Research Notes

Diversity of butterflies in the Government College for Women campus, Thiruvananthapuram, Kerala, India

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Received: 12/11/2025; Revised: 30/11/2025; Accepted: 03/12/2025; Published: 01/01/2026

Abstract

The present study provides an account of butterfly diversity within the campus of the Government College for Women, Thiruvananthapuram, Kerala. Despite its urban setting and limited area, the campus supports a variety of tall trees, herbs, and shrubs, which in turn provide habitats for several butterfly species. This study was conducted to document and understand the butterfly diversity within the campus, with an additional aim of photographing the observed species. A total of fifteen butterfly species belonging to the following five families were recorded during the study: Papilionidae, Pieridae, Nymphalidae, Lycaenidae, and Hesperiidae.

Keywords: Butterfly diversity, *Catopsilia Pomona, Junonia iphita, Leptosia nina.*

Introduction

Insects exhibit the widest distribution among all animals, occurring from the equator to the poles and inhabiting nearly every conceivable habitat and climate. Representing about 90% of the animal Kingdom, they demonstrate extraordinary resilience, evident in their exceptional reproductive capacity and remarkable adaptive traits.[1] The comprehensive study of organismal diversity forms a cornerstone of biology, and within this field, insect identification holds special importance due to the complex nature of human–insect relationships. These interactions encompass both beneficial and harmful aspects that influence culture, health, and the environment. Insects play intricate ecological roles and make substantial contributions to biodiversity. They are indispensable for pollination and ecosystem stability, provide valuable resources such as silk and honey, and serve as important models in scientific research. At the same time, they transmit diseases, damage crops, and can be sources of discomfort or fear. Our perception of insects thus spans a broad spectrum—from viewing them as pests to recognizing them as essential components of nature that inspire art, technology, and innovation.

Butterflies are perhaps most conspicuous and colourful insects. There are about 18,000 species of butterflies in the world. India has 1501 species of which 321 are skippers, 107 are swallowtails, 109 whites and yellows, 521 Brush footed butterflies and 443 Blues.[2] Butterflies and moths belong to the order Lepidoptera (lepis = scale, pteron = wing) and are the only insects whose wings are covered with scales; the tiny, loosely attached structures that give them their striking colours and patterns. In Lepidoptera, there is complete metamorphosis, comprising four distinct stages: egg, caterpillar, pupa and adult. Although butterflies and moths are closely related, most species of butterflies can be distinguished from moths by the following characteristics.[3]

i. Antennae: The antennae of butterflies are clubbed. They may be scaly but are not hairy. The antennae of moths vary greatly, ranging from feathery to hair-like.

ii. Wings: When at rest, butterflies fold their wings vertically over their backs, holding them erect. Moths, in contrast, rest with their wings spread flat or folded alongside their bodies.

iii. Flight: Most butterflies are diurnal (fly by day), whereas moths are nocturnal (fly by night).

Butterflies are classified into two superfamilies: Hesperioidea and Papilionoidea. The superfamily Hesperioidea consists of a single family, Hesperiidae (Skippers), whereas Papilionoidea comprises four families: Papilionidae (Swallowtails), Pieridae (Whites and Yellows), Nymphalidae (Brush-footed Butterflies), and Lycaenidae (Blues).

Hesperiidae (Skippers)

Skippers (Hesperiidae) are small to medium-sized butterflies known for their rapid, darting flight, which often makes their wing movements appear blurred. Many species bask in the sun in a distinctive posture, with the forewings partially open and the hindwings fully spread.

Papilionoidea

Papilionidae (Swallowtails)

The Papilionidae, commonly known as Swallowtails comprise some of the world's largest and most spectacular butterflies. They are typically large, brightly coloured, and most species possess short tail-like extensions on their hind wings. Although this is the smallest butterfly family, with only about 700 species, it has a worldwide distribution. The family includes many of the largest, most attractive, and most endangered butterfly species.[2]

Pieridae (Whites and Yellows)

The family Pieridae includes small to medium-sized butterflies, usually white or yellowish in colour. It consists of about 1,100 species worldwide. In India, 109 species have been recorded.[3]

Nymphalidae (Brush-footed Butterflies)

The Nymphalidae is the largest butterfly family, comprising several thousand species, of which about 480 species occur in India.[3] Members of this family are commonly known as "Brush-footed Butterflies." Their forelegs exhibit diverse structures but are never fully developed or completely functional, unlike those of other butterfly families. These forelegs are often covered with long, dense scales that form brush-like structures, giving the family its common name.

Lycaenidae (Blues)

The Lycaenidae is the second-largest family of butterflies. The Blues are small butterflies, typically exhibiting shades of blue or purple on the upper side and brown or white on the underside, often with darker spots or lines. The Blue butterflies are among the most difficult groups to identify due to their subtle variations in colour and pattern.

The Government College for Women is located in the heart of Thiruvananthapuram city. Though the campus area is relatively limited, it hosts an abundance of tall trees, herbs, and shrubs. The present study is an attempt to document and understand the butterfly diversity within this campus with an additional aim of photographing the observed species.

Materials and Methods

The survey for butterflies was conducted in and around the campus of Government College for Women, Thiruvananthapuram, Kerala. Observations were conducted daily, primarily in the morning between 8:00 a.m. and 9:30 a.m., over a period of one month. Occasionally, observations were also made at other times when butterflies were sighted. All observed butterflies were photographed to ensure accurate documentation, and sketches of their wing patterns and markings were prepared to assist in identification. Species identification was carried out using field guides, consultation with expert lepidopterists, and a review of relevant literature.[4-9]

Observations and Results

The adult butterfly has three body regions: head, thorax, and abdomen. The head bears a pair of conspicuous compound eyes, antennae, palpi and a proboscis (Figures 1 and 2). The antennae are multi-segmented and thickened at the tip. Due to variations in their shape, size and length, they are often used as key features for identification. The proboscis is composed of two greatly elongated interlocking halves through which liquid food is imbibed.

The thorax consists of three segments, each bearing a pair of legs, while the first two segments also bear a pair of wings (forewings

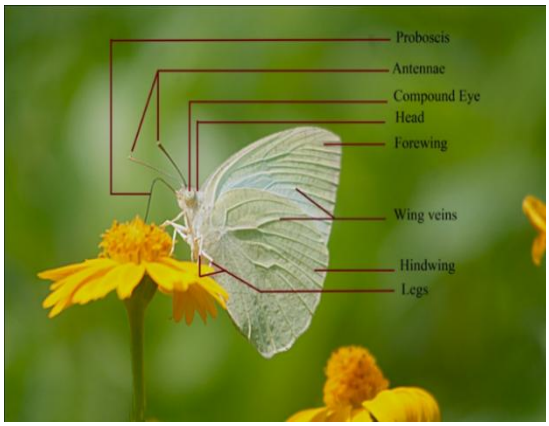

Figure 1: Butterfly with wings in the closed position, highlighting the key morphological features used for species identification

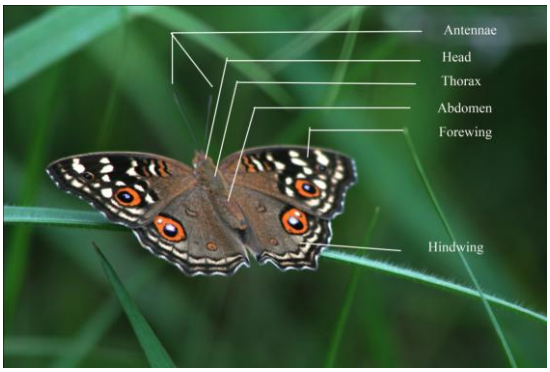

Figure 2: Butterfly with wings spread, highlighting the key morphological features used for species identification

and hind wings). The wings are composed of upper and lower membranes supported by veins.

The following fifteen species of common butterflies were identified from the campus during the survey period: Psyche, Common grass yellow, Common emigrant, Tawny coster, Chocolate pansy, Blue tiger, Common palmfly, White four ring, Common cerulean, Common pierrot, Common rose, Tailed jay, Common blue bottle, Blue mormon, and Chestnut bob (Table 1 and Figure 3).

Psyche

Psyche is a bright white butterfly and one of the most common species observed on our campus, as well as in urban areas. Its slow flight is a characteristic feature, and the flight path is so unpredictable that the direction of movement is impossible to anticipate. The only prominent marking is a large black spot on the forewings. The underside of the wings is also white, with faint greenish tinges.

Common grass yellow

The common grass yellow is a small, bright yellow butterfly with black borders on the upper side of its wings. It can often be seen fluttering erratically or resting on sunlit patches, usually 1–2 m above the ground and is frequently observed flying along roadsides.

Common emigrant

It is a very common butterfly and one of the liveliest species. It flies powerfully, with erratic ups and downs and unpredictable jerks. The colour of its wings varies in light shades of yellow, and the apex of the forewing is narrowly black.

Tawny coster

The Tawny Coster is a low-flying butterfly commonly found in grassy areas. It is a colourful and attractive species. Both pairs of wings are tawny-red with black borders, the border being broader on the hindwings and marked with a series of white spots. The wings bear black spots, which are more prominent on the forewings. Its flight is slow yet sustained, characterized by weak wing beats, and it usually flies close to the ground.

Chocolate pansy

It is a brown-coloured, very active butterfly. The wings are chocolate brown with darker markings. It always flies close to the ground, wandering around for some time but often returning to the same spot. It is commonly seen basking on low-growing herbs or on the ground, resting with its wings spread flat and facing the sun.

Blue tiger

Tiger butterflies are named for the spotted pattern that appears on their wings. The Blue Tiger is a large butterfly with broad, dark brown wings marked with blue streaks and spots. It is often seen gently flying or nectaring on flowers.

Common palmfly

The Common Palmfly is not a very active butterfly and is often seen resting with its wings closed. The underside of the wings is brown with white markings, while the upper side is blackish-brown with a purple gloss.

Table 1: Scientific names, family names and wing spans of the common butterflies identified from the campus of the Government College for Women, Thiruvananthapuram, Kerala

Common butterflies	Scientific names	Family names	Wing spans
Psyche	*Leptosia nina*	Pieridae	35-50 mm
Common grass yellow	*Eurema hecabe*	Pieridae	40-50 mm
Common emigrant	*Catopsilia pomona*	Pieridae	55-80 mm
Tawny coster	*Acraea violae*	Nymphalidae	50-65 mm
Chocolate pansy	*Junonia iphita*	Nymphalidae	5-65 mm
Blue tiger	*Tirumala limniace*	Nymphalidae	90-100 mm
Common palmfly	*Elymnias hypermenstra*	Nymphalidae	58-70 mm
White four ring	*Ypthima ceylonica*	Nymphalidae	34-40 mm
Common cerulean	*Jamides celeno*	Lycaenidae	27- 40 mm
Common pierrot	*Castalius rosimon*	Lycaenidae	24-34 mm
Common rose	*Pachliopta artistolochiae*	Papilionidae	80-110 mm
Tailed jay	*Graphium agamemnon*	Papilionidae	85-100 mm
Common bluebottle	*Graphium sarpedom*	Papilionidae	80-90 mm
Blue mormon	*Papilio polymnester*	Papilionidae	120-150 mm
Chestnut bob	*Iambrix salsala*	Hesperiidae	26-30 mm

Figure 3: The fifteen species of common butterflies that were identified from the campus during the survey period

White four ring

This is a small, low-flying butterfly often seen basking on low-growing herbs with its wings open. The forewings are brown, each with a black, eye-like marking bordered in yellow and containing two white spots. More than half of the hindwings are white, with three eye spots.

Common cerulean

It is a very active butterfly. Its flight usually stays close to the ground, among bushes and hedges. The underside of the wings of this small butterfly is pale brown with a long, straight white line. The butterfly has tails. A black spot with an orange ring can be seen near the two

tiny tails. As it is a fast flier, we can only see flashes of blue while it is in flight.

Common pierrot

It is a tiny butterfly, predominantly white in colour. The upper side of its wings are white with black spots and patches. There is a distinct central region on the hind wings that lacks any markings. It has a white-tipped black tail and near the tail there is a brilliant green spot.

Common rose

The Common Rose is a very common butterfly often seen nectaring on flowers. It is a black butterfly with a crimson coloration on the ventral side of the body. There is a large white patch on the hindwings, and a series of deep red or brownish-red spots is present along the outer margin of the hindwings.

Tailed jay

The Tailed Jay is another swift-flying butterfly. It is black with apple-green spots, and a green streak is present near the base of each wing, close to the body. Each hind wing also bears a characteristic tail.

Common bluebottle

The body of the Bluebottle resembles the sail of a boat. It is a fast-flying butterfly with rapid wing beats. The upper side of the butterfly is black with a greenish-blue central band, and the wings are pointed. The hind wings have a row of submarginal, crescent-shaped blue spots. The underside of the wings is brown with a pale blue band and a few red spots.

Blue mormon

The Blue Mormon is one of the largest and most fascinating butterflies, ranking second in India in terms of wingspan.[4] Identifying the Blue Mormon is not difficult, as its exceptional size makes it easily recognizable. It is a very large black butterfly with glistening pale blue markings. The underside is entirely black, with a red spot at the base of the wings and a few pale markings. Both the thorax and abdomen are black.

Chestnut bob

The Chestnut Bob is a typical skipper that flies rapidly. It is a small butterfly with dark brown wings overlaid with chestnut scales. Apart from its chestnut colouration, the most prominent feature is a silver spot at the centre of the underside of the hind wing, enclosed within a thin black ring. The upper side of the forewing may have a variable number of spots, which can be orange or white.

Discussion

The present study revealed the presence of fifteen species of butterflies on our campus. Four species belonged to the family Papilionidae, three to Pieridae, five to Nymphalidae, two to Lycaenidae, and one to Hesperiidae. The preservation of life is based on special relationships, in which all living organisms are connected to one another. Butterflies are no exception. Butterflies are an important biotic component of the ecosystem, serving as both key pollinators and visually appealing organisms. Their ecological role extends beyond that of herbivores; for example, butterflies may serve the function as valuable indicators for monitoring environmental conditions.[10] Likewise, butterfly diversity can also serve as an indicator of rich plant diversity, as many species are host-specific and depend on particular plants for survival. A high diversity of plants, in turn, supports organisms across different trophic levels. Thus, a significant diversity and stable population of butterflies can help sustain habitats that support a wide range of species, from mega herbivores to top predators.

By nature, butterflies are quite selective requiring a narrow range of environmental conditions to thrive. While anyone can easily spot a beetle or grasshopper in a garden, finding a Blue Tiger or a Common Rose butterfly is far less common. To observe the complete life cycle of a butterfly, the mere presence of flowers is not sufficient; the habitat must also contain the specific host plants required to support the immature larvae. The vibrant colours and graceful, fluttering movements of butterflies are a delight to observe. For those passionate about photography, butterflies offer some of the most captivating subjects. They also add significant aesthetic appeal to the campus environment. The butterfly populations are declining due to urbanization and the increased use of pesticides and other chemicals in agriculture and related activities.[11] Therefore, their conservation is of vital importance to ensure the continuity of these species.

There are pockets of conservation for butterflies in the form of protected areas such as national parks and wildlife sanctuaries where a rich diversity of butterflies can be observed.[12] Butterfly gardens and parks also play a crucial role in conserving these fascinating insects and in spreading awareness about their ecological importance. Such gardens should include specific host plants for caterpillars as well as nectar-producing plants for adult butterflies. The present study is significant as it attempts to document the diversity of butterflies within the campus ecosystem, which supports a variety of plants and other animals. It may also help raise awareness among students about conservation strategies, emphasizing the importance of actively preserving and enhancing the campus environment to support local butterfly diversity.

Conclusion

Butterflies are fascinating insects, and their identification helps us understand their diversity. Their conservation is essential to preserving this existing diversity.

Financial support and sponsorship
Nil.

Conflict of interest
The author declares that there are no conflicts of interest related to this work.

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How to cite this article: Meher BSA, Kumar RP. Diversity of butterflies in the Government College for Women campus, Thiruvananthapuram, Kerala, India. Journal of Experimental Biology and Zoological Studies 2026; 2 (1):87-92.