



Rediscovery of two rare butterflies *Papilio elephenor* Doubleday, 1845 and *Shijimia moorei* Leech, 1889 from proposed Ripu-Chirang Wildlife Sanctuary, Assam, India

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Two rare and hitherto unreported butterflies were sighted in the proposed Ripu-Chirang Wildlife Sanctuary (henceforth PRCWS) that is part of Manas Biosphere Reserve in lower Assam, northeastern India. These butterflies are Yellow-crested Spangle *Papilio elephenor* Doubleday, 1886 and Moore's Cupid *Shijimia moorei* Leech, 1889. *Papilio elephenor* is endemic to northeastern India. Past literature shows that two specimens of *Papilio elephenor* were collected and sighted from Khasi Hills of Meghalaya and Naga Hills by Mr. Sherwill in 1886 and the female brood was collected by Dr. Standinger in the late 1800's in Assam province (Wood-Mason et al. 1886) and it has remained almost unknown since then. Evans (1932) and Wynter-Blyth (1957) mentioned the distribution of this

species from Assam and southern Shan States in Myanmar. However, the subspecies from the Shan States (*schanus*) is now under *Papilio dialis*, not *Papilio elephenor* (Talbot, 1939).

Thus, *Papilio elephenor* is endemic to northeastern India. Bingham (1907) and Antram (1924) stated the presence of *Papilio elephenor* from the hills of upper Assam with its taxonomic keys. The global distribution of *Shijimia moorei*, on the other hand, is in Japan and southern China. About hundred years ago it was reported from Khasi hills of Meghalaya by Swinhoe, but there have been no records in India since 1896. Evans (1932) described the presence of this butterfly from Assam and mentioned that it was very rare.

The rediscovery of these two new butterflies also needs to be understood in the context of the lack of past surveys in the region - the 'Wallacean shortfall' in biogeography which states that assumptions of population size, extinction and rediscovery are underpinned by the extant knowledge of global, regional and local distributions of butterfly taxa, much of which is inadequate for tropical regions (Whittaker et al. 2005). Not a single survey on butterflies has been undertaken in the Ripu-Chirang RF areas till date and although the present author has been observing the butterflies for the past ten years, systematic study was initiated only in 2007. There is a gap of nearly sixty years in updating distribution records and hence claiming the rediscovery of these rare butterflies is justified.

Study area

The butterflies are reported from the PRCWS that extends between 89°55'-90°30'E & 27°15'-26°35'N in western Assam. It is a transitional zone between Manas Tiger Reserve in the east and Buxa Tiger Reserve in the west. It also has strong habitat linkages with the Bhutan Biological Conservation Complex as it is located just at the foothills of Phipsu Wildlife Sanctuary and Royal Manas National Park of Bhutan. It is also part of Ripu-Chirang Elephant Reserve and forms the buffer for Manas Tiger Reserve and Biosphere Reserve. The total area of PRCWS is 590km². The climate is moist tropical (average ambient temp 15-36 °C) with high rainfall (2000-2500 mm) and humidity 60-87 % levels. The mean sea elevation ranges between 60-150 m and the land has a gentle sloping gradient with a preponderance of rock and boulder deposits characteristic of *Bhabhar* region. The forest types have been classified as ranging from semi-evergreen to moist mixed deciduous with a predominance of Sal *Shorea robusta* (Champion & Seth 1968). The author has already reported more than 300 species of butterflies (Choudhury 2009) and given the high density and visibility of butterflies, the sanctuary holds immense potential for developing eco-tourism focused around

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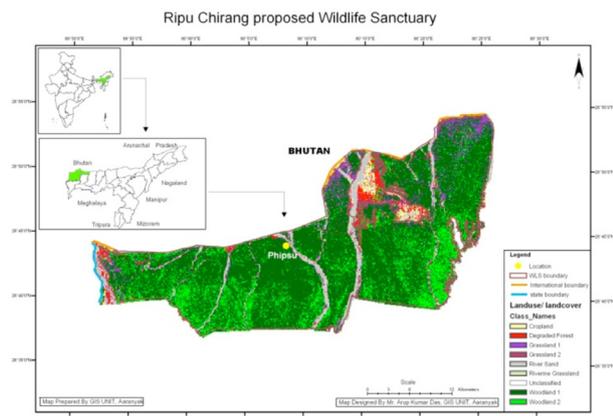


Image 1. Distribution of Yellow-crested Spangle *Papilio elephenor* Doubleday, 1845 from proposed Ripu-Chirang Wildlife Sanctuary, Assam. India.



Image 2. Yellow-crested Spangle *Papilio elephenor*

butterfly watching and conservation.

Detailed description of the species

A. Yellow-crested Spangle *Papilio elephenor* Doubleday, 1845

On 05 May 2009, around 1330hr, I observed and photographed a black-bodied swallowtail mud puddling on a forest trail along with few other black-bodied swallowtail butterflies of Singimajuli Block (26°44'05.6"N & 90°08'25.2"E) (Image 1) under RCRF. The weather was dull and cloudy when the butterfly was first spotted sitting on a shrub (*Clerodendrum*) at the height of about 1.5m from the ground. It was basking and on approaching nearer, it suddenly dropped down on wet soil. Here it began to probe a portion of cattle excrete with its proboscis for extracting minerals etc. It was photographed at that moment and later it was identified with the references of Wood-Mason et al. (1886), Bingham (1907), Antram (1924), Evans (1932), Talbot (1939), Winter-Blyth (1957) and K. Kunte (pers. comm.) as the Yellow-crested Spangle.

Morphology: The individual was identified as a male due to the presence of abdominal claspers. The upper side of the fore-wing was dull black with brilliant blue scales that formed a pattern of cellular and inter-nervular streaks. Anal red marks on the hind-wing above were larger, rounded, marginal and included a small black spot dusted with violet scales. The underside of the fore-wing was found to be blackish-grey with a black stripe and the underside of the hind wing had a series of red marginal crescents sprinkled with violet scales that were very prominent. The head portion was yellow while the sides of the abdomen were buff in color (Image 2).

Habitat: The butterfly was sighted on a forest track made of sand and gravel. The habitat predominantly comprised evergreen trees and shrubs mainly of species such as (*Lagerstroemia parviflora*, *L. speciosa*,

Terminalia bellerica, *Cinnamomum tamala*, *Bauhinia purpurea*, *Clerodendron*, *Leea*, *Premna*, *Mussaenda*, *Blumera* etc.). The forest type can however generally be classified as moist mixed deciduous with a predominance of Sal *Shorea robusta* trees. Heavy incidence of grazing and illegal felling (selective removal of trees with timber values) was observed in most of the region. Soil is lateritic to sandy loam. Phipsu River and its tributaries are the major sources of water.

Similarities and dissimilarities between Yellow-crested Spangle and Spangle *Papilio protenor*:

Similarities: Both the spangles are similar in their wing span i.e. 100-130 mm without tails. The upper side of both the wings is dusted with blue scales with a prominent black-centered red spot in tornus of hind wing. Both the species have cellular and inter-nervular streaks

Dissimilarities: *Papilio elephenor* is easily distinguish from *P. protenor* by the yellow marking on the head and buff colour on the side of the abdomen. The hind wing is much narrower and the under side has a series of red marginal crescents sprinkled with violet scales; the crescents form a conspicuous patch at tornal angle upto the dorsum bearing two black spots whereas in *P. protenor* the red marginal crescent is confined to the tornus and inter space 6-8. Head and abdomen are black like other black-bodied swallowtails.

Behaviour: Like other swallowtails it also basks by opening its wings by approximately 180°. It vibrates its wings when threatened, but otherwise keeps its wings closed. Flight is leisurely but rapid when alarmed. The species I observed was a male individual and he mud-puddled for about 18 minutes in the same spot.

B. Moore's Cupid *Shijimia moorei* Leech, 1889

Three individuals of this butterfly were spotted on a sunny day at around 1200hr when they were mud-puddling on a damp area near the forest road along with few other lycaenids and skippers. The forest road runs

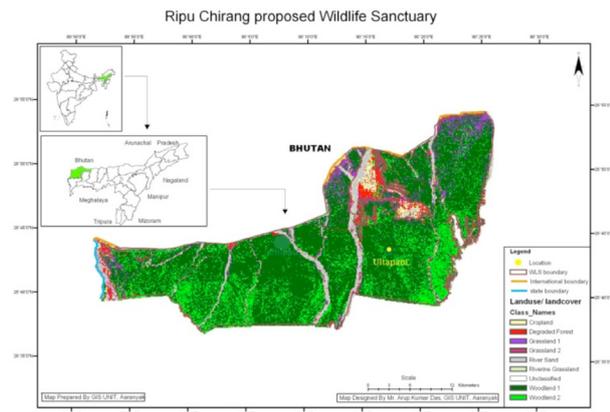


Image 3. Distribution of Moore's Cupid *Shijimia moorei* Leech, 1889 from proposed Ripu-Chirang Wildlife Sanctuary, Assam, India.



Image 4. Moore's Cupid *Shijimia moorei*.

through Ulitapani Block (26°48'02.52"N & 90°15'01.45"E) (Image 3) under Chirang Reserve Forest of Haltugaon Forest Division in Assam. Individuals were photographed and were later identified as *Shijimia moorei* in consultation with K. Kunte (pers. comm.) and by cross-referencing with Evans (1932), Varshney (1997) and Winter-Blyth (1957).

Morphology: The upper portion of the wings are dark brown. Underneath, both the wings are white in colour with black markings arranged irregularly (Image 4). Two unequal black spots are present on the base of the hind wings with slightly larger prominent black spots near the costa. There is a dark thin border line on both the wings without having a tail in the hind wing.

Habitat: The butterfly was sighted near the damp patches on a motorable forest road made of sand and gravel. The habitat predominantly comprised deciduous trees and shrubs mainly of species such as (*Michelia champaca*, *Terminalia bellerica*, *Sterculia villosa*, *Imperata* spp., *Clerodendron* spp., *Litsea* spp. etc.). Soil is lateritic to sandy loam. Laopani River and their tributaries are the major sources of water.

Similarities and dissimilarities between Moore's Cupid and Common Hedgeblue *Acytrolepis puspa*:

Similarities: The underside of both the wings of each species have white ground colour and the black spots of the hind wings are irregular and of unequal size. Hind wings tailless and orange marking on the tornus absent

Dissimilarities: In *S. moorei* the upper side of both the wings is dark brown whereas in Common Hedgeblue *Acytrolepis puspa* it is glossy pale blue.

Behaviour: The species were observed to undertake mud-puddling for prolonged periods (for over two and half hours) if they were not disturbed. During this time they kept their wings closed and it is likely that their preferred habitat was the high litter concentrated areas near mud-puddling sites. It was observed mud-puddling on cloudy as well as on sunny days. I have observed this behaviour

in certain nymphalids such as *Tanaecia lepidea* and *Tanaecia julina* as well. The butterfly is tiny and its flight is very fast. The species was sighted (3-4 individuals) at the same spot throughout the monsoon period but it disappeared just before the onset of winter in October. No individual was spotted in subsequent years.

Discussion and Conservation Implications

Butterflies and particularly swallowtails have played an important role in our understanding of some of the fundamental evolutionary processes such as principles of genetic variation and sexual dimorphism. These in turn have aided our understanding of other cryptic polymorphisms such as human blood groups thereby clearly indicating the need to conserve these species for the greater benefit of mankind (New & Collins 1991).

Northeastern India harbours at least 62 species of swallowtail (papilionid) butterflies (Evans 1932) and very few reports could be found that describe their present day status and threat assessments (Collins & Morris 1985; New & Collins 1991; Gupta & Mandal 2005). The author did not have access to the complete reports written by these previous authors and therefore providing a complete description of their views is not possible. Similarly the online search of red list report for threatened species (IUCN 2009) did not return details for *Papilio elephenor* and *Shijia moorei*. Nevertheless, the summary chapters of all the previous reports clearly indicate that the precise conservation status of several of the species including the Yellow-crested Spangle and Moore's Cupid is unknown in the Indian subcontinent.

The ongoing survey and reporting by the present author has therefore contributed towards future red list assessment in this region. It has also indicated the need to undertake detailed surveys including behavioural studies on least known butterflies in areas such as PRCWS that have been hitherto unsurveyed. The proposal to declare Ripu-Chirang as a Wildlife Sanctuary that will federally protect its biodiversity under the highest wildlife law in India has been pending for 20 years (Rodgers & Panwar 1988).

The lack of reliable biodiversity information combined with insurgency and lack of political will has also resulted in keeping the issue on a backburner for some time. As a consequence to this, other issues such as settlement of forest rights for tribals and forest dwellers, encroachment and extraction of forest produce as a source of legal and illegal income is gaining momentum. The rediscovery of two rare butterflies will perhaps refocus the need to come up with a species-based approach to wildlife conservation in this region.

It also opens up the opportunity for attracting more research and funding in lesser known taxa such as butterflies in remote regions of northeast India. Butterfly watching is an important component of eco-tourism worldwide where butterfly ranching has been encouraged thereby giving a legitimate source of income to local communities on a sustainable basis. Whether rare butterflies such as *Papilio elephenor* and *Shijimia moeri* can be ranched and whether it will help in enhancing community conservation is a matter of research that can be an outcome of this study. The author expects to gather further ecological information on these butterflies in the near future and further reiterates the need to conserve and bring the forests of Ripu-Chirang under a protected area network.

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