

Range extension of the *Macroglossum pyrrhosticta* Butler, 1875, in Northwestern India (Lepidoptera: Sphingidae)

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During a faunistic survey of Lepidoptera in Sasni (27.7063° N, 78.0823° E; 181 m), Uttar Pradesh, a specimen of *Macroglossum pyrrhosticta* Butler, 1875, was collected and thus the species reported for the first time from the Gangetic Plains Biogeographic Zone of India, as well as North-West India as a whole. Details of the known larval host plants of *M. pyrrhosticta* are also provided, together with a checklist of the Indian species of genus *Macroglossum* Scopoli, 1777.

Keywords: Lepidoptera, Sphingidae, female genitalia, *Macroglossum pyrrhosticta*, new record, India.

Extensión del área de distribución de *Macroglossum pyrrhosticta* Butler, 1875, en el noroeste de la India (Lepidoptera: Sphingidae)

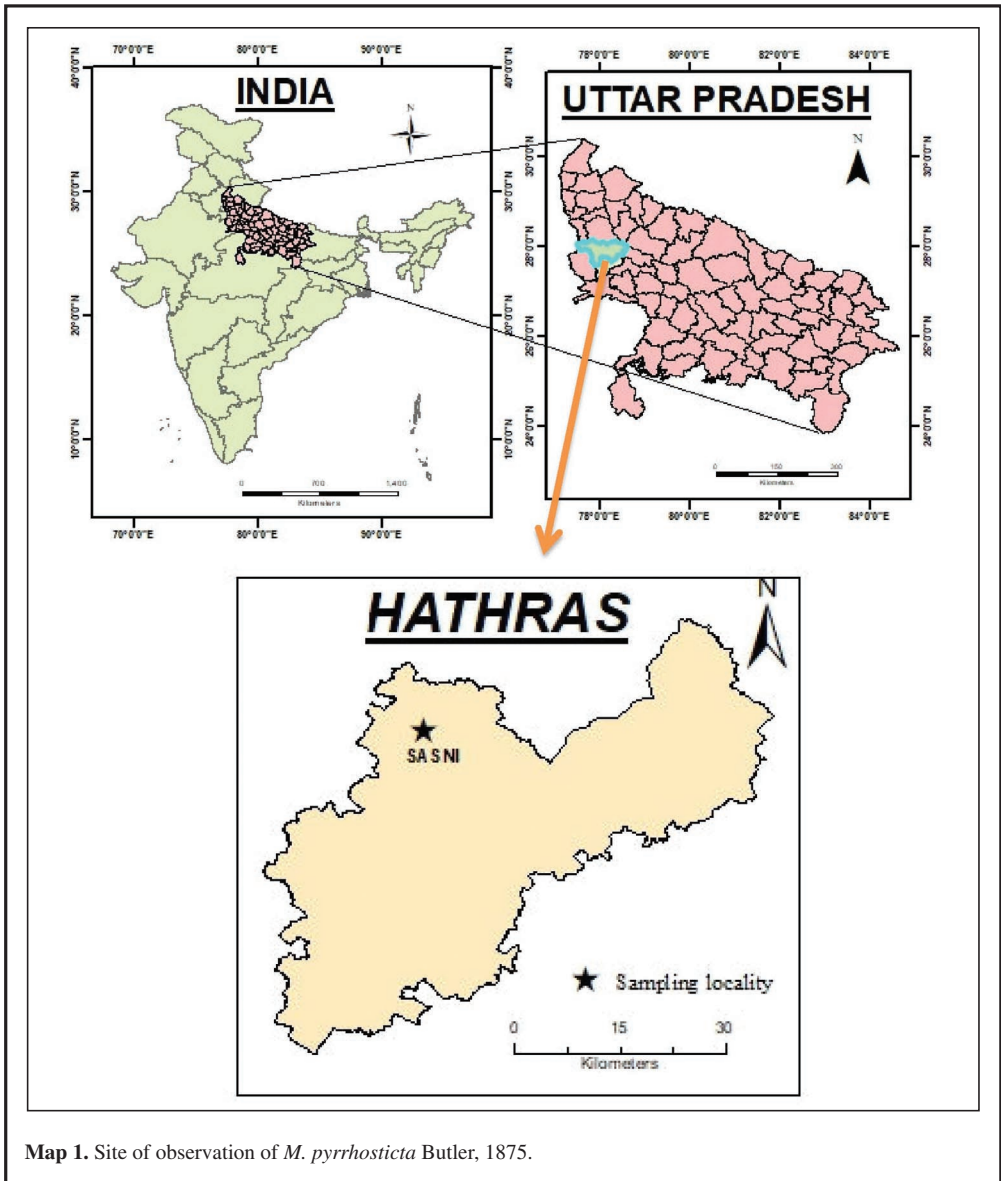
Resumen

Durante un estudio faunístico de Lepidoptera en Sasni (27,7063° N, 78,0823° E; 181 m), Uttar Pradesh, se recogió un espécimen de *Macroglossum pyrrhosticta* Butler, 1875, con lo que se registró la especie por primera vez en la zona biogeográfica de las llanuras del Ganges de la India, así como en el noroeste de la India en su conjunto. También se proporcionan detalles de las plantas nutricias conocidas de larvas de *M. pyrrhosticta*, junto con una lista de control de las especies indias del género *Macroglossum* Scopoli, 1777.

Palabras clave: Lepidoptera, Sphingidae, genitalia hembra, *Macroglossum pyrrhosticta*, nuevo registro, India.

Introduction

Adults of many species of the moth family Sphingidae, are nectarivorous (Boggs, 1987) and important pollinators in both natural and anthropogenic environments, being highly specialized flower visitors equipped with a long, thin and very flexible proboscis (Meeuse & Morris, 1984). Many species hover at flowers like hummingbirds to imbibe nectar. They can be quite abundant in forests and in Costa Rica, pollinate 5-10% of all trees and shrubs (Janzen, 1983; Bawa et al. 1985; Haber & Frankie, 1989). Most adult hawkmoths are nocturnal, although some species fly by day, or predominantly in the crepuscular period (Opler, 1983). Among the diurnal and crepuscular species are members of the genus *Macroglossum*, although many are also nocturnal. The genus was erected by Giovanni Antonio Scopoli in 1777. The genus name was derived from the Latin prefix “macro” meaning big or large, and the Greek γλωσσα [glossa] meaning tongue. Only five species of *Macroglossum* have so far reported from Gangetic Plains Biogeographic Zone of India (encompassing Uttar Pradesh, Uttarakhand, Bihar and West Bengal states), viz., *M. assimilis* Swainson, 1821, *M. belis* (Linnaeus, 1758), *M. corythus* Walker, 1856, *M. gyrans* Walker, 1856 and *M. nycteris* Kollar, 1844 (Joshi et al. 2021). The present paper provides information on the occurrence of a sixth species, *Macroglossum pyrrhosticta* Butler, 1875, based on morphotaxonomic and genital study.



Map 1. Site of observation of *M. pyrhosticta* Butler, 1875.

Materials and Methods

Our study was carried out at Sasni (27.7063° N, 78.0823° E; 181 m; Map 1), nearby Shri Balaji Garden in Hathras District, Uttar Pradesh, in the late afternoon (5:10 p.m.) of 12th October 2018. A specimen of the genus *Macroglossum* was collected on the wing using an insect net. After killing with ethyl acetate, the specimen was transferred to an insect envelope and labelled with the name of locality, date, latitude, longitude, and altitude. Later, in the laboratory, the specimen was relaxed and spread on a setting board. The exemplar was initially identified simply as *Macroglossum* sp. but the identification

as *Macroglossum pyrrhosticta* was later confirmed by the second author. The specimen has been preserved in a fumigated insect storage box in the collection of the Zoology Department, Aligarh Muslim University (ZDAMU), Aligarh, Uttar Pradesh.

Results

TAXONOMIC

Class: Insecta Linnaeus, 1758

Order: Lepidoptera Linnaeus, 1758

Clade: Ditrysia Börner, 1925

Superfamily: Bombycoidea Latreille, [1802]

Family: Sphingidae Latreille, [1802]

Subfamily: Macroglossinae Harris, 1839

Tribe: Macroglossini Harris, 1839

Subtribe: Macroglossina Harris, 1839

Genus: *Macroglossum* Scopoli, 1777

Distribution: Europe, Africa, Asia, and Australian region (Hampson, [1893]).

Note: The species of this genus are numerous, closely allied and can be difficult to discriminate.

Macroglossum pyrrhosticta Butler, 1875

Macroglossa pyrrhosticta Butler, 1875; *Proc. zool. Soc. Lond.*, 1875, 242

TL: CHINA, Shanghai.

Holotype: ♀, CHINA, Shanghai [NHMUK].

= *Macroglossa catapyrrha* Butler, 1875

= *Macroglossum pyrrhosticta* form *albifascia* Mell, 1922

= *Macroglossum pyrrhosticta* form *ferrea* Mell, 1922

= *Macroglossum fukienensis* Chu & Wang, 1980

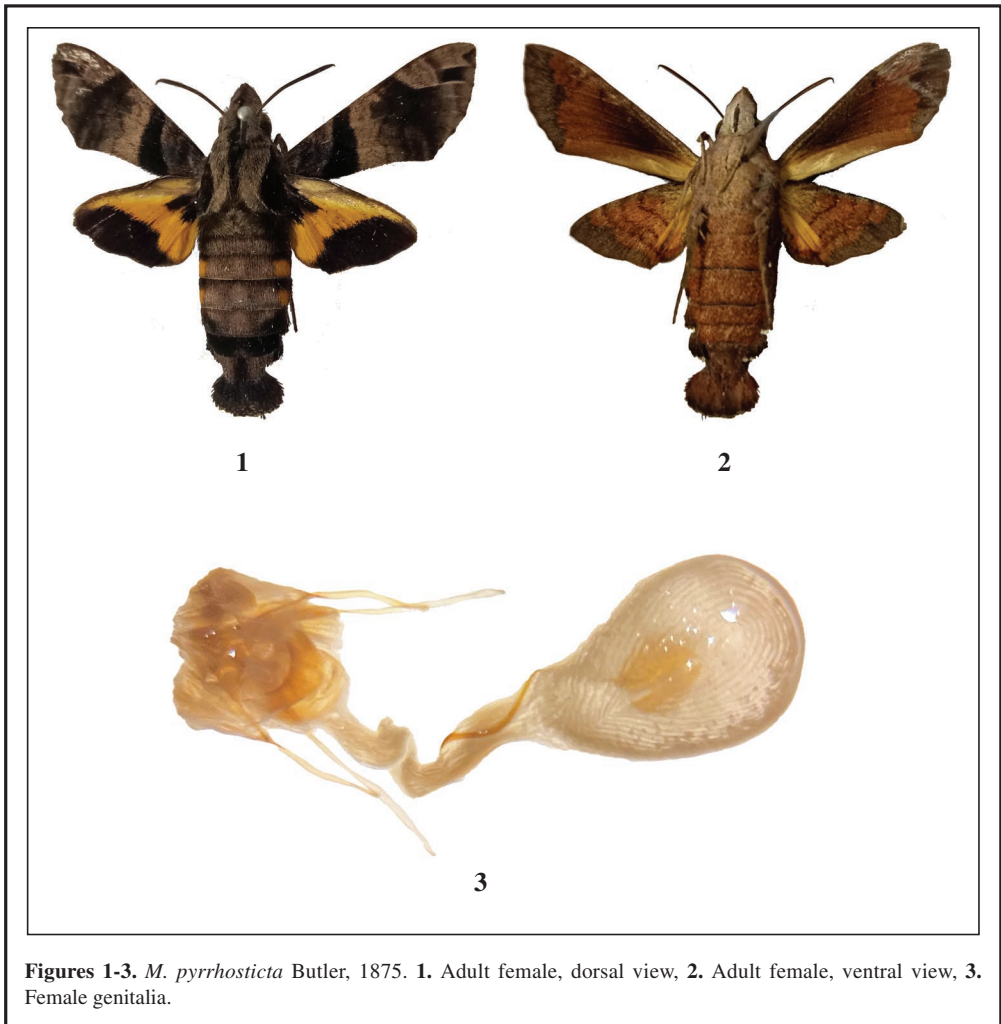
Description Adult (Figures 1-2): Very similar to *Macroglossum variegatum* Rothschild & Jordan, 1903, but most easily distinguished by the chestnut brown underside of the abdomen (greyish brown in *M. variegatum*). Head, thorax, abdomen, and forewings greyish without a rufous tinge. The upperside of the forewing is brown flushed with whitish grey, the dark brown antemedial band is wider at the inner margin than the costa, with slightly curved margins.

Female genitalia (Figure 3): Papillae anales broad, strong. Apophyses anteriores and posteriores large and weak, blunt apically. Ductus bursae thin, curved and spiralled, long, anterior end gradually widening into the corpus bursae. Corpus bursae ovoid. Signum with a circular anterior section and a very long and narrow posterior band that runs along the anterior half of the ductus bursae.

Distribution in India: Uttar Pradesh (Hathras District) (this study); Arunachal Pradesh (Changlang District); Assam (East Karbi Anglong District); West Bengal (Bankura District, South 24 Parganas District) (Sondhi et al. 2021).

Elsewhere: Sri Lanka, Nepal, Bhutan, Myanmar, central, eastern and southern China, South Korea, North Korea, Japan, the southern Russian Far East, Taiwan, Philippines (Luzon), Laos, Cambodia, Thailand, Vietnam, Malaysia (Peninsula and Sarawak) and Indonesia (Sumatra, Java, Bali, Lombok) (Pittaway & Kitching, 2021); established in Hawaii, USA.

Larval Host Plants: Larvae have been recorded feeding on *Paederia scandens*, *Psychotria rubra*, *Paederia foetida* and *Paederia tomentosa*; *Paederia foetida* and *Psychotria rubra* (Rubiaceae) in Hong Kong, *Paederia foetida* in India (Bell & Scott, 1937, 1937), and *Paederia foetida* in mainland China and Taiwan. On the latter island, it has also been recorded from *Paederia cavaleriei*, *Serissa japonica* [syn.: *Serissa serissoides*] and *Sida rhombifolia* (Pittaway & Kitching, 2021); also, *Paederia foetida* (Rubiaceae) and *Impatiens* sp. (Balsaminaceae) (Robinson et al. 2010).



Figures 1-3. *M. pyrrhosticta* Butler, 1875. **1.** Adult female, dorsal view, **2.** Adult female, ventral view, **3.** Female genitalia.

Discussion

In the first comprehensive treatment of the Sphingidae fauna of the Indian subcontinent, Hampson ([1893]) reported 23 species under the genus name “*Macroglossa*”, representing 18 currently accepted species of *Macroglossum*. *Macroglossum pyrrhosticta* was not mentioned as such, but was included under the current junior subjective synonym, *Macroglossa catapyrrha*. In their updated and expanded treatment of the Sphingidae of India and adjacent countries, Bell & Scott (1937) reported 27 species representing 24 currently valid species, including *M. pyrrhosticta* (from the Eastern Himalaya). Kendrick (2010) mentioned only 15 species of *Macroglossum* in India (those that were in common with Hong Kong, China), while the *Moths of India* website (Sondhi et al. 2021) currently lists only 13 species that have been photographed in the different parts of the country (which may reflect the difficulties of photographing these fast-flying insects).

Prior to the present study, *M. pyrrhosticta* was only known in India from several eastern states,

namely Arunachal Pradesh, Assam and West Bengal. However, the two districts in West Bengal (Bankura district and South 24 Parganas district) do not include land of the Gangetic Plains. Thus, the present study is the first to report the occurrence (and associated range extension) of *M. pyrrhosticta* in the state of Uttar Pradesh, the Gangetic Plains and North-West India in general.

Checklist of Indian species of the genus *Macroglossum* Scopoli, 1777.

1. *Macroglossum afflictitia* Butler, 1875
2. *Macroglossum aquila* Boisduval, 1875
3. *Macroglossum assimilis* Swainson, 1821
4. *Macroglossum belis* (Linnaeus, 1758)
5. *Macroglossum bifasciata* Butler, (1875)
6. *Macroglossum bombylans* Boisduval, 1875
7. *Macroglossum corythus* Walker, 1856
8. *Macroglossum divergens divergens* Walker, 1856
9. *Macroglossum divergens heliophila* Boisduval, 1875
10. *Macroglossum gyrans* Walker, 1856
11. *Macroglossum mitchellii imperator* Butler, 1875
12. *Macroglossum neotroglodytus* Kitching & Cadiou, 2000
13. *Macroglossum nycteris* Kollar, 1844
14. *Macroglossum obscura* Butler, 1875
15. *Macroglossum particolor* Rothschild & Jordan, 1903
16. *Macroglossum passalus* (Drury, 1773)
17. *Macroglossum prometheus* Boisduval, 1875
18. *Macroglossum pyrrhosticta* Butler, 1875
19. *Macroglossum regulus* Boisduval, 1875
20. *Macroglossum saga* Butler, 1878
21. *Macroglossum semifasciata* Hampson, 1893
22. *Macroglossum sitiene* Walker, 1856
23. *Macroglossum stellatarum* (Linnaeus, 1758)
24. *Macroglossum troglodytus* Boisduval, 1875
25. *Macroglossum variegatum* Rothschild & Jordan, 1903
26. *Macroglossum vicinum* Jordan, 1923

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