

PLACEMENT OF GENERA IN THE REVISED CLASSIFICATION OF INDIAN NYMPHALID BUTTERFLIES

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While reporting the revised higher classification of Indian nymphalid butterflies (Varshney, 2016), I did not report the final arrangement of genera, in the style of Varshney, 2010; Smith, 2010; and Varshney & Smetacek, 2015; given therein. It was a lapse. Hence, in this supplementary note, I have attempted to report the placement of Indian genera in higher categories of classification of the family.

Except Satyrinae (vide infra), this arrangement may be considered updated, till further studies come across.

Order LEPIDOPTERA

Family NYMPHALIDAE

I. Subfamily DANAINAE

Tribe Danainae

Danaus, Ideopsis, Parantica, Tirumala.

Tribe Euploeini

Idea, Euploea.

II. Subfamily CALINAGINAE

Calinaga.

III. Subfamily MORPHINAE

Tribe Amathusiini

Faunis, Aemona, Stichophthalma, Amathusia, Amathuxidia, Thauria, Thaumantis, Discophora, Enispe.

IV. Subfamily SATYRINAE

Unfortunately, the tribal classification of this subfamily (and even the synonymy of some generic names) seems still unclear. Miller (1968) is no more followed, and Varshney & Smetacek (2015) have not classified this subfamily satisfactorily.

Eliot (2006) has merely commented on placement of genus *Xanthotaenia*.

Hence, I am forced to put here all Indian genera together. Incidentally, Smith (2010) has also not classified this subfamily further into tribes and subtribes.

Xanthotaenia, Elymnias, Neorina, Penthema, Ethope, Melanitis, Cyllogenes, Parantirrhoea, Ypthima, Dallacha, Ragadia, Mycalesis, Orsotriaena, Zipaetis, Erites, Coelius, Hyponephele, Callerebia, Lethe, Zophoessa, Nemetis, Neope, Lasiommata, Kirinia, Chonala, Raphicera, Orinoma, Heteropsis, Paralasa, Loxerebia, Oeneis, Paroeneis, Karanasa, Hemadara, Coenonympha, Maniola, Melanargia, Satyrus, Aulocera, Hipparchia, Chazara,

Pseudochazara, Kanetisa.

V. Subfamily HELICONIINAE

Tribe Acraeini

Acraea.

Tribe Heliconiini

Cethosia.

Tribe Vagrantini

Phalanta, Cupha, Vagrans, Vindula, Algia (=Paduca),

Cirrochroa, Terinos.

Tribe Argynnini

Subtribe Argynnina

Issoria, Argynnis.

Subtribe Yrameina

Boloria.

VI. Subfamily NYMPHALINAE

Tribe Melitaeini

Melitaea.

Tribe Nymphalini

Vanessa, Kaniska, Symbrenthia, Araschnia,

Nymphalis, Aglais, Polygonia.

Tribe Kallimini

Rhinopalpa, Yoma, Hypolimnas, Doleschallia,

Kallima, Junonia.

VII. Subfamily LIMENITIDINAE

Tribe Limenitidini

Moduza, Lebadea, Athyma, Sumalia, Limenitis,

Parasarpa, Auzakia.

Tribe Neptini

Neptis, Phaedyra, Lasippa, Pantoporia.

Tribe Parthenini

Parthenos, Bhagadatta, Neurosigma.

Tribe Adoliadini

Tanaecia, Euthalia, Dophla, Bassarona, Lexias,

Symphaedra, Abrota, Cynitia.

VIII. Subfamily BIBLIDINAE

Tribe Biblidini

Ariadne, Laringa, Byblia.

IX. Subfamily CYRESTINAE

Tribe Cyrestini

Cyrestis, Chersonesia.

Tribe Pseudergolini

Stibochiona, Dichorragia, Pseudergolis.

X. Subfamily APATURINAE

Rohana, Eulaceura, Herona, Euripus, Sepsis,

Hestina, Hestinalis, Chitoria, Mimathyma, Dilipa, Helcyra, Sasakia.

XI. Subfamily CHARAXINAE

Tribe Prothoini

Prothoe.

Tribe Charaxini

Polyura, Charaxes.

XII. Subfamily LIBYTHEINAE

Libythea.

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Ganga and Brahmaputra basins to have more floods Bay of Bengal is rising 3.15 mm every year

Major rivers of the world, including the Ganga and Brahmaputra, are facing a big human onslaught, a point related to the Climate Change Summit in Copenhagen.

The areas drained by the Ganga and Brahmaputra in India are getting regularly submerged due to the construction of dams and canals, and rising sea levels.

Similar has been the case of 22 other large rivers of the world like the Irrawady in Myanmar and the Mekong in Indo-China, whose deltas (landmasses formed at the mouths of the rivers) are critically threatened.

The University of Colorado, in the central United States of America, has published this finding in the journal *Nature Geo Science*.

The study highlights a two way process. On the one hand, pebbles and silt brought in through man-made canals are obstructing the flow of the rivers, causing an elevation in their level and the consequent overflowing of the banks.

And the rise in the sea level, due to the melting of glaciers, is blocking what might have flowed into the sea waters, leading to rivers remaining laden with impurities.

More than 400 million of India's population lives in the basins of Ganga (2,510 km) and Brahmaputra (960 km in India).

The two rivers play a major part in 25 per cent (more than 50 million tonnes) of India's agricultural production.

Around the world about 500 million people living in major river deltas are likely to be hit by this process, causing more frequent floods.

"Our data analysis... clearly show that human ac-

tivity has fastened the process of the sinking of deltas and has caused increase in the frequency of the severe floods," said the lead author James Syvitski, Dean, Department of Earth Sciences, Colorado University.

Syvitski is directing a \$4.2 million effort funded by the National Science Foundation to model large-scale global processes like erosion and flooding.

"Disturbances caused in the hydro-geological structure of a particular river basin can increase the frequency of floods," said S. P. Gautam, Chairperson of the Central Pollution Control Board.

Gautam said no research has been done in India on the impact of human activity on the rivers' hydro-geological structures.

Gautam agreed with the study's finding that a rise in the sea level could increase the severity of floods.

Both the Ganga and the Brahmaputra, which cause major inundations every year and displace close to a million people, flow into the Bay of Bengal.

The Bay of Bengal, whose level is rising at a rate of 3.15 mm every year as compared to the global average of 2 mm.

"There are already 7,000 environmental refugees in the Sunderbans (close to 1,00,000 people live in Sunderban islands)," said Pranabes Sanyal, Head of the School of Oceanographic Studies in West Bengal's Jadavpur University.

"And the numbers can only increase with the sea devouring more islands as a result of global warming."

Sanyal has been monitoring the sea level of the Bay of Bengal at the Sunderbans for the past several years.