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Cover Photo by Rajib Dey of *Cupitha purreea*

TABLE OF CONTENTS

NEW HESPERIIDAE (INSECTA: LEPIDOPTERA) LARVAL HOST PLANT ASSOCIATIONS FROM WEST BENGAL, INDIA

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Reviewer: Peter Smetacek

Abstract

Imperata cylindrica (L.) Raeusch., is documented as a larval host plant of *Ampittia dioscorides*, *Pelopidas agna*, *Parnara bada* and *Borbo cinnara.*

Keywords: Larval host plant, immature stages, Hesperiidae, West Bengal, India.

Introduction

Bell (1909 - 1927); Sevastopulo (1973), Kunte (2000, 2006) and Nitin *et al*. (2018) described several additions to our knowledge of the larval host plants of butterflies in India. Sengupta *et al*. (2014) had made a checklist of 143 larval host plants during their work from Neora Valley National Park, West Bengal. From West Bengal and North-eastern Himalayan states, 64 species were documented by Karmakar *et al*. (2018) and 68 species of host plants were recorded from Taki (Ghosh & Saha, 2016) in North 24 Parganas district of West Bengal.

Materials and Methods

A diligent field survey was carried out around the author's address in Madhyamgram, North 24 Parganas district, West Bengal (22.70° N and 88.45° E). The place is next to a water body and is overgrown with grasses and sedges like *Imperata cylindrica*, *Cyperus* spp., *Cynodon dactylon, Apluda mutica, Phragmites australis* etc. On 25.v.2020, a female *Ampittia dioscorides* (Fabricius, 1793) was sighted ovipositing on leaf blades of *Imperata cylindrica* growing in a small overgrown patch of the wetland. Another single egg and a 3rd instar caterpillar of an unknown Hesperiid, which was later identified as *Pelopidas agna* (Moore, [1865]) from examining the eclosed adult, was found by the author on the same day in the same patch of *I. cylindrica*. The author could observe the caterpillar's head peeping out from the concealed leaf as it was busy feeding. The author collected eggs and caterpillars and put them in a clay pot along with *I. cylindrica* in his home garden. On 03.vii.2020, another single 4th instar caterpillar of an unknown Hesperiid, which was later identified as *Parnara bada* (Moore, 1878), was observed on the same patch of *Imperata* grasses after regular searching. Finally, a large number of caterpillars of another unknown Hesperiid, which was later identified as *Borbo cinnara* (Wallace, 1866), were sighted by the author in July 2020. The author could notice similarities between the feeding pattern of *P. agna* and *B. cinnara* whereas feeding of caterpillars of *A. dioscorides* and *P. bada* not only differed from the former two but also from each other. All the caterpillars completed their life cycle by feeding on the *Imperata* leaves provided. The life history of all these species for India has already been described in detail. The observations of the author is similar to Bell (1925c, 1926) and Bhakare & Ogale (2018). All eclosed butterflies were identified using Evans (1949); Kehimkar (2016) and Bhakare & Ogale (2018). The larval host plant was identified using the keys provided by Ibrahim *et al*. (2018) and confirmed by plant experts on eFloraofIndia Google Group (2007).

Results

Imperata cylindrica (L.) Raeusch. was described as the larval host plant for *Pseudoborbo bevani, Pelopidas mathias, Arnetta mercara, Baracus hampsoni, Caltoris kumara, Potanthus diana, Taratrocera ceramus, Telicota bambusae, Oriens gola, Parnara guttata, Potanthus omaha, Potanthus trachala, Potanthus lydia, Telicota besta, Melanitis leda, Lethe rohria, Mycalesis francisca, Mycalesis perseus, Orsotriaena medus, Polytremis lubricans* (Sengupta *et al*. 2014; Nitin *et al*. 2018; Robinson *et al*. 2001) but no earlier information about *Ampittia dioscorides, Pelopidas agna, Parnara bada and Borbo cinnara* (Table No. 01) can be found regarding their larval association with these plants.

Family: Hesperiidae

1.*Ampittia dioscorides* (Fabricius, 1793) Bush Hopper

The distribution of Bush Hopper is from Maharashtra to West Bengal in the east and Kerala in the South; Himachal Pradesh to North-East India (Varshney & Smetacek, 2015) which was easily identified by its distinctive yellow with black spots on the under hindwing and chequered hair fringe (Kehimkar, 2016). The larva and pupa was examined using Bell (1925c).

2.*Pelopidas agna* (Moore, [1865]) Obscure Branded Swift

The distribution of Obscure Branded Swift is Andaman & Nicobar Islands; Jammu & Kashmir; Kerala to Gujarat and West Bengal (Varshney & Smetacek, 2015). The observed larva and pupa was identified based on photographs following keys developed by Bhakare & Ogale (2018) and web-based resources (http://www.butterflycircle.com). A freshly eclosed specimen was characterized by its heavy spined mid tibia; the upper forewing all spots narrower and inconspicuous (Evans, 1949, Omoto, 1959). In addition, an imaginary line drawn through the two radial spots would usually bypass the lower end of the stigma (Young *et al*., 2016).

3.*Parnara bada* (Moore, 1878) Ceylon Swift

The distribution of Ceylon Swift in India is from Jammu & Kashmir to N.E. India, Kerala to West Bengal and Gujarat (Varshney & Smetacek, 2015). Bell (1926) described the various stages of its life cycle. The larvae have a distinct neck with rounded or long semi-circular; cellular-rugose head (slightly bilobed), and right behind it a thin black collar mark can be found on the dorsum of the prothorax. A dorsal line depressed slightly as far as apex of clypeus with minute setae. The greyish green to yellowish body managed with equally minute tubercles and long setae emanate from the posterior end. The pupa head is square in front; short in segment 2 and thorax likely snout. The proboscis length goes beyond the ends of wings but is only produced free as far as the middle of segment 10. The cremaster is formed as a pointed-triangular shape at apex or end. Chiba & Eliot (1991) made addition to its keys in their revision of the *Parnara* Moore, [1881] genus. The bred specimen was characterized by its unspined mid tibia and lower end cell spot on UNH, also with smaller and irregular spots in spaces 2-5, as well as in space 6.

4.*Borbo cinnara* (Wallace, 1866) Rice Swift

The Rice Swift has been recorded throughout India (Varshney & Smetacek, 2015; Seikh 2018). The larva and pupa was checked based on the web-based resources (https://butterflycircle.blogspot.com). The freshly eclosed adult butterfly was examined by its unspined mid tibia, uniformly greenish ochreous scales at thorax and base (Ek-Amnuay, 2012). In addition, a large and prominent spot at the forewings at the dorsal area next to dorsum, placing it as female (Young *et al*., 2016). Under hindwing have three discal spots in spaces 2, 3 & 6 (Evans, 1949) and no cell spot (Bhakare & Ogale, 2018).

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The author expresses his sincere gratitude to Dr. T.L. Seow, Singapore for the caterpillar identification of *Pelopidas agna* and Mr. Sajib Rudra, Bangladesh for larval host plant. The author is indebted to Mr. Subhajit Roy, India for improving the draft during the preparation of the manuscript. Finally, special thanks to my family for their support throughout the work.

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Table: 1 Earlier recorded larval host plant of 4 species

Butterfly name	Larval host plants	Family	References
Ampittia dioscorides (Bush Hopper)	*Oryza* spp.	Poaceae	Robinson *et al.*, 2010, Davidson *et al*., 1897, Swinhoe, 1913; Bell, 1925c; Wynter- Blyth, 1957
	Oryza sativa	Poaceae	Robinson *et al*., 2010
	Leersia hexandra	Poaceae	Kalesh & Prakash, 2015
Pelopidas agna (Obscure Branded Swift)	*Axonopus compressus*	Poaceae	Kalesh & Prakash, 2015
	Ischaemum ciliare	Poaceae	Robinson *et al*., 2010
	Microstegium sp.	Poaceae	Robinson *et al*., 2010
	Oryza spp.	Poaceae	Robinson *et al*., 2010
	Oryza sativa	Poaceae	Robinson *et al*., 2010
	Paspalum conjugatum	Poaceae	Robinson *et al*., 2010
	Pennisetum sp.	Poaceae	Naik & Mustak, 2020
Parnara bada (Ceylon Swift)	*Brachiaria mutica*	Poaceae	Kalesh & Prakash, 2015
	Oryza sativa	Poaceae	Davidson *et al*., 1897; Bell, 1926
Borbo cinnara (Rice swift)	*Setaria barbata*	Poaceae	Kalesh & Prakash, 2007, Nitin *et al*., 2018
	Setaria pumila	Poaceae	Wynter-Blyth, 1957, Kunte, 2000, Nitin *et al*., 2018
	Poaceae	Poaceae	Davidson *et al*., 1898, Pant & Chatterjee, 1950, Robinson *et al*., 2010, Nitin *et al*., 2018
	Axonopus compressus	Poaceae	Kalesh & Prakash, 2007, Nitin *et al*., 2018
	Rottboellia cochinchinensis	Poaceae	Kalesh & Prakash, 2007, Nitin *et al*., 2018
	Brachiaria mutica	Poaceae	Kalesh & Prakash, 2007; Nitin *et al*., 2018
	Phragmites karka	Poaceae	Kalesh & Prakash 2015, Nitin *et al*., 2018
	Stenotaphrum dimidiatum	Poaceae	Kalesh & Prakash, 2015, Nitin *et al*., 2018
	Stenotaphrum secundatum	Poaceae	Kalesh & Prakash, 2015; Nitin *et al*., 2018
	Andropogon sp.	Poaceae	Wynter-Blyth, 1957; Kunte, 2000; Nitin *et al*., 2018
	Arundo donax	Poaceae	Nitin *et al*., 2018

	Cymbopogon sp.	Poaceae	Wynter-Blyth, 1957; Kunte, 2000; Nitin *et al*., 2018
	Eragrostis sp.	Poaceae	Wynter-Blyth 1957, Kunte 2000, Nitin *et al*., 2018
	Ischaemum sp.	Poaceae	Wynter-Blyth, 1957; Kunte, 2000; Nitin *et al*., 2018
	Oryza	Poaceae	Robinson *et al*., 2010, Nitin *et al*., 2018
	Oryza sativa	Poaceae	Robinson *et al*., 2010; Wynter-Blyth, 1957; Kunte, 2000; Nitin *et al*., 2018
	Pennisetum sp.	Poaceae	Wynter-Blyth, 1957; Kunte, 2000; Nitin *et al*., 2018
	Apluda mutica	Poaceae	Robinson et al., 2010
	Eleusine indica	Poaceae	Robinson et al., 2010
	Miscanthus sinensis	Poaceae	Robinson et al., 2010
	Paspalum conjugatum	Poaceae	Robinson et al., 2010

Fig.1: Life history of *Ampittia dioscorides*

Fig.2: Life history of *Pelopidas agna*

Fig.3: Life history of *Parnara bada*

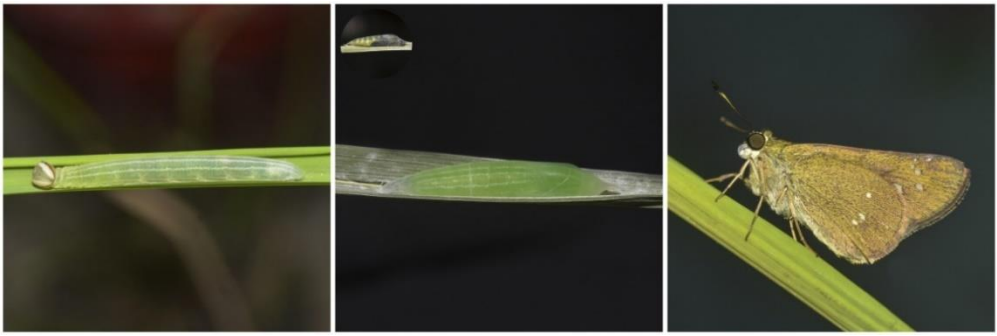

Fig.4: Life history of *Borbo cinnara*

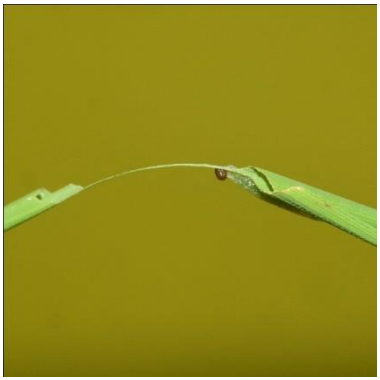

Fig.5: Feeding pattern of *A. dioscorides*

Fig.6: Feeding pattern of *P. agna*

Fig.7: Feeding pattern of *P.bada*

Fig.8: Feeding pattern of *B. cinnara*

Fig.9: Habitat of *Imperata cylindrica*