



# Studies on Four Species of Genus *Hypolampurus* Hampson (Lepidoptera: Thyrididae) from Western Ghats, India

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**Abstract:** The communications deals with the studies on the morphotaxonomy of four species i.e., *angulalis* Moore, *striatalis* Swinhoe, *langualis* sp. nov. and *neostriatalis* sp. nov. belonging to genus *Hypolampurus* Hampson under family Thyrididae of order Lepidoptera. The species i.e., *H. angulalis* Moore is recorded for the first time from India. The female genitalia of species *striatalis* Swinhoe have been studied for the first time which is the type-species of the genus *Hypolampurus* Hampson. Beside this, the details on the morphology of the adults, male and female genitalia, nomenclature of the wing venation, distribution and materials examined for all the species have been discussed and illustrated in full details. A dichotomous key for their interspecific discrimination is also provided.

**Keywords:** Morphotaxonomy, Lepidoptera, Thyrididae, *Hypolampurus* Hampson, Western Ghats

Lepidoptera are scaly winged insects (Moths, butterflies and skippers) in the class Insecta which are having 1,58,570 species on global basis which are approximately to 9% of total Animalia. About 15,000 species belonging to 84 families fall in this order out of which 13,359 species under 78 families are moths and remaining are butterflies from India (Chandra 2011). Under this order one of the Superfamily Thyridoidea, the family Thyrididae comprise the picture winged leaf moths which are sometime included in Superfamily Pyraloidea, but all these not supported by cladistic analysis.

The genus *Hypolampurus* Hampson is a genus of the family Thyrididae under order Lepidoptera. This genus was proposed for its type-species i.e., *Microsca striatalis* Swinhoe (Hampson 1893). Hampson (1894) reported only seven species from the then limits of India including and only one species i.e., *striatalis* Swinhoe from Western Ghats of India. Eleven specimens belonging to four species of genus *Hypolampurus* Hampson were identified from the Lepidoptera collection of Western Ghats which are housed in different museums. Owing to characters such as position of labial palpi, type of antenna (which are minutely ciliated in male) and on the basis of wing maculation and venation, the phenon has been found to be identical to the genus *Hypolampurus* Hampson of family Thyrididae. Besides above, the materials were comparison with the reference collections housed in different national museums and consultation of relevant literature (Warren 1896, 1896a and Whalley 1971), the aforesaid phenon has been sorted out into four species i.e., *H. angulalis* Moore, *H. striatalis* Swinhoe, *H. langualis* sp.

nov and *H. neostriatalis* sp. nov. A dichotomous key for their interspecific discrimination is also prepared.

## MATERIAL AND METHODS

The adults of this genus were exclusively collected with the help of portable light trap (Plate 1) or fluorescent lights at night hours from different localities of Western Ghats of India (Plate 2) and put in the glass bottles charged with the ethyl acetate. The collected specimens were stretched and dried in stretching boxes and afterwards preserved well fumigated wooden boxes. The external morphological characters like antennae, proboscis, labial palpi, colour of frons and vertex, eyes, markings on patagia and tegula, wing venation and maculation, colour and markings of thorax, abdominal characters, position and number of tibial spurs were studied at first instance. To study wing venation, permanent slides of wings were made. For the preparation of permanent slides of fore and hindwings, the method proposed by Common (1970) and advocated by Zimmerman (1978) and to study the external male genitalia, methodology given by Robinson (1976) were followed. The photographs of genitalia were taken in stereo zoom binocular and wing venation drawn on graph papers. Multiple dissections of the studied species were made to examine the population variations. The terminology given by Klots (1970) was followed for the nomenclature purpose. All the collections were deposited in the Insect Museum, Department of Zoology & Environmental Sciences, Punjabi University, Patiala and National PAU Insect Museum, Department of Entomology, Punjab

Agricultural University, Ludhiana, Punjab. The geographical information of the localities in the states/district of Karnataka, Kerala, Maharashtra and Goa are provided below (Table 1).

## RESULTS AND DISCUSSION

### *HYPOLAMPRUS* Hampson

*Hypolamprus* Hampson, 1893, *Fauna of British India (Moths)* 1: 364.

**Type-species:** *Hypolamprus striatalis* Swinhoe.

Labial palpus slight, upturned and reaching above vertex of head; antenna minutely ciliated in male; forewing with costa straight, convex near apex, apex slightly produced and acute, termen wavy or evenly curved, tornus rounded, anal margin nearly straight,  $R_3$ ,  $R_4$  stalked,  $M_1$  from middle of discocellulars; hindwing with costa straight, apex rounded, termen wavy or evenly curved, tornus rounded, anal margin straight.

#### Key to the species of the genus *Hypolamprus* Hampson

- |  |                               |
|--|-------------------------------|
| 1. Abdomen brown, irrorated with pale red scales ...             | 2                             |
| - Abdomen not as above .....                                     | 3                             |
| 2. Head with frons and vertex velvety red tinged with brown..... | <i>angulalis</i> Moore        |
| - Head with frons and vertex fuscous.....                        | <i>striatalis</i> Swinhoe     |
| 3. Legs furnished with red brown scales .....                    | <i>langualis</i> sp. nov.     |
| - Legs furnished with white scales .....                         | <i>neostriatalis</i> sp. nov. |

### *Hypolamprus angulalis* Moore

*Morva angulalis* Moore, 1888, *Lepid, Atkin* : 214.

*Hypolamprus angulalis* (Moore) Hampson, 1892.

**Male:** Alar expanse: 24 mm (Plate 3). Vertex and frons velvety red tinged with brown; labial palpus slight, upturned and reaching above vertex of head; antenna minutely ciliated; forewing with costa straight, convex near apex, apex slightly produced and acute, termen wavy, tornus rounded, anal margin nearly straight, ground color dull coffee color, irregularly striated with light red; hindwing with costa straight, apex rounded, termen wavy, tornus rounded, anal margin rounded, anal margin straight, ground color dull coffee color, irregularly striated with light red; underside of both wings suffused with silvery scales; tarsi striped white and brown; abdomen brown, irrorated with pale red scales.

**Wing Venation:** Forewing with vein Sc ending beyond middle of costa,  $R_1$  and  $R_2$  from cell,  $R_3$  and  $R_4$  stalked,  $R_5$  from upper angle of cell,  $M_1$  from middle of discocellulars,  $M_2$  and  $M_3$  from lower angle,  $Cu_1$  very near to lower angle,  $Cu_2$  from middle of cell, 1A present, 2A forked with 1A at base; hindwing with  $Sc+R_1$  originating from base of cell,

anastomosing upper nervure at angle and separates to meet costa,  $R_5$  and  $M_1$  from upper angle of cell,  $M_2$  and  $M_3$  from lower angle,  $Cu_1$  very near to angle of cell,  $Cu_2$  from middle of cell, 1A and 2A present.

**Male genitalia:** Male genitalia with uncus strongly built, sclerotized, broadens toward middle and again tapering towards distal end, tip ending to a small spine, gnathos absent; tegumen broad, vinculum very long, deep U-shaped; saccus present; valva simple, flap-like, without any projections, setosed with long setae, tip blunt; transtilla membranous; juxta small; aedeagus moderately long, much broad towards proximal end, cornuti absent, ductus ejaculatorius enters apically.



Plate 1. Portable light trap

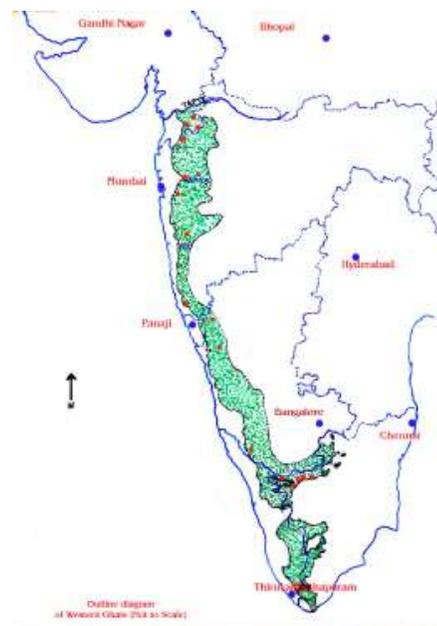


Plate 2. Area surveyed

**Female genitalia:** Not examined.

**Material examined:** India: Goa: Distt. Sanguem, Molem, 110mASL, 23.ii.2004, 2♂; Distt. Ponda, Ponda, 85mASL, 28.ii.2004, 1♂, coll. A. Katewa.

**Old distribution:** Rangoon (Hampson 1892)

**Remarks:** The species *angulalis* Moore has earlier been reported from Rangoon by Hampson (1892). During the present studies, three specimens were collected from two different localities in the state Goa. In view of this, it is clear that the species is new record not only for the Western Ghats but the country, as well. The external male genitalia of this species is being studied for the first time.

***Hypolamprus striatalis* Swinhoe**

*Microsa striatalis* Swinhoe, 1886, *Proceeding of the Zoological Society, London*. 1885: 875.

*Hypolamprus striatalis* (Swinhoe) Hampson, 1892

**Male and Female:** Alar expanse: 17mm (Plate 4). Vertex and frons fuscus; labial palpus slight, upturned and reaching above vertex of head; antenna minutely ciliated; forewing with costa straight, convex near apex, apex slightly produced and acute, termen evenly rounded, not wavy, tornus rounded, anal margin straight, ground color pale red brown, evenly striated with brown lines, a dull spot on upper angle of cell and one below cell; hindwing with costa straight, apex rounded, termen straight, tornus rounded, anal margin straight, ground color pale red brown, evenly striated with brown lines, medial band present; legs white; abdomen pale red brown.

**Wing Venation:** Forewing with vein Sc ending beyond middle of costa, R<sub>1</sub> and R<sub>2</sub> from cell, R<sub>3</sub> and R<sub>4</sub> stalked, R<sub>5</sub> from upper angle of cell, M<sub>1</sub> from middle of discocellulars, M<sub>2</sub> and M<sub>3</sub> from lower angle, Cu<sub>1</sub> very near to lower angle, Cu<sub>2</sub> from middle of cell, 1A present, 2A forked with 1A at base; hindwing with Sc+R<sub>1</sub> originating from base of cell, anastomosing upper nervure at angle and separates to meet costa, Rs and M<sub>1</sub> from upper angle of cell, M<sub>2</sub> and M<sub>3</sub> from lower angle, Cu<sub>1</sub> very near to angle of cell, Cu<sub>2</sub> from middle of cell, 1A and 2A present.

**Male genitalia:** Not studied.

**Female genitalia:** Female genitalia with corpus bursae

rounded, weakly sclerotized; signum not distinct; ductus bursae long and narrow, sclerotized towards corpus bursae; ostium bursae marked with two sclerotized structures; apophyses small; papilla analis weakly sclerotized, setosed with fine setae.

**Material examined:** India: Maharashtra: Distt. Sindhudurg, Amboli, 850mASL, 11.x.2005, 3♀♀, coll.

**Distribution:** Dharamshala, Calcutta, Poona, Nilgiris, Ceylon (Hampson 1892)

**Remarks:** The species *striatalis* Swinhoe has earlier been reported from Poona (Maharashtra) near the Western Ghats by Hampson (1892). During the present collection tours, it has again been collected from a locality (Amboli) which is nearer to Poona, from the same state which is very close to Poona. The present distributional data is additional to the old one. It can be inferred that the species has restricted distribution. Also, the female genitalia of this species which is type-species of the genus *Hypolamprus* Hampson has been studied for the first time.

***Hypolamprus langualis* sp. nov.**

**Male:** Alar expanse: 19mm (Plate 5). Vertex and frons fuscus; labial palpus slight, upturned and reaching above vertex of head; antenna minutely ciliated; forewing with costa straight, convex near apex, apex slightly produced and acute, termen wavy, cilia white, tornus rounded, anal margin straight, ground color red-brown, evenly striated with red lines; hindwing with costa straight, apex rounded, termen wavy cilia white tornus rounded, anal margin straight, ground color rusty-red, striated with brown lines; legs furnished with red brown scales; abdomen fuscus.

**Wing Venation:** Forewing with vein Sc ending beyond middle of costa, R<sub>1</sub> and R<sub>2</sub> from cell, R<sub>3</sub> and R<sub>4</sub> stalked, R<sub>5</sub> from upper angle of cell, M<sub>1</sub> from middle of discocellulars, M<sub>2</sub> and M<sub>3</sub> from lower angle, Cu<sub>1</sub> very near to lower angle, Cu<sub>2</sub> from middle of cell, 1A present, 2A forked with 1A at base; hindwing with Sc+R<sub>1</sub> originating from base of cell, anastomosing upper nervure at angle and separates to meet costa, Rs and M<sub>1</sub> from upper angle of cell, M<sub>2</sub> and M<sub>3</sub> from lower angle, Cu<sub>1</sub> very near to angle of cell, Cu<sub>2</sub> from middle of cell, 1A and 2A present.

**Table 1.** Geographical information of the localities

State	District	Locality	Geographical coordinates	Altitude
Karnataka	Uttar Kannada	Ganeshgudi	15.2843° N, 74.5302° E	480mASL
Kerala	Palakkad	Mukkali	11.0587° N, 76.5402° E	560mASL
	Idukki	Vallakadavu	8.4750° N, 76.9195° E	780mASL
Maharashtra	Sindhudurg	Amboli	15.9647° N, 74.0036° E	850mASL
Goa	Sanguem	Molem	15.3758° N, 74.2269° E	110mASL
	Ponda	Ponda	15.4027° N, 74.0078° E	85mASL

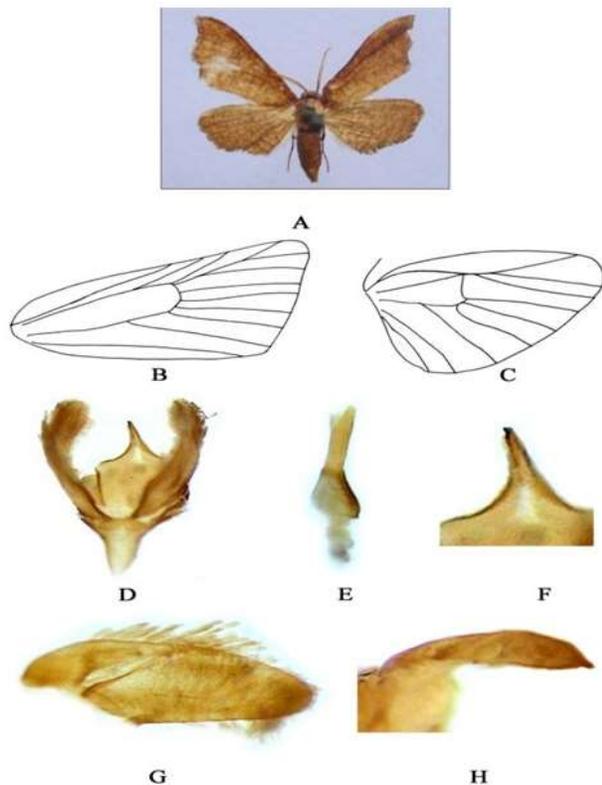
**Male genitalia:** Male genitalia with uncus long and narrow, sickle-shaped, sparsely setosed, tip ending to a curved spine; tegumen broad; vinculum long, broad U- shaped; saccus present; valva simple, costa and succulus well differentiated, a pair of small projections present towards distal end, tip blunt without any bifurcation, setosed with long hairs; transtilla membranous; juxta present; aedeagus long and narrow, curved, cornuti absent, ductus ejaculatorius enters laterally.

**Female genitalia:** Not studied.

**Material examined:** India: Kerala: Dist. Palakkad, Mukkali, 560mASL, 22.ix.2004, 01♂; Karnataka: Dist. Uttar Kannada, Ganeshgudi, 480mASL, 16.x.2005, 02♂, coll.

**Etymology:** The name of the species as *Hypolamprus angualis* sp. nov. is proposed as an anagram of its closely allied species i.e., *Hypolamprus angualis* Moore.

**Remarks:** *Hypolamprus angualis* sp. nov. is allied to the species i.e., *striatalis* Swinhoe from which it can be easily differentiated on the basis of ground color which is red in the former species and grey in latter. The former species is smaller in size as compared to the latter.



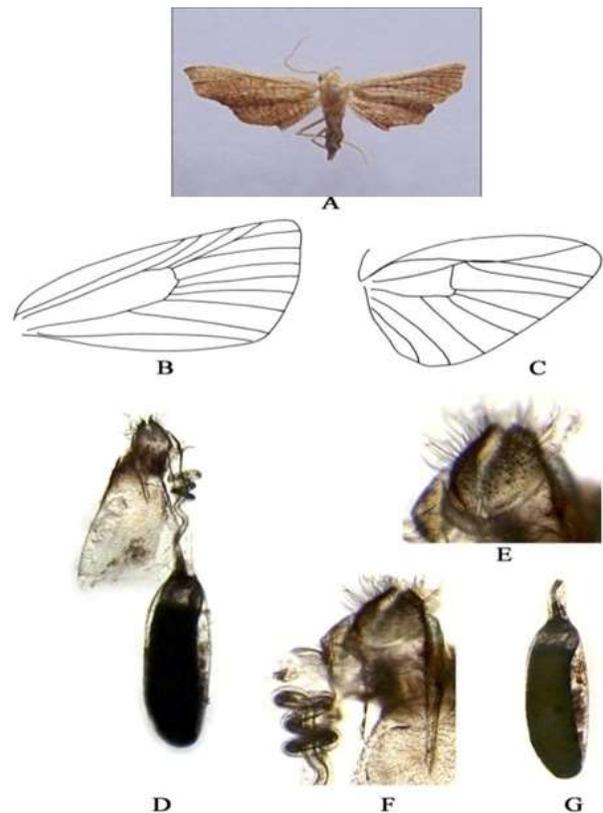
Figs. A=Adult, B=Forewing, C=Hindwing, D=Male external genitalia, E=Aedeagus, F=Uncus and Gnathos ventral view, G=Valva, H=Uncus and Gnathos ventral view

**Plate 3.** *Hypolamprus angualis* Moore

***Hypolamprus neostriatalis* sp. nov.**

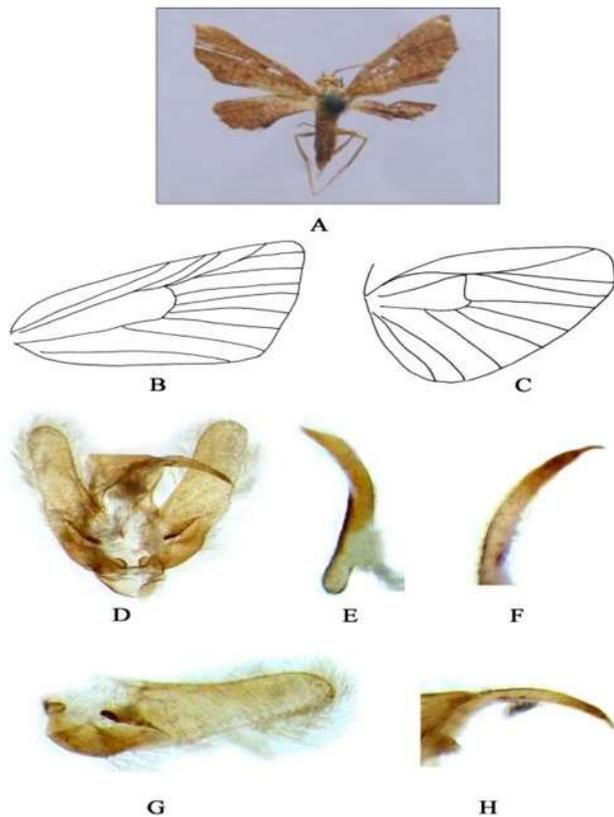
**Male:** Alar expanse: 13mm (Plate 6). Vertex and frons white; labial palpus slight, upturned and reaching above vertex of head; antenna minutely ciliated; forewing with costa straight, convex near apex, apex slightly produced and acute, termen wavy, cilia fuscus, tornus rounded, anal margin straight, ground color red-brown, striated with red lines; hindwing with costa straight, apex rounded, termen wavy, cilia fuscus, tornus rounded, anal margin nearly straight, ground color rusty-red, few ill-defined dark-red striae present; legs white; abdomen scaled with few white scales.

**Wing Venation:** Forewing with vein Sc ending beyond middle of costa,  $R_1$  and  $R_2$  from cell,  $R_3$  and  $R_4$  stalked,  $R_5$  from upper angle of cell,  $M_1$  from middle of discocellulars,  $M_2$  and  $M_3$  from lower angle,  $Cu_1$  very near to lower angle,  $Cu_2$  from middle of cell, 1A present, 2A forked with 1A at base; hindwing with Sc+ $R_1$  originating from base of cell, anastomosing upper nervure at angle and separates to meet costa,  $R_s$  and  $M_1$  from upper angle of cell,  $M_2$  and  $M_3$  from lower angle,  $Cu_1$  very near to angle of cell,  $Cu_2$  from middle of cell, 1A and 2A present.



Figs. A=Adult, B=Forewing, C=Hindwing, D=Female external genitalia, E=Ovipositor lobes, F=Ductus Bursae and Apophyses, G=Corpus Bursae

**Plate 4.** *Hypolamprus striatalis* Swinhoe



Figs. A=Adult, B=Forewing, C=Hindwing, D=Male external genitalia, E=Aedeagus, F=Uncus and Gnathos ventral view, G=Valva, H=Uncus and Gnathos ventral view

**Plate 5.** *Hypolamprus langualis* sp. nov.

**Male genitalia:** Not studied.

**Female genitalia:** Female genitalia with corpus bursae elongated, bag-like, sclerotized; signum not distinct; ductusbursae very long and narrow, coiled towards ostium bursae; ostium bursae simple; apophyses long, almost of same length small; papilla analis semicircular, setosed with fine setae.

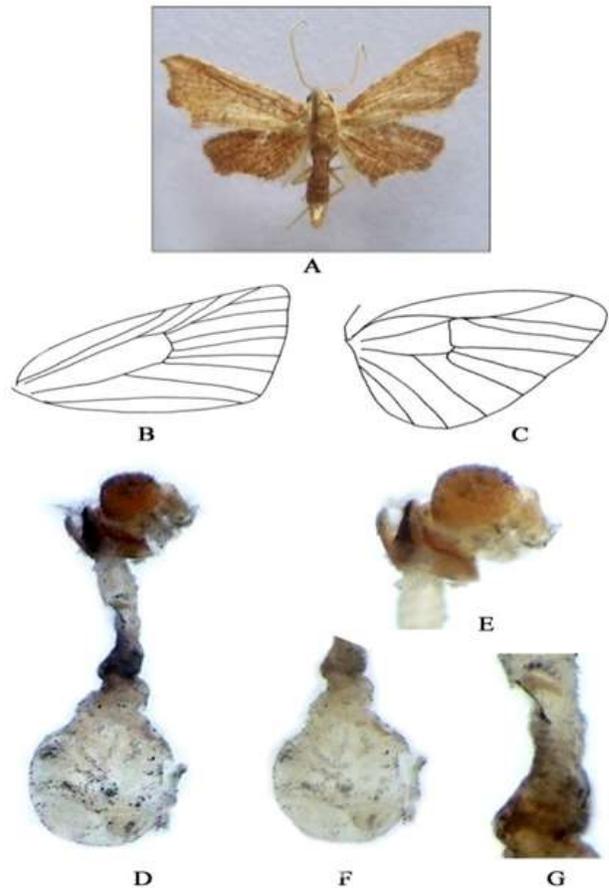
**Material examined:** India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 11.ix.2004, 01♀; Dist. Palakkad, Mukkali, 560mASL, 19.ix.2004, 01♀, coll..

**Etymology:** The specific name is derived as *Hypolamprus neostratialis* sp. nov. being sibling to *Hypolamprus angulalis* Moore.

**Remarks:** *Hypolamprus neostratialis* sp. nov. is allied to *Hypolamprus angulalis* Moore sp. nov. but either of them can be easily separated by their alar expanse and general maculation of the wings.

### CONCLUSIONS

The present study has information on the taxonomy and distribution of four species of genus *Hypolamprus* Hampson



Figs. A=Adult, B=Forewing, C=Hindwing, D=Female external genitalia, E=Ovipositor lobes, F=Ductus Bursae and Apophyses, G=Corpus Bursae

**Plate 6.** *Hypolamprus neostratialis* sp. nov.

from Western ghats of India. Seven species from the then limits of India including and only species i.e., *stratialis* Swinhoe from Western Ghats of India was reported (Hampson, 1894). The collected materials have been sorted out into four species i.e., *angulalis* Moore (New record from India), *stratialis* Swinhoe and two new species i.e., *langualis* sp. nov and *neostratialis* sp. nov. reported from the area under reference. A dichotomous key for their interspecific discrimination is also provided.

### ACKNOWLEDGEMENTS

Authors are grateful to MoEFCC (GoI), New Delhi for funding the project on Microlepidoptera. Thanks are also due to Head, Department of Entomology, Punjab Agricultural University, Ludhiana for providing necessary facilities. The financial help given by Indian Council of Agricultural Research (ICAR) New Delhi for "Network Project on Insect Biosystematics" is greatly acknowledged. We are thankful to Dr. V.V. Ramamurthy, Principal Scientist (Retd.), Division of

Entomology, for giving permission to consult reference collections housed at NPC, IARI, New Delhi.

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Received 03 June, 2024; Accepted 21 September, 2024