

STUDY OF SOME BUTTERFLY DIVERSITY AT THE MAITRI GARDEN IN DURG  
DISTRICT IN CHATTISGARH, INDIA**Dipika Dikshit**Research Scholar, Department of Zoology, Bharti  
Vishwavidyalaya, Durg**Saman Siddiqui**Associate Professor, HOD Zoology, Bharti  
Vishwavidyalaya, Durg**ABSTRACT**

From January 2023 to May 2023, research was conducted to determine the variety of butterflies at the Maitri Garden in Durg District, Chhattisgarh, India. During the course of the study, 26 butterfly species from the three families Papilionoidea (5 species-34 %), Pieridae (5 species-22 %), Hesperidia (3 species- 12 %), Lycaenidae (5 species-9 %), and Nymphalidae(8 species-34 %) were identified from two different habitats in the Garden open area and dry deciduous environment. The Shannon diversity indices index was used for each environment to determine the butterfly diversity. The Garden open area was determined to have the highest Shannon index. The most common of the 26 species were *Demoleus linnaeus* (the lime butterfly), while the rarest and tiniest was *Chilades trochilus* (grass jewel). These species' dominance in the Garden is explicable by the presence of their host and larval plants. 97 individuals from 5 families and 26 butterfly species overall were counted throughout the research period of time and were documented with photographs.

Keywords: Butterfly, Garden, Diversity, Habitat.

**INTRODUCTION**

One of the most noticeable species in the diversity of life on Earth is butterflies. These insects are regarded as valuable bioindicators because of how sensitive they are to changes in their environment, namely variations in temperature, humidity, light, and rainfall patterns. They are therefore in harmony with the diversity and quality of their habitats since they have varied requirements for various habitat types for mating, breeding, and survival. The purpose of this study is to compare the variety and distribution of butterflies in three distinct habitats: the Garden open habitat, the dry deciduous environment, and the habitat. There is also a list of the many species of butterflies. (Bingham, 1905, 1907; Williams, 1930; Evans, 1932; Talbot, 1938, 1947; Wynter-Blyth, 1947; Larsen, 1987; Kunte, 2000, 2001). All these authors have contributed

much to the field of butterfly fauna in various ecosystems in a few regions of the world. In India, Singh et al. (2001), Sreekumar and Balakrishna (2001), Sharma (2009), Rautand Pendharkar (2010), Knuteetal. (2012), and Tewariand Rawat (2013), have reported on the butterfly fauna in a few protected areas of central, northern, and north-eastern parts of India. Radhakrishna and Lakshminaryana (2001) and Radhakrishna and Sharma (2002) have studied the butterfly fauna in Nilgiri Biosphere and Ernakulam National Park in South India.

Butterflies (Rhopalocera) are flying insects that have noticeable, fluttering flight patterns and huge, sometimes brilliantly colored wings. The superfamilies Hedyloidea and Papilionoidea make up the group. The fossilized butterflies are from the Paleocene, or around 56 million years ago. Butterflies are frequently polymorphic, and many species utilize aposematism, camouflage, and imitation to thwart predators. Some migrate across vast expanses, such as the monarch and the painted lady. Many butterflies are preyed upon by other creatures or are parasitized by them, including wasps, protozoans, flies, and other invertebrates. Some butterfly larvae feed on dangerous insects, while others coexist with ants as mutualists. Some butterfly larvae are ant predators. In both the artistic and literary arts, butterflies are a common theme across cultures.

## **MATERIALS AND METHOD**

### **Species Collection:**

Five meters in front of the observer, 2.5 meters to the left and right, and within 2.5 meters of the butterfly. The butterflies at the time of capture, the animal were seen, apprehended, recognized, and promptly released. For this, a butterfly net was employed. Numerous species were captured on camera in their natural habitats. The deceased specimens were preserved in butterfly collecting boxes, many of which weren't in very good shape. During the research, no live specimens were collected.

### **Study Area:**

A popular tourist destination in Bhilai, India, Maitri Bagh Zoo was created as a mark of friendship between the Soviet Union and India. In Chhattisgarh and Madhya Pradesh, it is the biggest and oldest zoo. 111 acres (44.94 hectares) of land. Maitri Bagh's latitude and longitude are both 1. The GPS coordinates for Maitri Bagh are 1° 00' 0.0" N and 1° 00' 0.0" E. It is situated in Durg, India.

### **Analysis of Data**

(A) Shannon Index (H). The Shannon Index was used to determine species diversity:

$$H' = -\sum p_i \ln p_i.$$

The percentage of its species in this case is represented by  $p_i$ .

The two factors that determine H are the number of species (species richness) and the equality of their abundance (or equitability) in the community.

(B) the J value or Palou's Evenness Index (Equitability). The ratio of individuals within each species is known as the species evenness.

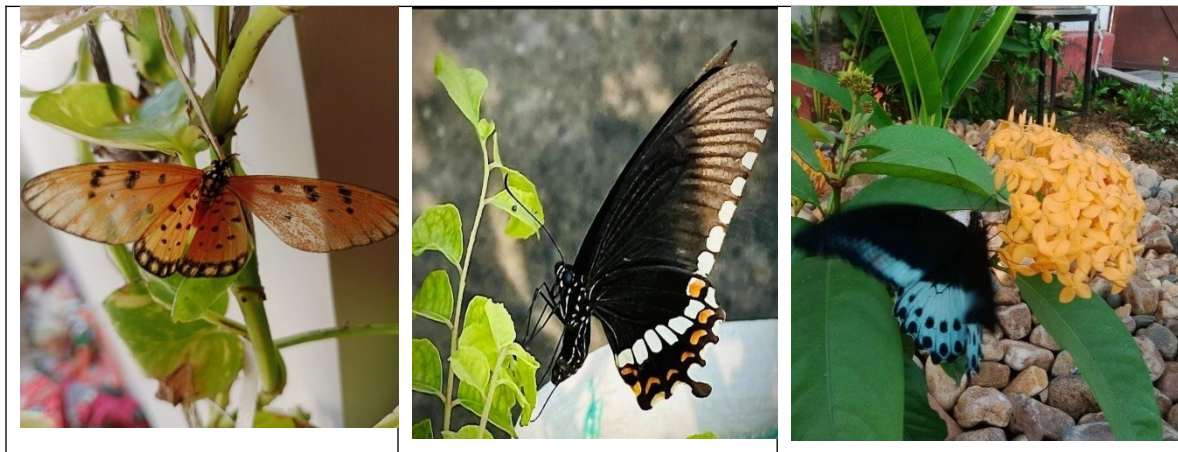
The evenness of the species in the location reflects their relative abundance:

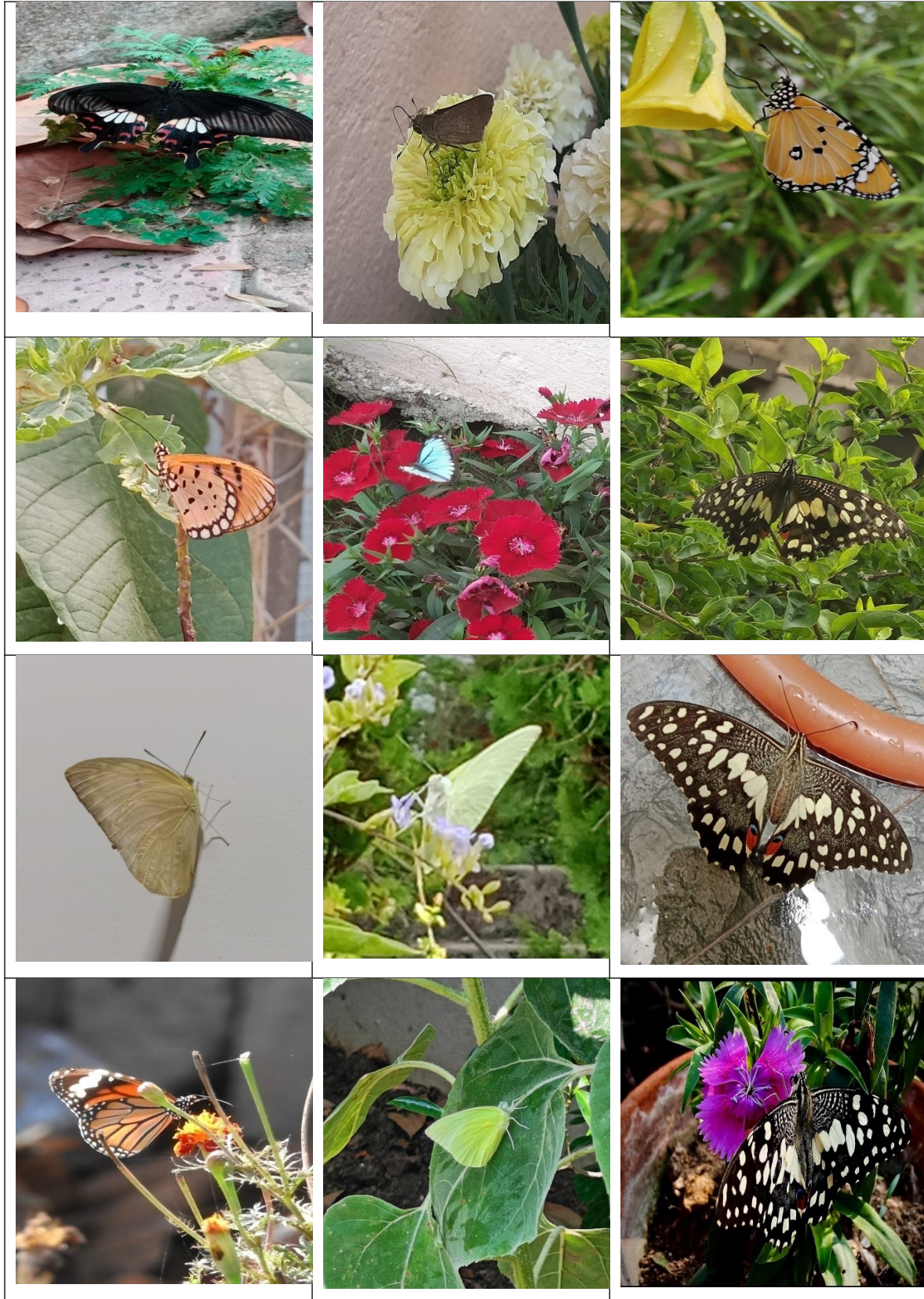
$$J' = H' / \ln S. (2)$$

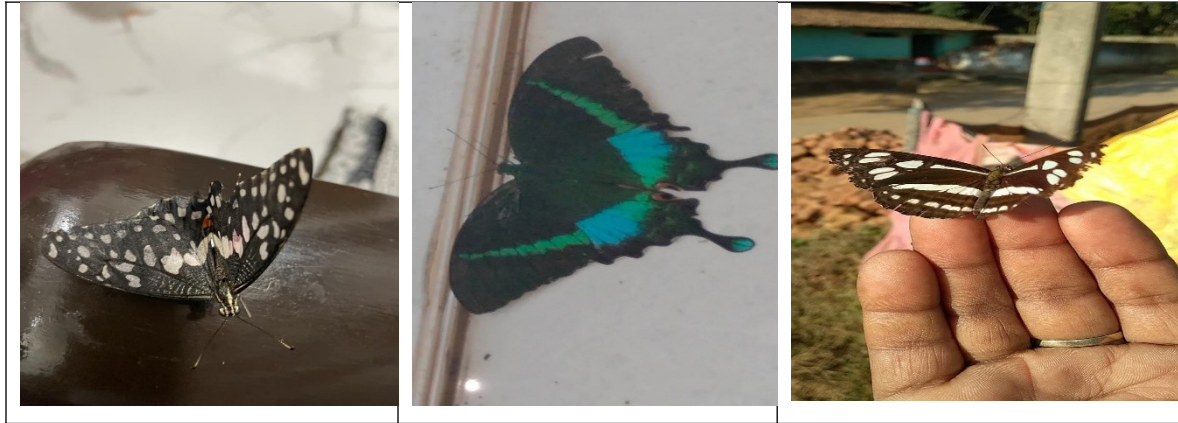
S stands for the number of species found at the location.



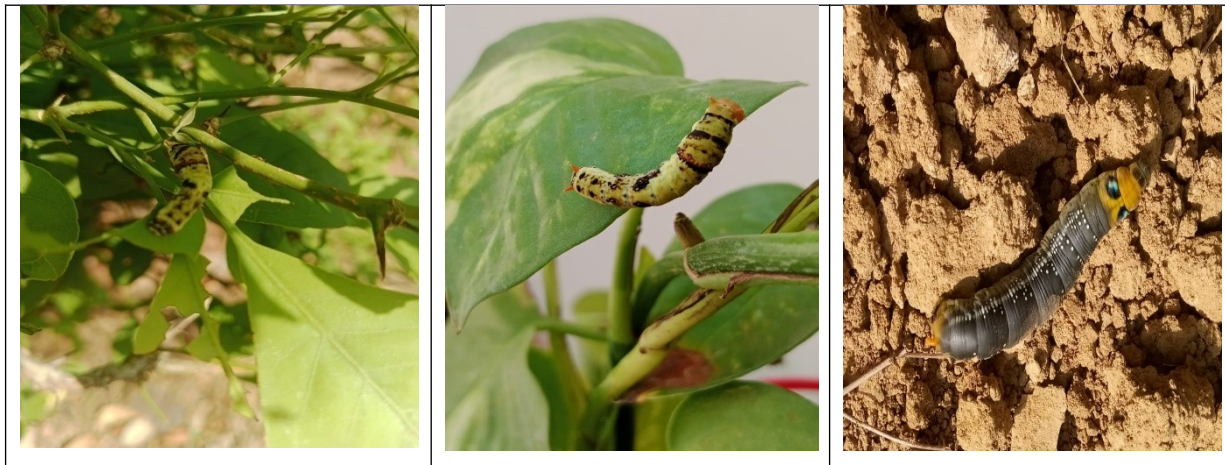
Figure 1: Different species of butterfly are observed.







**Figure 2: larvae of some butterflies belong to the families Hesperidia, Lycaenidae, and Nymphalidae**

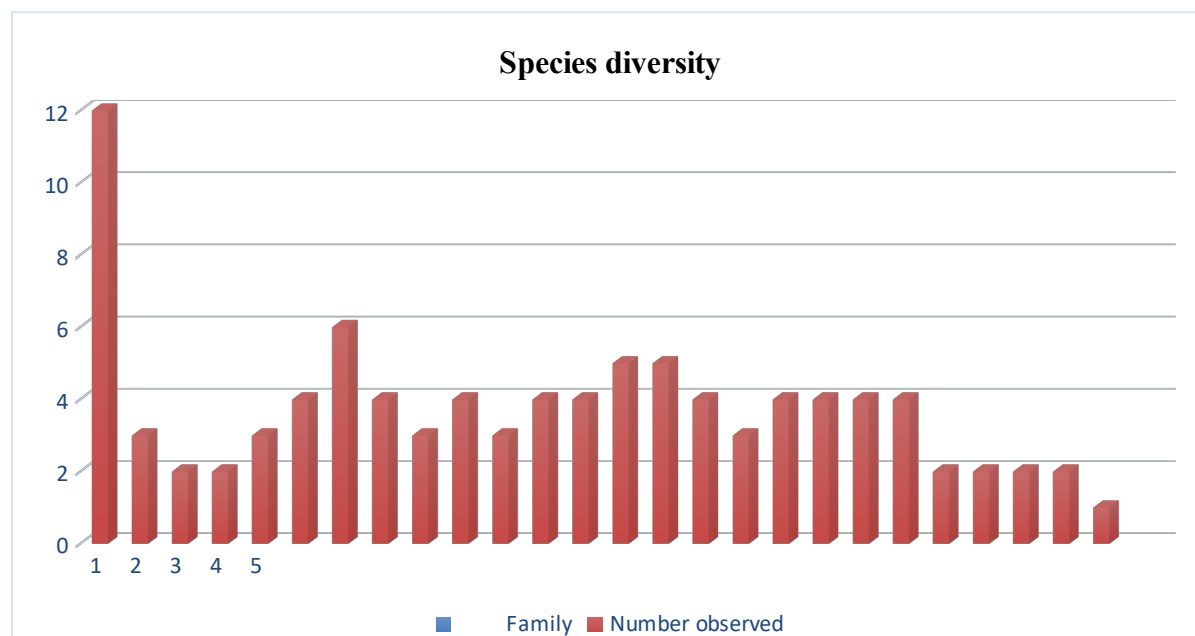


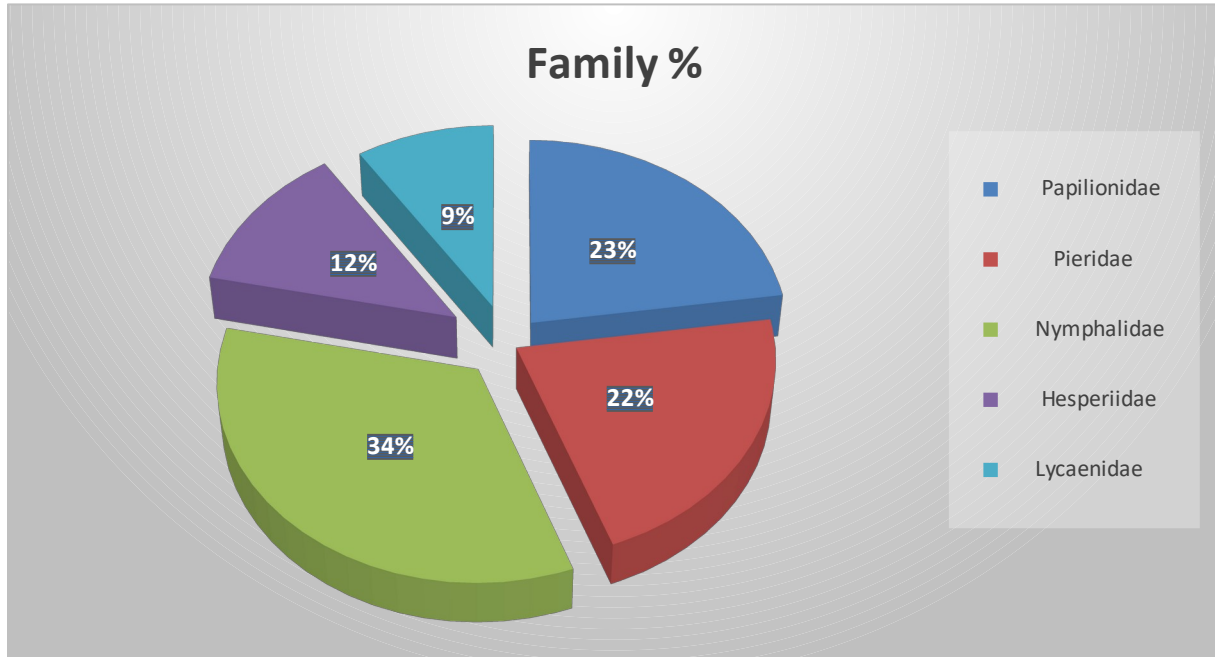
**Table 1 displays the variety of butterfly species and their abundance**

Family	%	Common name	Genus	Species	Number observed
Papilionidae	23%	1)Lime	papilio	Demoleus	12
		2)Common Mormon	Papilio	Polytes	3
		3)Blue Mormon	Papilio	Polymnestor	2
		4)Red Helen	Papilio	Helenus	2
		5)Green Swallowtail	Papilio	Blumei	3
Pieridae	22%	6)Grass Yellow	Eurema	Hecabe	4
		7)cabbage White	Pieris	Rapae	6
		8)Floride White	Appicas	Drusilla	4

		9)Lyside sulphur	Kricogonia	Lyside	3
		10)Lemon emigrant	Catapsilia	Pomona	4
Nymphalidae	34%	11)common sailer	Neptis	Hylas	3
		12)Blue morpho	Morpho	Peleides	4
		13)Striped Tiger	Danaus	Genutia	4
		14)Plain Tiger	Danaus	Chrysippus	5
		15)Tawny Caster	Acraea	Violae	5
		16)Lemon Pansy	Junonia	Lemonias	4
		17)Peacock Pancy	Junonia	Almanac	3
		18) Hackberryemperor	Asterocapa	Celtis	4
Hesperiidae	12%	19)Rice swift	Borbo	Cinnara	4
		20)Indian Skipper	Spialia	Galba	4
		21)Pale palm dart	Telicota	Colon	4
Lycaenidae	9%	22)Common Pierrot	Castalius	Rosimon	2
		23)Dark Pierrot	Tarucus	Ananda	2
		24)Forget Me Not	Catochrysps	Strabo	2
		25)Rounded Pierrot	Tarucus	Nara	2
		26) Grass jewel	Chilades	Trochylus	1

**Table: 2 Demographic analysis of butterfly species**





### CONCLUSION:

In the research area, a total number of 96 individuals of 26 butterfly species from five families were identified. The appearance of the species was widespread among them belonging to the family Papilionoidea (23 %), Pieridae (22 %), Hesperidia (12%), Lycaenidae (9 %), and Nymphalidae (34%). every butterfly species is observed, preserve for those that displayed habitat specialization, this was demonstrated by the Simpson 'J' (Equitability) and Shannon 'H' indices of evenness. The biodiversity profile indicated the healthy diversity profile of butterflies and revealed a normal pattern of decline. In protected natural settings, the presence of butterflies is crucial for pollination of many plant species. Additionally, these avian species' seasonal migratory patterns and preferences for specific habitats show that they must take advantage of specific environmental factors in order to survive. In order to get insight into the species variety and distribution patterns that might aid to offer information on the population statuses of these diverse species and, in turn, inspire future research for their conservation, assays of butterfly populations should be updated annually.

### RESULT

97 individuals from 5 families and 26 butterfly species overall were counted throughout the research period of time and were documented with photographs. Table-1 shows the butterfly species along with their abundance in various environments. There are twenty-six species, with

the lowest individual abundance in each of the two habitats being fewer than three. Papilionoidea (5 species), Pieridae (5 species), Hesperidia (3 species), Lycaenidae (5 species), and Nymphalidae are the three most common species. All three of these species were most prevalent in open areas of gardens.

The most common of the 26 species were *Demoleus linnaeus* (the lime butterfly), while the rarest and tiniest was *Chilades trochilus* (grass jewel). The number of uncommon species tends to rise from garden open regions to dry deciduous settings to urbanized environments, as seen in Figure 1. In open spaces and dry deciduous habitats, the proportion of unusual species is comparable, however, it tends to fall in urbanized regions. On the other hand, the fraction of common species shows a declining tendency from dry deciduous settings to garden open regions.

Table 2 displays the variety of butterfly species in two main habitat categories. The open garden area has the most species types.

## DISCUSSION

During the study, only twenty-six species of butterflies were identified. The most common of the 26 species were *Demoleus linnaeus* (the lime butterfly), while the rarest and tiniest was *Chilades trochilus* (grass jewel). The least destroyed open garden regions had the highest species richness, followed by dry deciduous habitat, which had the lowest species richness. These outcomes are explained by the existence of the host and larval plant species, whose occurrence affects the butterfly distribution. The statistics of common species across various habitats, which show beta diversity and how distinct these environments are in terms of the variety and number of species found there, are an essential component of the research. As these regions are rather abundant in food supplies in terms of nectars for butterflies, the open garden area and dry deciduous environment demonstrated the number of shared species (26 species).

Different environments have various species community structures however, the open scrub and dry deciduous habitats were quite comparable. Particularly in urban environments, many butterfly species are dependent on secondary forests or remaining vegetation to survive.

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