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BUTTERFLY BIODIVERSITY AT BANNERGHATTA NATIONAL PARK

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ABSTRACT

In the present study, observation made in the Butterfly Park, Bannerghatta shows the presence of a great number of variety of species of butterflies. Some rare species like Southern birdwing were also observed. Many other species like the Baronet, Common castor, Crimson rose, common Emigrant, common Mormon, Mottled Emigrants etc., were also observed. The park displayed a rich floral surrounding for the proliferation of the butterflies along with many other insects. Though many species were identified and many unknown species were observed, the populations of different species were not very high. This may be due to change in the climatic condition or impact of human activities.

INTRODUCTION

The sheer beauty and diversity of butterflies have attracted both collectors and naturalists alike. Besides having an aesthetic appeal butterflies form an important component of the food chain of birds, reptiles, spiders and predatory insects. Their role as pollinators is a major one. They are also sensitive to changes in temperature, weather conditions and habitat disturbance and thus serve as good indicators of environmental change. The butterfly fauna of India is rich with over 1500 species which is close to 9% of the total butterfly species of the world. Out of these about 417 species are reported from the western Himalayan region.

A butterfly is a mainly day-flying insect of the order Lepidoptera, the butterflies and moths. Like other holometabolous insects, the butterfly's life cycle consists of four parts, egg, larva, pupa and adult. Most species are diurnal. Butterflies have large, often brightly coloured wings, and conspicuous, fluttering flight. Butterflies comprise the true *butterflies* (superfamily: Papilionoidea), the *skippers* (superfamily: Hesperioidea) andthe*moth-butterflies* (superfamily: Hedyloidea). All the many other families within the Lepidoptera are referred to as moths.

Study Area

The Country's first Butterfly Park at Bannerghatta Biological Park, Bangalore was inaugurated on 25th November 2006 by Hon'ble Minister Science & Technology and Earth Sciences, Shri Kapil Sibal. It is situated 22 km south of

Bangalore, Karnataka, India. This hilly place is the home for one of the richest natural, zoological reserves. The area of this zoological park is 25,000 acre.The coordinates are 12°48'03''N 77°34'32''E.

The Park houses more than 2000 butterflies at any given time representing 42 species. The uniqueness lies in the research activities continuing specially for rearing technologies, DNA Barcoding etc. The project was executed by the Zoo Authority of Karnataka in collaboration with the University of Agricultural Sciences (UAS), Bangalore and Ashoka Trust for Research in Ecology and the Environment, Bangalore. The butterfly park is spread over an area of 18 acres which includes a ten acre host-plant garden and 7.5 acres of the park which is open to visitors. The park comprises a butterfly garden which leads to a butterfly conservatory spread over an area of 10,500 sq feet, under a polycarbonate roof. The visitors to the conservatory can see a 15 to 30 species of butterflies depending on the season. The butterfly conservatory leads to a museum spread over an area of 3000 sq feet that houses dioramas, live-exhibits, specimens and inter-active computer kiosks. The museum also has a multi-media centre attached to it which will be used for educational programmes. The UAS, Bangalore has achieved the following milestones during the project period.

- Developed captive breeding methods for 42 species of butterflies of peninsular India
- Carried out DNA finger-printing 25 species of butterflies
- Developed methods for DNA bar-coding of butterflies
- PathangaBharathi - A database CD on butterflies of India has been developed
- PathangaSuchya - An interactive CD for identification of common butterflies of peninsular India has been developed.

Vegetation:

It consists of dense forest and scrub land. The setting is entirely tropical, with humid climate and an artificial waterfall. The flora of the conservatory includes those plants and shrubs that attract butterflies. Ten reserve forests of Anekal Range of the Bangalore Forest Division come under this national park. A treasure trove of exotic wildlife species, Bannerghata wildlife sanctuary is enriched with evergreen flora. The park teems with expansive tracts of moist deciduous teak forest. Other varieties of trees include jalari, chujjullu, neem, tamarind, and zizyphus.

REVIEW OF LITERATURE

On a survey done by Swati Kittur, R. Padmawathe, V.P. Uniyal and K. Sivakumar in Simbalbarra wildlife sanctuary, himachalpradesh, seventy species representing 54 genera of five families were recorded during the sampling period. The family Nymphalidae was dominated in this region followed by Lacaenidae; Papilionidae and Hesperidae were poorlt represented with five species each.

A total of 24 butterfly species belonging to four families viz. Papilionidae, Pieridae, Nymphalidae and Lycaenidae were documented during the assessment of butterflies in shikargah wildlife sanctuary, Haryana by V.P. Uniyal and

VinayBhargav. A large proportion of the species of the Papiliondae and Pieridae were found t be engaged in mud-

Name of the species	Total Count

puddling behavior in many location.

On a survey in butterflies done in Maharashtra nature park, Dharavi, Mumbai y PrashantGokarankar, Sachin V. chorge and Anil Rajbhar, a total of 72 butterfly species were present in the Maharashtra Nature Park.

On a survey done on butterflies in the great Himalayan national park, western Himalaya by V.P. Uniyal and P.K. MAthur about 50 species with 34 genera representing 13 subfamilies within 5 families were recorded in the present study. The study revealed that the maximum no. of nymphalid species prefer both the type of forest vegetation. There was a good representation of butterflies of each family in the broad leaved and conifer forest types.

MATERIALS AND METHODS

The method applied for this project is the line transects method. Equipment required for proceeding with this project is as follows:

- Notebook
- Camera(10.2 MP, 3X zoom, Kodak)
- Pen
- A measuring tape

The park was divided in 3 areas of approximately 15 m each for the survey. The butterflies were observed and recorded on both side of the line. There was no deviation from the line. All observations and photography was done and recorded from the line. The observations were done during evening hours for 5 days and morning hours for 2 days. The observation was done on every alternate day. The project work started on Sunday 29 August 2010 at 9 am in the morning and was continued till Friday 10 September 2010 evening. The days on which morning observations were done are Sunday 29 August 2010 and Saturday 4 September 2010.

RESULT & DISCUSSION

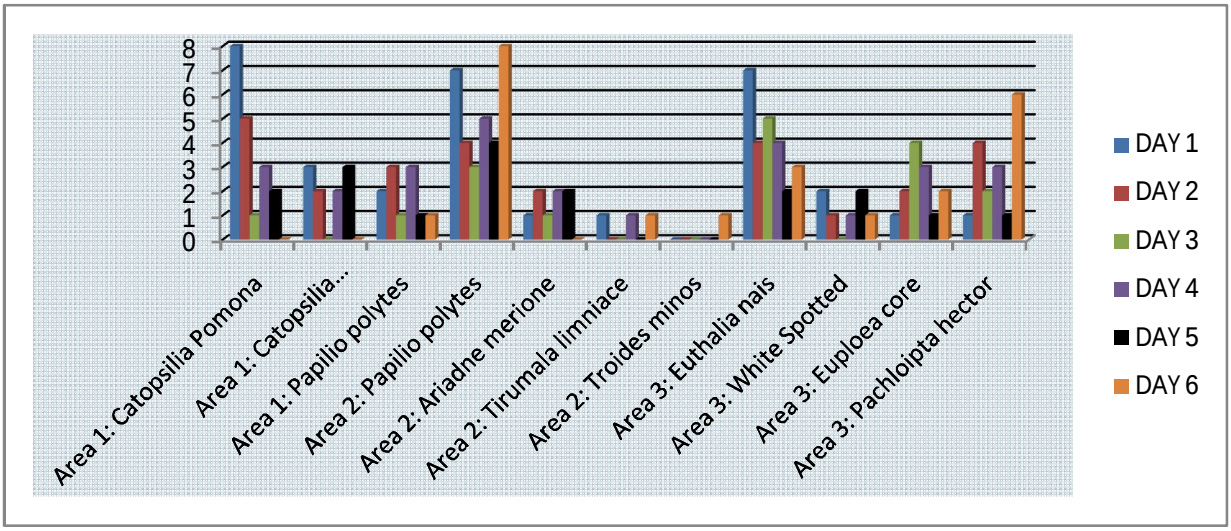
In the present investigation in Bannerghatta national park by line transect method; the following data was accumulated as shown in Table 1.

		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Area 1	***Catopsilia Pomona***	**8**	**5**	**1**	**3**	**2**	**0**
	Catopsiliapyranthe	**3**	**2**	**0**	**2**	**3**	**0**
	Papiliopolytes	**2**	**3**	**1**	**3**	**1**	**1**
Area 2	***Papiliopolytes***	**7**	**4**	**3**	**5**	**4**	**8**
	Ariadne merione	**1**	**2**	**1**	**2**	**2**	**0**
	Tirumalalimniace	**1**	**0**	**0**	**1**	**0**	**1**
	Light Blue Butterfly	**0**	**0**	**0**	**0**	**0**	**1**
Area 3	***Euthalianais***	**7**	**4**	**5**	**4**	**2**	**3**
	White Spotted	**2**	**1**	**0**	**1**	**2**	**1**
	Euploea core	**1**	**2**	**4**	**3**	**1**	**2**
	Pachloipta hector	**1**	**4**	**2**	**3**	**1**	**6**

Table 1:

The table gives a picture of the abundance of the various types of butterflies in the park. As observed from the table the *CatopsiliaPomona(*Common emigrant) and the *Papiliopolytes(*common mormon)were seen in abundance. One rare species southern birdwing was also observed. It was observed only on one day and was not observed for the rest of the days. The southern birdwing is considered to be one of the endangered species. Many of the butterflies were observed in less no. due to unfavourable climatic conditions or due to disturbance by the human visitors.

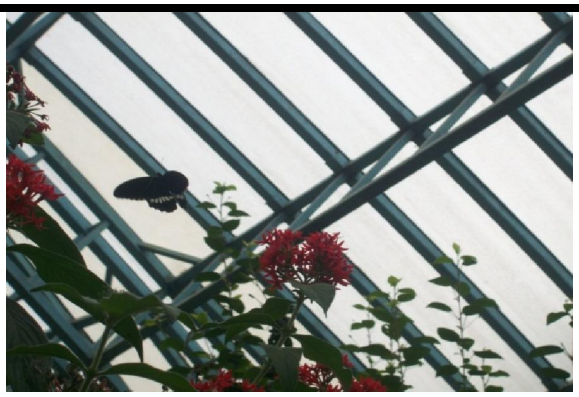
The following graph gives the total number of butterflies observed in the park i.e. 145 butterflies of which various species were observed in different numbers are shown below:



Species	Total	Species	Total	Species	Total
Catopsilia Pomona	19	*Ariadne merione*	8	*White spotted*	7
Catopsiliapyranthe	10	*Tirualalimniace*	3	*Euploea core*	13
Papiliapolytes	41	*Troidesminos*	1		
Pachloipta hector	17	*Euthalianais*	25		

Table 3 provides the identification of the various butterflies observed in the park.

Table 3.



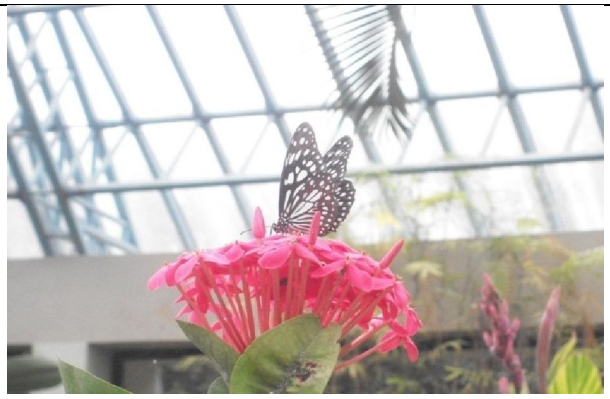
***Papiliopolytes*Linn (common Mormon)**

***Euploea core* cramer (Crow butterfly)**

Pieridae-Mottled Emigrants

***Catopsilia Pomona* Fab (common Emigrant)**

Baronet



Tiger Butterfly-Blue tiger

Common castor

***Pachloipta hector* Linn (Crimson rose)**

	
Southern Birdwing	**Unknown**

As observed from table 3. Only one butterfly was not identified. All the species were identified in the park itself at the interpretation centre in the park.

Table 4 provides details about the various butterflies identified in the national park.

Table 4.

Species Name	Taxonomy	Description	Distribution
Ariadne merione	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Nymphalidae Genus : *Ariadne* Species : *A. merione*	Ø Known as the **Common Castor.** Ø Is an orange butterfly	All over India, Simla to Sikhim in the Himalayas, and recorded from Rajputana and Bengal. Assam, Burma; Tenasserim; Malayan Subregion. The Tenasserim specimens are darker and often without the white subcostal spot in the forewing, approximating thus to the Southern Indian and Ceylon race.
Atrophaneura hector	Kingdom : Animalia Phylum : Arthropoda Class : Insecta Order : Lepidoptera Family : Papilionidae Subfamily: Papilioninae Genus : Arophaneura	Ø Known as **Crimson Rose.** Ø large swallowtail butterfly belonging to the subgenus *Pachliopta* of the Red-bodied Swallowtails	It is found in India and Sri lankaand possibly the coast of western Myanmar. In India, it is found in the Western Ghats, southern India (Kerala), eastern India (West Bengal and Orissa) and the Andaman Islands. Recorded

	Subgenus: (Pachliopta) Species : A.(P). hector		from Pune.
Catopsilia Pomona	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Pieridae Genus : *Catopsilia* Species : *C. pomona*	Ø Known as Common Emigrantor Lemon Emigrant Ø Is a medium sized pieridbutterfly. The species gets its name from its habit of migration.	Found in Asia and parts of Australia.
Catopsiliapyranthe	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Pieridae Genus : *Catopsilia* Species : *C. pyrantha*	Ø Commonly Known as **Mottled Emigrant.** Ø Medium sized butterflyof the Family Pieridae.	Found in South Asia, Southeast Asia and parts of Australia.
Papiliopolytes	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Papiliondae Subfamily: Papilioninae Genus :*Papilio* Species : *P. polytes*	Ø Known as **Common Mormon.** Ø Is a common species of swallowtail butterfly. Ø This butterfly is known for the mimicry displayed by the numerous forms of its females which mimicinedible Red-bodied Swallowtails, such as theCommon Rose and the Crimson Rose	Wdely distributed across Asia. Prefers lightly wooded country, but is present everywhere and high up into the hills It is most common in the monsoon and post-monsoon months.

Euploea core	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Nymphalidae Subfamily: Danainae Genus : *Evploea* Species : *E. core*	Ø The **Common Crow** is a common butterfly. Ø It belongs to the Crows and Tigers subfamily of the Nymphalidae. Ø The Crows are inedible and thus mimicked by other Indian butterflies. Ø In addition, the Indian species of the *Euploea* genus shows another kind of mimicry, Müllerian mimicry.	Found in South Asia. It is found in Sri Lanka, India, Myanmar and Australia.
Euthalianais	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Nymphalidae Subfamily:Lamenitidinae Genus : *Euthalia* Species : *E. nais*	Ø Also known as **Baronet**	Found in South Asia. The plains of India and the Lower Himalayas; Southern India; Ceylon
PapilioPolymnestor	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Pailionidae Genus : *Papilio* Species : *P. ploymnestor*	Ø Also known as **Blue Mormon**	Found in South India and Sri Lanka. Endemic to India and Sri Lanka. In India it is restricted to the Western Ghats, Southern India and the East coast. It has been recorded as far north as Gujarat. It is often seen even in the gardens and sometimes in the middle of busy traffic in large cities such asMumbai, Pune and Bangalore, in Madhya Pradesh, and, West Bengal and Sikkim.

Tirumalalimniace	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Superfamily:Papilionoidea Family : Nymphalidae Subfamily: Danainae Genus : *Tirumala* Species : *T. limniace*	Ø Known as Blue Tiger. Ø Belongs to the Crows and Tigers, that is, the Danaid group of the Brush-footed butterfly family. Ø This butterfly shows gregarious migratory behavior in southern India	Found in South Asia and Southeast Asia.
	Kingdom: Animalia Phylum : Arthropoda Class : Insects Order : Lepidoptera Family : Pailionidae Subfamily: Papilionae Tribe : Troidini Genus : *troides* Species : *T.minos*	Ø The **Southern Birdwing** (*Troidesminos*) is a large and striking Swallowtailbutterflyendemic to Peninsular India. With a wingspan of 140-190mm, Ø The species is more common in the Western Ghats,	The species is more common in the Western Ghats, which is a biodiversity hotspot with a high degree of endemism in many taxa.

CONCLUSION

The Butterfly Park in Bannerghattais a great natural habitat for the butterflies but if enough care is not taken to protect these wonderful winged creatures, even national parks won't be able to protect them from becoming extinct.Just providing a natural habitat for their survival is not enough, but proper maintenance, periodic survey of the vegetation cover and the prevailing butterfly species is important. Checking the change in climatic condition and the impact of human activities is also necessary as these creatures are sensitive to environmental changes. As one can infer from Table 1, one needs to start putting effort in saving these beautiful creatures as the data already shows low count of the various butterfly species.

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