

Diversity pattern of Butterfly Lepidoptera (*Papilio demoleus*) in Union Council Koaz Bahram Dheri Khyber Pakhtunkhwa Pakistan

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Abstract

In ecosystem the butterflies play dual role as pollinators, silk producers and indicators of environmental quality. The present study was conducted in Union Council Koaz Bahram Dheri during the period July 2012 to August 2012. The collection of butterflies was done randomly by using the sweep net. A total of 32 specimens of *Papilio demoleus* were collected from different villages of the said area. The high number of specimen was collected from Aratt Kally (21.88%). The wing span is 9.8 ± 0.40 cm and body length 2.9 ± 0.16 cm. From the present investigation it was concluded that the *Papilio demoleus* species is common in Union Council Koaz Bahram Dheri. The area has rich fauna of butterflies and recommended further studies.

Keyword: Butterflies; Ecosystem; Pollinators; Sweep net; *Papilio demoleus*; wing span.

1. Introduction

Butterflies are the best known insects of the world and estimated 90% of the world's species have scientific names. Butterflies and moths offer good opportunities for research studies on population and community ecology. Butterflies are generally regarded as one of the best taxonomically studied groups of insects [1,2].

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Order Lepidoptera which means scale-winged are beneficial as pollinators, silk producers, indicators of environmental quality, and respected for their visual value [4]. The order contains over 19,000 species of butterflies and 100,000 species of moths worldwide, of which 1,501 species are known from India and 700 butterfly species occur in North America [5]. Generally insect diversity is highest in plant diversity and lowest in shrub, grass and open areas [6]. Butterfly diversity in natural forests lower while, higher in disturbed forests, and highest in moderately disturbed forests [7,8]. Tropical rain forests support the majority of global biodiversity and so understanding the impacts of habitat fragmentation in these areas is crucial for the conservation of biodiversity [8,9]. Related studies have also indicated that the numbers of butterfly species and individuals are high in disturbed and regenerating forests and low in natural forests [10,11].

1.1. Description of *Papilio demoleus*

Lime butterfly, *Papilio demoleus* can live in a broad variety of climatic conditions due to its wide range ecological tolerance ability. The body of Lime butterfly, is dark black, the fore wings are black. The whole wing is powdered by black scales. The margins are ridged. The bigger part of wing is powdered by yellow strips and apex of forewing has yellow spots present in a distal band. The hind wings are also dark black. The margins are ridged without tail. Blue black spot is also present along with red spot. Ventral body has paler yellow color, with the black areas dusted with yellow. Upper side of butterfly is pale creamy, when it is freshly emerged. Later on it changes to deeper yellow. The wing span is 9.8 ± 0.40 cm and body length 2.9 ± 0.16 cm. The sexes of *Papilio demoleus* are similar.

1.2. Scientific classification

Kingdom: Animalia

Phylum: Arthropoda

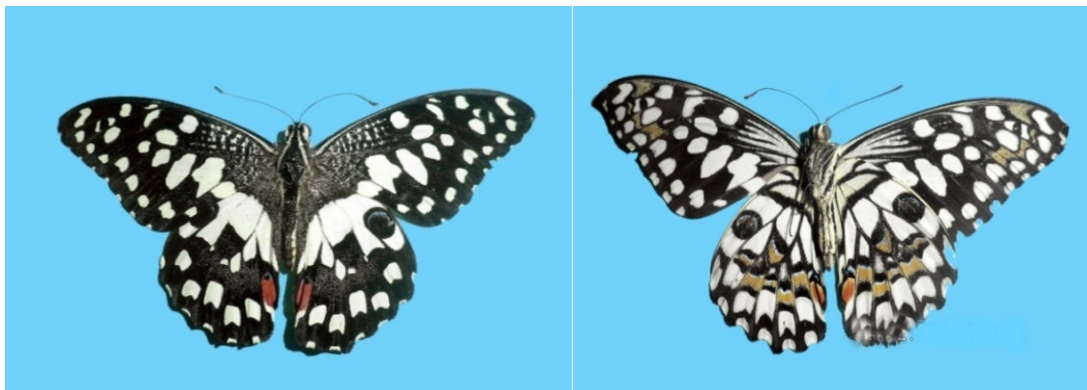
Class: Insecta

Order: Lepidoptera

Family: Papilionidae

Genus: *Papilio*

Species: *P. demoleus*, Lime butterfly (Linnaeus, 1758)



(Dorsal view)

(Ventral view)

2. Material and Methods

The aim of the current study was to explore the fauna of the butterflies in Union Council Koaz Bahram Dehri. More study is needed in this regards.

2.1. Study area

The present study was carried out in Union Council Koaz Bahram Dheri, District Charsadda, Khyber Pakhtunkhwa, Pakistan.

2.2. Study duration and collection time

The present study was carried out in the period from July 2012 to October 2012. The butterflies were collecting during the day time 9:00 AM to 4:00 PM.

2.3. Materials used

The material used in the collation of the butterflies are Sweep net, chloroform bottle, digital camera, and insect's pins, setting boards, insect boxes, naphthalene balls, ruler and field book.

2.4. Collection and Preservation of butterflies

The collection of butterflies was done randomly by using sweep net and naked hands. The collected species were killing used cotton soaked chloroform and then placed them in chloroform bottle. They were pinned and their body parts were set on thermopile setting board in laboratory. Specimens were tagged with scientific name and area of collection along with date. On drying these were properly labeled and mounted in the collection boxes. Naphthalene balls were placed in the boxes to keep them safe from the pests.

2.5. Identification of butterflies

The identification of butterflies was done with the help of keys, and available literature. The help was also taken from the available identified specimens placed in National Insect Museum, (NARC) Islamabad by Dr. Muhammad Ather Rafi Director National Insect Museum Islamabad Pakistan and Sardar Azhar Mahmood lecturer Department of Zoology Hazara University Mansehra Pakistan. After the identification all the collected specimens were kept in the museum of Department of Zoology Hazara University Mansehra Pakistan.

2.6. Morphological study

The total body length and wing span of the specimens were measured with the help of graph paper and ruler.

2.7. Photography

The photograph of the identified specimen was taken placed one by one on top of a light blue paper. Photographs were taken on ventral side as well as by dorsal side by using digital camera, Yashica (14.2 megapixels), made in China.

3. Results and Discussions

The reserve area has different habitats like scrub, grassland, plantation, botanical and nursery gardens. Each zone was explored on the basis of possibility and availability of butterflies. A total of 32 specimens of *Papilio demoleus* were collected from different villages of Union Council Koaz Bahram Dehri. The high number of *Papilio demoleus* species were collected from Aratt Kally 7 (21.88%), Haji Sargund Kally 5 (15.62%), Aslam Khan Kally 5 (15.62%), Pally Qalla 5 (15.62%), Gulandy kally 4 (12.5%), Fazal Kally 3 (9.38%), Toor Khat Kally 3 (9.38%) and no species were recorded from Landi Shah, Soor Kamar, Bahram Dheri, Mardhand and Sewan kally as shown in table 1. The result of the present study shows that the *Papilio demoleus* is very common in Aratt Kally, while common in Haji Sargund Kally, Aslam Khan Kally, Pally Qalla. The species is rare in Fazal Kally and Toor Khat Kally (Table. 1)

Table No 1: Area wise distribution of *Papilio demoleus* Occurrence

S. No	Name of area	Total No	Occurrence (Months)	Status	Biotope
1	Aratt Kally	7	04-07-2012	VC	B, S, G, P
2	Haji Sargund kally	5	25-09-2012	C	S, G, P
3	Aslam Khan Kally	5	09-09-2012	C	S, G, P, B
4	Pally Qalla	5	05-07-2012	C	S, G, P
5	Gulandy kally	4	08-09-2012	NR	S, P
6	Fazal Kally	3	06-09-2012	R	S, P
7	Toor Khat Kally	3	04-07-2012	R	S, P
8	Landi Shah	0	26-08-2012	VR	-
9	Soor Kamar	0	05-08-2012	VR	-
10	Bahram Dheri	0	11-08-2012	VR	-
11	Mardhand	0	11-09-2012	VR	-
12	Sewan Kally	0	16-07-2012	VR	-

Keys of table: Status: (VC: Very Common; C: Common; NR: Not Rare; R: Rare; VR: Very Rare) and Biotope: (S: Scrub; G: Grassland; P: Plantation; B: Botanical and Nursery Garden).

3.1. Month wise distribution

The months wise distribution of *Papilio demoleus* shows that the high number of species were recorded in October 17 (53.12%) followed by August 15 (46.88%), and no species were recorded in July and September as shown in figure 1.

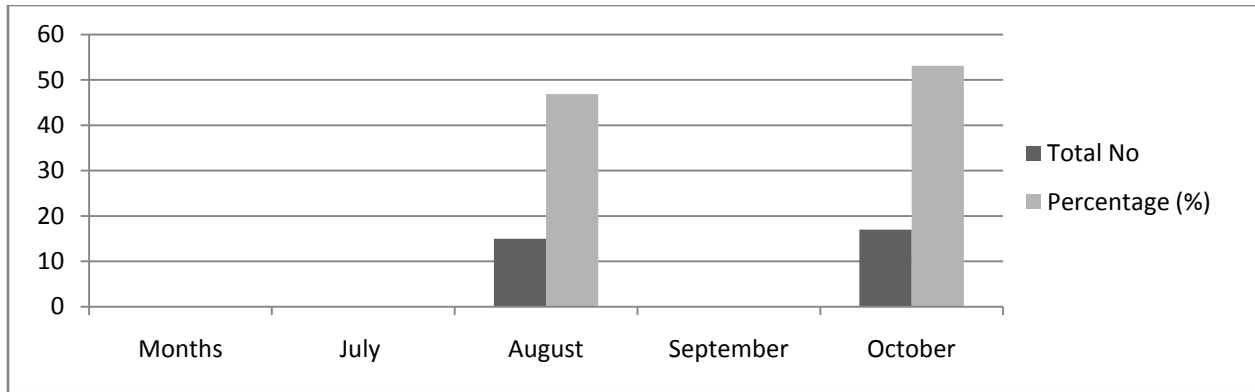


Figure 2: Month wise distribution of *Papilio demoleus* in Union Council Koaz Bahram Dheri.

4. Recommendation

This was the first study on *Papilio demoleus* in the said area. We recommend further studies in the District Charsadda to explore the different species of butterflies. Also everyone should become conscious that the protection of habitat is an important aspect in the conservation of such species.

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Competing interest: The authors are contributed equally and declare that they have no competing interest.

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