



## A First report of Butterfly diversity in the hills of Udayagiri and the vicinity of the River Bais near Vidisha city, Madhya Pradesh

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### Abstract

Butterflies are found everywhere in the world according to their climatic conditions, where a temperature varies neither too hot nor too cold, a pleasant and appropriate environment is needed. At present this study is based on the first report of butterflies in the hills of Udayagiri and the vicinity of the River Bais near Vidisha city of Madhya Pradesh. A total of 14 species and 05 families were recorded during the year 2022 to 2024. As previously recorded data, the total number of butterflies recorded from the Indian region is 1504 species according to Tiple, 2011<sup>[10]</sup>. Butterflies represent the arthropods group which are the most beautiful and colourful arachnids or invertebrates on the earth and have essential aesthetic value as well it remains a matter of curiosity.

Butterflies fly thousands of miles during the winter season to different places like the warmer climates and return in the spring season conditionally. Butterflies always serve as the most important plant pollinators in our environment and pollinate more economically important plants (Borges *et al.*, 2003). The studied area is the Hills of the Udayagiri which is situated near the city of the Vidisha, which is located around the hills. The water reservoir and type of vegetation around the river Bais created an ideal habitat for the attraction of butterflies and many faunal species like insects, birds, fish, mammals, and so on. The eco-park of MPT is situated around the hills and makes the scenic beauty of the place.

A butterfly survey is a way to report the diversity of the vicinity of the Bais River near the city of Vidisha. The studied area is covered by a variety of trees, forests, large grasslands, and small hills; these are essential elements as well as preferred habitats for many species.

A present study aims to evaluate the diversity of butterflies [Lepidoptera] from the city of Vidisha. Butterflies are the largest group of insects of Arthropoda, while they belong to the "Lepidoptera", which means "scalywing". They are identified and characterized by their colourful wings and by their siphoning type of mouth part that forms the Proboscis, which they use to suck the nectar of the flower. A variety of host plants and flowers easily be found in the city of Vidisha. Butterflies lay their eggs that become larvae after the hatching process occurs. Now a stage is known as a caterpillar, which has a different morphology or appearance, with its elongated body, and they feed mainly on leaves of the plant. Also, we have recorded the different host plants of butterflies. As we know the Butterflies have an economic interest and have a pivotal role in the ecosystem through pollination and as the prey for other species. Butterflies also support a wide range of parasitoids and are worthy of the conservation of host trees. Now, we are focussing on the diversity of the butterflies and their conservational status, we have to spot the site first.

**Keywords:** Bais River, the Udayagiri Hill, Butterfly, the Betwa River

### Introduction

The Vidisha city is one of the most historically enriched, valued, and diverse areas for flora and fauna diversity. The beauty of this place is by the River of the Betwa and Bais with the hills of the Udayagiri around it, which provides a natural habitat and good climatic conditions for the butterfly species. The diversity of butterflies is one of the most abundant in this area due to the suitable and favorable environment for them. During the survey of the Udayagiri Hill and Bais River vicinity, we observed different types of butterflies from 2022 to 2024. According to the Worldwide data, we have 28,000 species of Rhopalocera and found 80% of which are in tropical areas. In India, there are 1504 species of butterfly fauna found (Bhowate and Kumar, 2022). Studies on Butterflies always supported the host trees and they are essential pollinators and cross-pollinate for a variety of flora. A survey was done for the study of butterfly diversity in the above-mentioned sites. There are five Families of butterflies belonging to *Nymphalidae*, *Pieridae*,

*Lycaenidae*, *Hesperiidae* and *Papilionidae*. We studied them along with their host plant.

### Materials and Methods

**Study area:** The survey was conducted and carried out in the hills of the Udayagiri and the vicinity of the Bais River of the Vidisha, Madhya Pradesh.

**Identification:** The photography method was used for the identification of the studied areas. we have used a Canon R10 DSLR/Nikon Cool Pics digital camera for photography. The random survey for the butterflies was done from the morning 7.30 am to 11 am, and 3 pm to 5.30 pm, which is the perfect time for the identification of the butterflies from selected sites.

### Result and Discussion

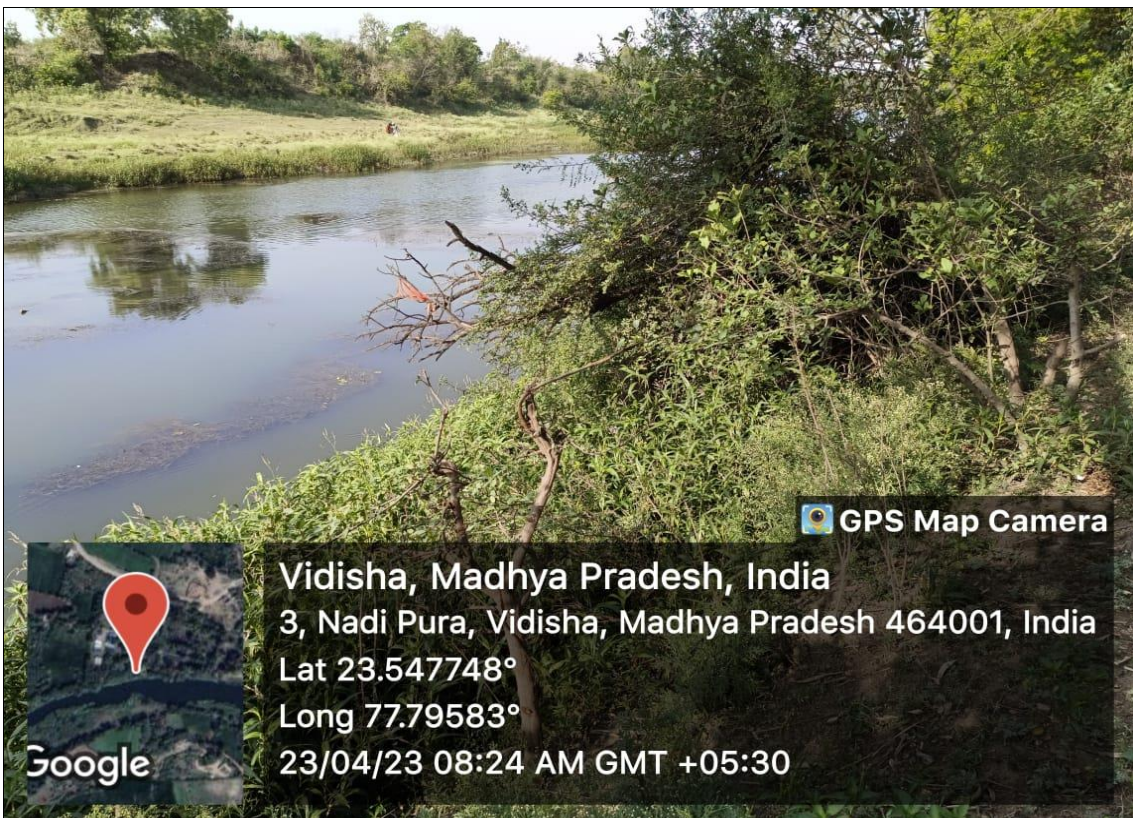
After the survey of the selected areas, we have observed that butterflies are recorded from the hills of the Udayagiri and

the vicinity of the Bais River of the city Vidisha and there are a total of 108 individual butterflies recorded with 14 genera and 05 various Families belonging to *Nymphalidae*, *Pieridae*, *Lycaenidae*, *Hesperidae* and *Papilionidae*. All of them Family *Nymphalidae* is the dominant group among the others. As we know many medicinal plants and native plants are found in Vidisha City near the hills of the Udayagiri. The most favorable habitat for the larvae of the butterflies is the host tree and for adults, it is a nectar plant. This is a component of the Nature's food web. As we know In-situ and Ex-situ conservation always play pivotal roles in supportive mechanisms for the conservation of butterflies in the region. The Government and local community taking so many initiatives to conserve the flowering plants and their visitors. The population of butterflies declining due to

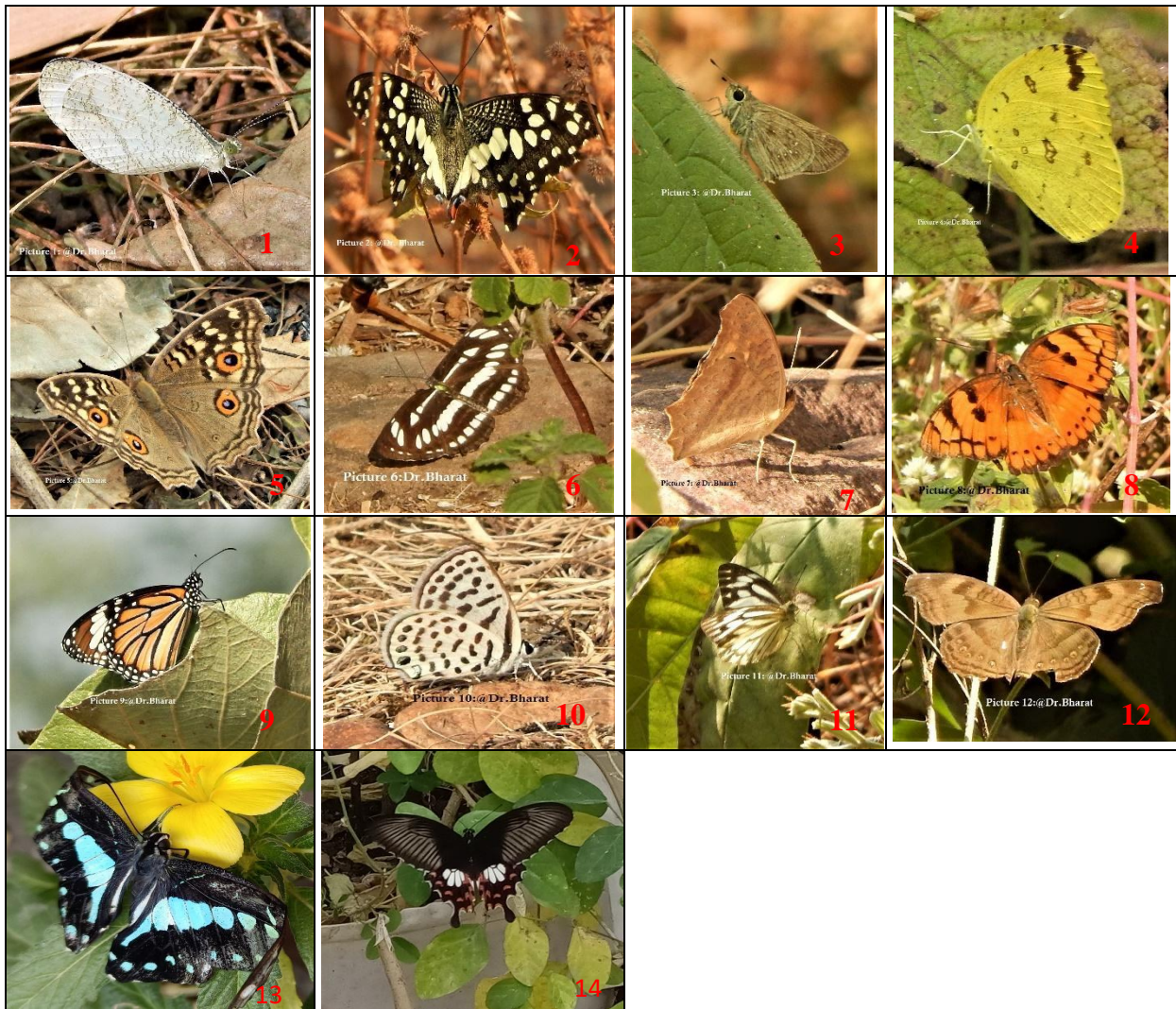
overexploitation and loss of native host and nectar plants, but the hills of the Udayagiri and the vicinity of the Bais River always support and provide a healthy environment for butterflies and always bring back their diversity. we have calculated the diversity indices by using a Simpson and Shannon Weiner index, which takes into account the number of species present, along with the relative abundance of each species. As species richness and evenness increase, so does it mean diversity increases. The butterflies are very diverse in the areas. Among the families, Hesperidae and Lycaenidae are less diverse compared to the group with a low percentage of 7.1 and a high in the family Nymphalidae at 50%. The cumulative percent in the species of *Papiliopolytesis* high and low in the *Castaliusrosimon*.



**Fig 1:** Map of the Udayagiri Hills, Vidisha, Madhya Pradesh.



**Fig 2:** Map of Nadipura area of the Vidisha city, Madhya Pradesh.



**Fig 3:** 1. Common vagrant, 2. Lime butterfly, 3. Skipper, 4. Common grass yellow, 5. Lemon Pansy, 6. Common sailor, 7. Grey pansy, 8. Baronet, 9. Striped Tiger, 10. Common Pierrot, 11. White Tiger, 12. Long Brand Bush Yellow 13. Common Jay 14. Common mormon

**Table 1:** Statistical Data

		Family			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hesperiidae	1	7.1	7.1	7.1
	Lycaenidae	1	7.1	7.1	14.3
	Nymphalidae	7	50.0	50.0	64.3
	Papilionidae	3	21.4	21.4	85.7
	Pieridae	2	14.3	14.3	100.0
	Total	14	100.0	100.0	

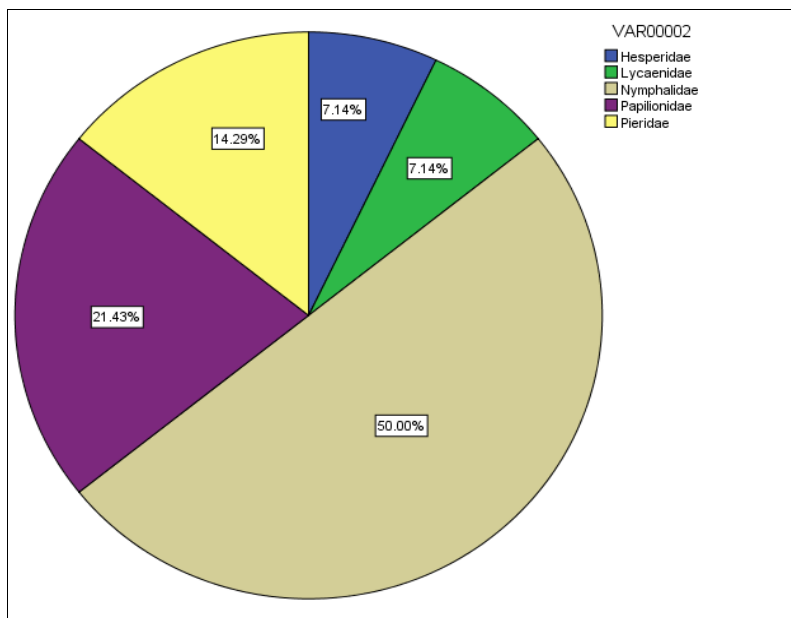
		SPECIES		
		Frequency	Percent	Cumulative Percent
Valid	Castaliusrosimon	1	7.1	7.1
	Coliadinae	1	7.1	14.3
	Danausgenutia	1	7.1	21.4
	Dismorphinae	1	7.1	28.6
	Erynnistages	1	7.1	35.7
	Euthalianais	1	7.1	42.9
	Graphiumdoson	1	7.1	50.0
	Junonia	1	7.1	57.1
	Junoniaatlites	1	7.1	64.3
	Local melanippus	1	7.1	71.4
	Mycalesis	1	7.1	78.6
	Nepthishylas	1	7.1	85.7
	Papiliodemoleus	1	7.1	92.9
	Papiliopolytes	1	7.1	100.0
Total	14	100.0		

**Table 2:** Diversity Index

Diversity Measures	Index
Simpson Index	0.090
Simpson Index of Diversity	0.91

**Table 3:** The List of Butterflies.

SN	Common Name	Family	Genus/species	Individual
01	Common vagrant	<i>Pieridae</i>	<i>Dismorphinae</i>	05
02	Lime butterfly	<i>Papilionidae</i>	<i>Papiliodemoleus</i>	08
03	Skipper	<i>Hesperiidae</i>	<i>Erynnistages</i>	04
04	Common grass yellow	<i>Pieridae</i>	<i>Coliadinae</i>	08
05	Lemon Pansy	<i>Nymphalidae</i>	<i>Junonia</i>	07
06	Common sailor	<i>Nymphalidae</i>	<i>Nepthishylas</i>	15
07	Grey pansy	<i>Nymphalidae</i>	<i>Junoniaatlites</i>	04
08	Baronet	<i>Nymphalidae</i>	<i>Euthalianais</i>	10
09	Striped Tiger	<i>Nymphalidae</i>	<i>Danausgenutia</i>	20
10	Common Pierrot	<i>Lycaenidae</i>	<i>Castaliusrosimon</i>	08
11	White Tiger	<i>Nymphalidae</i>	<i>Local melanippus</i>	03
12	Long Brand Bush Yellow	<i>Nymphalidae</i>	<i>Mycalesis</i>	03
13	Common Jay	<i>Papilionidae</i>	<i>Graphiumdoson</i>	10
14	Common Mormon	<i>Papilionidae</i>	<i>Papiliopolytes</i>	03



**Graph 1:** The percentage of butterfly families encountered in the hills of the Udayagiri.

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