

Study on butterflies (Lepidoptera: Rhopalocera) of campus of University of Kashmir, Srinagar, Jammu and Kashmir State

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ABSTRACT

Butterflies are most interesting groups of insects. They play an important role in pollination and being highly sensitive to change in the environment, are considered as indicators of environmental quality. The University of Kashmir situated on the outskirts of Srinagar city at Hazratbal with Dal Lake on one side and Nageen Lake on the other, is an apex institution of higher education in the Kashmir division of Jammu & Kashmir State. The campus has a famous Chinar Bagh and a botanical garden called Kashmir University Botanical Garden (KUBG), having an internationally recognized herbarium, Kashmir University Herbarium (KASH). As compared to floral wealth, the faunal components of the campus are not well documented. In order to document the faunal components, for the first time a four year baseline field study was conducted from 2004-2007 in the campus. The present preliminary field observations revealed presence of 25 species of butterflies distributed under 7 families and 23 genera. They include Danaidae (1 genus and 1 species), Hesperidae (1 genus and 1 species), Lycaenidae (1 genus and 1 species), Lycaenidae (4 genera, 4 species), Nymphalidae (11 genera, 12 species), Papilionidae (1 genus and 1 species) and Pieridae (4 genera, 5 species) from the campus. The butterfly activity was observed from late February to late November. The highest abundance was in summer season (June-August) whereas least was in winter (December-February). Nymphalidae was the most dominant family followed by Pieridae and Lycaenidae. Flight period of each species is also given in the present investigations.

Key words: University of Kashmir, KUBG, Butterflies, Abundance

The University of Kashmir is an apex institution of higher education in the Kashmir Division of Jammu & Kashmir State. It came into existence in 1969 as a result of the bifurcation of the Jammu and Kashmir University which was founded in 1948. Since 2002, the University stands accredited as an A- Grade University by the National Accreditation and Assessment Council (NAAC) of the University Grants Commission (UGC), New Delhi. Spread over a rambling campus of 250 acres land having world famous Dal Lake on one side and Nageen Lake on the other, the campus lies between coordinates 34°07'25.73" N and 74°50'21.53" E on the outskirts of Srinagar city at Hazratbal¹. The main campus of the University has a botanical garden called Kashmir University Botanical Garden (KUBG) having an internationally recognized herbarium, Kashmir University Herbarium (KASH) in it. Established in 1961 and spread over an area of about 10 acres the garden is devoted to *ex-situ* conservation of plant germ-plasm. KASH is one of the largest herbaria in the northwestern India, containing about 40,000 plant specimens. The garden houses a large number of plant species *viz.*, Coniferatum, Deciduous Tree-Section, Shrubbery, Lilly Pond, Rosetum, Salicatum, Medicinal and Aromatic Unit, Rare, Endemic and Threatened-Plant Repository, Fernery, Rosaceous-fruit Section, Grassland, Nursery etc distributed in various plant families². Known by their beautiful colours and graceful flight, butterflies are the most abundant group of insects on the earth⁷. They form important food chain components of many organisms; act as good pollinators and are regarded as indicator taxa. As compared to the floral wealth, the faunal components of the campus are poorly studied and documented.

Thus for the first time a baseline study was conducted to know the butterfly fauna of the campus.

Field observations were made during the years March 2004 – November 2007. Butterflies were collected by Insect Collecting Net and killed with the help of vapours of ethyl acetate. Random surveys were conducted fortnightly in different months/seasons of the year, depending on the prevailing weather conditions and butterfly activity. And no survey was conducted during unfavourable climatic conditions. For identification of butterflies works of^{3-6,8-11,14} and for their common names works of^{13,14} were followed.

During the course of present field investigations 25 species of butterflies distributed under 7 families and 23 genera have been reported from the campus (Table 1). They include Danaidae (1 genus and 1 species), Hesperidae (1 genus and 1 species), Libytheidae (1 genus and 1 species), Lycaenidae (4 genera, 4 species), Nymphalidae (11 genera, 12 species), Papilionidae (1 genus and 1 species) and Pieridae (4 genera, 5 species).

The present study revealed that *Pieris brassicae* (Pieridae) was the first to emerge (from March) and *Pelopidas mathias* (Hesperidae) was the most late arrival emerging in the month of June. Nymphalidae was found to be the dominant family (48%) followed by Pieridae (20%), Lycaenidae (16%), Papilionidae (4%), Danaidae (4%), Hesperidae (4%), and Libytheidae (4%) (Figure 1). The majority of the butterfly species surveyed were active from May to September *i.e.*, from late spring to early autumn seasons. The highest abundance was at and around the area of Kashmir University Botanical Garden (KUBG).

Table-1. Butterflies of campus of University of Kashmir, Srinagar, J&K

S. No.	Family	Scientific Name	Common Name	Flight Period
1	Danaidae	<i>Danaus chrysippus</i> Linnaeus	Plain Tiger	May-Sep
2	Hesperiidae	<i>Pelopidas mathias</i> (Fabricius)	Small Branded Swift	Jun-Nov
3	Libytheidae	<i>Libythea lepita</i> Moore	Common Beak	Apr-Sep
4	Lycaenidae	<i>Aricia agestis</i> (Denis and Schiffermuller)	Orange-Bordered Argus	May-Oct
5		<i>Lampides boeticus</i> Linnaeus	Pea Blue	May-Sep
6		<i>Lycaena phlaeas</i> (Linnaeus)	Common Copper	May-Sep
7		<i>Rapala nissa</i> Linnaeus	Common Flash	Jun-Sep
8	Nymphalidae	<i>Aglais cashmirensis</i> (Kollar)	Indian Tortoiseshell	Mar-Nov
9		<i>Argyreus hyperbius</i> (Johanssen)	Indian Fritillary	May-Sep
10		<i>Childrena childreni</i> (Gray)	Large Silverstripe	May-Sep
11		<i>Cynthia cardui</i> (Linnaeus)	Painted Lady	Apr-Nov
12		<i>Hypolimnas misippus</i> (Linnaeus)	Danaid Eggfly	May-Sep
13		<i>Issoria gemmata</i> Butler	Gem Silverspot	May-Sep
14		<i>Issoria lathonia</i> (Linnaeus)	Queen of Spain Fritillary	May-Sep
15		<i>Junonia orithya</i> (Linnaeus)	Blue Pansy	May-Sep
16		<i>Kaniska canace</i> Linnaeus	Blue Admirable	June-Sep
17		<i>Neptis hylas</i> (Linnaeus)	Common Sailor	June-Sep
18		<i>Phalanta phalanta</i> (Drury)	Common Leopard	June-Sep
19		<i>Vanessa indica</i> (Herbst)	Indian Red Admirable	May-Sep
20	Papilionidae	<i>Papilio machaon</i> Menetries	Common Yellow Swallowtail	May-Sep
21	Pieridae	<i>Colias electo fieldi</i> Menetries	Dark Clouded Yellow	Apr-Nov
22		<i>Colias erate</i> Esper	Pale Clouded Yellow	Apr-Nov
23		<i>Gonepteryx rhamni</i> Linnaeus	Common Brimstone	Apr-Nov
24		<i>Pieris brassicae</i> (Linnaeus)	Large Cabbage White	Feb-Nov
25		<i>Pontia daplidice</i> (Linnaeus)	Bath White	Apr-Nov

Abbreviations used in the above table. Mar- March, Apr- April, Jun-June, Jul-July, Sep-September, Oct- October, Nov-November

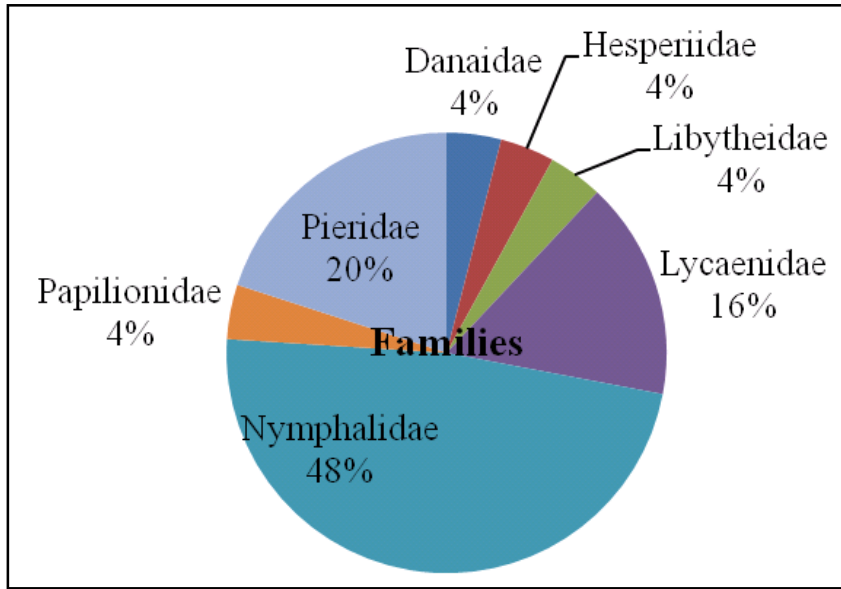


Figure 1. Family wise abundance of butterflies.

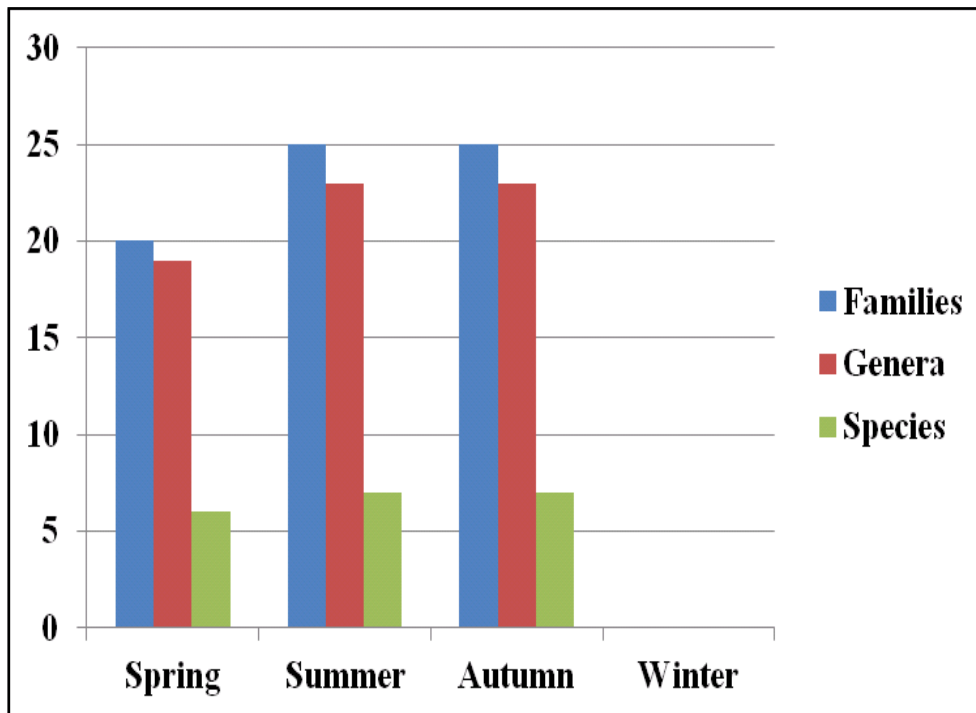


Figure 2. Seasonal abundance of butterflies

Table-2. Diversity of families/genera/species reported in each month.

Months	Families	Genera	Species
January	0	0	0
February	0	0	0
March	2	2	2
April	3	6	7
May	6	19	20
June	7	23	25
July	7	23	25
August	7	23	25
September	7	23	25
October	4	8	9
November	3	7	8
December	0	0	0

The peak butterfly activity was observed in the months of June, July, August, and September incorporating all the 7 families under 23 genera, covering 25 species. However, there was no butterfly activity during the months of January, February and December (Table 2). In general the butterfly activity was observed from late February to late November from 7.30 am to 7.00 pm, depending upon weather, month, season, temperature and type of the species concerned. The highest abundance was in summer season (June-August) & autumn (September-November) seasons whereas least was in winter (December-February) (Figure 2). The widely prevalent genera/ species included Hesperidae (*Pelopidas mathias*), Lycaenidae (*Aricia agestis*, and *Lycaena phlaeas*), Nymphalidae (*Aglais cashmirensis* and *Cynthia cardui*),

Pieridae (*Colias electo fieldi*, *C. erate*, *Pieris brassicae* and *Pontia daplidice*).

Argyreus hyperbius, *Childrena childreni*, *Colias erate*, *Cynthia cardui*, *Danaus chryssipus*, *Gonepteryx rhamni*, *Hypolimnas missipus*, *Issoria lathonia*, *Papilio machaon*, *Phalanta phalanta* and *Vanessa indica* were witnessed to be the quick fliers. Species like *Argyreus hyperbius*, *Childrena childreni*, *Danaus chryssippus*, *Gonepteryx rhamni*, *Hypolimnas missipus*, *Issoria gemmata*, *I. lathonia*, *Junonia orithya*, *Kaniska canace*, *Lampides boeticus*, *Libythea lepita*, *Neptis hylas*, *Papilio machaon*, *Phalanta phalanta*, *Rapala nissa* and *Vanessa indica* showed restricted distribution.

Being highly sensitive to change in the environment, butterflies are easily affected by even relatively minor perturbation in the habitat and serve as good indicators of environmental change^{5,12}. The present field investigations revealed that the area seems to be under tremendous anthropogenic pressure and its effect on the butterfly fauna cannot be overlooked. However since this being the first baseline study in the area, it cannot be predicted whether the butterfly fauna of the region is increasing or decreasing. Hence it is proposed that the area may be continuously monitored. Further, there is urgent need to have a baseline data of the whole floral & faunal wealth of the campus so that any changes in the environment of the campus and its subsequent effects on the biological wealth of the area can be ascertained and appropriate measures devised by the future researchers.

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References :

1. Anonymous, (2009). *Prospectus 2009*. University of Kashmir, Srinagar, 145 pp.
2. Dar, G.H. and Z.S. Khan (2007). The Kashmir University Botanical Garden (KUBG): A profile. Centre for Plant Taxonomy, Department of Botany, University of Kashmir, Srinagar, pp 98.
3. Evans, B. W. H. (1932). The identification of Indian butterflies. Diocesan Press, Madras, India. pp 454.
4. Feltwell, J. (2001). The Illustrated Encyclopedia of Butterflies. Chartwell Books, New Jersey, USA. pp 288.
5. Haribal, M. (1992). The Butterflies of Sikkim Himalaya and their Natural History. SNCF, Gangtok, Sikkim. pp 217.
6. Kehimkar, I. (2008). The book of Indian butterflies. Bombay Natural History Society, Mumbai. pp 497.
7. Khan, M. R., M.R. Khan, K. Ali, I. Bashir, I.A. Malik and A. Mir (2004). *Asian Journal of Plant Science*. 3(5): 556-560.
8. Kunte, K. (2006). India-A Lifescape, Butterflies of Peninsular India. Universities Press (India) Private Ltd. Hyderabad, India. pp 254.
9. Pajni, H. R., H. S. Rose, and V. K. Walia, (2006). Butterflies of North-West India. Part-1. Atma Ram and Sons, Chandigarh, India. pp 115.
10. Talbot, G. (1939). The Fauna of British India including Ceylon and Burma. Butterflies. Vols. I. Taylor and Francis Ltd. London. pp 600.
11. Talbot, G. (1947). The Fauna of British India including Ceylon and Burma. Butterflies. Vol. II. Taylor and Francis Ltd. London. pp 506.
12. Uniyal, V. P. and P. K. Mathur (1998). *Indian Journal of Forestry*. 21(2):150-155.
13. Varshney, R. K. (1983). *Records of the Zoological Survey of India*, Occasional Paper No. 47. pp 49.
14. Wynter-Blyth, M. A. (1947). Butterflies of the Indian Region. Bombay Natural History Society, Bombay. pp 527.