

# A NEW SPECIES OF *LEMAIREIA* NÄSSIG & HOLLOWAY (LEPIDOPTERA: SATURNIIDAE, SATURNIINAE) FROM NORTH-EASTERN INDIA

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## Abstract

A new species of the genus *Lemaireia* Nässig & Holloway, 1987 is described from the north-eastern Indian state of Arunachal Pradesh; it is compared with *L. luteoepplus* Nässig & Holloway, 1988. For both taxa, males and their genital structures are figured. Females and preimaginal instars remain unknown at present.

**Keywords:** Himalaya, Arunachal Pradesh, Meghalaya, Mizoram, *Lemaireia*, new species

## Introduction

The genus *Lemaireia* was established by Nässig & Holloway with *Antheraea loepoides* Butler, 1880 being its type species. At the time of the generic description only four taxa were known, two of them described in a second parallel publication by Nässig & Holloway (1988), which was planned originally to contain also the generic description but then eventually was published a little later than Holloway (1987) which now contains the original diagnosis. In the last 25 years, the number of described taxa in *Lemaireia* increased to 11, with the latest description of *L. daparo* Jiang *et al.*, 2021 from Sichuan and Yunnan, PR China. Those authors gave an overview about published taxa and literature about the genus and figured the known Chinese species. The genus is known from the north-eastern parts of India via Myanmar, Laos, Thailand to China, Vietnam, West Malaysia and from the islands of Sumatra, Java, Borneo, and Mindanao.

Records for the genus are completely missing in publications exclusively on the Indian fauna, such as Hampson (1893), Arora & Gupta (1979) and Chandra *et al.* (2019), which shows that the records of *Lemaireia* specimens

in India are rare. The only report besides the original description of *L. luteoepplus* is by Sondhi *et al.* (2021) who mention one specimen record from Arunachal Pradesh. Although tentatively identified as *L. luteoepplus luteoepplus* in image 463 in their paper, the authors note that further research is necessary.

Following is a description of the twelfth species in the genus:

### *Lemaireia himalayana* n. sp.

Holotype (Fig. 1a, recto; Fig. 1b, verso): Male, India (NE), C. Arunachal Pradesh, Apatani area, Ziro valley 1800 m, vi.1990, leg. local collector; GP 2600/19 SNB; barcode SNB 6315. – A red holotype label will be added accordingly. The holotype will be deposited within the Rainer Seegers Foundation in the collections of Museum für Naturkunde, Berlin, Germany.

**Etymology:** *L. himalayana* n. sp. is the only Himalayan species of the genus and named for its origin.

### Description

Male (Figs. 1a, dorsal view, & b, ventral view).

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Length of forewing, measured from base to apex: 37 mm.

Wing expanse, measured from forewing apex to centre of thorax and doubled: 88 mm.

Head, thorax, abdomen and ground colour of the forewing upperside intense orange-brown. The wings bear the typical yellow and orange pattern characteristic of the genus. Antennae orange-brown, quadripectinate, 9.0 mm in length, with 25 segments in total, maximum length of rami 1.3 mm.

Forewing apex elongate, produced with slightly rounded tornus, the outer margin concave. Antemedial area orange-brown, central part of the medial area egg-yolk yellow, basal portion of the medial area orange-brown, separated by a serrate line from the antemedial area. In the centre of the yellow medial area an almost round, orange-brown ocellus, outwardly defined by black scales, of 3.5 mm diameter. The postmedial line consists of an inner orange brown and an outer yellow zigzag band, the costal half of this line medially with black scales. Postmedial area again orange-brown, with a violet apical patch and a yellow portion at the lower angle. In between the veins is a row of submarginal small dark greyish patches. Outer margin dark yellow.

Hindwing groundcolour yolk yellow, with small antemedial and medial orange-brown patches around the abdominal margin, the medial patch reaching the round hindwing ocellus, which has an orange-brown centre with central hyaline patch, circled with light blue and a broad black line, and is of 4.5 mm diameter in total. Additional markings are a blackish tiny zigzag postmedial line, followed by a row of larger orange brown and smaller black patches. Outer margin darker yellow.

On ventral surface, both fore- and hindwings with pinkish orange antemedial area, suffused there with white scales. Forewing medial area yellow with central orange-brown ocellus, outer margin of that ocellus somewhat darker than centre, median area outwardly defined by a dark brown zigzag postmedial line.

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Postmedial area darker, orange, marginal zone more pinkish, with dark grey subapical patch and a row of small patches of same colour between the veins. Hindwing medial area yellow, the ocellus dark red with a black ring and a pink shade directed to the anal margin. The median area is separated by a serrate, dark grey postmedial line. The postmedial area is yellow, suffused with pinkish scales and with a row of small dark blue patches. Outer fringe dark yellow.

Male genitalia (Figs. 4, 7a – c): Uncus with one central process, sclerotized at its ventral end. Dorsal process of the valves prolate, bent and sclerotized, internal process with very short dorsal thorn and a long, broad and acute process. Saccus very short, triangular, juxta with two lateral broad-based processes, tapered to their tips. Aedeagus right lateral with broad sclerite, right and left lateral with a serrate margin. Vesica with apical sclerite with two larger and three smaller spines.

Female and preimaginal instars are unknown.

### Distinctive characters and discussion

The species described here is compared with its probable nearest relative, *L. luteopeplus*, described from the Khasi Hills in Meghalaya, India. Not many records for that species exist to our knowledge, and aside from the small type series in the Natural History Museum, London (holotype and one male paratype; Figs 2a & b) with unknown collection date, but bequeathed by Rothschild in 1939, we know only of two further males in the senior author's collection (Figs. 3a & b). They bear the locality "India, Mizoram, Phawngpui, x.1990, leg. local collector" and are morphologically similar to the type specimens. Also, male genital structures of the holotype (Fig. 5; reproduced from Nässig & Holloway, 1988) compare well with those of a Mizoram specimen (Fig. 6).

*L. himalayana* n. sp. differs from *L. luteopeplus* by its somewhat larger wingspan and the somewhat more quadrate, broader form of the wings. It is of more intense colouration, the ocelli on dorsal side are little

larger, and on ventral side the antemedial and postmedial areas are more orange, in contrast to a yellow colour in *L. luteoepplus*. Male genitalia of both species differ significant: *L. luteoepplus* has a more triangular dorsal process of the valves, the inner process has a long and bent dorsal thorn and a short and broad internal process, much broader than in *L. himalayana* n. sp. The saccus of *L. luteoepplus* is larger and more triangular; the lateral processes of the juxta have a narrow base and are longer, and the aedeagus is less sclerotized, less serrate on its margin; the vesica has only one larger and one smaller apical spine.

Samples of both taxa were analysed in the barcoding project of the University of Guelph, Canada, and results show about 2% divergence of COI barcodes in the resulting tree. The system assigns two different automatically created Bin Code numbers, that of *L. himalayana* n. sp. being ADQ8984 (Barcode of Life, 2021).

While *L. luteoepplus* is known only from two localities at medium elevation south of the Brahmaputra River, the known localities of *L. himalayana* n. sp. are two places in the Himalayan foothills in central Arunachal Pradesh, India, well separated from each other by the wide lowland valley of the Brahmaputra. A similar separation of species south and north of this lowland area was mentioned in several other cases of Saturniidae already, e.g., for *Archaeoattacus edwardsii* (White, 1859) versus *Arch. malayanus* Kurosawa & Kishida, 1984 (Naumann *et al.*, 2016), or *Saturnia zuleika* Hope, 1843 versus *S. lesoudieri* Le Moul, 1933 (Naumann & Nässig, 2010)

In general morphological differences between nearly related species within the genus *Lemaireia* are not easily visible and mainly can be mentioned when large series are available. In our case only very few specimens were available to us, but the external morphological differences to its nearest relative and other species in addition to

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differences in male genitalic structures, results of DNA barcoding and zoogeographical reasons supported and justified proposing *L. himalayana* n. sp. as a different species.

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Fig.1: *Lemaireia himalayana* n. sp., male holotype, India, Arunachal Pradesh, dorsal view



Fig.2: *Lemaireia himalayana* n. sp., male holotype, India, Arunachal Pradesh, ventral view



Fig.3: *Lemaireia luteopeplus*, male holotype, India, Meghalaya, Khasi Hills, dorsal view, NHM



Fig.4: *Lemaireia luteopeplus*, male holotype, India, Meghalaya, Khasi Hills, ventral view, NHM



Fig.5: *Lemaireia luteopeplus*, male, India, Mizoram, dorsal view



Fig.6: *Lemaireia luteopeplus*, male, India, Mizoram, ventral view



Fig.7: *Lemaireia himalayana* n. sp., holotype, male genitalia prep. no. 2600/19 Naumann

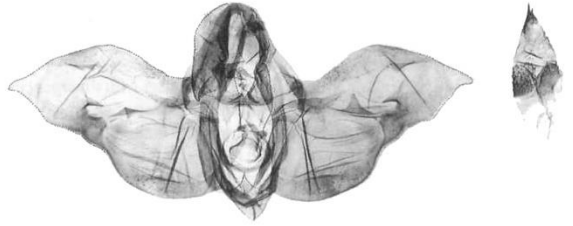


Fig.8: *Lemaireia luteopeplus*, holotype, male genitalia prep. no. B.M. Sat. 531.



Fig.8: *Lemaireia luteopeplus*, India, Mizoram, male genitalia prep. No. 2601/19 Naumann.



Fig.9: *Lemaireia himalayana* n. sp., same genitalia as in Fig. 4, lateral view.



Fig.10: *Lemaireia himalayana* n. sp., same genitalia as in Fig. 4, posterier view.



Fig.11 *Lemaireia himalayana* n. sp., same genitalia as in Fig. 4, Aedeagus.