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From classroom to conservation: Student-driven development of a butterfly park in Udupi

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Abstract
Butterflies are widely recognized as sensitive bioindicators of environmental health, owing to their rapid responses to habitat alteration. They also play essential ecological roles in pollination, nutrient cycling, and as trophic components within food webs. Habitat creation is a fundamental strategy for butterfly conservation, contributing to the maintenance of local biodiversity. The present study assessed the role of the Savita Sastri Butterfly Park at MGM College, Udupi, in butterfly conservation, with particular emphasis on the effectiveness of student participation in monitoring programs. Systematic surveys conducted in collaboration with students documented 31 species belonging to 25 genera across five families. The family Nymphalidae was dominant, accounting for 45.2 percent (14 species) of the total diversity, followed by Hesperiidae at 19.4 percent (6 species), Pieridae at 16.1 percent (5 species), and Lycaenidae and Papilionidae each contributing 9.7 percent (3 species each). Among the 31, one species is found to be legally protected under wildlife protection regulations. Seasonal variation in abundance was evident, with peak occurrences between August and October, and the lowest counts recorded from February to April. The establishment and regular monitoring of the butterfly park not only generated baseline data on species diversity but also served as a practical educational resource, enhancing student engagement and promoting community awareness of butterfly conservation.

Keywords: Diversity, citizen science, landscaping, life on earth

Introduction
India is home to a rich diversity of butterfly species harbouring approximately 1501 species (Elanchezhyan *et al*., 2017) [3]. Habitat fragmentation is one of the major reasons for the decline in the population of butterflies, similar to other species. Habitat is the most important requirement for the survival and conservation of butterflies. All butterflies are habitat specific because of their life cycle and larval and adult food resources. Butterflies are integral components of healthy ecosystems that play a role in pollination and nutrient cycling and are vital indicators of environmental health (Nair *et al*., 2014) [6]. They are sensitive to environmental changes such as habitat loss, pollution and climate change. Habitat loss due to urbanization and land use changes is a major threat to butterflies (Choudhary and Chishty, 2020) [1]. Protecting butterflies and their habitats upholds the integrity of the ecosystem and ensures a legacy of beauty and diversity for generations. Citizen science initiatives, particularly those involving student participation, offer promising solutions.
This study represents the first documented attempt in Udupi district to evaluate a student-led initiative for butterfly conservation through the establishment and systematic monitoring of a dedicated butterfly park. The campus of Mahatma Gandhi Memorial College, Udupi, Karnataka, is characterized by heterogeneous vegetation and proximity to small forest fragments, providing suitable habitats for diverse faunal assemblages. The present study focused on assessing butterfly diversity within the Savita Sastri Butterfly Park, a 15-cent enclosure situated within the college premises.

Materials and Methods
The campus of Mahatma Gandhi Memorial (MGM) College, Udupi, Karnataka, extends over approximately 46 acres and is characterized by heterogeneous vegetation capable of supporting a wide range of faunal species. The campus is situated along the state highway connecting Karkala and Dharmasthala, in proximity to the urban center of Udupi. In 2022, the Savita Sastri Butterfly Park was established within the campus in memory of the late Mrs. Savita Sastri, with financial support from her husband, Dr. Prabhakar Sastri. The park occupies an area of 15 cents adjacent to a small forest patch on the campus. Initial plantation activities commenced in November 2022 and were carried out under the guidance of Mr. Sammilan Shetty, curator of the Belvai Butterfly Park. The layout consisted of parallel rows for each host plant species, with an inter-row spacing of 1.5 m to facilitate visitor movement. Plant selection prioritized both nectar sources and larval host plants to support multiple butterfly species. Ground vegetation was retained to provide microhabitats for species dependent on low-lying flora. The area was enclosed with fencing to minimize disturbance from adjacent land.
A preliminary survey conducted in 2022 documented butterfly species occurring within the campus and aided in selecting suitable host plants for the park. Systematic monitoring began in August 2023 following the establishment of the plantations and continued until September 2024, with active student participation. Surveys were conducted using the Pollard walk method to assess butterfly diversity and abundance. Observations were made during two daily intervals - 09:30 to 11:00 h in the morning and 15:00 to 16:30 h in the afternoon, corresponding to periods of peak butterfly activity.

Results and Discussion
Role of students in butterfly gardening and its importance
The establishment of the butterfly park was undertaken with active participation from students under expert supervision. The activity served as both a conservation initiative and a practical learning experience. Students were organized into groups, and planting was carried out systematically. The

saplings, propagated in polythene bags at the nursery of Mr. Sammilan Shetty, were transplanted by removing the bags and placing the plants into pre-dug pits arranged in rows with uniform spacing. Soil and organic manure were applied in appropriate proportions to ensure optimal plant growth. The nectar plants introduced in the area are Stachytarpheta jamaicensis, Stachytarpheta mutabilis, Lantana sp., Hibiscus sp., Ixora sp., Cuphea sp., Hamelia sp., Cosmos sp., Leea sp., Premna sp., Pentas sp., and Clerodendrum sp.

The larval host plants introduced are Mussaenda sp., Citrus sp., Citrus medica, Wattakaka sp., Acronychia sp., Kalanchoe sp., Alpinia sp., Aristolochia sp., Ochlandra sp., Saraca sp., Hiptage sp., Cassia sp., Zanthoxylum sp., Parsonsia sp., Crateva sp., Cinnamomum sp., Plumbago sp., Barleria sp., Pseuderanthemum sp., Cleome sp., Senna sp., Ricinus sp., Thottea sp., Bixa sp., Costus sp., Dioscorea sp., Acacia sp., Urena sp., Tinospora sp., Bridelia sp., and Flacourtia sp.

This hands-on activity complemented classroom-based theoretical instruction by providing students with direct exposure to butterfly ecology, host plant identification, landscaping practices, and habitat maintenance techniques. The butterfly park functions as a 'living laboratory' enabling long-term monitoring of butterfly populations and the study of their life cycles. By creating a habitat conducive to all stages of the butterfly life cycle, the students contributed to the conservation of butterflies and other pollinators, including bees. Student engagement extended to daily maintenance activities such as watering plants and recording butterfly sightings, resulting in the systematic documentation of species observed within the park.

Diversity of butterflies in Savita sastri butterfly park

Surveys conducted at the Savita Sastri Butterfly Park documented a total of 31 butterfly species representing five families of the order *Lepidoptera*. Of these, 14 species belonged to *Nymphalidae*, six to *Hesperiidae*, five to *Pieridae*, and three each to *Lycaenidae* and *Papilionidae*. Table 1 shows the checklist of butterflies in the butterfly park. The predominance of *Nymphalidae* suggests the availability of a rich and diverse floral assemblage, offering both abundant nectar resources and suitable vegetation for oviposition. The park's proximity to a botanical garden and a small forest fragment within the Mahatma Gandhi Memorial (MGM) College campus further enhances habitat heterogeneity by providing a mosaic of herbs, shrubs, and I.

The butterfly park contains 13 nectar plant species and 33 larval host plant species selected to support multiple butterfly taxa across life stages. The preliminary survey emphasizes the contribution of diverse floral resources to maintaining high butterfly diversity within a relatively small habitat. The successful establishment of the Savita Sastri Butterfly Park demonstrates the potential for integrating habitat restoration with student-led biodiversity monitoring. Student participation in plantation, maintenance, and monitoring activities not only facilitated data collection but also fostered environmental stewardship and conservation awareness. The project illustrates that even small-scale habitats, when planted with appropriate host and nectar plants, can serve as effective butterfly gardens, an idea that has inspired students to initiate similar efforts at their homes.

Overall, the Savita Sastri Butterfly Park functions as both a conservation site and an educational platform, promoting community engagement in butterfly conservation. The initiative underscores the value of citizen science and targeted habitat enhancement in safeguarding butterfly populations and contributing to broader biodiversity conservation goals.

Table :1 Checklist of butterflies at Savita Sastry Butterfly Park, MGM College

Sl.no	Family	Common name	Scientific name
1.	Nymphalidae	Grey Pansy	Junonia atlites
2.	Nymphalidae	Chocolate Pansy	Junonia iphita
3.	Nymphalidae	Common Evening Brown	Melanitis leda
4.	Nymphalidae	Tailed Palmfly	Elymnias caudata
5.	Nymphalidae	Common Palmfly	Elymnias hypermnestra
6.	Nymphalidae	Common Fivering	Ypthima baldus
7.	Nymphalidae	Common Crow	Euploea core
8.	Nymphalidae	Blue Tiger	Tirumala limniace
9.	Nymphalidae	Dark Blue Tiger	Tirumala septentrionis
10.	Nymphalidae	Glassy Tiger	Parantica aglea
11.	Nymphalidae	Great Eggfly	Hypolimnas bolina
12.	Nymphalidae	Common Bush Brown	Mycalesis perseus
13.	Nymphalidae	Common Baron	Euthalia aconthea
14.	Nymphalidae	Clipper	Parthenos sylvia
15.	Hesperiidae	African Straight Swift	Parnara bada
16.	Hesperiidae	Water Snow Flat	Tagiades litigiosa
17.	Hesperiidae	Suffused Snow Flat	Tagiades gana
18.	Hesperiidae	Smaller Dartlet	Oriens goloides
19.	Hesperiidae	Grass Demon	Udaspes folus
20.	Hesperiidae	Rice Skipper	Pelopidas mathias
21.	Pieridae	Mottled Emigrant	Catopsilia pyranthe
22.	Pieridae	Common Emigrant	Catopsilia pomona
23.	Pieridae	Three Spot Grass Yellow	Eurema blanda
24.	Pieridae	Common Grass Yellow	Eurema hecabe
25.	Pieridae	Wandering Psyche	Leptosia nina
26.	Papilionidae	Tailed Jay	Graphium agamemnon
27.	Papilionidae	Common Mormon	Papilio polytes
28.	Papilionidae	Common Rose	Pachliopta aristolochiae
29.	Lycaenidae	Common Pierrot	Castalius rosimon
30.	Lycaenidae	Common Ciliate Blue	Anthene emolus
31.	Lycaenidae	Plains Cupid	Chilades pandava

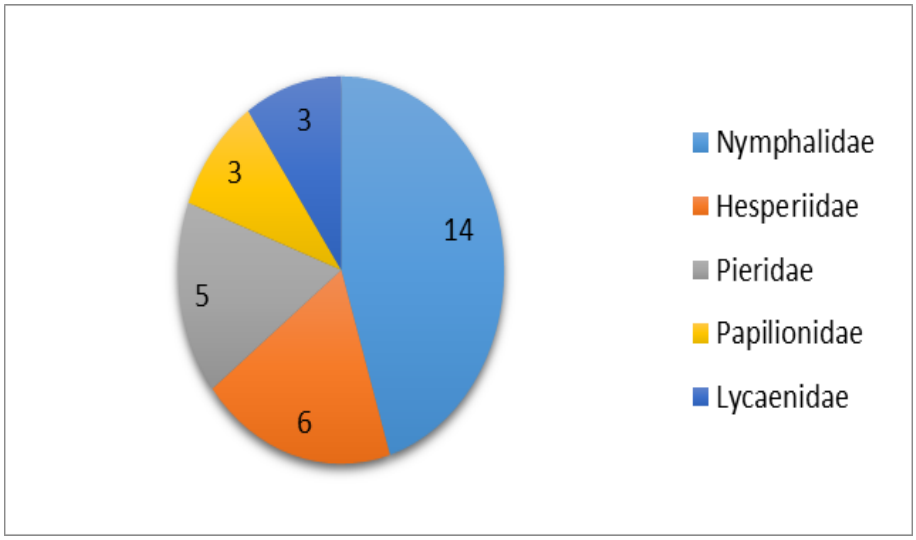

Fig :1 Butterfly species diversity at Savita sastri Butterfly Park

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