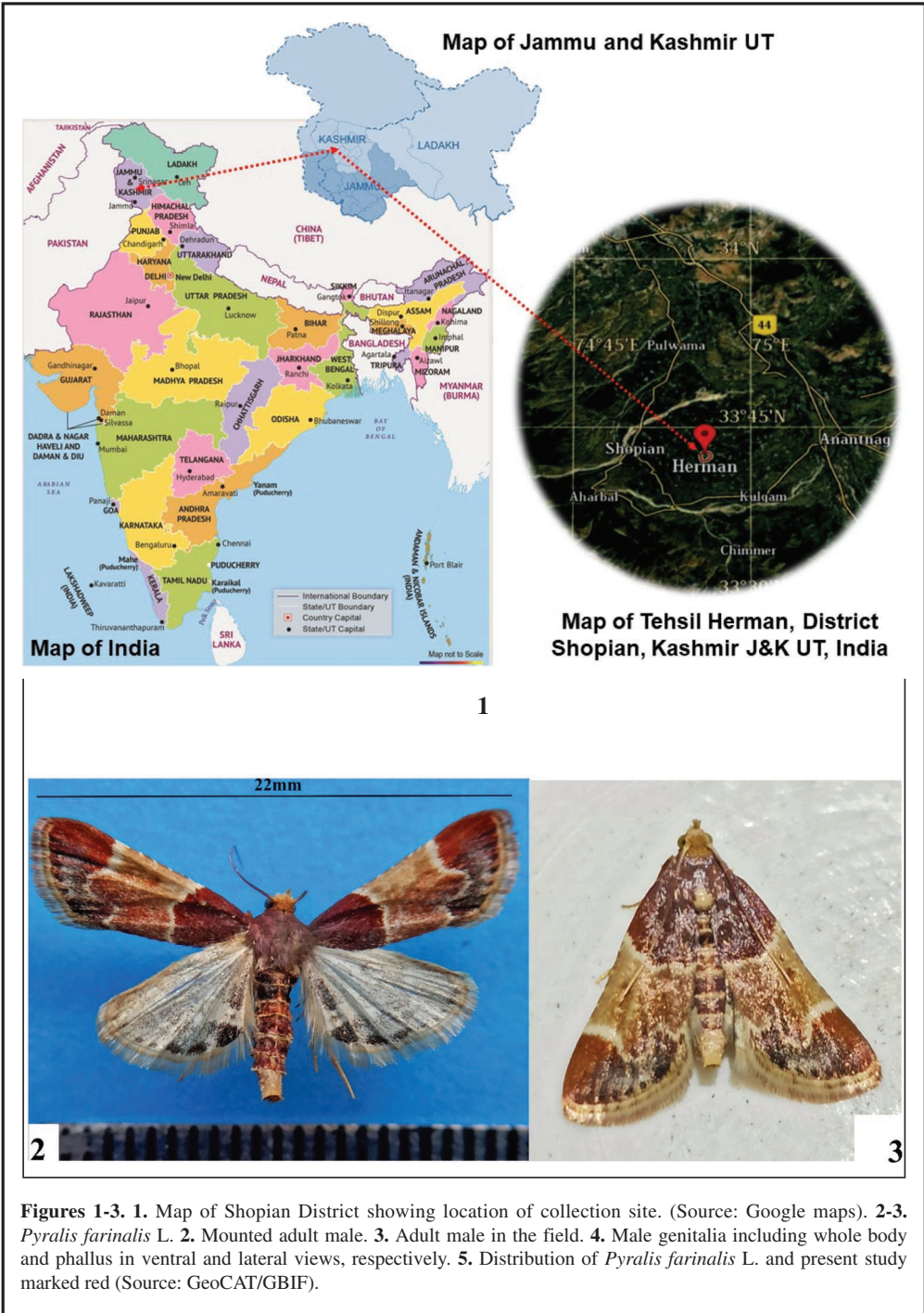
*Muzafar Riyaz
Xavier Research Foundation
St. Xavier's College
Palayamkottai
627002-Tamil Nadu
INDIA / INDIA
E-mail: bhatmuzaffar471@gmail.com
<https://orcid.org/0000-0001-9372-681X>

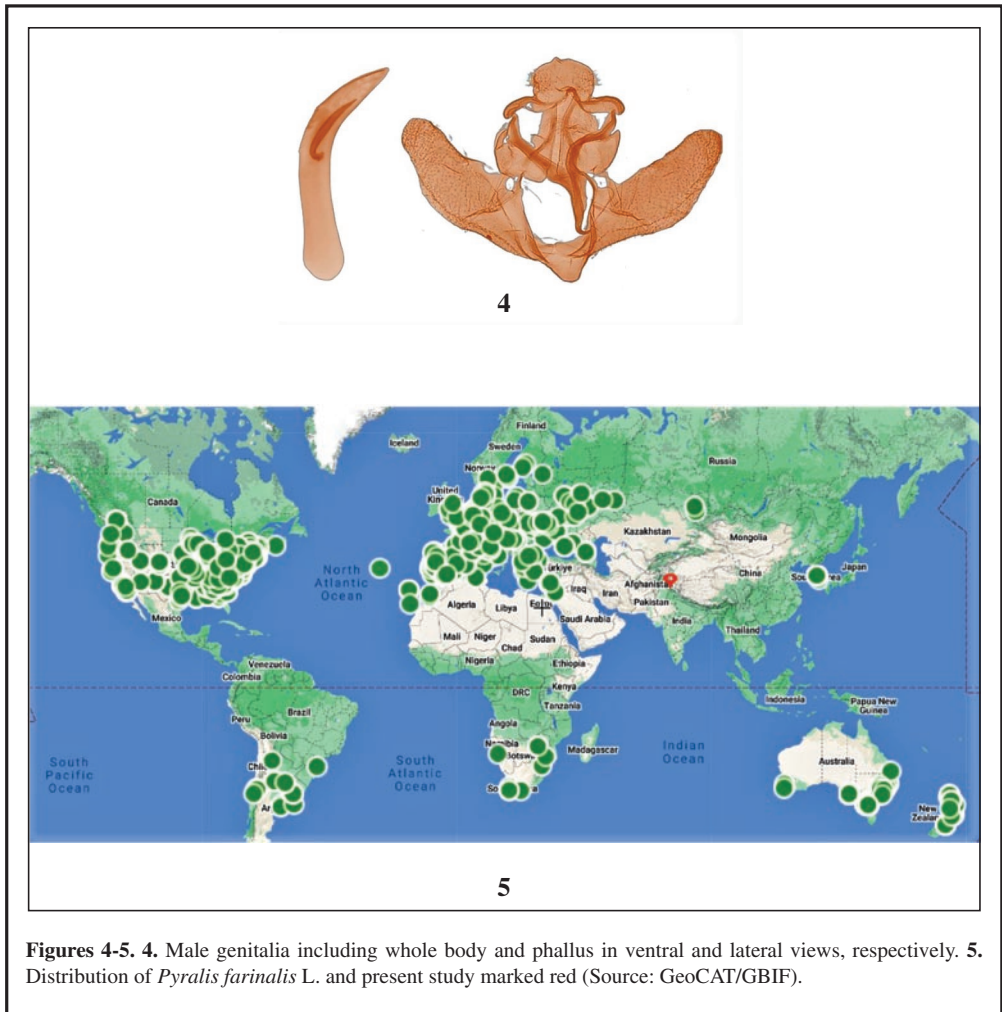
Savarimuthu Ignacimuthu
Xavier Research Foundation
St. Xavier's College
Palayamkottai
627002-Tamil Nadu
INDIA / INDIA
E-mail: imuthus@hotmail.com
<https://orcid.org/0000-0002-8467-789X>

*Autor para la correspondencia / *Corresponding author*

(Recibido para publicación / *Received for publication* 2-V-2023)
(Revisado y aceptado / *Revised and accepted* 5-VII-2023)
(Publicado / *Published* 30-XII-2023)

Derechos de autor: El autor(es). Este es un artículo de acceso abierto distribuido bajo los términos de la Licencia de Reconocimiento 4.0 Internacional de Creative Commons (CC BY 4.0), que permite el uso, distribución y reproducción sin restricciones en cualquier medio, siempre que se cite al autor original y la fuente. / **Copyright:** The author(s). This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.





Figures 4-5. 4. Male genitalia including whole body and phallus in ventral and lateral views, respectively. 5. Distribution of *Pyralis farinalis* L. and present study marked red (Source: GeoCAT/GBIF).