

## DIVERSITY AND STATUS OF BUTTERFLIES IN LOWLAND DISTRICTS OF WEST NEPAL

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### Abstract

This paper is an outcome of the studies made in four districts (Dangdeukhuri, Banke, Bardia and Surkhet) of western Terai in different months of various years. Altogether 85 species categorized into 64 genera and 10 families have been reported with their status categories based on national status list. The process of urbanization has altered valuable natural habitats of many of the rare species especially in Banke and Dangdeukhuri districts. Monitoring process under the established regulation and thorough investigations in many unexplored areas of this region have been felt essential so to design suitable conservation measures to butterflies of this region.

**Key words:** Biodiversity, western terai, butterflies, unexplored, habitats.

### Introduction

Among the covered districts, Dang valley in Dangdeukhuri district is the inner Terai bounded around by Mahabharat and Siwalik mountains to the north and south respectively. The remaining districts of the lower Terai like Surkhet, Banke and Bardia are under complete influence of the subtropical to tropical climatic types. These districts once were very popular for displaying remarkable luxuriant forests are now heavily pressurized under human activities mainly for settlements, agricultural practices, and urbanization. These districts are characterized with their own river systems which include big rivers like Rapti in Dangdeukhuri and Banke, Bheri in Surkhet and Karnali in Bardia.

Forests in west lowlands are mainly deciduous or mixed deciduous types. The mesic riverine forest shelters rich and diverse butterflies compared to the dry areas. The popular vegetation components seen in these parts are *Shorea robusta*, *Michelia* spp., *Ficus* spp., Bamboo, *Dalbergia sisoo* etc. The altitudinal variation in these districts ranges from 129 m to 2060 m (Anonymous, 1971).

Comparatively, Bardia still has retained good forested zones including the well known Bardia National Park which is worth to safeguarding many of the rare flora and fauna occurring here. Rare fauna in this park include Bengal Tiger (*Panthera tigris*), One Horned Rhinoceros (*Rhinoceros unicornis*), Asiatic Elephant (*Elephas maximus*) and Gharial (*Gavialis gangeticus*). The Siwalik areas of Dang and Deukhuri exhibit many valuable fossil elements like the skull of *Archidiskodon planifrons*, an extinct elephant fossil, and many petrified bone remnants of crocodiles and other animals.

A change in butterfly diversity is an interesting phenomenon noticed in this region owing to its land structure and changing vegetation pattern within a short stretch of Dang to Surkhet Valleys. The butterfly diversity observed here is more diversified around the riverine forests.

The National Park in Bardia shelters rich diversity while deforested zones of Banke and Surkhet are mostly furnished with common and robust species. Many parts of Bardia still retain potential habitats to many of the rare species.

The influence of warm climate and occurrence of diverse floral components have widened butterfly season in these areas. The said suitable season generally starts here from March to mid-November. Many interesting and rare species emerge out in May till August. Some robust species which have ability to tolerate cold climatic condition still can be seen till last of December. Species like Cabbage White, Peacock Pansy, Tortoise Shell, Grass Yellows etc. occur here year round.

### Materials and Methods

Studies conducted in different periods from 1988 to 1993 and 1999 to 2003 have been incorporated in this paper. Only those species of butterflies not promptly identifiable in the field were collected by butterfly net. Notes on complete field data of each observed and collected species included location altitude, collection date, collection locality and assessed species status based on national status scale. Collected specimens were identified at the Natural History Museum which comprised the process of tallying museum specimens and consultations of characteristic keys developed by Talbot (1975). All the collected specimens are deposited at the Natural History Museum in Kathmandu.

### Result

All the reported butterflies with their scientific names, altitudinal range and current status are provided below in tabulated form. The status of every observed species was determined by their frequencies in the field, consulting Smith (1989) and checking Nepal Red Data Book (NRDB) Status Data (1995). Many species in this study were common excluding few like *Euploeopsis clytia* f. *dissimilis*, *Catopsilia pomona* f. *catilla* Fabricius, *Chilades pandava*, *Tarucus callinara*, *Curetis dentata*, *Rapala manea schistacea*, *Spindasis elima uniformis*, *Horaga onyx*, *Rapala nissa*, *Remelana jangala* and *Thoressa aina* (Table 1) which were specific to their distributional range and occurred in certain localities only. Few species like *Papilio demoleus*, *Menelaides polytes*, *Eurema hecabe*, *Pieris brassicae nepalensis*, *Pieris canidia indica*, *Catopsilia pyranthe pyranthe*, *Heliophorous epicles*, *Zizeeria maha maha*, *Freyeria putli*, *Pantoporia hordonia*, *Precis orithya ocyale*, *Precis hierta*, *Precis almana almanac*, *Precis iphita*, *Vanessa indica indica*, *Precis lemonias persicaria*, *Neptis hylas*, *Melanitis leda leda*, *Mycalesis persius blassius*, *Orsotrioena medus*, *Tirmala limniace leopardus*, *Danaus chryssipus chryssipus*, *Danaus genutia* and *Euploea core core* were quite prevalent and shared their habitats in all the four districts of west Terai (Table 1). Majority of the species reported here were fond of open field, riverine forests, cultivated lands and forested areas.

Table 1. Summary results of the status of butterfly fauna in districts of Dangdeukhuri, Banke, Bardia and Surkhet is provided below in tabulated form. This list is based upon the study made in various periods during 1988 to 2003.

Genus and species	District				Altitude (m)	Status
	Dangdeukhuri	Banke	Bardia	Surkhet		
<b>PAPILIONIDAE</b>						
<i>Menelaides nephelus chaon</i> Westwood	+	-	-	-	160	Uncommon
<i>Menelaides polytes</i> Linnaeus	+	+	+	+	Every-where	Common
<i>Iliades memnon</i> Linnaeus	+	-	-	-	1100	Uncommon
<i>Euploeopsis clytia f. dissimilis</i> Linnaeus	-	-	-	+	400	Rare
<i>Papilio demoleus</i> Linnaeus	+	+	+	+	200-400	Common
<i>Pachliopta aristolochiae</i> Fabricius	+	-	-	-	450	Common
<i>Deoris nomius</i> Esper	+	+	-	-	300-450	Uncommon
<b>PIERIDAE</b>						
<i>Metaporia agathon</i> Gray	+	-	-	-	2820	Common
<i>Eurema hecabe</i> Linnaeus	+	+	+	+	Various altitudes	Common
<i>Eurema laeta</i> Boisduval	+	-	-	+	200- 910	Uncommon
<i>Pieris brassicae nepalensis</i> Doubleday	+	+	+	+	Various altitudes	Common
<i>Pieris canidia indica</i> Evans	+	+	+	+	Various altitudes	Common
<i>Catopsilia pyranthe pyranthe</i> Linnaeus	+	+	+	+	200 -800	Common
<i>Catopsilia pomona pomona</i> Fabricius	-	+	-	+	200 -660	Uncommon
<i>Catopsilia pomona f. catilla</i> Fabricius	+	-	-	-		Rare
<i>Ixias pyrene familiaris</i> Butler	+	-	-	+	350 -910	Common
<i>Belenois aurota aurota</i> Fabricius	-	-	+	-	200-500	Common
<i>Cepora nerissa phryne</i> Fabricius	+	-	+	+	250- 900	Uncommon
<b>LYCAENIDAE</b>						
<i>Heliophorus sena</i> Kollar	-	-	-	+	785	Uncommon
<i>Heliophorous epicles</i> Godart	+	+	+	+	200- 900	Common
<i>Castalia rosimon</i> Fabricius	+	+	+	-	200 -915	Common
<i>Chliaria othona</i> Hewitson	+	-	-	-	900	Uncommon
<i>Anthene emolus emolus</i> Godart	+	-	+	-	500-848	Common
<i>Zizeeria maha maha</i> Kollar	+	+	+	+	200 -900	Common
<i>Freyeria putli</i> Kollar	+	+	+	+	200 -900	Common
<i>Zizeena otis otis</i> Fabricius	+	-	+	-	200-930	Uncommon
<i>Lampides boeticus</i> Linnaeus	+	-	+	-	300 above	Common
<i>Prosotas nora ardates</i> Moore	+	-	+	+	350 -900	Common
<i>Arhophala pseudocentaurus</i> Doubleday	-	+	+	-	200-500	Common
<i>Euchrysops cnejus</i> Fabricius	+	-	+	-	200-500	Uncommon
<i>Chilades pandava</i> Horsfield	-	-	-	+	780	Rare
<i>Freyeria trochilus orientalis</i> Forster	-	-	-	+	730	Common
<i>Tarucus callinara</i> Butler	-	-	-	+	700	Rare
<i>Curetis dentata</i> Moore	-	-	+	+	700 -900	Rare
<i>Curetis bulis</i> Westwood	+	-	+	+	300-900	Uncommon
<i>Rapala manea schistacea</i> Moore	-	-	+	+	300-700	Rare
<i>Catochrysops strabo</i> Fabricius	-	-	-	+	700	Uncommon
<i>Spindasis elima uniformis</i> Moore	+	-	-	-	850	Rare
<i>Horaga onyx</i> Moore	-	-	+	-	340	Rare

<i>Rapala nissa</i> Kollar	-	-	+	-	320	Rare
<i>Remelana jangala</i> Horsfield	-	-	+	-	165	Rare
<b>Nymphalidae</b>						
<i>Ariadne merione</i> Cramer	+	-	+	-	327-1090	Common
<i>Zemeros flegyas</i> Cramer	+	-	+	+	165-850	Common
<i>Cupha erymanthis lotis</i> Sulzer	+	-	+	+	160-930	Common
<i>Cyrestis thyodamus</i> Boisduval	-	-	+	+	202-700	Uncommon
<i>Hypolimnas bolina</i> Linnaeus	+	-	+	+	165-800	Common
<i>Symbrentia lilaea</i> Hewitson	-	-	+	-	350	Common
<i>Pantoporia hordonia</i> Stoll	+	+	+	+	148-750	Common
<i>Precis orithya ocyale</i> Hubner	+	+	+	+	165-800	Common
<i>Precis hierta</i> Fabricius	+	+	+	+	170-859	Common
<i>Precis almana almana</i> Linnaeus	+	+	+	+	200-800	Common
<i>Precis atlites</i> Linnaeus	+	-	+	+	"	"
<i>Precis iphita</i> Cramer	+	+	+	+	160-900	Common
<i>Phalanta phalantha</i> Drury	+	-	-	+	700-900	Common
<i>Vanessa indica indica</i> Herbst	+	+	+	+	200-900	Common
<i>Vagrans egista</i> Cramer	+	-	+	+	200-900	Common
<i>Precis lemonias persicaria</i> Fruhstorfer	+	+	+	+	200-900	Common
<i>Neptis hylas</i> Linnaeus	+	+	+	+	165-900	Common
<i>Athyma perius</i> Linnaeus	+	-	+	+	424-850	Common
<i>Kallima inachus</i> Boisduval	+	-	+	+	450-900	Uncommon
<b>Satyridae</b>						
<i>Ypthima baldus baldus</i> Fabricius	+	+	-	+	350-900	Uncommon
<i>Ypthima singala</i> Felder	+	+	+	-	450	Uncommon
<i>Ypthima huebneri</i> Kirby	-	-	+	-	166 & 320	Uncommon
<i>Ypthima newara</i> Moore	-	-	+	-	410	Common (ZSL 2003)
<i>Lethe confusa</i> Aurivillius	-	-	-	+	350	Common
<i>Melanitis leda leda</i> Linnaeus	+	+	+	+	165-800	Common
<i>Mycalasis mineus</i> Linnaeus	-	-	+	-	202	Common
<i>Mycalasis persius blaussius</i> Fabricius	+	+	+	+	200-800	Common
<i>Orsotrioena medus</i> Fabricius	+	+	+	+	165-900	Common
<i>Elymnias hypermnestra</i> Linnaeus	+	-	-	-	900	Uncommon
<b>Acraeidae</b>						
<i>Acraea issoria</i> Hubner	+	-	-	+	300-950	Common
<b>Libytheidae</b>						
<i>Libythea myrrha</i> Godart	-	-	+	+	220 & 640	Common
<b>Nemeobiidae</b>						
<i>Abisara bifasciata</i> Moore	-	-	+	-	448	Common
<b>Danaidae</b>						
<i>Tirmala limniace leopardus</i> Butler	+	+	+	+	200-800	Common
<i>Danaus chryssipus chryssipus</i> Linnaeus	+	+	+	+	165-800	Common
<i>Danaus genutia</i> Cramer	+	+	+	+	200-900	Common
<i>Parantica aglea melanoides</i> Moore	+	+	+	-	180-900	Common
<i>Euploea core core</i> Cramer	+	+	+	+	165-900	Common
<i>Euploea mulciber mulciber</i> Cramer	+	-	+	-	200-900	Common
<i>Tirmala septentrionis</i> Butler	-	-	+	-	424	uncommon
<b>Hesperiidae</b>						
<i>Thoressa aina</i> DeNiceville	+	-	-	-	600	Rare
<i>Udaspes folus</i> Cramer	+	+	-	-	160 & 730	Common
<i>Tagiades litigiosa</i> Moschler	-	-	+	-	450	Common
<i>Badamia exclamatoris</i> Fabricius	-	+	-	-	160	Uncommon
<i>Pseudocoladenia dan</i> Fabricius	+	-	+	+	200-800	Common

## Discussion

A diversity account of butterfly within the length of Dang to Surkhet valleys revealed out 85 species under 64 genera and 10 families, about 13% of the total record (650 species) of the country hitherto. Majority of the species resulted in this study have affiliation to oriental elements characteristics of the tropical to subtropical climatic types. Popular species like *Pieris brassicae nepalensis*, *Pieris indica*, *Aglais kashmirensis*, *Lampides boeticus* etc. also share their habitats in the cold alpine zone besides the warmer habitats of lowland Terai. The basic approach to data updating is missing since 2003 mainly due to the lack of monitoring under the established guidelines. This study, though conducted for a short period, revealed an appreciable result especially at the valley floor and riverine ecosystem of Dangdeukhuri where 65 species were investigated in a short tenure of time. On district basis, Surkhet though exhibited diversified species but are mostly common and widely spread across nation. The localities especially the inner area of the Bardia National Park is remarkably interesting where multitude species of various status categories are under the safe line of protection. A brief survey over the Chepang Ghat of Bardia brought out a list of 78 species (ZSL, 2003) with none matching the protected list of the country (BPP, 1995). Some Nymphalids and Satyrids have remarkable display of seasonal variations. Most of the species observed in post autumn period display remarkable features of Dry Season forms (Khanal, 1999). Many of the significant and pristine habitats in this part are under demolishing state due to increasing pressure of humans, which definitely is changing the status of many species into the vulnerable state.

Among 11 families of butterflies occurring in Nepal, 10 families have been reported in this study except Amathusiidae which has just three species countrywide so far.

## Acknowledgement

The Zoological Society of London and Natural History Museum in Kathmandu are specially acknowledged for providing me an opportunity to study butterflies of Bardia, west Nepal. I am thankful to the Nepal Academy of Science and Technology (NAST) for sponsoring me a small grant to study natural environment of Dang Valley in 1988. All colleagues at Natural History Museum who cooperated me in this work are specially acknowledged.

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Submitted Date: November 27, 2007  
Accepted Date: March 10, 2008