

Butterflies of Bangladesh: Geographical Expedition and Camouflage

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ABSTRACT

To protect butterflies, knowledge at the field level on various larvae and pupae of butterflies are mandatory. Based on the coloration of both larval and pupal stages, this paper could be act as a guideline to the taxonomy of butterflies. Such observations in nature as well as in the laboratory specimens are helpful to accumulate knowledge completing this write-up. Accordingly, out of 23 species of butterflies in Bangladesh, the highest members were found in the family Nymphalidae (12 species) and Papilionidae (5 species) (Table 1; Figure 1). Observed larvae exhibited varied coloration such as red, brown, green, yellow, and white gradually (Table 1). The long-term keen observation on larvae could identify such adult butterflies of Bangladesh.

Keywords: Butterfly, occurrence, metamorphosis, camouflage, sexual selection, Bangladesh.

INTRODUCTION

Color can be involved in thermoregulation, crypsis, aposematism, and sexual selection. This is a striking phenotypic trait with clear adaptive significance, and its role may change dramatically through life [1-4]. For example, in many animals with complete metamorphoses such as butterflies, crabs, or frogs, sexual dichromatism develops with the transition to adulthood, when males experience strong sexual selection [5-8]. Butterflies (Lepidoptera: Rhopalocera) and their caterpillars are among the most colorful animals in the world. Butterflies are an important group of model organisms to investigate many areas like pest control, embryology, mimicry, evolution, genetics, population dynamics, and biodiversity conservation [9]. Ancient people were astonished to observe the larvae of butterflies and their metamorphosis from larva to adult. Until direct association with this phenomenon those were not possible to believe. Moreover, these larvae were hidden and mostly used to come out at night for feed; for this reason, people could not understand this phenomenon. Besides, the pupa was another camouflage stage with those life-saving threatening markings. Bristles of the larvae and bright color pigments came about for protection from predators. Occasionally, the body and wing color pigments of the adults can be understandable on the puparium. Various larvae of different species were seen with a more or less similar appearance and not easily recognizable to their

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adults afterward. Besides, some larvae of moths look-like the larvae of butterflies. Scientists have carried out various pigments of adult butterflies which are comparable by the larval coloration.

RESULTS AND DISCUSSION

Common butterflies of Bangladesh

Table 1. Larval pigmentation of some butterflies with their taxonomic status

Common Name	Scientific Name	Family	Larval Color
Five-barred Swordtail	<i>Graphium antiphates</i>	Papilionidae	White→Yellow orange→Reddish brown
Lime Swallowtail	<i>Papilio demoleus</i>	Papilionidae	Black yellow patches→Greenish
Common Rose Butterfly	<i>Pachliopta aristolochiae</i>	Papilionidae	Flegy red→Tipped white protuberances on the velvet maroon body
Common Mormon	<i>Papilio polytes</i>	Papilionidae	White patches on brown body→Yellowish green body with black brown banded→Greenish→Green
Common Birdwing	<i>Triodes helena</i>	Papilionidae	Black or Maroon
Red-base Jezebel	<i>Delias pasithae</i>	Pieridae	Reddish brown
Common Grass Yellow	<i>Eurema hecabe</i>	Pieridae	White→Green
Indian Cabbage White	<i>Pieris canidia</i>	Pieridae	Green body with laterally yellow spotted
Common Jezebel	<i>Delias eucharis</i>	Pieridae	Dark yellow body with black head→Dark yellow body with black patches
Orchid Tit	<i>Chliaria othona</i>	Lycaenidae	Green body with red banded head→Greenish gray
Common Pierrot	<i>Castalius rosimon</i>	Lycaenidae	Yellowish green with laterally yellow spots
Common Castor	<i>Ariadne merione</i>	Nymphalidae	Green→Brown
Common Leopard Butterfly	<i>Phalanta phalantha</i>	Nymphalidae	Head- blackish, thorax- pinkish, abdomen- yellowish
Common Sailor	<i>Neptis hylas</i>	Nymphalidae	bright yellow body with white bristles and black patches
Common Baron	<i>Euthalia aconthea</i>	Nymphalidae	Green
Peacock Pansy	<i>Junonia almana</i>	Nymphalidae	Head blackish, body pale ochreous-brown, lateral bluish line, second segments transverse reddish stripe, 2nd-3rd-4th segments are transverse blackish stripe
Common Sergeant	<i>Athyma perius</i>	Nymphalidae	Brown body with black spotted
Commander	<i>Moduza procris</i>	Nymphalidae	Darty brown→Brown
Common Palmfly	<i>Elymnias hypermnestra</i>	Nymphalidae	Light yellow body with black head→Green body with pink striped
Great Eggfly	<i>Hypolimnas bolina</i>	Nymphalidae	Black body with orange head→Brown
Striped Tiger Butterfly	<i>Danaus genutia</i>	Nymphalidae	Yellow→Black→White striped
Blue Tiger Butterfly	<i>Tirumala limniaceae</i>	Nymphalidae	Yellowish white→3 rd and 12 th segments black and greenish white→Each segment with four transverse black bars→2 nd bar yellow longitudinal line on each side; head, feet, and claspers spotted with black
The Clipper	<i>Parthenos sylvia</i>	Nymphalidae	Reddish brown→Pale green with yellowish white lateral stripes one on each side

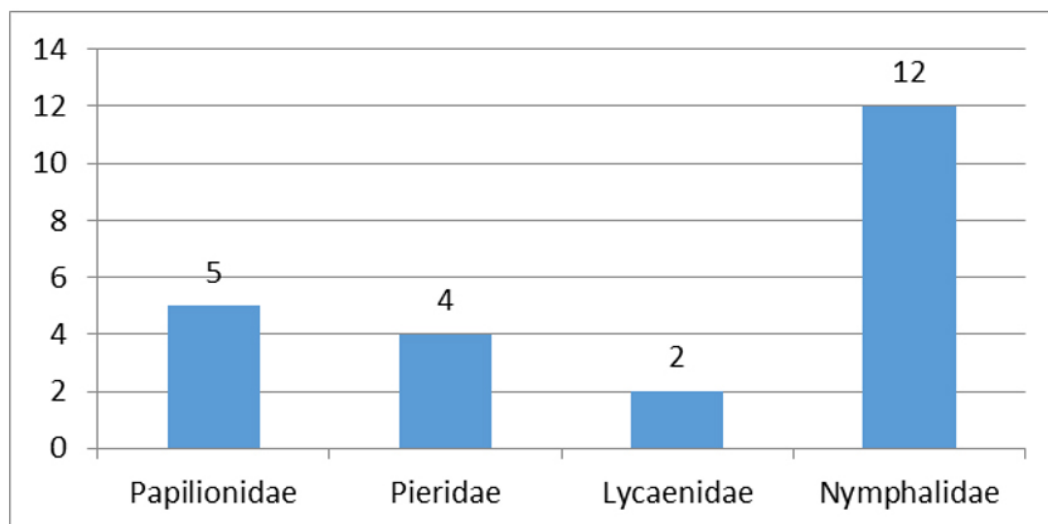


Figure 1. Families with observed species.

Protective coloration and sexual selection

The most common color strategies in caterpillars were green and black (Table 1) and the family Nymphalidae was found more among other families of butterflies (Figure 1). The high contrast of these signals is suggested to have an important role in predator avoidance [10]. The high-contrast coloration is correlated with the body size in caterpillars but not adults [11]. Predation and sexual selection are likely to be the main drivers of wing color in adults, while in larval stages the main selective pressure is probably predation [12,13]. Wing color is an important trait involved in sexual selection in many butterflies, while the color of the underside of the wing is more likely to be driven by predation pressures [13]. Blue iridescent colors in adult butterflies are important sexual signals [14]. The likelihood of an attack is much higher due to the slow movement of larval stages [1,2]. Caterpillars are likely to be camouflaged on stems, while adults are more likely to be camouflaged on the trunks of trees or leaves [15]. For instance, caterpillar color saturation is significantly associated with adult coloration [16] and diet can significantly affect adult toxicity [17]. Adults of various species use color in courtship [6,13], thermoregulation, and anti-predatory strategies [5,12,18,19]. The use of warning signals is very common in both caterpillars and adult butterflies [15,20,21] but much less common in pupae [15,22].

CONCLUSION

We should be committed to elaborate our knowledge on the proper identification of the larvae and adults of various butterflies. Most studies of butterflies of Bangladesh focused on distribution, abundance, adult coloration, and new species identification. The breeding biology of particular species

and pigmentation in the larval and adult stages of butterflies could be consequential topics at the present context. To study the larvae of various butterflies, their foodplants could be an interesting issue [23].

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