

# FIRST RECORD OF *PSYRA MODERATA* INOUE, 1982 (LEPIDOPTERA: GEOMETRIDAE: ENNOMINAE) FROM MANIPUR, INDIA

<sup>1\*</sup>JATISHWOR SINGH IRUNGBAM

<sup>1\*</sup>Sphingidae Museum s.r.o., 261 01 Píbram - Orlov 79, Czech Republic

Corresponding Author: [jatishwor.irungbam@gmail.com](mailto:jatishwor.irungbam@gmail.com)

ORCID: [orcid.org/0000-0002-3003-6624](https://orcid.org/0000-0002-3003-6624)

Reviewer: Peter Smetacek

## ABSTRACT

In the present note, the geometrid moth genus *Psyra* Walker, 1860 in Manipur, India, is reported. *Psyra moderata* Inoue, 1982, is reported for the first time from India. The other five species - *P. cuneata* Walker, 1860; *P. angulifera* (Walker, 1866); *P. spurcataria* Walker, 1863; *P. falcipennis* Yazaki, 1994; and *P. crypta* Yazaki, 1994 were newly recorded from the territory of Manipur. Photographs of recorded species habitus and their genitalia are provided.

**Key words:** Gnophini, *Psyra*, taxonomy, Manipur, new record, north-eastern India

## INTRODUCTION

The monotypic genus *Psyra* was established by Walker in 1860 with *Psyra cuneata* Walker from North Hindostan (North India) as its type species. The genus is represented by nineteen species and four subspecies globally, of which fourteen species and one subspecies are reported from India (Mallick *et al.*, 2022). In the present study, *P. moderata* Inoue, 1982 is reported from Manipur, adding to the Indian moth fauna.

The specimens of the genus *Psyra* were collected through intensive light trapping at Shirui hill, Manipur during 2016 to 2019 as part of my doctoral research. A large number of geometrid moths were collected during the study, of which, the most interesting group was genus *Psyra*. The materials were carefully curated as per standard protocols. Genitalia preparations were carried out following the standard methods (Robinson, 1976). Genitalia images were taken using a PROMICAM 2-5CP camera attached to an Olympus SZX16 Stereo Microscope. Referring to the available literature on the genus *Psyra* (Hampson (1895), Inoue (1982), Yazaki (1992, 1994), Liu *et al.* (2013), Kirti *et al.*, 2019 and Mallick *et al.*, 2022), investigation was carried out. A careful examination of the morphology and genitalia of these materials, led to the discovery of *Psyra moderata*, which is a new species for Manipur as well as for India. The study led to the discovery of another five species of *Psyra* from Manipur which are all reported for the first time from the state.

**RESULT**

In the present study, we have reported six species of *Psyra* from Shirui Hills, Manipur. Among them, five species - *P. cuneata* *cuneata* Walker, 1860; *P. moderata* *inoue*, 1982; *P. spurcatoria* Walker, 1863; *P. falcipennis* Yazaki, 1994; and *P. crypta* Yazaki, 1994 were newly recorded from the territory of Manipur state. Of these, *P. moderata* *inoue*, 1982 has been recorded for the first time in India and is an addition to Indian *Psyra* fauna (fifteen species and one subspecies). An updated checklist on the genus is provided in Appendix I.

***Psyra* Walker, 1860**

*List Specimens lepid. Insects Colln Brit. Mus.*, **21**: 311, 482.

Type species: *Psyra cuneata* Walker, 1860, by monotypy.

***Psyra cuneata* Walker, 1860**

*Psyra cuneata* Walker, 1860, *List Specimens lepid. Insects Colln. Brit. Mus.*, **21**: 483. Type locality: India: North Hindostan.

*Material examined*: INDIA: Manipur, Ukhrl district, Shirui Hills, Site 4, 25.1264°N 94.4357°E, 1930 m ASL, 10.IV.2017, 2 ♂♂, Coll. Irungbam JS. Genitalia slide. IJ518.

*Distribution*. India: Arunachal Pradesh (Kameng, Tenga valley) (Sondhi *et al.*, 2020); Sikkim (Mallick *et al.* 2022); Meghalaya (Khasi Hills) (Hampson, 1895); Uttarakhand (Devalsari, Ranibagh, Govind National Park) (Smetacek, 2008; Uniyal *et al.*, 2013; Sanyal *et al.*, 2018); West Bengal (Mallick *et al.* 2022); Manipur (Senapati, Ukhrl) (in the present study). *Elsewhere*. China (Liu *et al.*, 2013); Japan (Hampson, 1895).

*Remarks*: The species is recorded for the first time from Manipur.

***Psyra angulifera* (Walker, 1866)**

*Scotosia angulifera* Walker, 1866, *List Specimens lepid. Insects Colln. Brit. Mus.*, 35: 1687. Type locality: India: North Hindostan (BMNH).

*Material examined*. INDIA: Manipur, Ukhrl district, Shirui Hills, Site 3, 25.1171°N 94.4456°E, 2190 m ASL, 24.vii.2019, 4 ♂♂, Coll. Irungbam JS.; Manipur, Ukhrl district, Shirui Hills, Site 4, 25.1264°N 94.4357°E, 1930 m ASL, 10.IV.2017, 1 ♂, Coll. Irungbam JS. Genitalia slide. IJ2833.

*Distribution*: India: Arunachal Pradesh (Mallick *et al.* 2022); Assam (Swinhoe, 1900); Himachal Pradesh (Dharamsala, Dalhousie) (Ghosh, 2003; Mallick *et al.* 2022); Sikkim (Yathang) (Hampson, 1895; Ghosh, 2003; Mallick *et al.* 2022); Uttarakhand (Devalsari, Maheshkhan, Govind National Park) (Smetacek, 2008; Sondhi & Sondhi, 2016; Sanyal *et al.*, 2018; Mallick *et al.* 2022); West Bengal (Darjeeling) (Cotes & Swinhoe, 1888; Ghosh, 2003; Mallick *et al.* 2022); Manipur (Ukhrl) (in the present study). Elsewhere: Nepal (Yazaki, 1994); China (Liu *et al.*, 2013).

*Remarks*. The species is recorded for the first time from Manipur.

***Psyra moderata* Inoue, 1982**

*Psyra moderata* Inoue, 1982, *Bull. Fac. domestic Sci., Otsuma Woman's Univ.* 18: 190; fig. 51b. Type locality. Nepal: near Nilgiri, Lete, 2400 m.

*Material examined*: INDIA, Manipur, Ukhrl district, Shirui Hills, Site 4, 25.1264°N 94.4357°E, 1930 m ASL, 10.

iv.2017, 1♂, Coll. Irungbam JS. Genitalia slide. IJ673.

*Diagnosis.* Forewing length 22 mm. ♀ not examined.

The species is characterized by having small antemedial and postmedial black patches. The male genitalia (figure 12) with the uncus narrower than that of *P. conferta*; the distal part of the valva is less curved with narrower gnathos; the aedeagus (figure 18) shares one bundle of long spines on the vesica.

*Distribution.* India: Manipur (in the present study). *Elsewhere.* Nepal (Inoue, 1982), China (Tibet) (Liu *et al.*, 2013).

*Remarks.* The species is recorded for the first time from India.

### ***Psyra spurcataria* Walker, 1863**

*Psyra spurcataria* Walker, 1863. *List Specimens lepid. Insects Colln. Brit. Mus.*, 26: 1498. Type Locality: India: Darjeeling.

*Material examined:* INDIA: Manipur, Ukhrul district, Shirui Hills, Site 1, 25.1264°N 94.4357°E, 1930 m ASL, 12.iv.2019, 3♂♂, Coll. Irungbam JS.; Manipur, Ukhrul district, Shirui Hills, Site 2, 25.1235°N 94.4407°E 2036 m ASL, 12.vii.2016, 20.vi.2019, 2♂♂1♀, Coll. Irungbam JS.; Manipur, Ukhrul district, Shirui Hills, Site 3, 25.1171°N 94.4456°E, 2190 m ASL, 13.iii.2019, 1♀, Coll. Irungbam JS.; Manipur, Ukhrul district, Shirui Hills, Site 4, 25.1264°N 94.4357°E, 2425 m ASL, 10.iv.2017, 1♂, Coll. Irungbam JS; Manipur, Ukhrul district, Shirui Hills, Site 5, 25.1069°N 94.4456°E, 2835 m ASL, 13-14.ix.2019, 5♂♂, Coll. Irungbam JS.

*Distribution.* India: Himachal Pradesh (Dalhousie) (Sondhi *et al.*, 2020); Uttarakhand (Ranibagh, Maheshkhan)

(Smetacek, 2008; Sanyal *et al.*, 2018); Sikkim (Hampson, 1895; Sanyal *et al.*, 2018); Meghalaya (Khasi Hills) (Hampson, 1895; Ghosh, 2003); West Bengal (Darjeeling) (Walker, 1883; Ghosh, 2003). *Elsewhere:* Nepal, Bhutan, China, and Taiwan (Liu *et al.*, 2013).

*Remarks.* The species is recorded for the first time from Manipur.

### ***Psyra crypta* Yazaki, 1994**

*Psyra crypta* Yazaki, 1994, *in* Haruta, *Tinea*, 14 (Suppl. 1): 26, pl. 71, figs 13, 16; text-figs 379. Type locality: Mt Phulchouki, Nepal.

*Material examined.* INDIA, Manipur, Ukhrul district, Shirui Hills, Site 4, 25.1107°N 94.4545°E, 2425 m ASL, 10. iv.2017, 1♂, Coll. Irungbam JS.

*Distribution.* India: Uttarakhand (Sanyal *et al.*, 2018); West Bengal (Darjeeling) (Yazaki, 1994); Manipur (Ukhrul) (in the present study). *Elsewhere:* Nepal (Yazaki, 1994), Vietnam (Ratnasingham & Hebert, 2007).

*Remarks:* The species is very similar to *P. spurcataria* thus, difficult to identify without the study of male and female genitalia. The species is recorded for the first time from Manipur.

### ***Psyra falcipennis* Yazaki, 1994**

*Psyra falcipennis* Yazaki, 1994. *in* Haruta, *Tinea*, 14 (Suppl. 1): 32, pl. 71, figs 11, 14; text-figs 374, 380. TL: Mt Phulchouki, Nepal.

*Material examined:* INDIA, Manipur, Ukhrul district, Shirui Hills, Site 1, 25.1264°N 94.4357°E, 1930 m ASL, 12.iv.2019, 1♀, Coll. Irungbam JS. Genitalia slide. IJ990.

*Distribution.* India: Uttarakhand (Sanyal *et al.*, 2018); Manipur (Ukhrul) (in the

present study). *Elsewhere*: Nepal (Yazaki, 1994); Bhutan (Ratnasingham & Hebert, 2007); Laos (Yazaki, 2020); China (Liu *et al.*, 2013).

*Remarks*: The species is recorded for the first time from Manipur.

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### CONFLICT OF INTEREST

None

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## APPENDIX I.

An updated checklist of the Genus *Psyra* in India.

1. *Psyra angulifera* (Walker, 1866)
2. *Psyra cuneata* Walker, 1860
3. *Psyra crypta* Yazaki, 1994
4. *Psyra delibis debilis* Warren, 1888
  - a. *Psyra debilis indica* (Butler, 1889)
5. *Psyra dsagara* Wehrli, 1953
6. *Psyra falcipennis* Yazaki, 1994
7. *Psyra fulvaria* Yazaki, 1992
8. *Psyra gracilis* Yazaki, 1992
9. *Psyra moderata* Inoue, 1982
10. *Psyra rufolinearia* Leech, 1897
11. *Psyra similaria* Moore, 1867
12. *Psyra spurcataria* (Walker, 1863)
13. *Psyra szetschwana* Wehrli, 1953
14. *Psyra trilineata* (Moore, 1868)
15. *Psyra variabilis* Mallick, Bandyopadhyay & Sanyal, 2022

## FIGURES 1-9. Adults of *Psyra*.

1. *P. cuneata cuneata* Walker, 1860, male;
2. *P. angulifera* (Walker, 1866), male; 3. *P. moderata* Inoue, 1982, male; 4-7. *P. spurcataria* Walker, 1863, 4. male; 5. male; 6. female; 7. female; 8. *P. crypta* Yazaki, 1994, male; 9. *P. falcipennis* Yazaki, 1994, female.

**FIGURES 10-15.** Male genitalia capsule of *Psyra*. 16 – 21. Aedeagus of male *Psyra*. 23 – 25. Female genitalia of *Psyra*. 10, *P. cuneata cuneata* Walker, 1860; 11, *P. angulifera* (Walker, 1866); 12, *P. moderata* Inoue, 1982; 13, *P. spurcataria* Walker, 1863; 14, Ditto; 15, *P. crypta* Yazaki, 1994; 16, *P. cuneata cuneata* Walker, 1860; 17, *P. angulifera* (Walker, 1866); 18, *P. moderata* Inoue, 1982; 19, *P. spurcataria* Walker, 1863; 20, Ditto; 21, *P. crypta* Yazaki, 1994; 22. Sternite 8 of male abdomen of *P. spurcataria*; 23, *P. spurcataria* Walker, 1863; 24, Ditto; 25, *P. falcipennis* Yazaki, 1994.

Figure 1-9

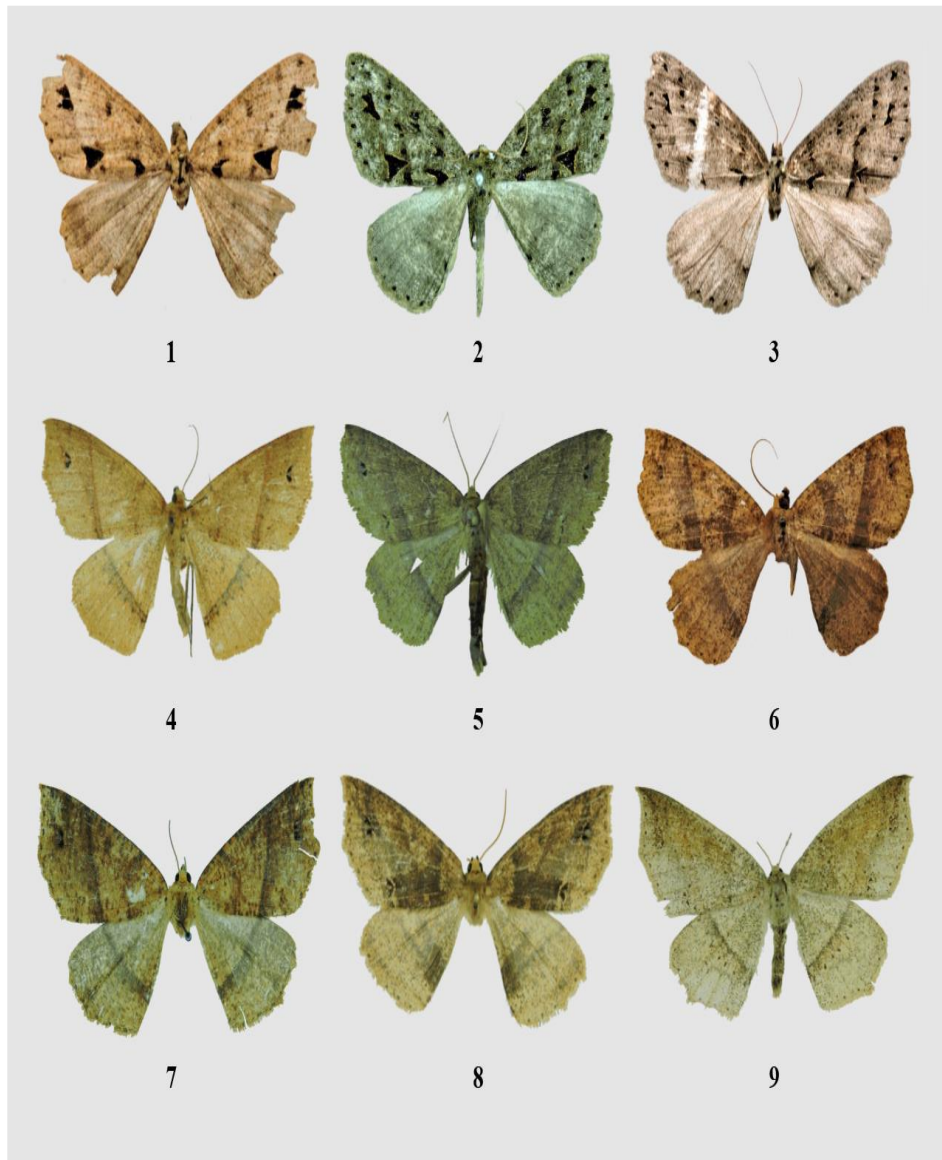


Figure 10-15

