



# RED DATA BOOK

(PART-2)

## Butterflies of India

I.J. GUPTA  
D.K. MONDAL



ZOOLOGICAL SURVEY OF INDIA



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**I.J. GUPTA**  
**D.K. MONDAL**

*Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053*

*Edited by the Director, Zoological Survey of India, Kolkata*



सत्यमेव जयते

**Zoological Survey of India**  
**Kolkata**

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## **FOREWORD**

With the increase in human population the natural habitats of butterflies have considerably decreased. Consequently, there have been a significant decline in the population and diversity of these spectacular insects. Customarily, so happens that with the disappearance of a single species of a plant, many species of animals get adversely affected. From this it may be inferred that a single species of butterflies may also be responsible for maintaining the natural balance of its food chain.

At the national and international levels, different conventions held on biodiversity expressed great concern about the recurring loss of natural resources including plants and animals. The ongoing development and progressive programmes on the so-called human welfare demand restraint-causing harm to the elements of biodiversity. The butterflies are no exception to the rule.

Moreover, the illicit trade of the beautiful and rare Indian butterflies has led to their over-exploitation by the traders. This is highly detrimental to the interest of our nation. Before it is too late, sincere efforts should be made to study the little known life histories of many rare and threatened species of butterflies.

The authors have made an attempt to provide information on various aspects of 123 species/subspecies of butterflies, included in Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments, with reference to their diagnostic characters, geographical distribution, habitat, conservation measures, etc. They have also made efforts to assign status to these threatened species at national level, following IUCN criteria with some modification considering the available information on these butterflies.

Place : Kolkata

Dated : March, 2005

**Dr. J.R.B. Alfred**

Director

Zoological Survey of India

Kolkata

## PREFACE

Butterflies of varied colour patterns are beautiful and the most admired among insects. They are natural pollinators and have close relationship with the flowering plants. The rare and beautiful butterflies are objects of pleasure to Man. They are used as decorative pieces, some tribes use them as ornaments, others worship them. Man's greed for their rarity and beauty have priced these creatures very high. A single specimen of such a butterfly is valued in fabulous amount of Indian exchequer. Consequently, lucrative trade of butterflies is prevalent.

The increasing pressure of human population has adversely affected the population of these butterflies and their diversity as well. Man's encroachment on the natural habitats of butterflies has led to clearing of forests for human settlements and their requirements of industrialisation, urbanisation, hydroelectric projects, etc. consequently, with the shrinkage of their habitats there has been decline in their diversity and populations and also disturbance in the food chain. With the latter aspect and other threats to their survival, some species have become very rare and endangered. Accordingly, these species have been protected by their inclusion in Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972.

The information on butterflies has been provided on various aspects common name, diagnostic characters, intraspecific variations, geographical distribution, habitat and ecology, threats to survival, conservation measures adopted and proposed. Of the 128 species and subspecies listed in Schedule-I, 123 occurring in India have been assigned status at national level following IUCN (2001) criteria with some modification and information available on these butterflies.

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**I.J. GUPTA**  
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# INTRODUCTION

Butterflies are magnificent insects with attractive colour patterns, hence, of great aesthetic value. They are natural pollinators and have close relationship with the flowering plants. Their value as ecological indicators is not less as being more sensitive they show changes in the climatic conditions through change in their colouration from dark to pale or other varied colour markings or patterns. Their existence in a habitat provides information regarding presence of other species of plants and animals. They are of great economic importance as during developmental stages, their larvae or caterpillars feed on a variety of food plants – crops, fruits, vegetables, forest trees, etc. Their association with coccids, ants, etc., is also interesting. Butterflies play a significant role in the food chain, being mainly herbivores on one hand and prey to their predators like amphibians, reptiles, birds and mammals, on the other.

## TRADE

Man's greed for rare and beautiful Butterflies has priced them very high. A single specimen of such a butterfly is valued exorbitantly. Consequently, the lucrative trade of butterflies is prevalent with the world turn over of about 100million US dollars of which Taiwan alone accounting for 20-30million dollars per year. Butterfly trading based in India and Indochina is now quite extensive and occurs at all levels, from personal collectors to substantial business (Collins & Morris, 1985). About no less than 50,000 specimens of butterflies are smuggled out of India every month; and also the butterfly collecting for illegal trade is prevalent in Western Himalaya (Himachal Pradesh, Ladakh and North-western parts of Uttar Pradesh), the Eastern Himalaya (Sikkim and in the north of West Bengal) and Western Ghats (Anonymous, 1996). The butterflies are collected from Ladakh, Lahul, Spiti, Sikkim and Meghalaya feeding into 100million US dollars international trade (Menon, 1996). There have been also reports in the media regarding seizure of a large number of insects including butterflies and moths in the possession of persons undertaking illegal collecting / trading.

## HABITAT

Politically, India (Map-1) has 28 States, 7 Union Territories with 595 Districts. India covering a geographical area of 32,87,263 sq km is the seventh largest country in the world. The mainland comprises four regions- a. Great Mountain Zone b. Plains of Ganga and Indus c. Desert region and d. Southern Peninsula (Map-2). Vegetation (Map-3) of a region is largely determined by its rainfall (Map-4), climate (Map-5), topography, etc.

There is intimate relationship between land, (Map-6) and vegetation. The kind of land determines the type of vegetation. The diversity of plants owe to insects, the natural pollinators. The butterflies and moths of the Order Lepidoptera are mostly phytophagous. The butterflies like other insects are largely influenced by vegetation, rainfall, temperature,

altitude, etc. The suitable vegetation, hot and humid climate provide favourable habitats for diverse kinds of butterflies. Obviously, the evergreen forests of eastern Himalaya and north-eastern hills of India harbour more than 50% of species of butterflies recorded from India. The rain forests of Andaman and Nicobar Islands and hilly areas of South India, viz., the Nilgiri hills, Western Ghats are well known for rich butterfly fauna.

### THREATS

The IUCN (2000) has provided threat types used in the Red List of threatened species (Appendix-C)

For the past several decades, the populations of species of butterflies have been facing tremendous threats of their excessive collection or over-exploitation for commercial purposes and loss of their habitat due to deforestation. The situation in India which has only 2% of the world's land surface with 15.5 of world population is far more critical.

*Over-exploitation* : The rare and beautiful butterflies are collected for trade. They are victims of collectors in all stages of their development –eggs, larvae, pupae and adults. The adults are killed for their use in making decorative table-show pieces, wall hangings, greeting cards, ashtrays and such other fancy items. On the other hand, their eggs, caterpillars, pupae are used for breeding purposes. Some tribes use brilliantly coloured butterflies as ornaments, others worship them.

*Habitat loss* :

Wells *et al.* (1983) drew attention to the fact that destruction of habitat is putting whole invertebrate communities at risk. The habitat loss is considered as the biggest current threat to biodiversity (World Resources, 1994-1995). Especially large areas have been deforested in Indonesia, Thailand, Malaysia, the Philippines, India, Myanmar (Burma) and Laos (World Resources, 1986). Although forest area is not currently shrinking, forest degradation continues (World Resources, 1994-95). According to Dhar (1996), deforestation has taken a toll of over 25,827 sq km of forest area in seven years (1975-1982). In some areas, habitat loss of maximum of 75% is alarming in subalpine forests of Jammu & Kashmir followed by Sikkim, Himachal Pradesh, Arunachal Pradesh and Uttar Pradesh.

A Citizen's Report (Anonymous, 1985) stated that the satellite data showed annual loss of 1.3 million hectares of forest cover which was eight times more than the loss of 0.15 million hectares recorded by Forest Department of the Government of India. During 1972-75 and 1980-1982, the National Remote Sensing showed 16.89% and 14.10% respectively of the India's forest cover which was less than FAO's estimate of 17.4%. Except the states of Tripura, Manipur, Meghalaya and Mizoram, all others and the Union Territories showed less forest area than that recorded by the Ministry of Agriculture. Arunachal Pradesh, Manipur and Andaman & Nicobars have forest cover fulfilling the criteria of National Forest Policy.

India's forest cover has declined in hundred years from nearly 40% of its geographical area to 22% in 1951 and further declined from 22% to 19% in 1997 (Ministry of Environment & Forests, 1997) which is far below the target of 33% as stipulated in the National Forest

Policy,1988. The forest cover of 72 million hectares in 1951 has come down to 63 million hectares in 1997 and the trend is being downwards over the entire period. Encroachments have led to conversion of forest to non-forest between 1950 and 1980 in the order of 4.5 million hectares. Thereafter, there has been only the marginal reduction in the forest cover and average annual rate of decline in forest being 0.016million hectares Though forest cover decline has been arrested since 1991, yet qualitative decline persists followed by the decline in forest growing stock.

The National Forest Policy (1988), has set a goal that aims at having a minimum of one-third (33.33%) of geographical area of the country under forest and tree cover and enjoins maintaining two-third (66.67%) of the area in hills (an elevation of more than 500m above mean sea level) under forest cover. The State of Forest Report (SFR, 2001) provides information that forest cover (Maps-7, Fig. 1) in the country is 675,538sq km and constitute 20.55% of its geographical area which falls short of 12.45% as per National Forest Policy (1988). Of this, dense forest is 12.68% (416,809sq km) and open forest is 7.87% (258,729sq km). Out of 595 districts, 199 have less than 5% forest cover of their geographical area including 59 districts having less than 1% forest cover. In only 146 districts, forest cover exceeded 33% of their geographical area.

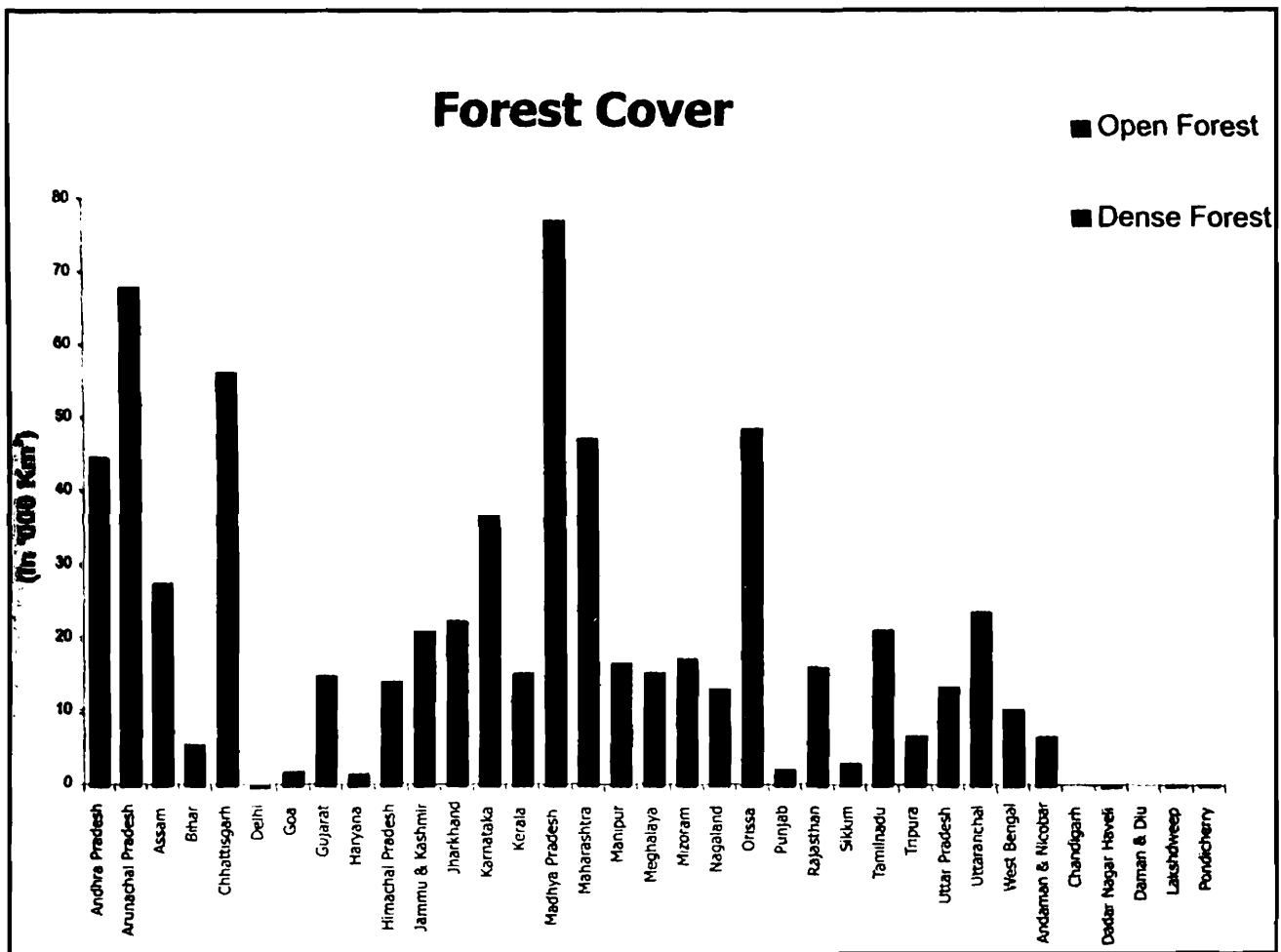
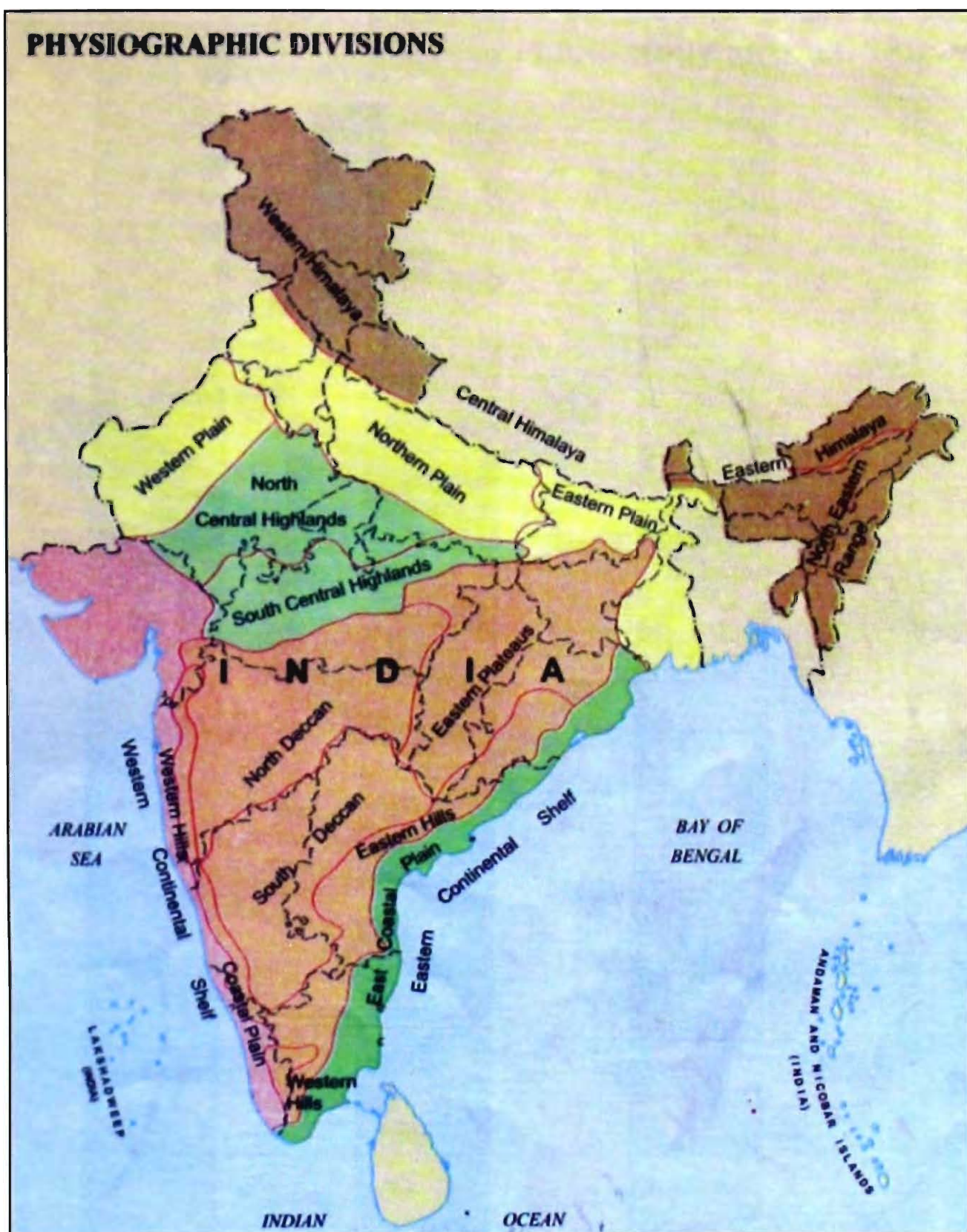


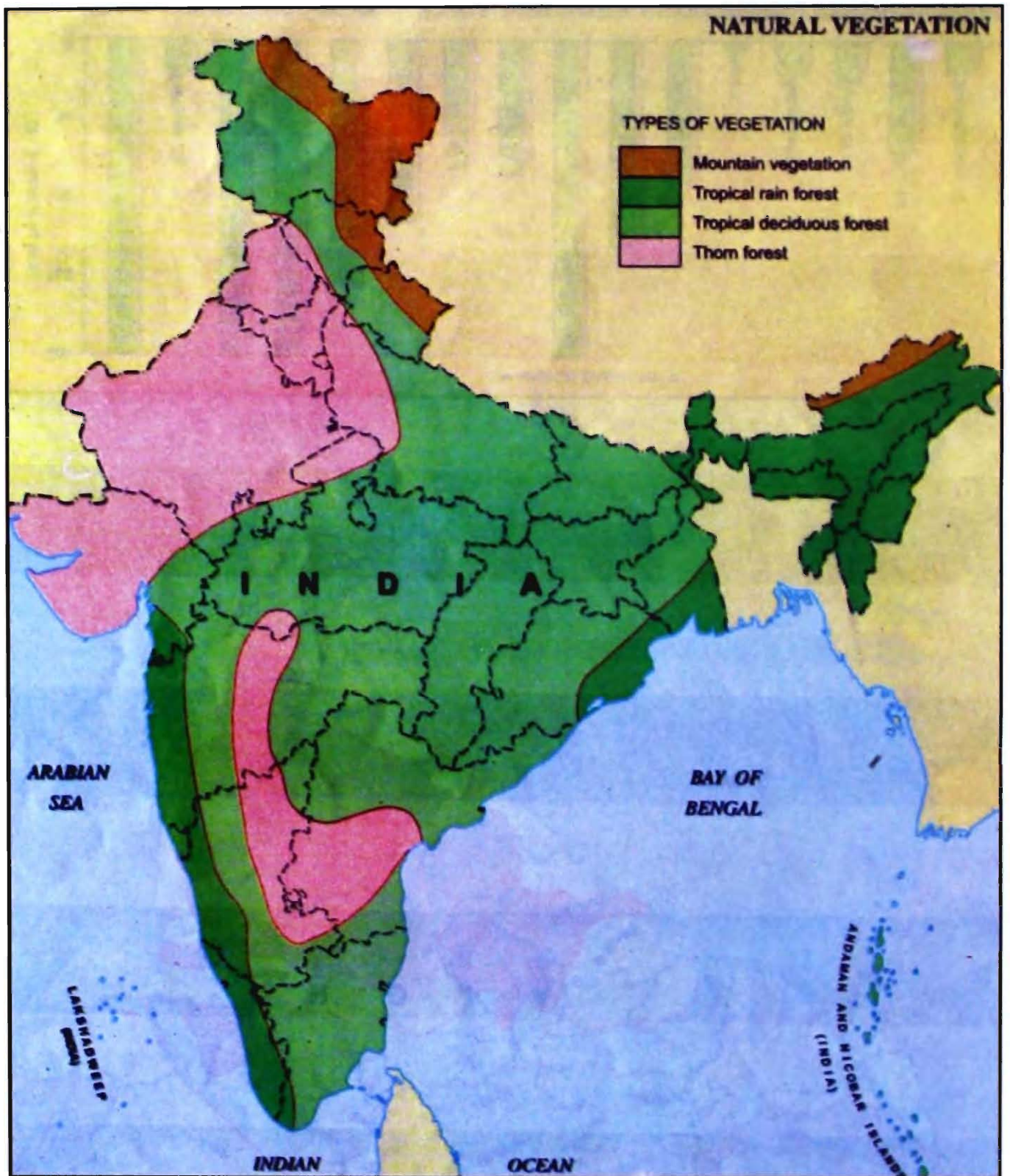
Figure-1. Forest Cover in States and UTs (State of Forest Report, 2001)



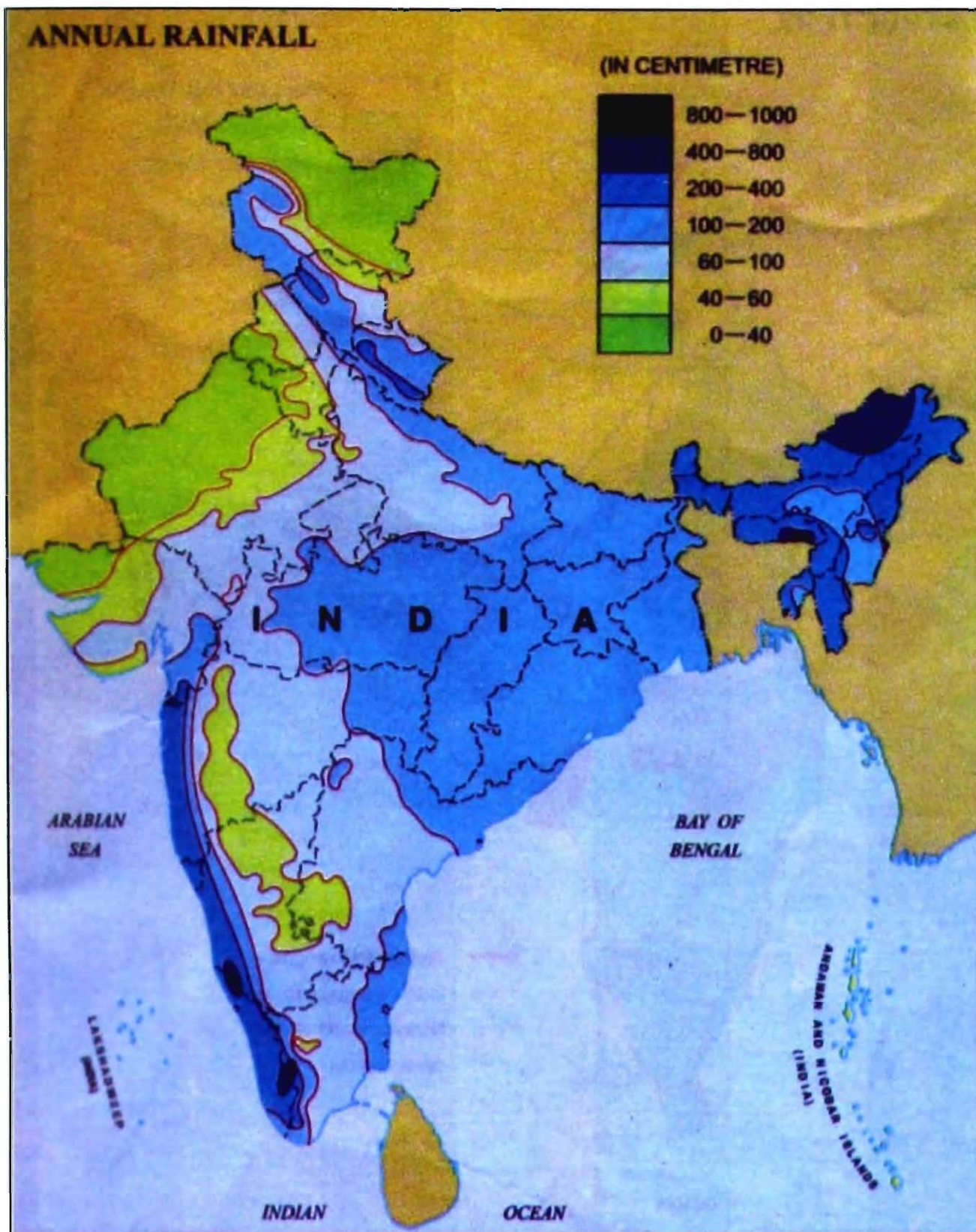
Map-1. Political India (TTK Map Atlas of India, 2002)



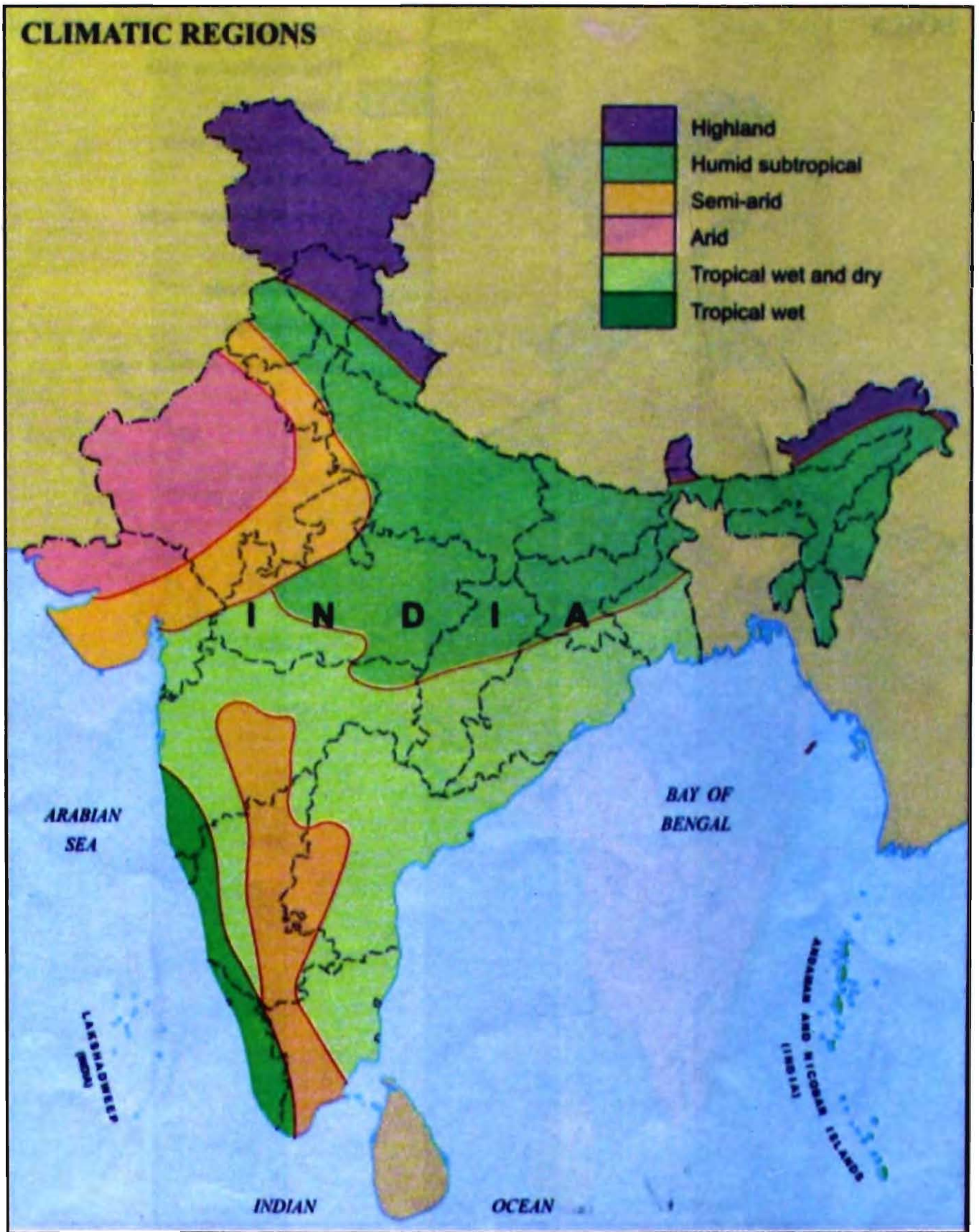
Map-2. Physiographic Divisions of India (Oxford Atlas, 2004)



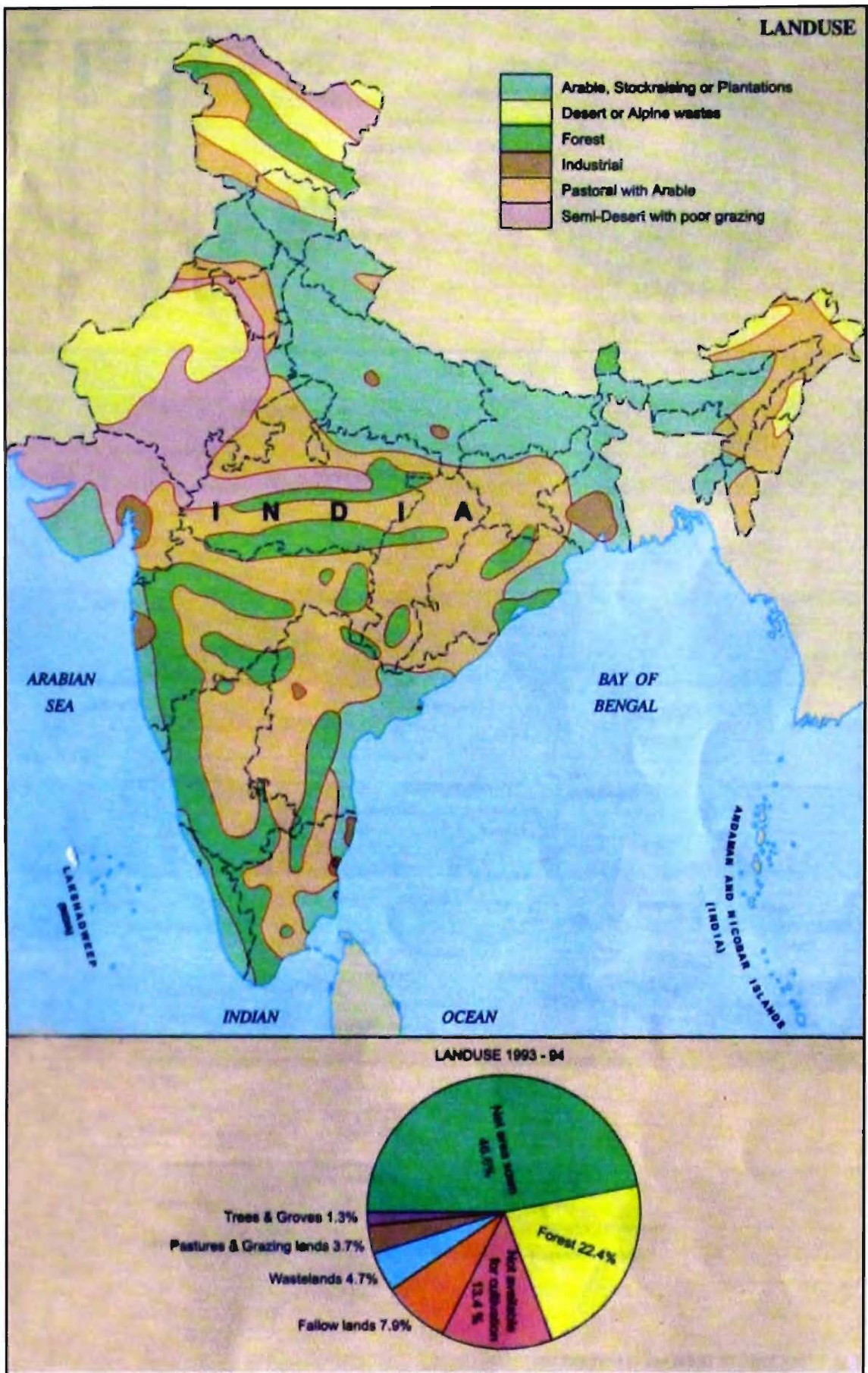
Map-3. Natural Vegetation in India (Oxford Atlas, 2004)



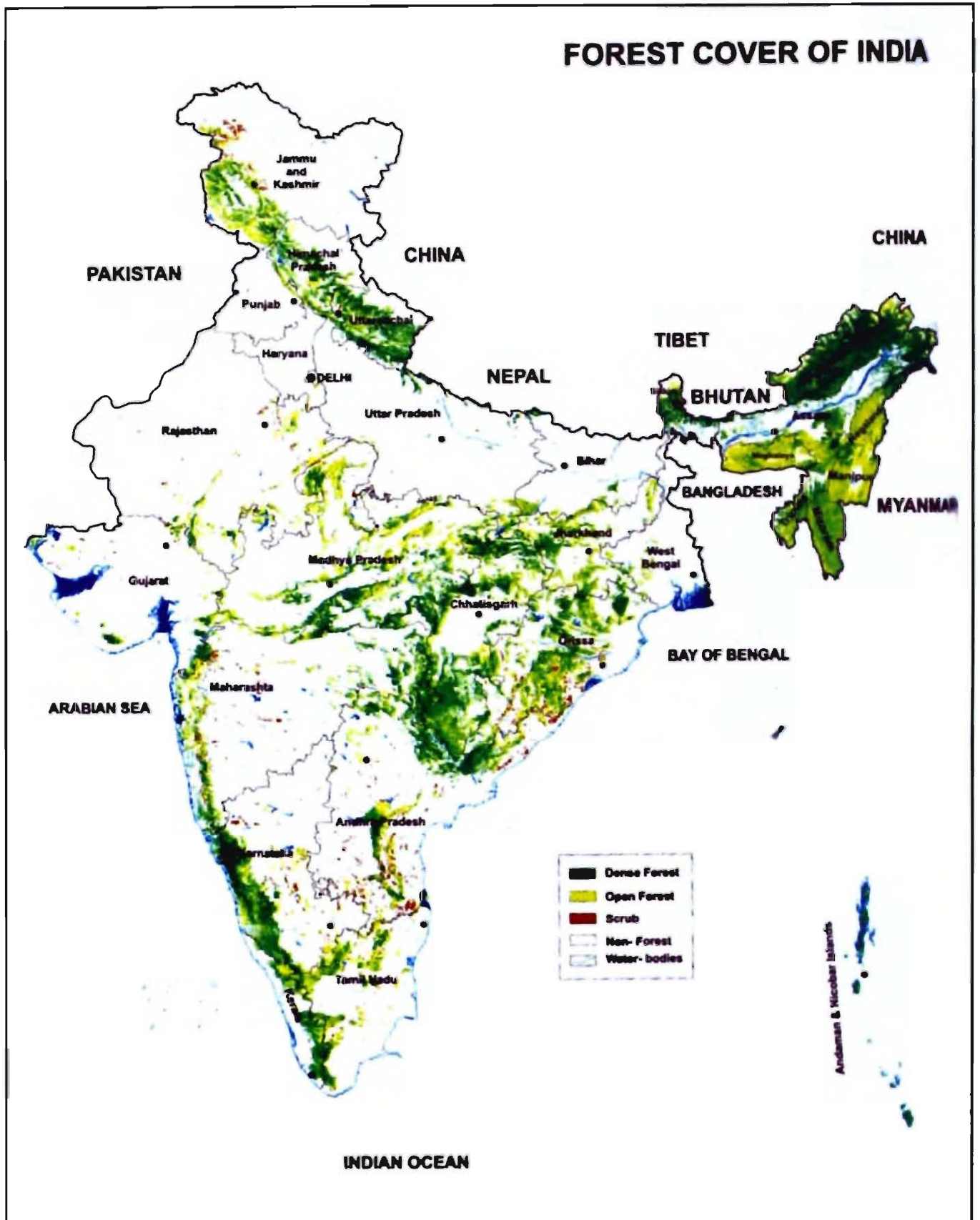
Map-4. Annual Rainfall in India (Oxford Atlas of India, 2004)



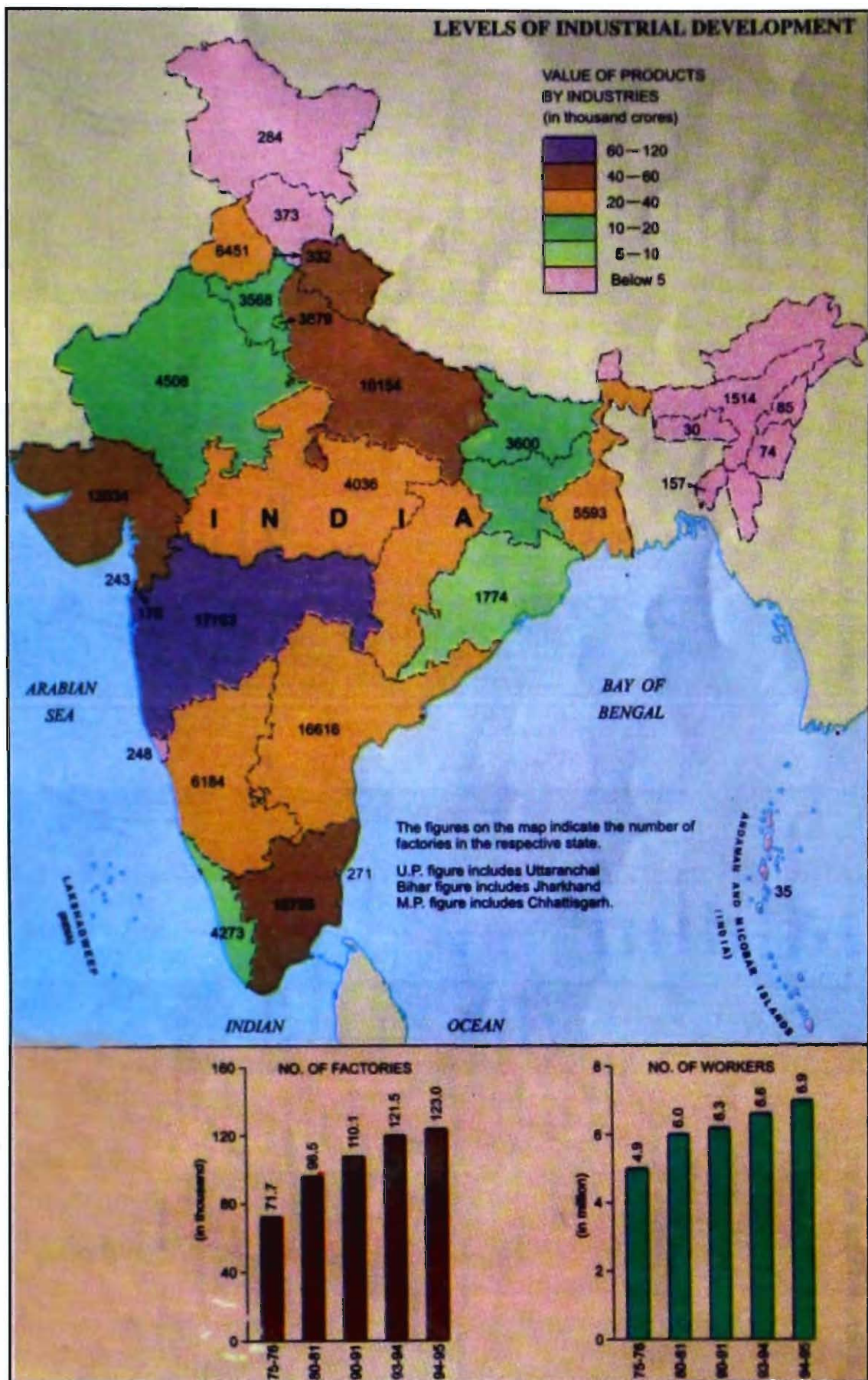
Map-5. Climatic Regions in India (Oxford Atlas of India)



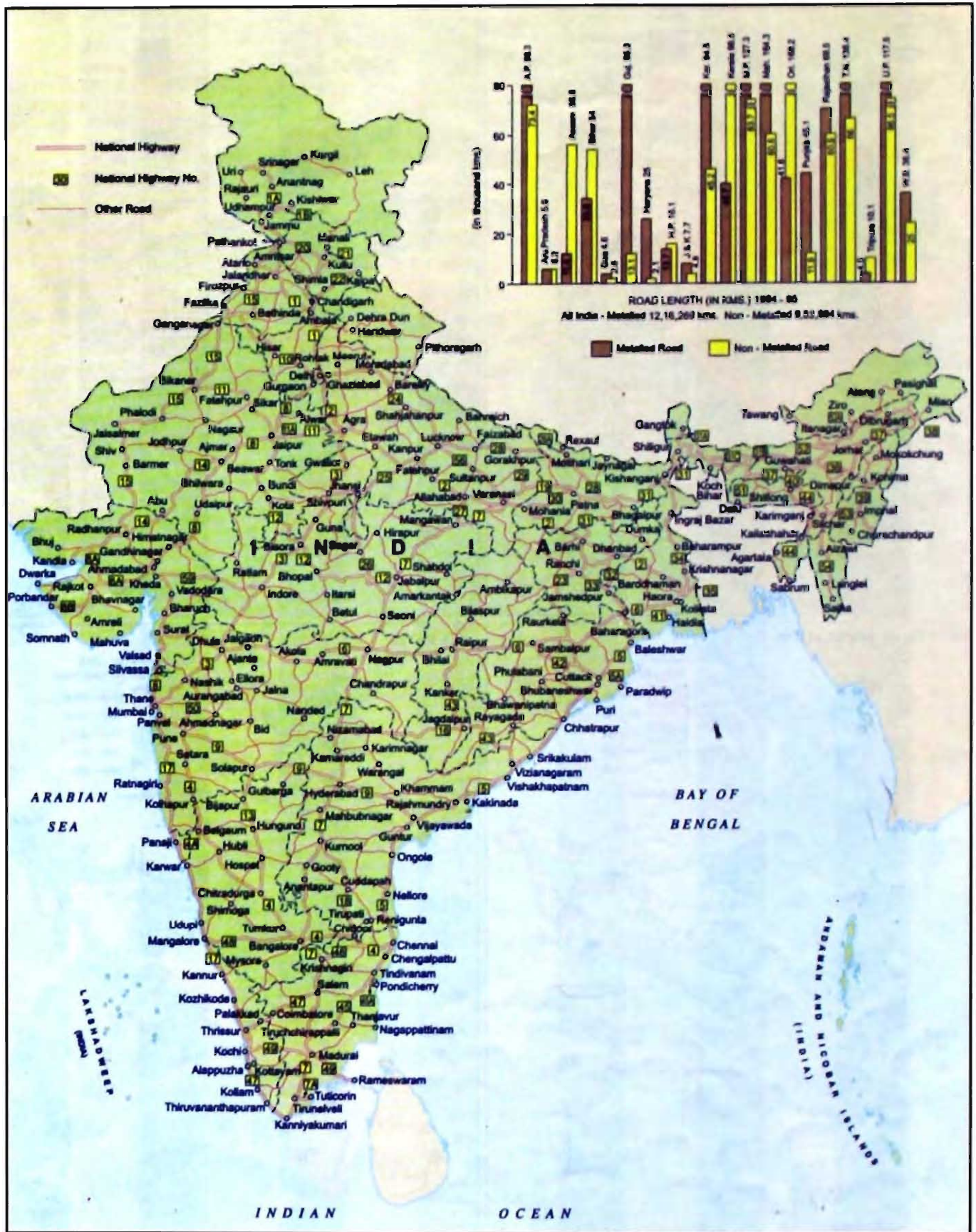
Map-6. Landuse in India (Oxford Atlas, 2004)



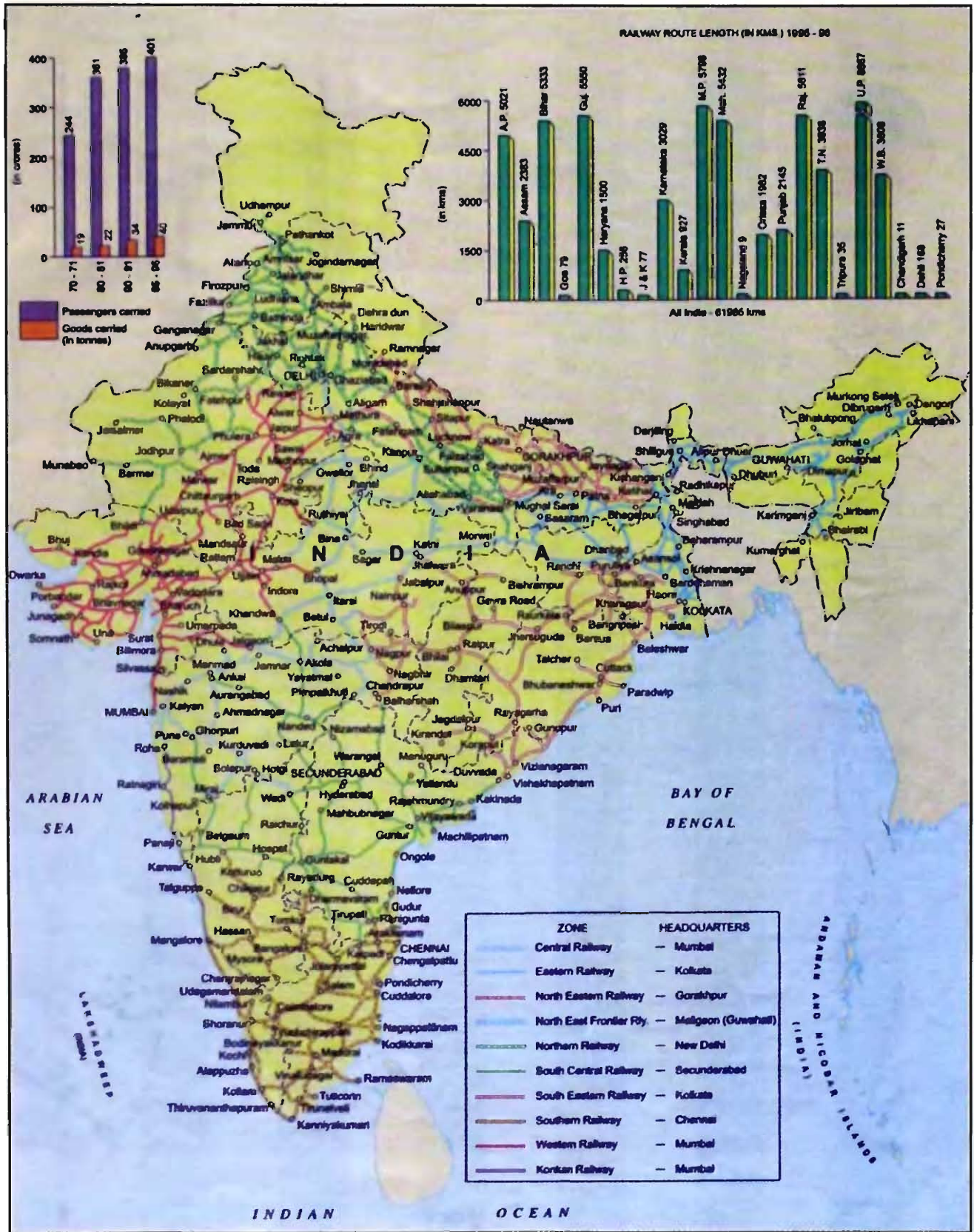
Map-7. Forest cover of India (State of Forest Report, 2001)



Map-8. Annual Rainfall in India (Oxford Atlas of India, 2004)



Map-9. Construction of Roads in India (Oxford Atlas, 2004)



Map-10. Setting up of Railway lines in India (Oxford Atlas, 2004)



Map-11. Increased Tourism in India

Hills districts with more than 66.67% forest cover are : Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and West Bengal where as hilly districts with less than 66.67% forest cover are : Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu and Uttaranchal.

The mangrove cover in the country constituted 4482sq km (0.14%) of the geographical area of which 2859sq km is dense mangrove and 1623sq km is open mangrove.

The increasing human population pressure has adversely affected the population of butterflies and their diversity. Human encroachment on their natural habitats has led to deforestation i.e. clearing of forests for human settlements and needs of industrialization (Map-8), construction of roads (Map-9), setting up railway lines (Map-10), increased tourism (Map-11), hydroelectric projects etc. Consequently, with the shrinkage and deterioration of their habitats there has been a marked decline in their diversity and populations and also disturbance in food chain. Moreover, some species have become very rare and threatened.

India is one of the 12 megadiversity countries with two out of the 18 hot spots recognized in the world. These two hot spots are Western Ghats and North-East Region, as mentioned earlier. Species require habitats, embedded in ecosystems that evolve and change. Therefore, ecosystems of India which have deteriorated for the past several years as treated by Alfred *et al.* (2002) are cited below.

1. **Eastern Himalaya** : This region includes the states of Sikkim, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Darjiling District of West Bengal and (some parts of the) Assam. There has been degradation of the habitat at a much faster rate and the causes for this have been man's induced activities like unplanned landuse, cultivation on steep slopes, random use of pesticides, over-grazing, major developmental activities e.g. mining and construction of dams, roads, over-exploitation of village and community forests as well as faunal resources and shifting cultivation; illegal trade, hybridization; pollution on setting up of industries; deforestation and continuing use of mountain slopes; forest exploitation for fuel, fodder, timber and selective use of medicinal and ornamental plants. These major developmental activities have been responsible for the decline/reduction of forest cover and fragmentation of the habitats of different animals. This region has suffered a loss of 783 sq km forest cover during 1995-1997 (Alfred, *et al.*, 2002).
2. **Western Himalaya** : This mountain ecosystem covers the state of Uttaranchal. The decline in the quality and destruction of the habitats of different animals are on account of rapid expansion of industries, agriculture, urbanization, dams, high ways, mining, overutilization biological resources, etc. Khanna & Kumar (2002) mentioned butterflies among the other wild animals in trade.
3. **North-West Himalaya** : This mountain ecosystem includes several parts the states of Jammu & Kashmir and Himachal Pradesh and it has been under tremendous stress due to increasing human population. The natural habitats have been overexploited, degraded and destroyed on account of overgrazing, agriculture and horticultural activities. Himachal Pradesh lost a forest cover of 2,573 sq km (17.1%) of its total

geographical area over a period of 14 years (1979-1993) whereas Jammu & Kashmir lost a forest cover of 10.6% of its total geographical area over a period of 12 years.

4. **Trans Himalaya** : This ecosystem is considered highly fragile, and includes mainly the Districts of Ladakh and Kargil (Jammu & Kashmir); Spiti valley, Lingti plains (Lahul valley), Pooh Tahsil (Kinnaur District) of Himachal Pradesh; small areas in the rainshadow of Nanda Devi range (U.P.) and Kangchendzonga range (Sikkim). This region excludes other parts of Sikkim and U.P. The degradation and destruction of natural habitats of different animals are due to activities of human population, e.g., overgrazing because of selective feeding, for food, fuel and under cultivation; and tourism during summer months.
5. **Desert Thar** : This region includes nine Districts and some parts of the four states, viz., Gujarat, Rajasthan, Haryana and Punjab. This fragile ecosystem is subject to human population which has increased 3% against 1% at national level. The rapid increase in the population of livestock has caused tremendous pressure on the grasslands leading to the shrinkage of the grazing area. Mining of stones and unwise use of other natural resources have also resulted in the loss of natural habitats of animals.
6. **Rann of Kutchh** : The single District of Gujarat- Rann of Kutchh, constitutes a separate agroclimatic zone having low rainfall and sparse vegetation. This is also a very fragile ecosystem. The grazing load is beyond the grazing capacity of the area. The establishment of industries has caused enough pollution.
7. **Forests** : There are four types of forests : Tropical, Subtropical, Temperate and Arctic. Tropical (very hot, summerless), Subtropical (hot, cool weather), temperate (warm, summer, pronounced winter), Arctic (short summer, prolonged winter). India's recorded forest area of 7,65,210 sq.km (23.42%) when analysed by satellites have been found to be 6,39,900 sq.km. (19.47%) of the geographical area of the country.
8. **Grasslands** : These occupy about 20% of the earth's surface. The country's land surface of the geographical area has 3.9% of grassland. Habitat loss is due to natural calamities like forest fires, floods overgrazing, etc. Severe destruction was caused in Northeast India due to Jhum (shifting) cultivation. Due to the human population pressure the intervals of jhuming cycles have been reduced to 4-5 years from 10 years. The high altitude pastures and the arid and the semiarid grasslands in Uttar Pradesh, Madhya Pradesh, Haryana, Punjab, Rajasthan and Gujarat suffer from severe seasonal grazing stress by migratory livestock.
9. **Mangroves** : According to the data of Forest Survey of India (1998), these cover a total area of 4,827 sq km in India, being distributed over West Bengal, Orissa, Andhra Pradesh and Tamil Nadu (East Coast); Gujarat, Maharashtra, Goa and Kerala (West Coast) and Andaman and Nicobar Islands. Mangrove areas in India have been reduced to more than 50% during the last 40 years.
10. **Islands** : These include Lakshadweep in the Arabian Sea and Andaman & Nicobar islands in the Bay of Bengal. In North Andaman, recorded rainforest of 96% has reduced to 21% , in Middle Andaman it is 29% and in South Andaman it is all over-

worked. The only tract stretch found is in the Jarawa reserve. There is habitat destruction and alteration, population influx and indiscriminate exploitation of biological resources. The forest coverage was about 86% of the total land area in these Islands has now been reduced considerably due to clearing of forests for human settlement, development activities, road construction and agriculture. These Islands represent the fragile and ecologically sensitive ecosystem.

11. **Western Ghats** : These Ghats stretch from river Tapi (Tapi) in the North to Kanayakumari in the south through the states of Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala. This ecosystem is significant being a hot spot in India and harbours rich diversity of flora and fauna. Man made factors, such as encroachment of forest habitation, overexploitation of timber and other forest produces, construction of the growing plantation of shifting cultivation, grazing and setting up of railway lines have largely modified the habitat by shrinking and segmentation of natural ecosystem. As per records there has been loss of 50% of forest cover in 50 years (Goankar, 1996).
12. **Eastern Ghats** : This region mainly spreads through the states of Orissa, Andhra Pradesh and Tamil Nadu. This region is highly affected adversely and is often cited an example of pathetic plight. The forest cover in the Ghats is diminishing at a much faster rate. Shifting cultivation and setting of railway lines, construction of dams and forest fire have surpassed the decline in quality of habitat and shrinkage of habitat.
13. **Deccan Peninsula** : This region covers the entire Indian peninsula south of the Narmada river. This includes Deccan Plateau South, Deccan Plateau North, Eastern High lands, Chhotanagpur and Central high lands. This region is a conglomeration of different types of ecosystems like dry and moist deciduous forests, degraded shrub lands, dry evergreen forests or thorn shrubs and tiny areas of semi evergreen forests, besides certain wetland ecosystem and fresh water bodies. There has been massive habitat loss for the past few decades. This has been mainly due to overexploitation of bioresources, pollution, etc. Population growth is a powerful force for biotic degradation.

## CONSERVATION

The earliest recorded case of insect conservation is from Spain was 1835 when there was move to protect Firefly (Coleoptera : Lampyridae). Other earlier instances are from Germany in relation to protection of *Parnassius appollo* (Lepidoptera : Papilionidae) and there was apprehension of survival of *Lycaena dispar* (Lepidoptera : Lycaenidae) in England followed by other lepidopterans in Coastal California. The need for self-restraint in the collection of butterflies and other insects was formally recognized by the Royal Entomological Society of London, by setting up a Protection Committee in 1923 which was replaced by The Joint Committee for the Conservation of British Insects in 1968. The concept of conservation gained importance and acceptance in Britain. This led to the establishment of various Societies. Contemporary movement of conservation followed in USA and Russia culminating into organising symposia between 1972-1973. The Joint Committee for the Conservation of British Insects provided 'Code of Insect collecting' in 1972 (Appendix-D) which is widely followed all over the world. Meanwhile, at international level IUCN (International Union for

Conservation of Nature and Natural Resources) and CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) became active.

**Conservation of Lepidoptera :** There are mainly three principal international bodies, viz., CITES, IUCN and WWF working for the conservation of biological diversity on a world scale. India is signatory to all these three international bodies. These bodies operate on distinct levels.

1. **CITES** (Convention on International Trade in Endangered Species of Wild Fauna and Flora): Observing commercial exploitation as prime cause of decline in wildlife through thriving global trade, legal and illegal, of rare and endangered species CITES came into effect on July 1, 1975 to protect these species of fauna and flora against over-exploitation through international trade. Thus, it deals with regulation of trade in specimens of species, subspecies or geographically separate population thereof pertaining to fauna and flora included in Appendix-I, Appendix-II and Appendix-III.
2. **IUCN** (International Union for Conservation of Nature and Natural Resources) : With its experts provides technical support and advice needed by any governmental or public or private body on questions of environmental conservation.
3. **WWF** (World Wide Fund) : Besides its public relations activities, promotes and finances projects all over the world for the conservation of particular species or of entire communities and ecosystems.

Since 1976, a Special Survival Commission has been formed by the IUCN with the Lepidoptera Specialist Group reporting to it, whose expert lepidopterists, professional and amateur, give the IUCN the benefit of their valuable knowledge in their field. In 1984, the Lepidoptera Specialist Group of the Special Survival Commission was divided into a Butterfly Specialist Group and a Moth Specialist Group. With their world-wide connections the Specialist Groups are of great value in centralizing conservation data and in advising on priorities for conservation attention. To obtain funds for conservation projects is more difficult for invertebrates than vertebrates, but the recommendations of the Group may be recognized as being of international priority and importance.

## CONSERVATION MEASURES TAKEN

### Legislation

Observing the alarming situation caused by the depletion of natural habitats of animals all over the globe, the Government of India took significant steps in establishing the Indian Board for Wildlife in 1952 followed by the Indian Wildlife Protection Act, 1972. Further, India also became one of the signatories to CITES, IUCN and WWF (World Wide Fund). The Indian Wildlife Protection Act, 1972 was the first step towards the conservation of insects as it included "Butterflies and moths" without reference to any particular species. Amended Indian Wildlife Protection Act, 1972 in 1980 effective from October included a large number of species / subspecies of butterflies only, under three Schedules.

**Schedule-I** : Animals included are totally protected throughout the country, live, dead or part thereof. Persons offending the schedule are liable to very rigorous punishments. The Schedule-I (Part IV) includes 128 species/subspecies/form of butterflies.

**Schedule-II** : Animals also protected under this Schedule but with controlled exploitation. When the population a species/ subspecies/form exceeds it may be transferred to next Schedule. The Schedule-II (Part II) includes 307 species/subspecies/form of butterflies.

**Schedule-IV** : Animals included under this Schedule are generally the common animals.

There are 19 species/subspecies of butterflies listed in Schedule-IV (Part II).

The majority of species/subspecies of butterflies to which Evans (1932) mentioned 'very rare' and 'rare,' are listed under Schedule-I (Part-4) and Schedule-II (Part-2), respectively. Wynter-Blyth (1957) and all later workers followed Evans (1932) regarding the status of species of butterflies. Gunathilagaraj *et al.* (2000) brought out a Handbook on butterflies listed in Schedule-I (Part- IV) of the Indian Wildlife (Protection) Act , 1972.

General restrictions on trade in Lepidoptera apply in both East and West Germany (GDR and FRG), Kenya, Madagascar, Mexico and Turkey. One or more species of swallowtail are protected or banned in trade under national legislation in Austria, Czechslovakia, Finland, France, Germany (GDR), United kingdom, Greece, Hungary, Luxembourg, Netherlands, Poland, Switzerland,U.S.S.R., Brazil, India, Indonesia. Malaysia, Papua New Guinea and the U.S.A. In recognition of the importance of conserving the habitats of threatened animals and plants, all northern European countries give greater emphasis to protected areas than to legislation concerning individual species (Collins & Morris, 1985).

### **Protected areas**

India to-day has an elaborate network of 578 protected areas covering an area of 1,55,508.54 sq km which is 4.73 % of the country's total geographical area (Singh & Singh, 2002). These protected areas serve *in situ* conservation which has advantage over *ex situ* conservation because of long range ecological processes and organic evolution that operate under natural conditions and constantly refine and update biodiversity through three cardinal elements of organic evolution, *viz.*, i) Mutation ii) Recombination and iii) Natural Selection. India is rich in biodiversity and poor in biotechnology and thus, has inherent capability to become rich in biotechnology than other countries which are poor both in biodiversity and biotechnology or poor in biodiversity and rich in biotechnology. Of these 578 protected areas, there are 89 National Parks and 489 Wildlife Sanctuaries located in 10 different Biogeographic zones/ Biotic Provinces.

**Biosphere Reserve** : A network project of protected areas launched by the UNESCO (United Nations Educational, Scientific and Cultural Organisation) under the MAB (Man and Biosphere) Programme to classify certain forest area rich in biodiversity, of cultural heritage significance and encompassing unique ecosystems which are representatives of major biogeographic zones of the world, as Biosphere reserve. The biosphere reserves are areas of terrestrial and coastal ecosystems which are internationally recognized within the

framework of UNESCO's Man and Biosphere Programme. There are 13 biosphere reserves covering an area of 55,550.39 sq km which is 1.69% of the total geographical area of the country.

**Wildlife Sanctuary :** The State Government may, by notification, declare any area to be a sanctuary if it considers that such area is of adequate ecological, faunal, floral, geomorphological, natural, or zoological significance, for the purpose of protecting, propagating wildlife or its environment. It shall specify, as nearly as possible, the situation and limits of such area. In a sanctuary, private ownership rights may be allowed to continue and forestry and other usages may be permitted to the extent that they do not adversely affect wildlife conservation. There are 489 Wildlife Sanctuaries covering an area of 1,17,974.53 sq km which is 3.59% of the total geographical area of the country.

**National Park :** Whenever it appears to the State Government that an area, whether within a sanctuary or not, is, by means of its ecological, faunal, floral, geomorphological, or zoological importance, needed to be constituted as a National Park for the purpose of protecting, propagating, or developing wildlife therein or its environment, it may, by notification, declare its intention to constitute such an area as a National Park. It shall define the limits of the area which is intended to be declared as a National Park. A National Park has a permanent status, and is entitled for financial support from the Central Government. In a National Park all private rights are extinguished all forestry operations and other usages such as grazing of domestic animals are prohibited. There are 89 National Parks covering an area of 37,534.01 sq km which is 1.14% of the total geographical area of the country.

Normally a Sanctuary or National Park is established by the State Government, but if any area, wholly and partly, is under the control of the Central Government, then the State Government must take consent of the Central Government before notifying such an area as a Sanctuary or National Park.

**Ranching and Farming :** An encouraging step is that 'A project on Butterfly ranching / farming in South Andaman' has been sanctioned during 2000-2001 by the Ministry of Environment and Forests, Government of India at Central Agriculture Research Institute, Port Blair, Andaman & Nicobar Islands

## CONSERVATION MEASURES SUGGESTED

**Documentation :** The species of butterflies with restricted distribution with poorly known habits, life-history, ecology, etc. may be documented.

**Public awareness :** The attention of public may be drawn to butterflies through calendars and picture cards bearing captions, life-history information, depicting a variety of butterfly kinds urging conservation rather than wanton collecting

**Ranching and Farming :** In farming, young ones are reared in captivity from parents that are also held in captivity. For ranching, young stages of wild parentage are captured and reared to the adult stage in captivity. The finest example of successful butterfly ranching

is without question the development of the birdwing industry in Papua New Guinea. There is need to establish more ranching / farming centers in India.

**Code for Insect collecting** : As widely followed the code should be adopted and adhered to while collecting insects in the field from their habitats.

**Protected areas** : More National Parks and Wildlife Sanctuaries may be established in order to achieve the stated goal to bring minimum of 9 % of the country's geographical area under protected area of network (PAN) as 4.73 % protected area (in 2002) is still short of 3.27 %.

**Afforestation** : The afforestation should be encouraged in areas which are falling short of forest cover as per National Policy (1988).

### THREATENED CATEGORIES

Wells *et al.* (1983) included a number of species of butterflies in their IUCN Invertebrate Red Data Book. Solely on butterflies, "*The Threatened Swallowtails of the World*" by Collins & Morris (1985) is the first IUCN Red Data Book. They used the then recognised categories of the threatened species, viz., Extinct (Ex), Endangered (E), Vulnerable (V), Rare (R), Indeterminate (I), Insufficiently Known (K) and Out of Danger (O). The IUCN Red List Categories and Criteria : Version 3.1 of IUCN (2001) provide the criteria for determining the status of categories as Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (NE). The IUCN (2001) recommended all assessments from January, 2001 to use the latest adopted version and cite the year of publication and version number.

To assign strictly the above-mentioned categories, however, sufficient information is not available for majority of the threatened species of India. As such, status of these species has been given on the basis of the available literature, collection of butterflies made by several parties during the faunistic surveys, field observation, and present condition of their habitats. Accordingly, of the 128 threatened species of butterflies included in Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 123 occurring in India have been dealt with and assigned the status at the national level of being Critically Endangered, Endangered, Vulnerable and Near Threatened. For this, IUCN Red List Categories and Criteria : Version 3.1 of IUCN (2001) has been followed as far as possible / with some modification. The accounts and photographs have been given laying stress particularly on species, subspecies and form only as they are listed in Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and, subsequent amendments. Threats, for species/subspecies/form, given are in the area of their occurrence rather than their specific habits/habitat. The photograph of a species is provided where the photograph is not available for the subspecies listed in the Schedule. Also, the photographs of other subspecies are provided where the photograph is not available for a particular subspecies mentioned in the Schedule.

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# IUCN Red List Categories and Criteria

Version 3.1 (2001)

## **EXTINCT (EX)**

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

## **EXTINCT IN THE WILD (EW)**

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

## **CRITICALLY ENDANGERED (CR)**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

## **ENDANGERED (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

## **VULNERABLE (VU)**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild. *1 Note : As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages (see Annex 2).*

## **NEAR THREATENED (NT)**

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

**LEAST CONCERN (LC)**

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

**DATA DEFICIENT (DD)**

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

**NOT EVALUATED (NE)**

A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

# **CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE**

## **CRITICALLY ENDANGERED (CR)**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild :

A. Reduction in population size based on any of the following :

1. An observed, estimated, inferred or suspected population size reduction of  $\geq 90\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood

AND ceased, based on (and specifying) any of the following :

- (a) direct observation
  - (b) an index of abundance appropriate to the taxon
  - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
  - (d) actual or potential levels of exploitation
  - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of  $\geq 80\%$  over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
  3. A population size reduction of  $\geq 80\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
  4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 80\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

- B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both :
1. Extent of occurrence estimated to be less than 100 km<sup>2</sup>, and estimates indicating at least two of a–c :
    - a. Severely fragmented or known to exist at only a single location.
    - b. Continuing decline, observed, inferred or projected, in any of the following :
      - (i) extent of occurrence
      - (ii) area of occupancy
      - (iii) area, extent and/or quality of habitat
      - (iv) number of locations or subpopulations
      - (v) number of mature individuals.
    - c. Extreme fluctuations in any of the following :
      - (i) extent of occurrence
      - (ii) area of occupancy
      - (iii) number of locations or subpopulations
      - (iv) number of mature individuals.
  2. Area of occupancy estimated to be less than 10 km<sup>2</sup>, and estimates indicating at least two of a–c :
    - a. Severely fragmented or known to exist at only a single location.
    - b. Continuing decline, observed, inferred or projected, in any of the following :
      - (i) extent of occurrence
      - (ii) area of occupancy
      - (iii) area, extent and/or quality of habitat
      - (iv) number of locations or subpopulations
      - (v) number of mature individuals.
    - c. Extreme fluctuations in any of the following :
      - (i) extent of occurrence
      - (ii) area of occupancy

(iii) number of locations or subpopulations

(iv) number of mature individuals.

- C. Population size estimated to number fewer than 250 mature individuals and either :
1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future) OR
  2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a–b) :
    - a. Population structure in the form of one of the following :
      - (i) no subpopulation estimated to contain more than 50 mature individuals, OR
      - (ii) at least 90% of mature individuals in one subpopulation.
    - b. Extreme fluctuations in number of mature individuals.
- D. Population size estimated to number fewer than 50 mature individuals.
- E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

#### **ENDANGERED (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild :

- A. Reduction in population size based on any of the following :
1. An observed, estimated, inferred or suspected population size reduction of  $\geq 70\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following :
    - (a) direct observation
    - (b) an index of abundance appropriate to the taxon
    - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
    - (d) actual or potential levels of exploitation
    - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of 50% over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
3. A population size reduction of  $\geq 50\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 50\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

**B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both :**

1. Extent of occurrence estimated to be less than 5000 km<sup>2</sup>, and estimates indicating at least two of a–c :
  - a. Severely fragmented or known to exist at no more than five locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following :
    - (i) extent of occurrence
    - (ii) area of occupancy
    - (iii) area, extent and/or quality of habitat
    - (iv) number of locations or subpopulations
    - (v) number of mature individuals.
  - c. Extreme fluctuations in any of the following :
    - (i) extent of occurrence
    - (ii) area of occupancy
    - (iii) number of locations or subpopulations
    - (iv) number of mature individuals.
2. Area of occupancy estimated to be less than 500 km<sup>2</sup>, and estimates indicating at least two of a–c :
  - a. Severely fragmented or known to exist at no more than five locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following :

- (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following :
- (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.
- C. Population size estimated to number fewer than 2500 mature individuals and either :
1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future)  
OR
  2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a–b) :
    - a. Population structure in the form of one of the following :
      - (i) no subpopulation estimated to contain more than 250 mature individuals, OR
      - (ii) at least 95% of mature individuals in one subpopulation.
    - b. Extreme fluctuations in number of mature individuals.
- D. Population size estimated to number fewer than 250 mature individuals.
- E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

#### **VULNERABLE (VU)**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild : A. Reduction in population size based on any of the following :

1. An observed, estimated, inferred or suspected population size reduction of  $\geq 50\%$  over the last 10 years or three generations, whichever is the longer, where the causes of

the reduction are : clearly reversible AND understood AND ceased, based on (and specifying) any of the following :

- (a) direct observation
  - (b) an index of abundance appropriate to the taxon
  - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
  - (d) actual or potential levels of exploitation
  - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
2. An observed, estimated, inferred or suspected population size reduction of  $\geq 30\%$  over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
  3. A population size reduction of  $\geq 30\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
  4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 30\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
- B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both :
1. Extent of occurrence estimated to be less than 20,000 km<sup>2</sup>, and estimates indicating at least two of a–c :
    - a. Severely fragmented or known to exist at no more than 10 locations.
    - b. Continuing decline, observed, inferred or projected, in any of the following:
      - (i) extent of occurrence
      - (ii) area of occupancy
      - (iii) area, extent and/or quality of habitat
      - (iv) number of locations or subpopulations
      - (v) number of mature individuals.
    - c. Extreme fluctuations in any of the following :

- (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.
2. Area of occupancy estimated to be less than 2000 km<sup>2</sup>, and estimates indicating at least two of a–c :
- a. Severely fragmented or known to exist at no more than 10 locations.
  - b. Continuing decline, observed, inferred or projected, in any of the following :
    - (i) extent of occurrence
    - (ii) area of occupancy
    - (iii) area, extent and/or quality of habitat
    - (iv) number of locations or subpopulations
    - (v) number of mature individuals.
  - c. Extreme fluctuations in any of the following :
    - (i) extent of occurrence
    - (ii) area of occupancy
    - (iii) number of locations or subpopulations
    - (iv) number of mature individuals.
- C. Population size estimated to number fewer than 10,000 mature individuals and either :
- 1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future)  
OR
  - 2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a–b) :
    - a. Population structure in the form of one of the following :
      - (i) no subpopulation estimated to contain more than 1000 mature individuals, OR
      - (ii) all mature individuals are in one subpopulation.
    - b. Extreme fluctuations in number of mature individuals.
- D. Population very small or restricted in the form of either of the following :
- 1. Population size estimated to number fewer than 1000 mature individuals.
  - 2. Population with a very restricted area of occupancy (typically less than 20 km<sup>2</sup>) or number of locations (typically five or fewer) such that it is prone to the effects

of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.

- E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

#### VULNERABLE (VU)

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future as defined by any of the following criteria (A to E) :

##### A. Population reduction in the form of either of the following :

1. An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following :
  - (a) direct observation
  - (b) an index of abundance appropriate for taxon
  - (c) decline in area of occupancy , extent of occurrence and or quality of habitat
  - (d) actual or potential levels exploitation
  - (e) the effect of introduced taxa , hybridization , pathogens, pollutants, competitors or parasites
2. A reduction of at least 20% projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of a), c), d) or e) above.

##### B. Extent of occurrence estimated to be less than 20,000 sq km' or area of occupancy estimated to be less than 2000 sq km, and estimates including any two of the following :

1. Severely fragmented or known to exist at no more than ten locations.
2. Continuing decline, observed, inferred or projected, in any of the following
  - (a) extent of occurrence
  - (b) area of occupancy
  - (c) area, extent and/or quality of habitat
  - (d) number of locations or subpopulations
  - (e) number of mature individuals
3. Extreme fluctuations in any of the following

- (a) extent of occurrence
- (b) area of occupancy
- (c) number of locations or subpopulations
- (d) number of mature individuals

**C. Population estimated to number less than 10,000 mature individuals and either :**

1. An estimated continuous decline of at least 10% within 10 years or three generations, whichever is longer. OR
2. A continued decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either
  - (a) severely fragmented (*i.e* no subpopulation estimated to contain more than 1000 mature individuals)
  - (b) all individuals are in a single subpopulation.

**D. Population very small or restricted in the form of either of the following :**

1. Population estimated to number less than 1000 mature individuals.
2. Population is characterised by an acute restriction in its area of occupancy (typically less than 100 sq km) or in the form of location (typically less than 5). Such a taxon would thus be prone to effects of human activities (stochastic events whose impact is increased by human activities) within a very short period of time in an unforceable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.

**E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.**

## MORPHOLOGY AND TERMINOLOGY

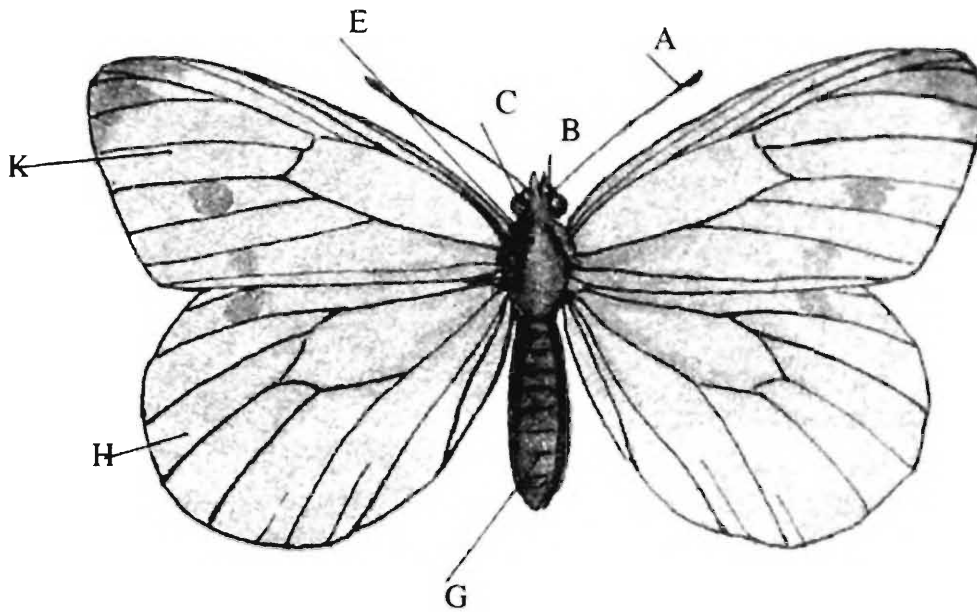
The body of an adult butterfly consists of head, thorax and abdomen.

The head bears a pair of long segmented antennae situated in front of or between the compound eyes and a proboscis (long coiled sucking tube) arising between the paired labial palpi. The shaft of antenna thickens abruptly or gradually at the distal end forming a distinct club which may be grooved on its lower side. The club usually narrows towards tip which may be pointed or rounded. The compound eyes are large and immobile and may be smooth or hairy. During feeding, the butterfly extends its proboscis which otherwise remains coiled up. The labial palpi are three segmented which may be porrect or erect.

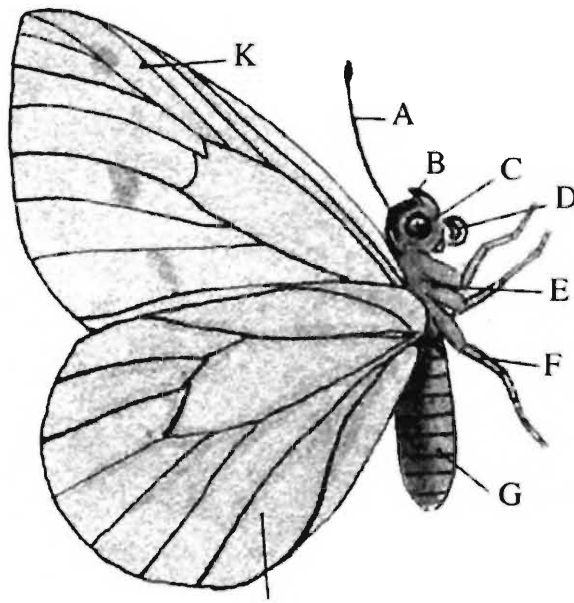
The thorax is made up of three segments namely prothorax, mesothorax and metathorax, each carrying a pair of legs. The mesothorax and metathorax also bear a pair of fore wings and hind wings, respectively. Each leg consists of five segments, the coxa articulating with the thorax; trochanter is a very small segment interposed between the coxa and femur; tibia of medium length or long and armed with one or two pairs of movable tibial spurs, may be spiny or densely fringed with hair; and lastly tarsus which is five segmented. The terminal or fifth segment ends in a pair of claws beneath which is usually a small pad called the pulvillus. Adjacent to each claw is a brush-like attachment known as the paronychium.

The shape of the wing is very variable. The upper or anterior margin is known as the costa and lower or posterior edge is the inner margin or dorsum, the proximal part of wing next to thorax is the base and margin remote from the thorax is distal margin, outer margin or termen. The anterior tip of the wing is called the apex and that of inner margin is known as the tornus. The prefix sub-implies "near to", and the lines or markings on wings may be described as basal, sub-basal, medial or discal, postmedian or post discal, submarginal or subterminal, marginal or terminal, apical, subapical, tornal, subtornal, etc. Along the outer margin is a regular fringe or the cilia composed of closely-packed scales in a double row. The markings on wings consist of bands, lines, spots, patches and rings of varied form.

The wings are membranous with veins running longitudinally from base to the wing margin or termen. There is a comparatively wide and approximately triangular space called discal or discoidal cell or simply the cell which is usually closed at the outer end by short transverse veinlets known as discoidal or discocellular veins. The portion of the wing surface surrounded by the discoidals is usually termed the discal area. Usually ten veins arise from the cell in fore wing and six in hind wing. Sometimes one or more veins are absent especially on the fore wing. There are different systems of notation to describe the venation namely numerical notation, Comstock-Needham notation, Rothschild & Jordan notation etc. In Numerical notation the veins are numbered from the dorsum or inner margin to the costa so that veins run from 1a or 1b to vein 12 *i.e.* veins 3A (third anal) or 1A + 2A (first anal + second anal) to vein Sc in fore wing and from vein 1a to 8 *i.e.* veins 3A (third anal) to

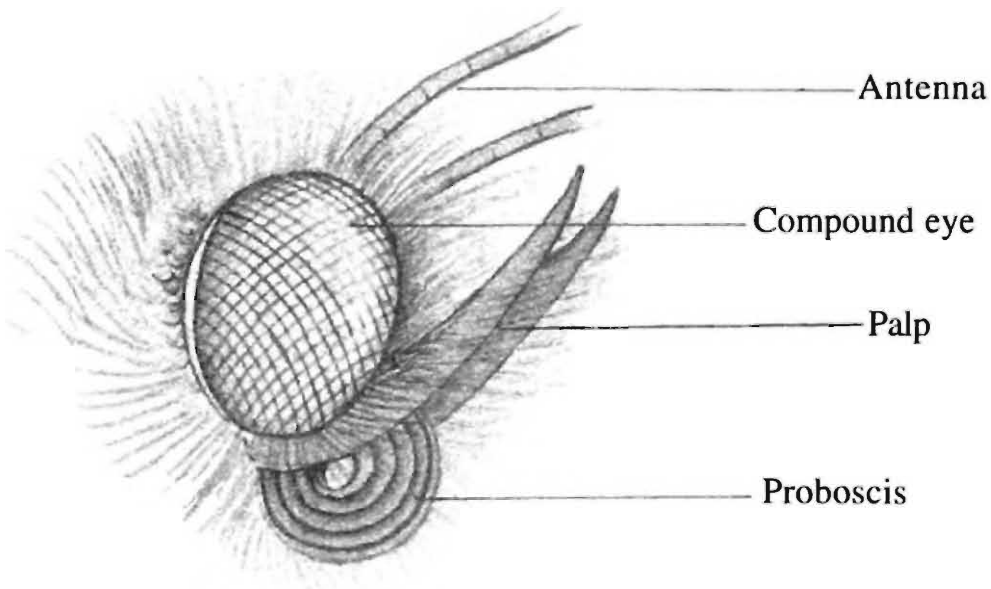


Adult Butterfly (Upperside)

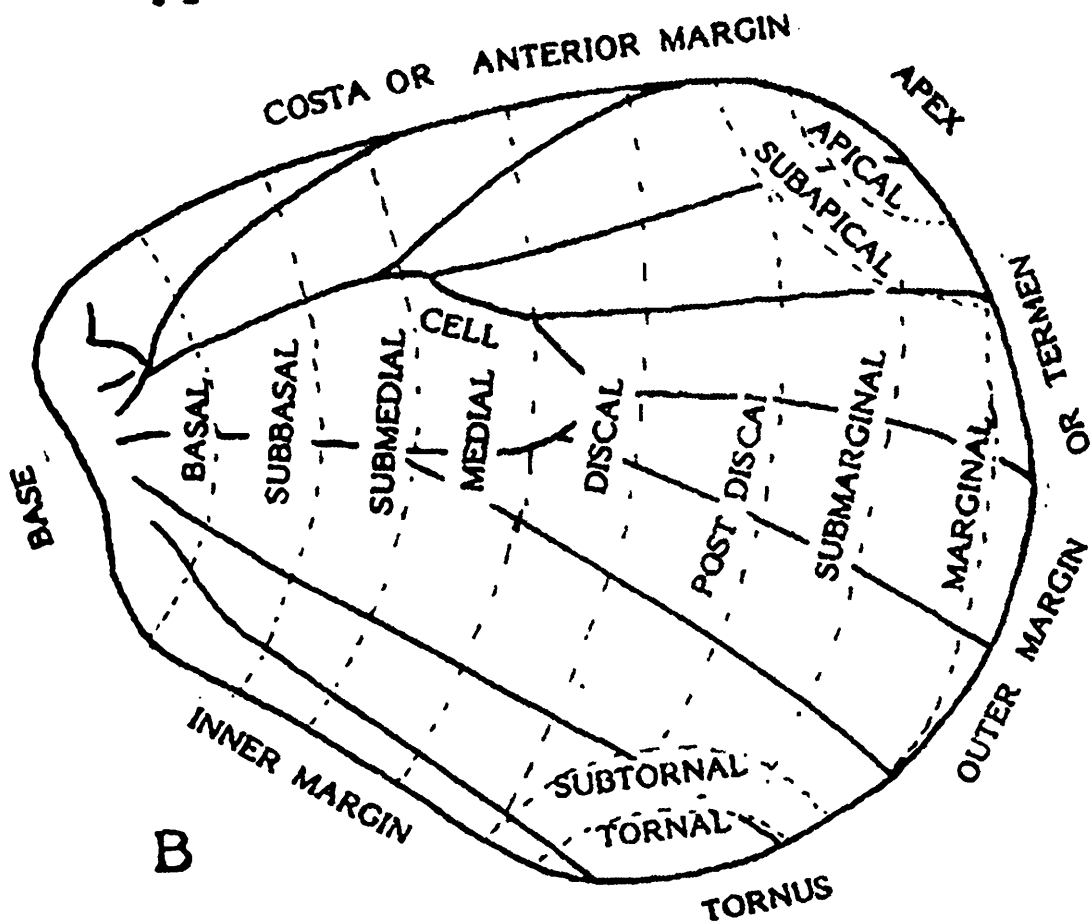
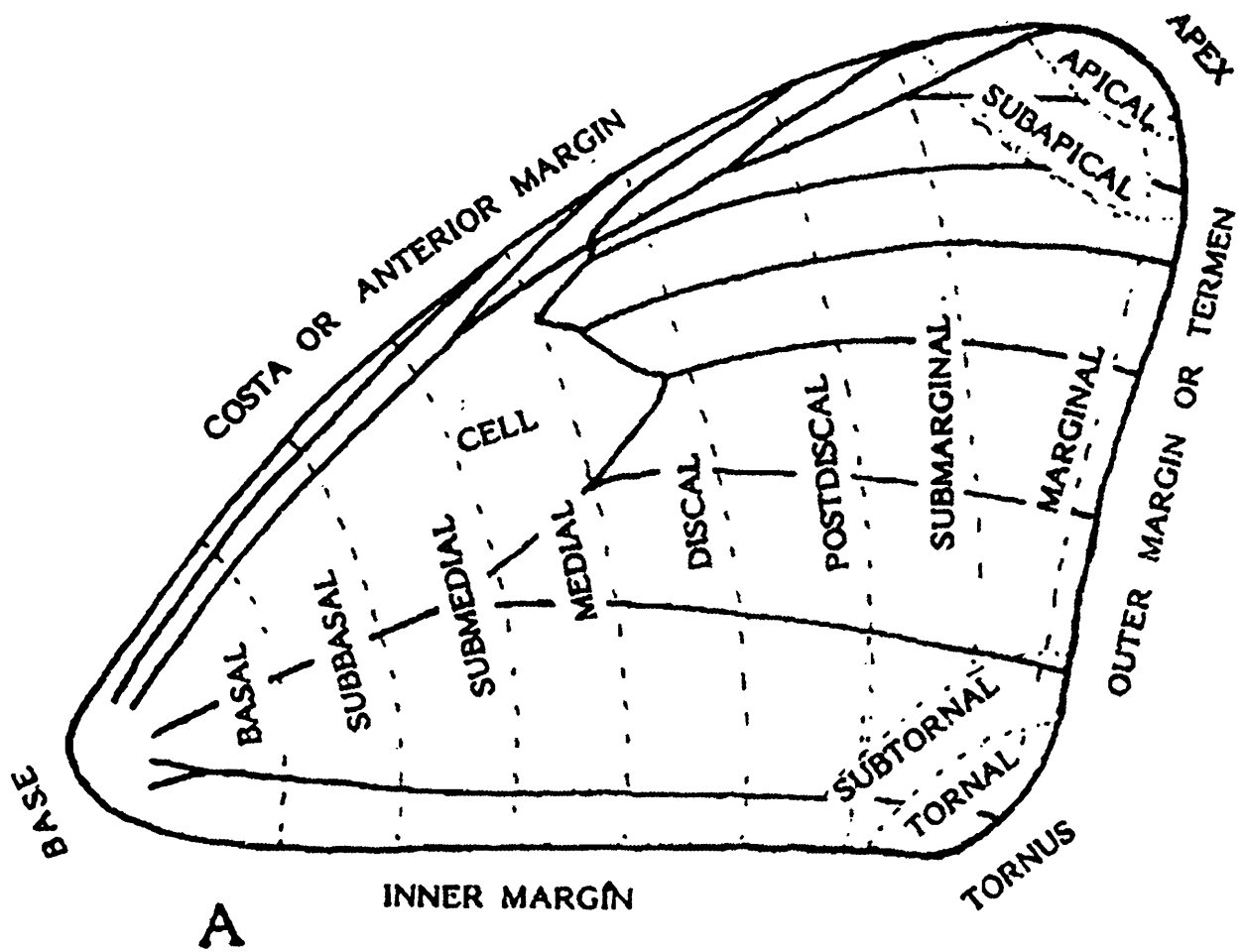


Adult Butterfly (Underside)

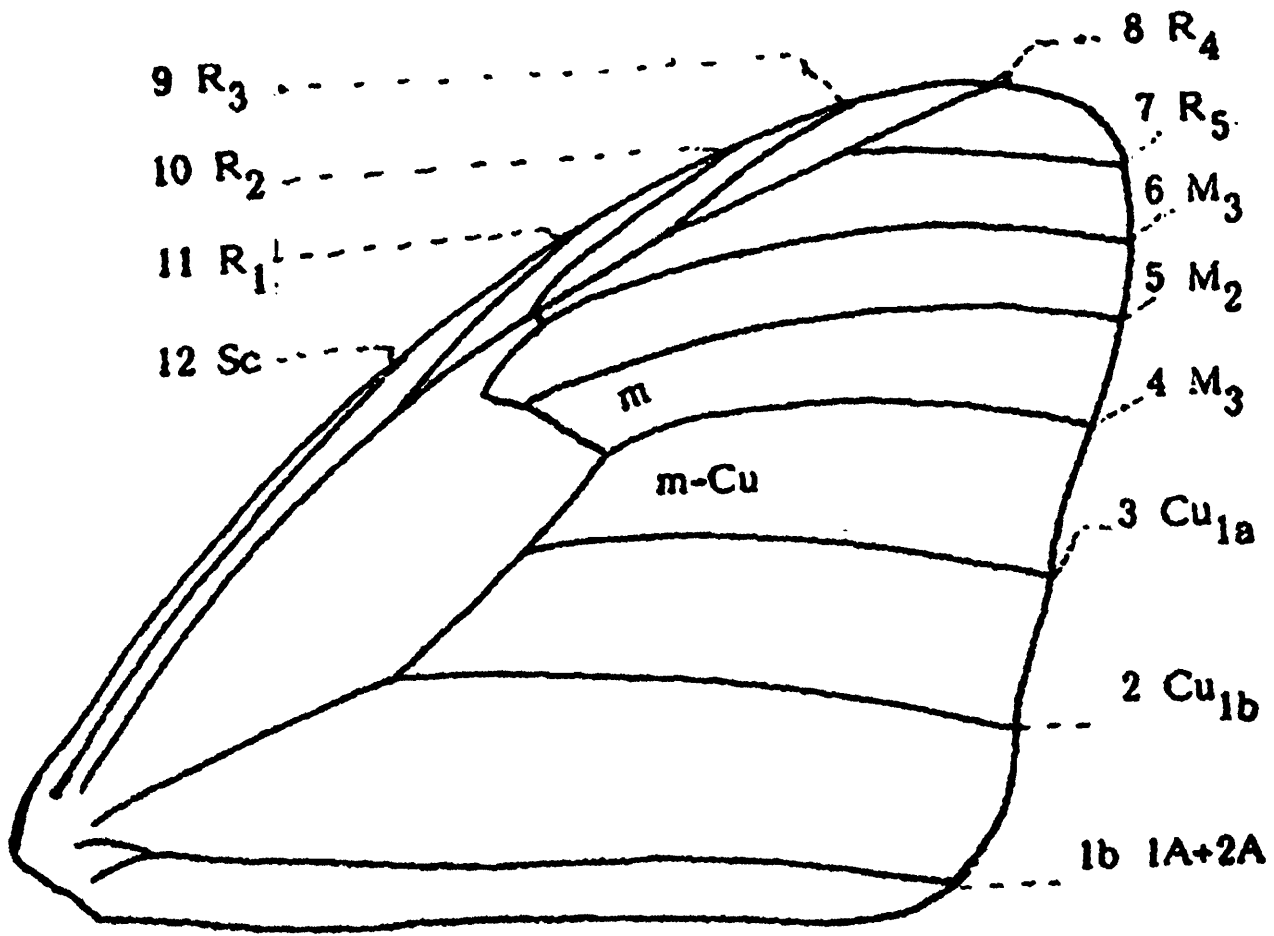
- A. Antenna
- B. Head
- C. Eye
- D. Proboscis
- E. Thorax
- F. Leg
- G. Abdomen
- H. Hind wing
- K. Fore wing



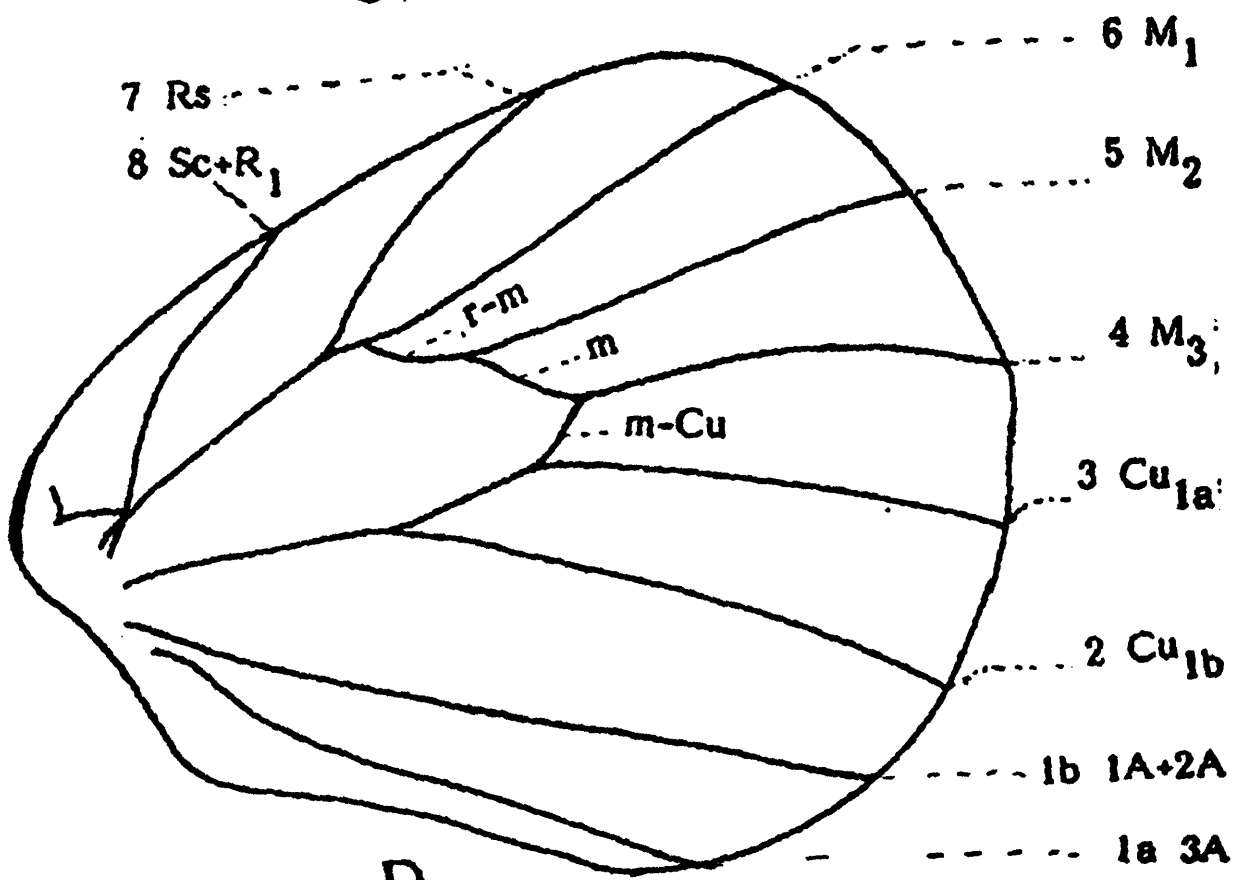
Head of a Butterfly



Subdivisional regions of the wings A - Fore wing; B - Hind wing



C



D

Wing venation : A - Fore wing; B - Hind wing

R<sub>1</sub> + Sc (radius I + subcostal) in hind wing. Veins 2 to 11 (Cu I b-R<sub>1</sub>) in fore wing and 2-7 (cu Ib-Rs) in hind wing arise from the margin of the cell (or veins arising from the cell) while remaining veins originate from the wing bases. The space between two veins is interspace or area and is known by the lower vein e.g. in fore wing space between anal margin and 1A + 2A, is inner/anal area, space between 1A + 2A and Cu<sub>1b</sub> is 1A + 2A - area, space between Cu I b and Cu<sub>1a</sub> is Cu<sub>1b</sub> area and so on. Similarly, in hind wing space between anal margin and 3A is inner/anal area, space between 3A and 1A + 2A is 3A-area, space between 1A + 2A and Cu<sub>1b</sub>, is 1A + 2A - area, space between Cu<sub>1b</sub> and Cu<sub>1a</sub> is Cu<sub>1b</sub> - area and so on.

The upper margin and lower margin of the cell are called radius and cubitus, respectively. In this case radius runs from base to origin of vein R<sub>5</sub> (i.e. vein 7) (or vein M<sub>1</sub>, when M<sub>1</sub> and R<sub>5</sub> stalked i.e. vein 6 when 6 and 7 stalked) whereas cubitus extends from base to origin of vein M<sub>3</sub>, i.e. vein 4. Lower discocellular vein is the cross vein joining veins M<sub>3</sub> and M<sub>2</sub> (veins 4 and 5), middle discocellular vein is cross vein joining veins M<sub>2</sub> and M<sub>1</sub> (veins 5 and 6) while upper discocellular vein is cross vein joining veins M<sub>1</sub> and R<sub>5</sub> (veins 6 and 7) and is often obsolete. In some cases, in hind wing, a small vein or a trace of such a vein arises from near base of vein Sc + R<sub>1</sub> (vein 8) and it is called precostal or humeral vein or spur.

The abdomen consists of ten segments and 8th to 10th segments contain male genital apparatus in male and female genital organs in female.





## CRITICALLY ENDANGERED

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

### 1. *Parnassius acco gemmifer* Fruhstorfer, 1904

#### THE VARNISHED APOLLO

*Parnassius acco gemmifer* Fruhstorfer, 1904

*Parnassius acco gemmifer* Fruhstorfer : Fruhstorfer, 1910; Evans, 1932; Talbot, 1939

*Diagnostic characters* : MALE - Upperside greyish white. Fore wing with white submarginal spots unusually sharp, veins broadly black especially  $Cu_{1b}$ ,  $Cu_{1a}$  and  $M_3$ ; hind wing with prominent red spot in  $M_3$ -area, a black spot in between the basal and middle red spots in  $M_1$ -area; spot in  $M_3$ -area joined to dorsum by a black band and usually a black spot between  $M_2$  and  $R_5$ ; submarginal spots prominent, well separated, margin narrowly black. *Underside* hind wing giving a varnished yellow appearance, concealing the basal red spots except that in  $M_1$ -area. FEMALE - As for male, but red spots more strongly developed and spheris bilobed, sac-like and furrowed beneath. *Wing expanse* : ♂ ♀ 40-65 mm.

*Intraspecific variation* : The subspecies exhibiting little variation has other following three counterparts occurring in India.

- i. *P. acco acco* Gray, 1853 - India : Jammu & Kashmir (East Ladak). *Elsewhere* : Nepal and Tibet.
- ii. *P. acco tagalangi* O. Bang-Haas, 1927 India : Jammu & Kashmir : South Ladak (Tagalang-la Pass, 4570m).
- iii. *P. acco pundjabensis* O. Bang-Haas, 1927 India : Jammu & Kashmir : East Spiti (Tum-Tum-Thang Mts., 4570m).

*Parnassius acco gemmifer* Fruhstorfer differs from all the above three subspecies by wing markings darker and strongly developed and also maximum wing expanse of 65 mm.

*Distribution* : India : Sikkim.

*Status* : Critically Endangered (CR A1c, B1 2bc).



*Parnassius acco gemmifer* Fruhstorfer After Smart (1981)

**Habitat and ecology :** This is a true high altitude-dwelling butterfly described from specimen/s captured at Kambajong, at altitude of about 6000-6500m in Sikkim. Its habits and ecology are not much known.

**Threats :** The area of its occurrence is considered highly fragile with threats of over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats: selective use of medicinal plants and collecting other forest commodities.

**Conservation measures taken :** The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2101.34 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** This subspecies is restricted to Sikkim, in India. There has been a significant loss and deterioration in its area of occurrence. Collins & Morris (1985) also referred to its protection in India.

**Taxonomic Reliability :** The subspecies, *Parnassius acco gemmifer* Fruhstorfer has been followed after Talbot (1939) who treated synonymy and other subspecies occurring in India.

Compiled by : I. J. Gupta and D. K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

## 2. *Parnassius delphius* (Eversmann, 1843)

### THE BANDED APOLLO

*Doritis delphius* Eversmann, 1843

*Parnassius delphius* (Eversmann) : Talbot, 1939

*Parnassius delphius* (Eversmann) : Varshney, 1993

**Diagnostic characters** : MALE - *Upperside* fore wing without red spot at base of M<sub>1</sub>-area, hind wing discal ocellus placed either mid-way between submarginal line and cell or nearer the cell, antemarginal ocelli or spots absent, subcostal ocellus often present. *Underside* hind wing with red basal spots obsolete. FEMALE - Like male; female pouch forming a belt round the abdomen and prolonged below to a bifid lobe, and provided with a deep longitudinal groove. *Wing expanse* : ♂ ♀ 55-65 mm.

**Intraspecific variation** : The species is highly variable and has given rise to the following several subspecies.

- i. *P. delphius ladakensis* Avinoff., 1916 - India : Jammu & Kashmir : Ladak (Lhera – la).
- ii. *P. delphius mamaievi* O. Bang-Haas, 1915 - India : Jammu & Kashmir : South and West Ladak.
- iii. *P. delphius rupshuana* Avinoff., 1916 India : Jammu & Kashmir : South-West Ladak (Rupshu).
- iv. *P. delphius lampidius* Fruhstorfer, 1903- India : Sikkim. *Elsewhere* : Bhutan and Tibet.
- v. *P. delphius lathonius* Bryk, 1913- India : Sikkim to Phari jong.

**Distribution** : India : North-west Himalaya to the Karakoram, South to Ladakh and Rupshu, Sikkim. *Elsewhere* : Afghanistan, Butan, U.S.S.R., Western China.

**Status** : Vulnerable (Vu A 1c, B 1 2bc).



*Parnassius delphius lampidius* Fruhstorfer, (Upperside, Underside) - After Seitz



*P. delphius ladakensis* Avinoff, female - After Talbot (1939)



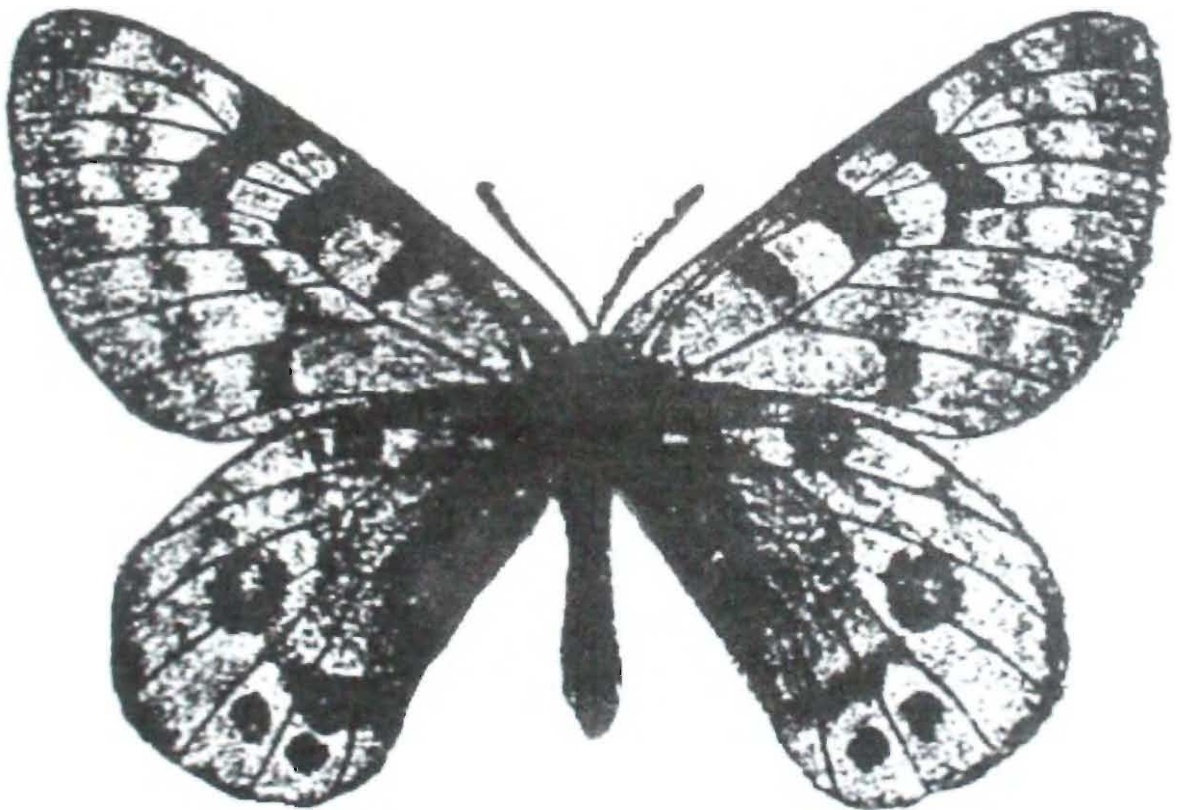
*P. delphius mamaievi* O. Bang-Hass, male - After Talbot (1939)



*P. delphius mamaievi* O. Bang-Hass, female - After Talbot (1939)



*P. delphius rupshuana* Avinoff, male - After Talbot (1939)



*Parnassius delphius lathonius* Bryk, female - After Talbot (1939)

*Habitat and ecology* : The butterfly is a typical alpine dweller. It shows a low rapid and zig-zagged flight, very much like the North-West Himalayan species, *P. charltonius* Gray (The Regal Apollo). *P. delphius rupshuana* was taken at 4650m. flying over loose stony areas at the top of the Tanglang-la Pass; it almost touched the ground, and its flight resembled that of bat. The larval food-plants are those of Saxifragaceae and Fumariaceae. The full-red larva occurs under stones, and as usual for the genus, pupation takes place underground. The adult flies between June and August.

*Threats* : This zone is considered highly fragile. Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and active tourism in summer months; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries cover a large protected area.

*Conservation measures proposed* : There should be check on human activities causing any more threats in its range of occurrence. Efforts should be made for information on its habits, ecology, life-history and distribution. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : The species has a wide range of distribution. There has been considerable decrease and deterioration in its area of occurrence.

*Taxonomic Reliability* : Talbot (1947) has been followed for the species, *Parnassius delphius* (Eversmann). He has also dealt with its subspecies, synonymy and local forms.

Compiled by : I. J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

### 3. *Parnassius hannyngtoni* Avinoff, 1916 THE HANNYNGTON' APOLLO

*Parnassius hannyngtoni* Avinoff, 1916

*Parnassius hannyngtoni* Avinoff : Evans, 1932; Talbot, 1939

**Diagnostic characters** : Upperside of wings very white with feeble markings but without red spots. Fore wing with discal band may or may not be complete; postdiscal band, submarginal white spots and marginal band all of equal width; veins  $R_2$  and  $R_1$  anastomosing,  $R_2$  and  $R_5$  well separated at base,  $R_5$  and  $M_1$  approximate, fringe pale yellow or white. Hind wing with spots present in  $M_3$ -area, in middle of  $M_1$ -area and base of  $M_1$ -area small and black; discal band more or less complete and continuous from  $R_5$  to inner margin; margin white. **FEMALE** : Like male. Female pouch resembles that of *Parnassius acco* Gray but shorter, not reaching so far round the upper part of the body. *Wing expanse* : ♂ ♀ 40-45mm.

**Intraspecific variation** : The species is known to exhibit little variation.

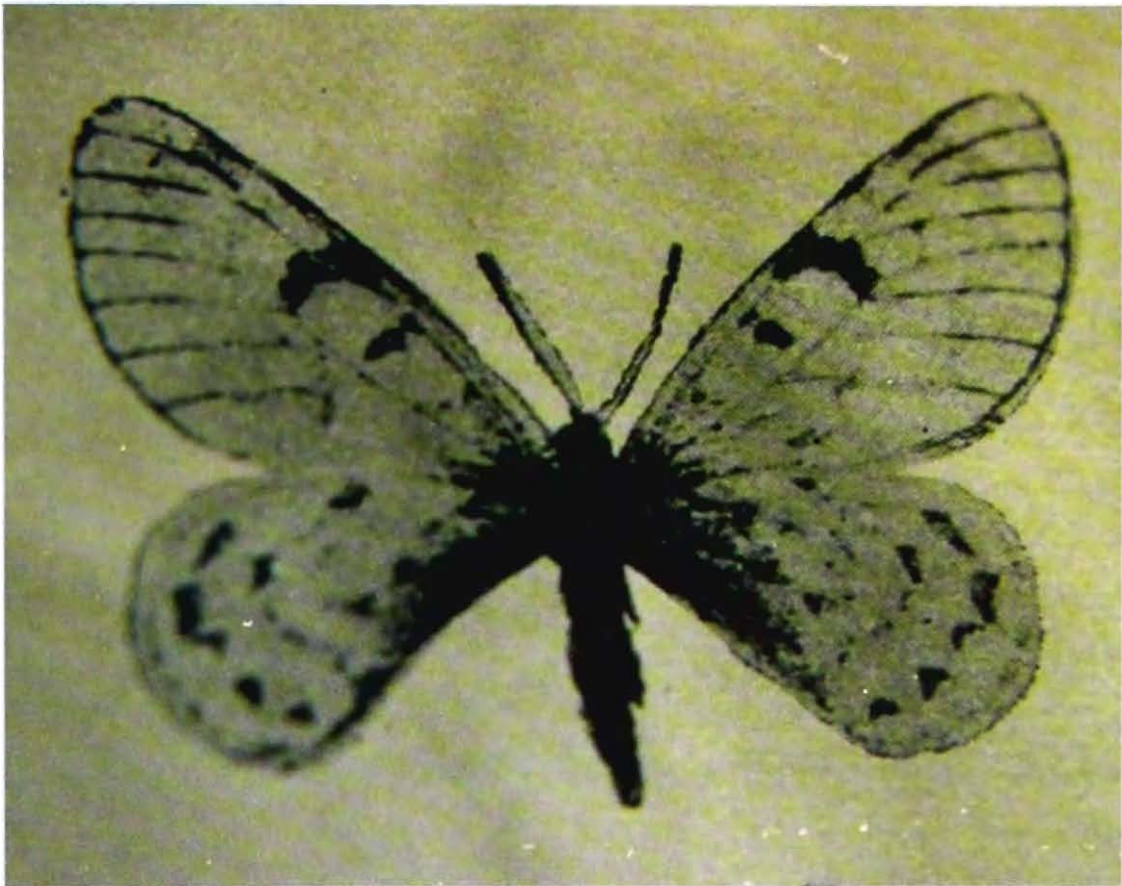
**Distribution** : India : Sikkim. *Elsewhere* : South Tibet.

**Status** : Critically endangered (CR A 1c, B 1 2bc).

**Habitat and ecology** : The butterfly is found at altitude from 4570-4625m. The other habits and ecology are not known.

**Threats** : The area of its occurrence is considered highly fragile. Threats in area include over-grazing clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities.

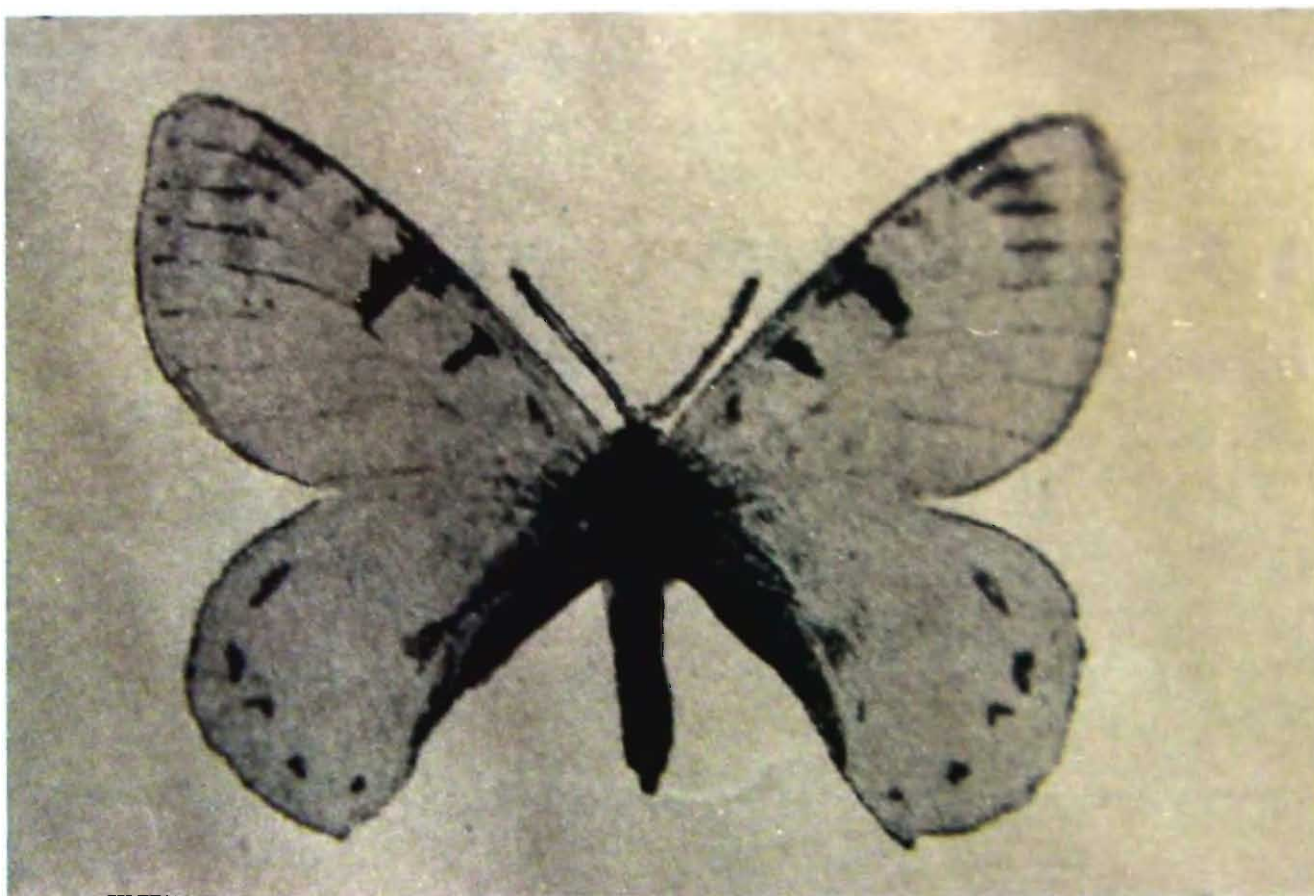
**Conservation measures taken** : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2101.34 sq km. (Singh & Singh, 2002).



*Parnassius hannyngtoni* Avinoff, female (Upperside) - After Talbot (1939)



*Parnassius hannyngtoni* Avinoff, female (Underside) - After Talbot (1939)



*Parnassius hanningtoni* Avinoff, male (Upperside) - After Talbot (1939)



*Parnassius hanningtoni* Avinoff, female (Upperside) - After Talbot (1939)

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : The species is confined to Sikkim, in India. There has been significant loss and degradation in its area of occurrence.

*Taxonomic Reliability* : Talbot (1939) has been followed for the species, *Parnassius hannyingtoni* Avinoff. He has also provided its synonymy.

*Compiled by* : I. J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

#### **4. *Parnassius imperator augustus* Fruhstorfer, 1903**

### **THE IMPERIAL APOLLO**

*Parnassius imperator augustus* Fruhstorfer, 1903

*Parnassius imperator augustus* Fruhstorfer : Bingham, 1907; Verity, 1907-1911; Fruhstorfer, 1908; Evans, 1932; Talbot, 1939.

**Diagnostic characters** : MALE - Ground colour creamy white. Fore wing with all the black bands sharply defined. Hind wing basal patch transparent, very large and red; cell and subanal area with red pear-shaped spots; red ocelli small, but broadly margined with black; blue anal ocelli markedly white-centred. FEMALE - As in male. Sphragis as in *P. delphius*, but stronger and darker, with two pointed lobes. *Wing expanse* : ♂ ♀ 80-90 mm.

**Intraspecific variation** : This is the only Indian subspecies showing little variation.

**Distribution** : India : Sikkim. *Elsewhere* : Tibet.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : This high altitude-dwelling butterfly is known to be the second largest representative of all the Indian Snow Apollos, the first being the nominal form. It was taken originally at Kambhajong, 64 km north of Sikkim border at about 4530m. The deep slate coloured larva, covered with short grey hair, curls up in a ring, when disturbed. The food-plant belongs to Fumariaceae.

**Threats** : The area of its occurrence is considered highly fragile. Threats are over-grazing, clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities.

**Conservation measures taken** : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2101.34 sq km. (Singh & Singh, 2002).



*Parnassius imperator augustus* Fruhstorfer After Bingham (1907)

**Conservation measures proposed :** There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** The subspecies is restricted to Sikkim, in India. Its area of occurrence has shrunk and degraded considerably. Collins & Morris (1985) also made reference to its protection in India.

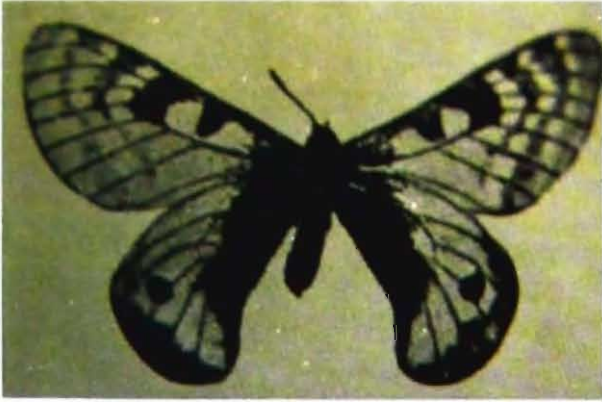
**Taxonomic Reliability :** Talbot (1939) is relied upon for the validity of the subspecies, *Parnassius imperator augustus* Fruhstorfer.

*Compiled by :* I.J. Gupta and D. K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

## 5. *Parnassius stoliczkanus* Felder, 1865 **THE LADAK BANDED APOLLO**

*Parnassius stoliczkanus* Felder, 1865

*Diagnostic characters* : MALE - *Upperside* fore wing without red spot in  $M_1$ -area, hind wing discal ocellus with a red centre and placed nearer the marginal border than to the cell, a row of five antemarginal ocelli or spots placed on the edge of black marginal border or within the border, these ocelli being dark blue to black with a light blue centre, subcostal ocellus often absent. *Underside* hind wing with red basal spots obsolete. FEMALE : Like male; female pouch small, with two lobes more truncate than in *Parnassius delphius* (Eversmann). *Wing expanse* : ♂ ♀ 50-59mm.

*Intraspecific variation* : The species shows much variation and is differentiated into following several species.

- i. *Parnassius stoliczkanus atkinsoni* (Moore) - India : Jammu and Kashmir (Pir Panjal; East Gilgit, Haramosh Mountain).
- ii. *Parnassius stoliczkanus zogilaica* Tytler - India : Jammu and Kashmir (North Kashmir, Zogila Pass)
- iii. *Parnassius stoliczkanus stoliczkanus* C. & R. Felder India : Himachal Pradesh (Kulu), Jammu and Kashmir, (Ladak).
- iv. *Parnassius stoliczkanus spitiensis* Bang-Haas India : Himachal Pradesh (Spiti, Tum Tum Thang Mountains, 4570m.
- v. *Parnassius stoliczkanus florenciae* Tytler India : Uttaranchal (Garhwal) Phup, Hundes, north of Tehri; also North Kumaon).

*Distribution* : India : Jammu & Kashmir : Ladakh, North Kashmir, south and east to Kulu (Himachal Pradesh) and Kumaon (Uttaranchal). *Elsewhere* : Afghanistan, China, Pakistan.

*Status* : Vulnerable (Vu A 1c, B 1 2bc).



*Parnassius stoliczkanus stoliczkanus* C. & R. Felder, male - After Talbot (1939)



*Parnassius stoliczkanus stoliczkanus* C. & R. Felder, female - After Talbot (1939)



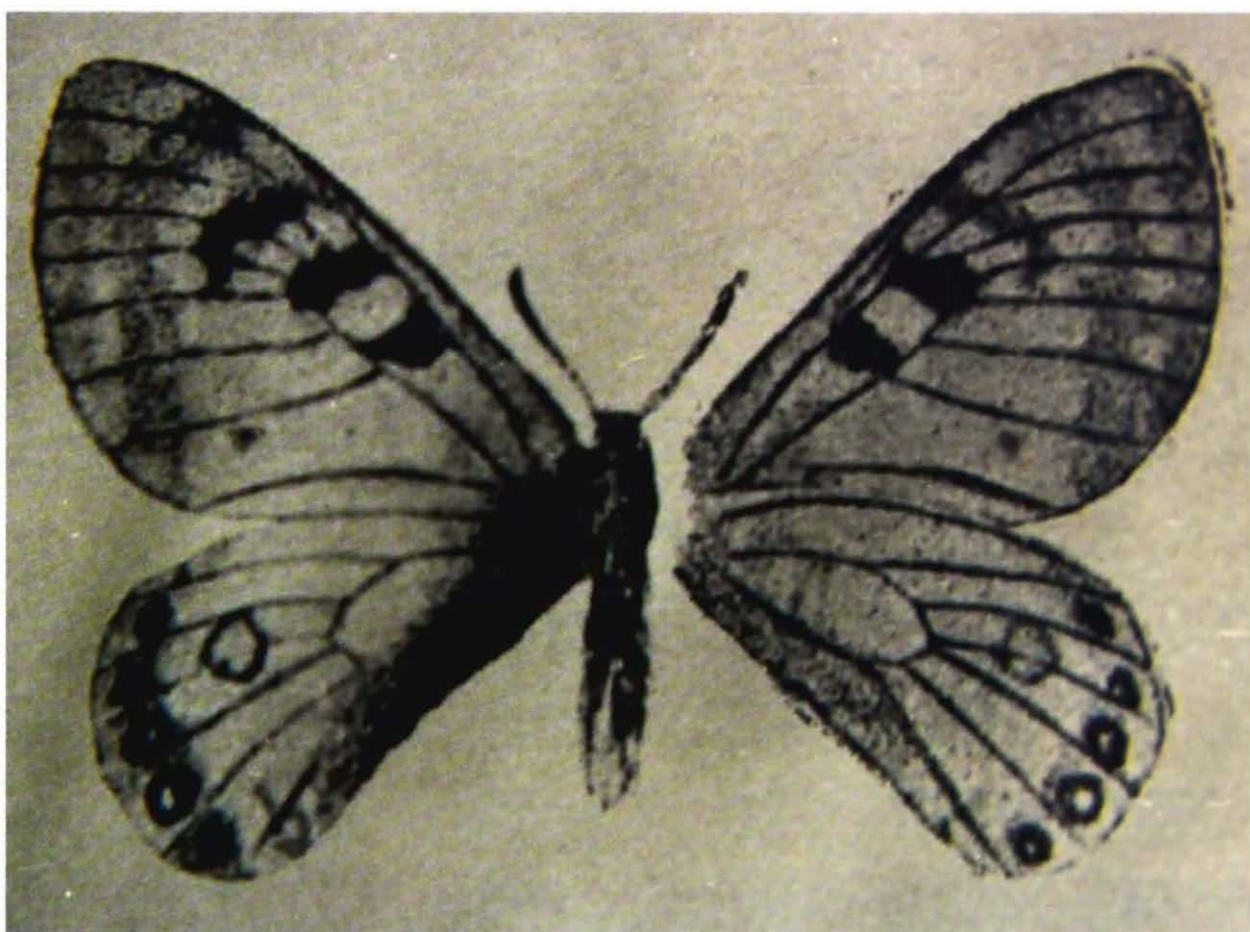
*Parnassius stoliczkanus atkinsoni* (Moore), male - After Talbot (1939)



*Parnassius stoliczkanus zogilaica* Tytler, female - After Talbot (1939)



*Parnassius stoliczkanus spitiensis* O. Bang-Haas, male - After Talbot (1939)



*Parnassius stoliczkanus florenciae* Tytler male - After Talbot (1939)

*Habitat and ecology* : The butterfly appears during June-August. It is recorded from Spiti at an elevation of 4570m. Arora *et al.* (1995) reported it from Nainital (Kumaon). The other habits and ecology are not known.

*Threats* : The area of its occurrence is considered highly fragile. Threats include expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, over-grazing; mining; over-utilization of biological resources; clearing of forests for wood for fuel expansion of industries; human settlements : urbanisation; construction of roads, dams and highways; active tourism in summer months; fragmentation of habitats; selective use of medicinal plants; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land, water and atmospheric pollution by using insecticides and pesticides. There is loss of forest cover of 17% (2,573 sq km) of the geographical area over a period of 14 years (1979-1993) for Himachal Pradesh and a loss of 10.6% of the geographical area over a period of 12 years for Jammu & Kashmir.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 18537.01 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : The species with its subspecies is widely distributed in India. Its range of occurrence should be monitored so as to check any further threat.

*Taxonomic Reliability* : The species, *Parnassius stoliczkanus* Felder and its subspecies have been followed after Talbot (1947) who also provided their synonymy and local forms.

*Compiled by* : I.J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**6. *Atrophaneura coon sambilanga* (Doherty, 1886)  
THE COMMON CLUBTAIL**

*Papilio doubledayi sambilanga* Doherty, 1886

*Losaria sambilanga* (Doherty) : Moore, 1902

*Papilio coon sambilanga* Doherty : Jordan, 1909

*Tros coon sambilanga* (Doherty) : Evans, 1932

*Polydorus coon sambilanga* (Doherty) : Talbot, 1939

*Atrophaneura coon sambilanga* (Doherty) : D'Abbrera, 1985

*Diagnostic characters* : MALE Wings very long and narrow. *Upperside* : Ground colour black. fore wing with prominent streaks extending into cell but not reaching termen. Hind wing tail spatulate; outer two-thirds of cell white; spot below cell short; two red marginal spots united with the corresponding submarginal ones of the cubital area. Abdomen with scent-fold very weak. FEMALE As in male, but without scent-fold. *Wing expanse* : ♂ ♀ 118-134 mm.

*Intraspecific variation* : The subspecies displaying little variation has another following counterpart in India.

*A. coon cacharensis* (Butler) India : Assam (Cachar).

The subspecies *sambilanga* differs from *cacharensis* by upperside hind wing with red spots near margin in  $Cu_{1a}$ -area united.

*Distribution* : India : Andaman and Nicobar islands (Great Nicobar).

*Status* : Critically endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Doherty (1886), however, found it plentiful in Great Nicobar but, subsequently, it was seldom seen (Talbot, 1939; Arora & Nandi, 1980). The other habits and ecology of the butterfly are not known.



*Atrophaneura coon* (Fabricius), (Upperside) After Lewis (1973)  
(Photograph of *A. coon sambilanga* Doherty not given)

**Threats :** This is fragile and ecologically sensitive ecosystem. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken :** This subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The Wildlife Sanctuaries cover an area of 19.18 sq km in Nicobar Islands. (Singh & Singh, 2002).

**Conservation measures proposed :** There should be check on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** The subspecies is confined to Great Nicobar Islands of Andaman and Nicobar islands, in India. There has been considerable loss and degradation in its area of occurrence. There is only one example (Great Nicobar) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** Talbot (1939) has been followed for subspecies with generic change after D'Abbrera (1985) as *Atrophaneura coon sambilanga* (Doherty).

Compiled by : I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

### **7. *Atrophaneura crassipes* (Oberthuer, 1893)**

#### **THE BLACK WINDMILL**

*Papilio crassipes* Oberthuer, 1893

*Byasa crassipes* (Oberthuer) : Moore, 1902

*Papilio crassipes* Oberthuer : Bingham, 1907; Jordan, 1909

*Tros crassipes* Oberthuer) : Evans, 1932

*Polydorus crassipes* (Oberthuer) : Talbot, 1939

*Atrophaneura crassipes* (Oberthuer) : D'Abrera, 1982; Varshney, 1993

**Diagnostic characters** : MALE Ground colour black. Fore wing for wing with black veins, a longitudinal streak between veins and streaks within the cell. Hind wing discal and submarginal spots faintly red; scent-wool greyish white; tail short, broad and tipped bright crimson; *underside* with two each of large anteroterminal and subanal lunules; anal lunule irregular in shape. FEMALE - As in male, but with hind tibiae markedly narrower and without scent-wool. *Wing expanse* : ♂ ♀ 110-120 mm.

**Intraspecific variation** : The species shows little variation in India.

**Distribution** : India : Manipur, Nagaland. *Elsewhere* : North Myanmar; Vietnam.

**Status** : Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The butterfly occurs at elevations of 300-750m. Tytler (1915) collected 10 specimens including a female from Western Manipur Hills, Manipur valley in March, June, July and September and two males from Nichugaurd, Naga Hills, Nagaland in April between altitude 900-1000m. The other habits and ecology are not known.

**Threats** : Threats in area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Atrophaneura crassipes* (Oberthuer), male - After D'Abrera (1982)



*Atrophaneura crassipes* (Oberthuer), female - After D'Abrera (1982)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in area of 433.35 sq km. (Singh & Singh, 2002).

*Conservation measures proposed* : Its range of occurrence should be monitored to check any further threat. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to Manipur and Nagaland in India. There has been significant decrease and degradation in its area of occurrence. The species is represented by only one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Talbot (1947) has been followed for the species, *Atrophaneura crassipes* (Oberthur) with generic change after D'Abrera (1982).

*Compiled by* : I.J. Gupta and D. K. Mondal

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**LEAST CONCERN**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**8. *Pachliopta hector* (Linnaeus, 1758)**  
**CRIMSON ROSE**

*Papilio hector* Linnaeus, 1758

*Papilio hector* Linnaeus : Bingham, 1907; Jordan, 1910

*Tros hector* (Linnaeus) : Evans, 1932; Wynter-Blyth, 1957

*Polydorus hector* (Linnaeus) : Talbot, 1947

*Pachliopta hector* (Linnaeus) : Varshney, 1993

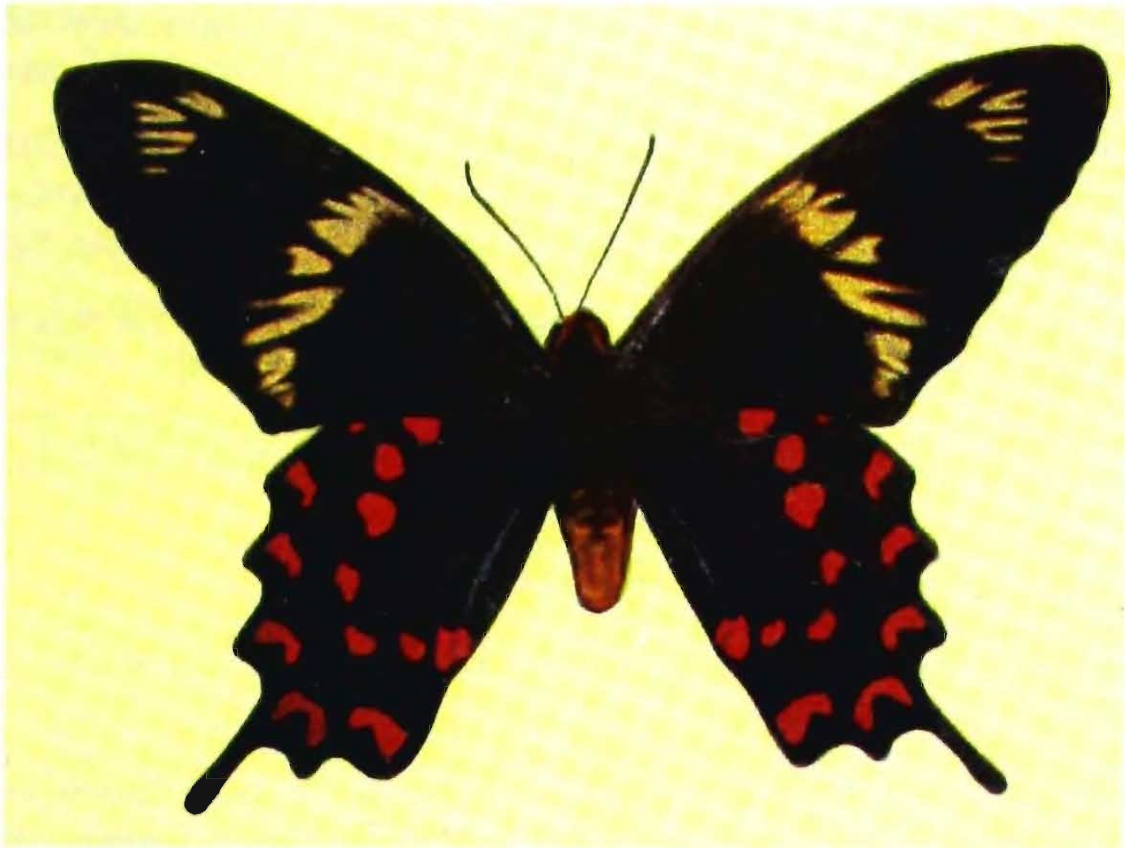
**Diagnostic characters :** MALE : Upperside black. Fore wing with a broad white interrupted band from the vein Sc opposite the origin of veins  $R_2$  and  $R_1$ , extended obliquely to the tornus, and a second similar subapical band; both bands composed of detached irregularly indented broad streaks in the interspaces. Hind wing a discal posteriorly strongly curved series of seven crimson spots followed by a submarginal series of crimson lunules. Cilia black alternating with white. Head, collar, sides of thorax and abdomen, with the exception of anterior tergites, red. FEMALE : Paler than the male. Discal and submarginal markings duller, pale crimson irrorated with black scales; anterior spots and lunules may be almost white. Abdomen above with black colour extending further towards the apex. *Wing expanse* : ♂ ♀ 90-110mm.

**Intraspecific variation :** The male and female are distinguishable. In female, the anterior spots and lunules may be almost white.

**Distribution :** India : Andaman & Nicobar Islands : Andamans, Bihar, Goa, Gujarat, Kerala, Maharashtra, Orissa, Tamil Nadu and West Bengal. *Elsewhere* : Bangladesh, Sri Lanka.

**Status :** Least Concern ( LC).

**Habitat and ecology :** The butterfly is very common in southern part of the Peninsula and all down the Western Ghats. It is found both in jungle and open country and is found



*Pachliopta hector* (Linnaeus)

of low flowering bushes and plants. During the dry weather it occurs up to elevation of 2450m in South India but flies all the year round at low elevations. In Bombay this butterfly roosted in great numbers together (Eaton, 1880). "On Western Ghats between Vingoria and Belgaum, where this butterfly occurred in some numbers, I also noted the habit they have roosting in company on twigs of some thorny shrub, but I never saw more than a score or so together" (Talbot, 1939). Talbot (*loc. cit.*) mentioned about its biology – larva and pupa. Its food plants are *A. indica*, *Aristolochia sp.*, *Bagantia wallichii*, (Sevastopulo, 1973); *Lantana* (Wynter-Blyth, 1957), *Aristolochia bractaslata*, *A. tagala chamisso*, *A. krisagartha*, *Thottea siliquosa* (Gunathilagaraj *et al.*, 2000).

**Threats :** There has been a massive habitat loss for the past few decades. Threats are shifting cultivation, crop plantation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal, selective logging *i.e.*, selective work of cutting down/making use of forest produces; clearing of forests for human settlements, construction of dams and hydroelectric plants, setting up of railway lines, setting up of industries; fragmentation of habitat; industrial pollutants causing land, water and atmospheric pollution and deliberate forest fires. There has been loss of 50% of forest cover in 50 years in Western Ghats (Goankar, 1996)

**Conservation measures taken :** The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. A number of National Parks and Wildlife Sanctuaries have been established in its area of occurrence.

*Conservation measures proposed* : There should be monitoring to check any more threats in its area of occurrence. The ferning programme of this species is suggested.

*Rationale* : The species is well represented its wide range of distribution. There has been considerable decrease and deterioration in its area of occurrence. There are several examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Pachliopta hector* (Linnaeus) has been followed after Talbot (1939) with generic change as treated by Varshney (1993).

Compiled by : I.J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Clas INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**9. *Atrophaneura nevillei* (Wood-Mason, 1882)**

**THE NEVILL'S WINDMILL**

*Papilio nevillei* Wood-Mason, 1882

*Byasa nevillei* (Wood-Mason) : Moore, 1902

*Papilio nevillei* Wood-Mason : Bingham, 1907; Jordan, 1909

*Tros nevillei* (Wood-Mason) : Evans, 1932

*Polydorus nevillei* (Wood-Mason) : Talbot, 1939

*Atrophaneura nevillei* (Wood-Mason) : D'Abrera, 1982; Varshney, 1993

*Diagnostic characters* : MALE Ground colour brownish black. Fore wing internervular streaks velvety black. Hind wing submarginal series of lunules crimson or vermillion red, one in Cu<sub>2</sub>-area often absent; tail black without any red spot; scent-wool yellowish white; sexual abdominal fold within white, not blackish brown. FEMALE - As in male, but without scent-wool. *Wing expanse* : ♂ ♀ 100-120 mm.

*Intraspecific variation* : This species is not known to show significant variation. The specimens from western China have the white spots on the upperside of hind wing more rose tinted than those from Assam or the Shan states (D'Abrera, 1982).

*Distribution* : India : Assam (Cachar). *Elsewhere* : North Myanmar; West China.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The butterfly is a forest-dweller, often coming out in the open to visit flowers. It has a slow and graceful flight and emits a very strong offensive odour to ward off the predators. The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; use of illegal



*Atrophaneura nevillei* (Wood-Mason) male (Upperside) - After D'Abrera (1982)



*Atrophaneura nevillei* (Wood-Mason) female (Upperside) - After D'Abrera (1982)

trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2851.75 sq km. (Singh & Singh).

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution to Assam, in India. There has been a significant reduction and degradation in its area of occurrence.

*Taxonomic Reliability* : Talbot (1939) has been followed for the species, *Atrophaneura nevillei* (Wood-Mason) with generic change after D'Abrera (1982).

Compiled by : I.J. Gupta and D. K. Mondal

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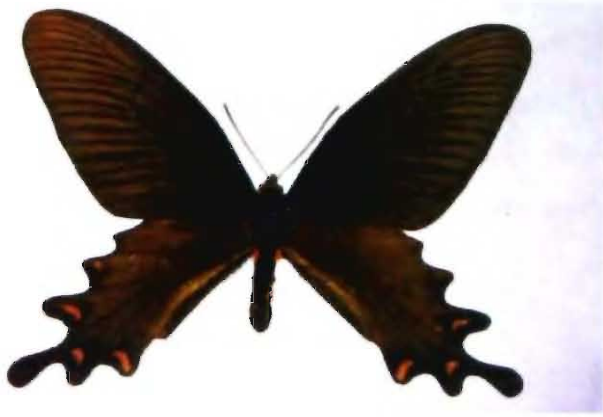
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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**10. *Atrophaneura plutionius pembedtoni* (Moore, 1902)  
THE PEMBERTON'S CHINESE WINDMILL**

*Byasa pembedtoni* Moore, 1902

*Papilio alcinous* race *pembedtoni* (Moore) : Bingham, 1907

*Papilio plutionius pembedtoni* (Moore) : Jordan, 1909

*Tros alcinous pembedtoni* (Moore) : Evans, 1932

*Polydorus plutionius pembedtoni* (Moore) : Talbot, 1939

*Atrophaneura plutionius plutionius* (Oberthuer) : D'Abbrera, 1982

**Diagnostic characters :** MALE Ground colour fuliginous black. Fore wing with broad pale adnervular-streaks, extending from base to termen. Hind wing cell and submarginal interspaces pale, but veins black; a submarginal series of pinkish-white broad lunules in  $Cu_{1b}$  to  $M_2$ -areas; tail immaculate; scent-wool black-brown; *underside* paler, with an additional lunule in anal area (1) extending over the vein into  $Cu_{1b}$  area, and another very small one in  $R_5$ -area. FEMALE - Ground colour pale olivascent greyish-fuliginous. Hind wing submarginal lunules flesh-coloured and larger, with surrounding borders dull black; *underside* a little paler with six submarginal pale flesh-coloured lunules besides a broad similarly coloured anal lunule. *Wing expanse* : ♂ ♀ 100-120 mm.

**Intraspecific variation :** This subspecies occurring in India has a following counterpart.

*A. plutionius tytleri* (Evans) - India : Manipur and Nagaland.

The subspecies *pembedtoni* is distinguished from *tytleri* by the upperside of hind wing with a complete row of nearly white submarginal spots in  $Cu_{1b}$  to  $M_2$ -areas.

**Distribution :** India : Sikkim. *Elsewhere* : Bhutan.

**Status :** Critically Endangered (CR A1c, B1 2bc).



*Atrophaneura plutionius plutionius* (Oberthues), male (Upperside) - After D'Abbrera (1982)



*Atrophaneura plutionius plutionius* (Oberthues), female (Underside) - After D'Abbrera (1982)

**Habitat and ecology :** The butterfly is found at high altitudes. Its other habits and ecology are not known

**Threats :** The area of its occurrence is considered highly fragile and threats include over-grazing, clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats. Selective use of medicinal plants and collecting other forest commodities and animals.

**Conservation measures taken :** The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in area of 2101. 34 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** Its range of occurrence should be monitored for any further threats. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** In India, this subspecies is restricted to Sikkim. There has been considerable loss and degradation in its area of occurrence.

**Taxonomic Reliability :** Talbot (1947) has been followed for the subspecies, *Atrophaneura plutonius pembertoni* (Moore) with generic change after D'Abbrera (1982). D'Abbrera (1982) considered subspecies *pembertoni* as synonym of nominate subspecies.

Compiled by : I.J. Gupta and D. K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

### 11. *Atrophaneura polla* (de Nicéville, 1897)

#### THE DE NICEVILLE'S WINDMILL

*Byasa polla* de Niceville, 1897

*Byasa polla* de Niceville : Moore, 1902

*Papilio polla* (de Niceville) : Bingham, 1907; Tytler, 1915

*Papilio latreillei polla* (de Niceville) : Jordan, 1910

*Tros polla* de Niceville : Evans, 1932

*Polydorus polla* (de Niceville) : Talbot, 1939

*Atrophaneura polla polla* (de Niceville) : Mandal, 1985

*Atrophaneura polla* (de Niceville) : D'Abbrera, 1982; Varshney, 1993

**Diagnostic characters** : MALE *Upperside* : Ground colour dull brownish black. Fore wing narrower, cell and intervein streaks as well as veins velvety black; cilia from tornus to Cu<sub>1a</sub> bright red; termen more oblique and the tornus more rounded. Hind wing postdiscal band of long white spots between M<sub>3</sub> and Cu<sub>1b</sub>; terminal series of semilunar red spots between M<sub>2</sub> and Cu<sub>1b</sub>; cilia at apex of M<sub>2</sub> red; tail red-tipped; white woolly scent fold along anal margin; *underside* base not marked red. FEMALE - As in male, but hind wing postdiscal white patch continued to anal margin but not extending to cell-end and without scent-fold. *Wing expanse* : ♂ ♀ 110-130 mm.

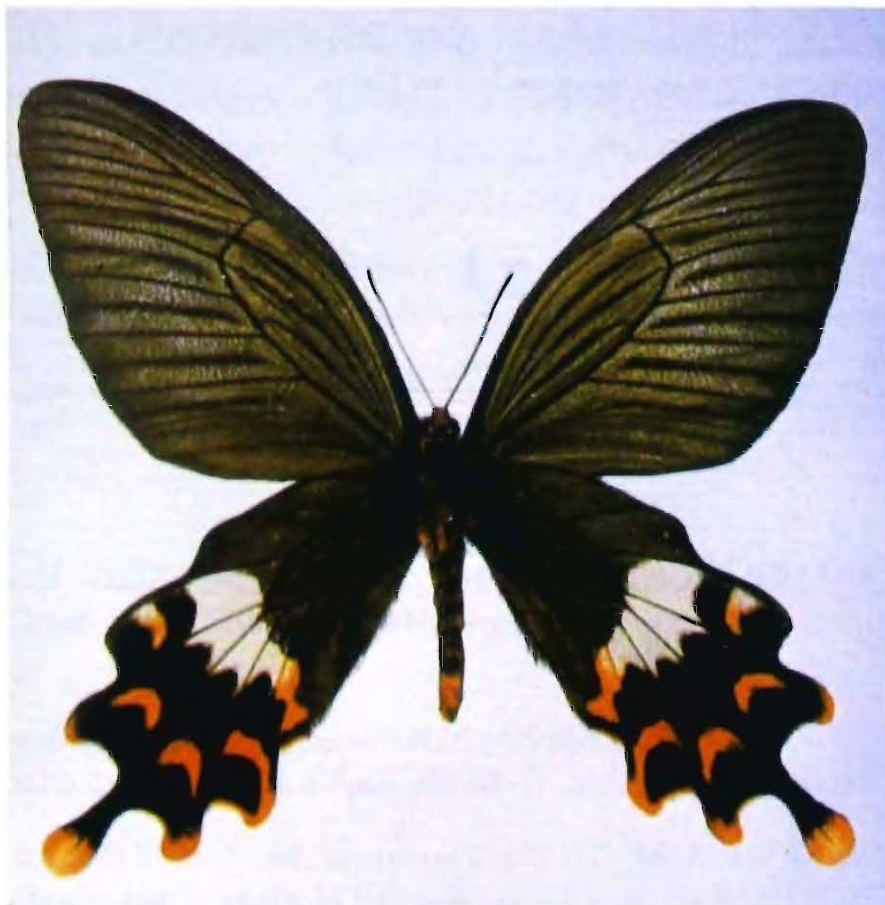
*Intraspecific variation* : The species is not known to show significant variation.

*Distribution* : India : Assam, Arunachal Pradesh; Manipur; Nagaland. *Elsewhere* : North Myanmar.

*Status* : Vulnerable (Vu A1c, B1 2bc).



*Atrophaneura polla* de Nicéville, male (Upperside) - After D'Abbrera (1982)



*Atrophaneura polla* de Nicéville, female (Underside) - After D'Abbrera (1982)

**Habitat and ecology :** This butterfly is single brooded. Tytler (1915) took two males at Saitu, Manipur, in May and a female at Paona, Naga Hills at 2530m. in June. The butterfly exhibits high soaring flight over tree-tops in very dense forests and often descends on wooded paths for repose. The species feeds exclusively on plants of Aristolochiaceae in the larval stage. Mandal (1985) recorded the nominate subspecies from Kameng, Arunachal Pradesh and mentioned that it appeared in temperate zone during spring and summer. The other habits and ecology are not known.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2000).

**Conservation measures taken :** The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 13405.01 sq km (Singh & Singh, 2002).

**Conservation measures proposed :** There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

**Rationale :** Qualifies for a few known records of its distribution in India. Its area of occurrence has shrunk considerably and also degraded.

**Taxonomic Reliability :** This species, *Atrophaneura polla* (de Niceville) has been followed after Talbot (1939) generic change as treated by D'Abrera (1982).

*Compiled by :* I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**12. *Chilasa clytia clytia f. commixtus* Rothschild, 1895**  
**THE COMMON MIME**

*Papilio clytia* ab. *commixtus* Rothschild, 1895

*Chilasa clytia clytia f. commixtus* (Rothschild) 1895

*Chilasa clytia f. commixtus* (Rothschild) : Jordan, 1909

*Chilasa clytia clytia f. commixtus* (Rothschild) : Evans, 1932 ; Talbot, 1939

**Diagnostic characters** : MALE - Ground colour dark brown. Fore wing brown-black, with faint discal stripes, and smaller spots before the outer margin. Hind wing cell mostly brown-black; long discal internervular streaks present. FEMALE - As for male. *Wing expanse* : ♂ ♀ 90-100 mm.

**Intraspecific variation** : The subspecies, *Chilasa clytia clytia* is highly variable. Besides *f. commixtus*, there are following another five forms.

- i) *f. clytia* (Linnaeus) - Northern India. Hind wing with a discal series of inwardly conical and outwardly emarginated, triangular streaks in areas 1 to 5.
- ii) *f. casyapa* (Moore) - Northern India. Hind wing black-brown from base to beyond apex of cell, post discal sagittate spots large.
- iii) *f. panope* (Linnaeus) Northern India. Hind wing with discal sagittate spots small.
- iv) *f. dissimilis* (Linnaeus) - Southern India to North-West Himalaya. Hind wing long discal streaks reaching outer margin of cell.
- v) *f. dissimillima* Evans North-East India to Myanmar. Pale markings dusted with black and are more restricted.

The *f. commixtus* Rothschild differs from above forms by the upperside of hind wing with long discal internervular streaks, but the cell for the most part brown-black. It is



*Chilasa clytia clytia* f. *commixtus* (Rothschild) After Seitz

considered intermediate between f. *clytia* and f. *dissimilis* having fore wing like the former and hind wing like the latter.

**Distribution :** India : Meghalaya (Khasia Hills); Sikkim. *Elsewhere :* (Bangladesh).

**Status :** Endangered (EN A1c, B1 2bc).

**Habitat and ecology :** The habits and ecology are not much known.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The butterfly is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2403.02 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits,

ecology, life-history and distribution of this butterfly. Efforts should be made to rear this butterfly by ranching.

**Rationale** : This form is restricted to a couple of localities in north eastern part of India. There has been significant loss as well as deterioration in its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability** : Talbot (1939) has been followed for the form, *Chilasa clytia clytia* f. *commixtus* (Rothschild).

Compiled by : I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**13. *Papilio elephenor* Doubleday, 1845  
THE YELLOW-CRESTED SPANGLE**

*Papilio elephenor* Doubleday, 1845

*Pangeranopsis elephenor* (Doubleday) : Moore, 1903

*Papilio elephenor* Doubleday : Bingham, 1907; Jordan, 1910

*Papilio elephenor elephenor* Doubleday : Evans, 1932

*Papilio elephenor* Doubleday : Talbot, 1939; Varshney, 1993

*Papilio elphenor* (sic) Doubleday : D'Abrera, 1982

*Diagnostic characters* : MALE Head yellow. Ground colour black. Fore wing cellular and internervular streaks irrorated with brilliant green scales; postero-distally with wooly scent-streaks. Hind wing tailless; elongate; irrorated with brilliant blue and green scales; anal angle with a small claret-red patch touched with violet and with a black spot; *underside* with a double row of claret-red submarginal lunules irrorated with violet. Abdomen laterally buff-coloured. FEMALE As for male. *Wing expanse* : ♂ ♀ 110-138 mm.

*Intraspecific variation* : The species is known to show little variation.

*Distribution* : India : Assam (Jorhat, Cachar and Sadyia); Meghalaya (Khasia Hills); Nagaland.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides



*Papilio elephenor* Doubleday, male (Upperside) - After D'Abrera (1982)



*Papilio elephenor* Doubleday, female (Underside) - After D'Abrera (1982)

and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 3375.11 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : More information from the eastern part of the species' range is desirable (Collins & Morris, 1985). There should be restraint on human interference causing any further threats in its range of occurrence. Efforts should be made for information on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for a few records in its short range of distribution. There has been significant decrease and degradation in its area of occurrence. There are five examples (Bangladesh-Sylhet) in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Talbot (1939) has been followed for the species, *Papilio elephenor* Doubleday.

*Compiled by* : I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PAPILIONIDAE

**14. *Papilio liomedon* Moore, 1874**  
**THE MALABAR BANDED SWALLOWTAIL**

*Papilio liomedon* Moore, 1874

*Papilio liomedon* Moore : Davison & Aitken, 1890

*Arominta liomedon* (Moore) : Moore, 1902

*Papilio demolion* race *liomedon* Moore : Bingham, 1907

*Papilio liomedon* Moore : Jordan, 1909; Talbot, 1939

*Papilio demolion liomedon* Moore : Evans, 1932

*Papilio liomedon* Moore : D'Abbrera, 1985; Varshney, 1993

*Diagnostic characters* : MALE *Upperside* : Ground colour black. Fore wing with a submarginal creamy yellow band made of separate spots; *underside* cell with longitudinal pale lines from base. Hind wing tailed; median band of coalescent spots continued to fore wing from middle of anal margin; submarginal series of greenish yellow lunules; *underside* with area beyond the median white band broadly streaked jet-black and followed by marginal row of lunules. FEMALE As in male. *Wing expanse* : ♂ ♀ 110-115 mm.

*Intraspecific variation* : The species is not known to show significant variation.

*Distribution* : India : Southern Peninsula : Kerala (Calicut); Karnataka (Kanara; Coorg).

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : This butterfly, which remains on flight chiefly during monsoon months is the rarest of all the South Indian "Papilios." It inhabits wooded hills and also plains. Sevastopulo (1973) provided its food-plants *Acronychia laurifolia* and *Evodia roxburghiana* of the family Rutaceae. The caterpillars of this prolific breeder live gregariously, but their rate of mortality mainly due to parasitic attack is well over 90% of the eggs laid



*Papilio liomedon* (Moore), male (Upperside) - After D' Abrera (1982)



*Papilio liomedon* (Moore), female (Upperside) - After D' Abrera (1982)

in a batch of ten. There are two or three broods in the year, and in breeding the males largely outnumber the females. It was recorded in July and September in Kanara, September to December and April to May in Coorg. Bingham (1907) and Talbot (1939) cited account of early stages as given by Davidson & Aitken (1890).

*Threats* : Threats in the area are shifting cultivation, crop plantation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal, selective logging i.e, selective work of cutting down/making use of forest produces; setting up of railway lines, clearing of forests for human settlements, construction of roads, dams and hydroelectric plants, setting up of industries; fragmentation of habitat; industrial pollutants causing land, water and atmospheric pollution. There has been a massive habitat loss for the past few decades. There has been loss of 50% of forest cover in 50 years in Western Ghats (Goankar, 1996).

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2101. 34 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. Efforts should be made to raise this butterfly through ranching and captive breeding. Parasites of this butterflies should not be destroyed at random to maintain nature's balance. More information is required on its distribution.

*Rationale* : This species is restricted to a couple of localities in southern part of India. There has been a significant loss as well as deterioration in its area of its occurrence. There are only six examples in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : This species, *Papilio liomedon* Moore has been treated after Talbot (1939).

*Compiled by* : I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PIERIDAE

15. *Baltia butleri sikkima* Fruhstorfer, 1903

**THE WHITE BUTTERFLY**

*Baltia shawi sikkima* Fruhstorfer, 1903

*Baltia butleri sikkima* Fruhstorfer : Evans, 1932 : Talbot, 1939

*Diagnostic characters* : MALE - Ground colour dead white; base of wings irrorated black and cell yellow. Fore wing submarginal band complete and continued in hind wing; *underside* apex with veins yellow and broadly defined dark brown. Hind wing *underside* with veins also yellow and dark brown. FEMALE As for male. *Wing expanse* : ♂ ♀ 35-45 mm.

*Intraspecific variation* : The other following nominate subspecies occurs in India :

*B. butleri butleri* (Moore) - Jammu & Kashmir (Ladakh) to Uttaranchal (Kumaon).

The subspecies, *sikkima* differs from *butleri* by the *underside* of both wings brightly coloured.

*Distribution* : India : Sikkim (Lachen Pok, c 5000 m). *Elsewhere* : Tibet.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This sun-loving butterfly dwells in high alpine belts where there is no vegetation. It is reported at altitude of 3650-5200m. Talbot (1939) mentioned that one male was collected by Evans in June, 1921, from Lachen Pok (5200m.) in Sikkim. It remains on flight during June and when disturbed, quickly hides amidst the rugged topography (Fruhstorfer, 1910). The other habits and ecology of the butterfly are not known.

*Threats* : The area of its occurrence is considered highly fragile and threats include over-grazing clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats. selective use of medicinal plants and collecting other forest commodities and animals.

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Baltia butleri sikkima* Fruhstorfer - After Seitz



*Baltia butleri butleri* (Moore), male (Upperside) - (specimen in ZSI Collection)



*Baltia butleri butleri* (Moore), male (Underside) - (specimen in ZSI Collection)



*Baltia butleri butleri* (Moore), female (Upperside), Ladakh - (specimen in ZSI collection)



*Baltia butleri butleri* (Moore), female (Upperside), Ladakh - (specimen in ZSI collection)

National Park and Wildlife Sanctuaries have been established in area of 2101.34 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

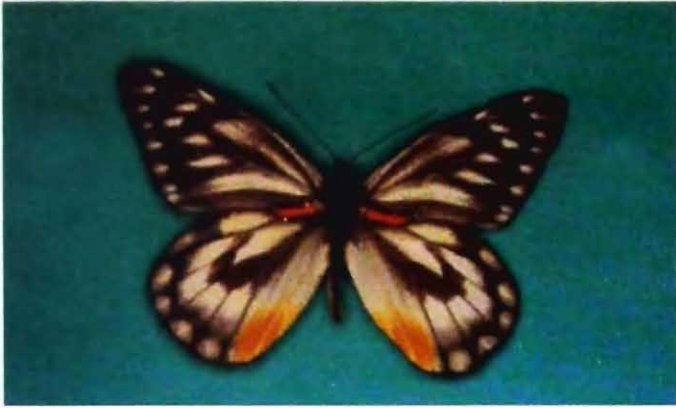
*Rationale* : The butterfly is confined to Sikkim in India. There has been significant reduction and deterioration in the area of its occurrence.

*Taxonomic Reliability* : The subspecies, *Baltia butleri sikkima* Fruhstorfer has been followed after Talbot (1939) who has also treated synonymy and other subspecies. Varshney (1993) listed *Baltia sikkima* Fruhstorfer as species.

*Compiled by* : I.J. Gupta and D. K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family PIERIDAE

## 16. *Delias sanaca* (Moore, 1857)

### THE PALE JEZEBEL

*Pieris sanaca* Moore, 1857a.

*Delias sanaca* (Moore) : Talbot, 1939, D'Abrera, 1985; Varshney, 1993

**Diagnostic characters** : MALE - Ground colour black. Fore wing scent-scale flask-shaped. Hind wing cell stripe broad and diffused, marginal spots large. FEMALE - Hind wing cell-stripe prominent white, distance between distal edge of cubital spots and inner edge of submarginal spots opposite them not greater than 4 mm. *Wing expanse* : ♂ 70-94 mm; ♀ 84-96 mm.

**Intraspecific variation** : This species shows variation in size and shape of spots and other markings on fore wing and hind wing and colouration. Consequently, three subspecies occur in India.

- i) *D. sanaca sanaca* (Moore) - North-West Himalaya.
- ii) *D. sanaca oreas* Talbot - Sikkim, West Bengal (Senchal : Darjiling District).
- iii) *D. sanaca perspicua* Fruhstorfer - Arunachal Pradesh (Kameng : Dirang Dzong, c 1830 m, and Jumla Pass, c 2848 m). *Elsewhere* : Myanmar, South-West China and Vietnam.

The ssp. *sanaca* has fore wing with submarginal spots very large; ssp. *oreas* Talbot with fore wing submarginal spots very small and ssp. *perspicua* with fore wing stripes narrow and submarginal spots of moderate size.

**Distribution** : India : Arunachal Pradesh, Sikkim, Uttaranchal, West Bengal. *Elsewhere* : Myanmar, South-West China and Vietnam.

**Status** : Vulnerable (Vu A1c, B1 2bc).

**Habitat and ecology** : This widely distributed species principally inhabits the mountains preferring open spaces amidst oak-wood. It flies like swallows, chases another of its kind



*Delias sanaca sanaca* (Moore), male (Upperside) - (specimen in ZSI collection)



*Delias sanaca sanaca* (Moore), male (Underside) - (specimen in ZSI collection)



*Delias sanaca sanaca* (Moore), female (Upperside) - (specimen in ZSI collection)



*Delias sanaca sanaca* (Moore), female (Underside) - (specimen in ZSI collection)



*Delias sanaca oreas* Talbot, female (Upperside) - (specimen in ZSI collection)



*Delias sanaca oreas* Talbot, female (Underside) - (specimen in ZSI collection)



*Delias sanaca perspicua* Fruhstorfer, male (Upperside) - After D'Abrera (1982)



*Delias sanaca perspicua* Fruhstorfer, male (Underside) - After D'Abrera (1982)



*Delias sanaca perspicua* Fruhstorfer, male (Upperside) - After D'Abrera (1982)

and is fond of circling round tree-tops on which it settles. Its scent somewhat resembles that of pears. It is encountered at altitude of 1200-3050m. (Wynter-Blyth, 1957) during May-October (May to July). Mandal & Ghosh (1967) recorded *D. sanaca perspicua* Fruhstorfer from Arunachal Pradesh (India). Arora *et al.* (1995) recorded it at altitude of 1525-3050m in Tehri. The other habits and ecology are not known.

*Threats* : Threats in the area are - increase of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements : urbanisation; construction of roads, dams, hydroelectric plants and highways, setting up of industries, for human settlements and tourism; fragmentation of habitats; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land , water and atmospheric pollution on account of using pesticides. There is a loss of 783 sq km forest cover during 1995-1997 for North-east India (Alfred *et al.*, 2002).

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. There are National Parks and Wildlife Sanctuaries in its area of occurrence

*Conservation measures proposed* : There should be restraint on human interference causing any more threats in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : The species is known with its subspecies from its range of distribution in India. There has been significant loss and deterioration in its area of occurrence. There are twenty two examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Delias sanaca* (Moore) has been followed after Talbot (1939) who has treated its subspecies, synonymy and local forms.

*Compiled by* : I.J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PIERIDAE

**17. *Pieris krueperi devta* (de Nicéville, 1883)**

**THE GREEN BANDED WHITE**

*Mancipium devta* de Niceville, 1883

*Pieris devta* (de Niceville) : Roeber, 1907

*Pieris krueperi* race *devta* (de Niceville) : Bingham, 1907.

*Pieris krueperi devta* (de Niceville) : Fruhstorfer, 1910; Evans, 1932; Talbot, 1939

*Diagnostic characters* : MALE Ground colour dead white. Fore wing base black-dusted; a subapical distal triangular black patch; upper cubital area with a large black spot; marginal black triangular spots on Cu<sub>1a</sub> to M<sub>2</sub>; *underside* margin faintly greenish yellow. Hind wing with a black subapical costal spot; marginal spots small; *underside* basal two-thirds black-dusted; with a broad oblique band from mid-costa to cell. FEMALE - More or less as in male, but with an additional spot in Cu<sub>1a</sub>-area. *Wing expanse* : ♂ ♀ 45-55 mm.

*Intraspecific variation* : *P. krueperi devta* is the only subspecies known from India and shows little variation.

*Distribution* : India : Jammu and Kashmir (Ladakh, c 3000 m). *Elsewhere* : China, (Kashgar); Pakistan (Baluchistan); Uzbekistan (Samarkand) (C Fruhstorfer, 1910).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This butterfly inhabits desolate alpine plateaux and artificially watered meadows (Fruhstorfer, 1910). It is on flight during June. Talbot (1939) mentioned, the subspecies is "but more frequent in Kashmir at about 2850m."

*Threats* : The area of its occurrence is considered highly fragile and threats include agricultural and horticultural activities over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities and



*Pieris krueperi devta* (de Niceville) (Upperside) - (Specimen in ZSI collection)



*Pieris krueperi devta* (de Niceville) (Underside) - (Specimen in ZSI collection)

animals. There is loss of forest cover of 10.6% of the geographical area over a period of 12 years for Jammu & Kashmir.

*Conservation measures taken* : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 14870.22 sq km of which Hemis National Park includes an area of 4100 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be check on activities posing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : In India, this species is confined to Ladakh, in Jammu & Kashmir. There has been significant decrease and deterioration in the area of its occurrence. There are two examples (Ladakh) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Talbot (1939) has been relied upon for the validity of the subspecies, *P. krueperi devta* (de Nicéville).

*Compiled by* : I.J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PIERIDAE

**18. *Colias cocandica thrasibulus* Fruhstorfer, 1909**

**THE LEMON CLOUDED YELLOW**

*Colias thrasibulus* Fruhstorfer, 1909

*Colias thrasibulus* Fruhstorfer : Evans, 1932

*Colias cocandica thrasibulus* Fruhstorfer : Talbot, 1939

*Diagnostic characters* : MALE - Ground colour pale greenish-yellow. Fore wing base with a small patch of black dusting; discocellular spot black; *underside* veins white. Hind wing discocellular spot absent; *underside* with proximal area rich dark green. FEMALE - Ground colour dead sullied white. Wing markings as in male. *Wing expanse* : ♂ ♀ 35-45 mm.

*Intraspecific variation* : This is the only subspecies known from India and shows little variation.

*Distribution* : India : Jammu & Kashmir : Ladakh (Chonging valley and Kardong Pass), c 5000-5600m.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The Talbot (1939) mentioned its a record from elevation of 5002-5600m. The butterfly inhabits open hill-tops at high altitude and flies fast but low. The other habits and ecology are not known.

*Threats* : The area of its occurrence is considered highly fragile and threats include over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats. selective use of medicinal plants and collecting other forest commodities and animals. The state has lost forest cover of 10.6% of the geographical area over a period of 12 years.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Colias cocandica thrasibulus* Fruhstorfer After Seitz

National Park and Wildlife Sanctuaries have been established in area of 14870.22 sq km of which Hemis National Park includes an area of 4100 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly

*Rationale* : This subspecies is confined to Ladakh (Jammu & Kashmir). There has been considerable loss and deterioration in its area of occurrence.

*Taxonomic Reliability* : The subspecies, *Colias cocandica thrasibulus* Fruhstorfer has been followed after Talbot (1939) who also provided its synonymy and local forms.

*Compiled by* : I.J. Gupta and D. K. Mondal

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## **CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family PIERIDAE

### **19. *Colias dubia* Elwes, 1906 THE DWARF CLOUDED YELLOW**

*Colias dubia* Elwes, 1906

*Colias dubia* Elwes : Roeber, 1907; Bingham, 1907

*Eurymus dubia* (Elwes) : Swinhoe, 1909

*Colias eogene* var. *dubia* Verity, 1909-1911

*Colias dubia* Elwes : Fruhstorfer, 1910; Evans, 1932; Talbot, 1939; Varshney, 1993

*Diagnostic characters* : MALE - Ground colour orange. Fore wing marginal border broadly black and spotted yellow. Hind wing without sex-brand; only discal area blackish; *underside* greenish; cell spot prominently flanked by deep crimson; discal spots prominent. FEMALE - Fore wing with black basal shading extended along inner margin. Hind wing dusky black; discocellular spot large and bright orange. *Wing expanse* : ♂ ♀ 40-45 mm.

*Intraspecific variation* : The upperside of fore wing in male bears a series of yellow submarginal spots showing variation in size which sometimes may be absent.

*Distribution* : India : Sikkim. *Elsewhere* : South Tibet.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This is a remote montane butterfly and its individuals were collected from Sikkim altitude between 5000-6000m). The butterfly represents a trans-himalayan offshoot (Fruhstorfer, 1910). The other habits and ecology are not known.

*Threats* : The area of its occurrence is considered highly fragile and threats include over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats. selective use of medicinal plants and collecting other forest commodities and animals.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Colias dubia* Elwes, (Upperside) - (Specimen in ZSI collection)



*Colias dubia* Elwes, (Underside) - (Specimen in ZSI collection)

National Park and Wildlife Sanctuaries have been created in an area of 2101.34 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is recorded, in India, from Sikkim only. There has been significant loss and deterioration in its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata and also two examples in the collection of Forest Research Institute, Dehra Dun. A small series of specimens is represented in the Collection of the British Museum.

*Taxonomic Reliability* : Talbot (1939) has been relied upon for validity of the species, *Colias dubia* Elwes.

Compiled by : I.J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family DANAIDAE

**20. *Euploea crameri nicevillei* (Moore, 1890)**

**THE SPOTTED BLACK CROW**

*Tronga nicevilli* Moore, 1890

*Euploea nicevilli* (Moore) : Bingham, 1905

*Euploea crameri nicevillei* (Moore) : Fruhstorfer, 1910

*Euploea crameri nicevillei* (Moore) : Evans, 1932; Talbot, 1947

**Diagnostic characters** : MALE - Ground colour dark brownish black. Both wings spotted. Fore wing without brand; hind wing submarginal spots unusually broad and pure white, forming a prominent band; these spots only separated by dark veins. FEMALE - As for male, but subapical spots larger and a small spot in the lower angle of cell present. **Wing expanse** : ♂ ♀ 85-95 mm.

**Intraspecific variation** : The subspecies may be with four or five post-cellular spots on underside of hind wing. It has two other following counterparts in India.

- i. *crameri esperi* Felder - India : Andaman & Nicobar Islands (Car and Central Nicobar Islands);
- ii. *crameri frauenfeldii* Felder - India : Andaman & Nicobar Islands (South Nicobar islands).

The subspecies *nicevillei* is distinguished from the other two subspecies by the upperside of hind wing with postdiscal spots larger than the submarginal spots.

**Distribution** : India : West Bengal (South 24-Parganas : Sunderbans).

**Status** : Critically Endangered ( CR A1c, B1 2bc).

**Habitat and ecology** : The butterfly occurs in the mangrove ecosystem. The other habits and ecology are not much known.



*Euploea crameri nicevillei* (Moore), (Upperside) - (Specimen in ZSI collection)



*Euploea crameri nicevillei* (Moore), (Underside) - (Specimen in ZSI collection)

*Threats* : The mangrove cover has decreased from 2125 sq km in 1999 to 2081 sq km in 2001 in West Bengal. Mangrove cover in South Parganas (West Bengal) is 2046 sq km comprising dense cover of 1624 sq km and open of 422 sq km is facing human interference.

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park (Sunderbans) covers an area of 1330.10 km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution to Sunderbans (West Bengal). There has been decline in the area and quality of its habitat. There is only one example (Sunderbans, West Bengal) in the National Zoological Collection of Zoological Survey of India, Kolkata. The types specimens male and female presented by Col. Swinhoe are in the collection of British Museum (Bingham, 1905).

*Taxonomic Reliability* : The subspecies, *Euploea crameri nicevillei* (Moore) has been followed after Talbot (1947).

Compiled by : I. J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family DANAIIDAE

**21. *Euploea midamus roepstorffi* (Moore, 1883)**

**THE ANDAMAN KING CROW**

*Tiruna roepstorffi* Moore, 1883

*Tiruna roepstorffi* Moore : Moore, 1890

*Eupoea roepstorfi* (sic) (Moore) : Bingham, 1905

*Eupoea roepstorffi* (sic) (Moore) : Evans, 1932

*Eupoea midamus roepstorffi* (Moore) : Talbot, 1947; D'Abbrera, 1982

*Diagnostic characters* : MALE Ground colour bronze-brown, slightly darker. Fore wing spotted, with short and very thin brand. Hind wing also spotted, submarginal row of spots larger. FEMALE - As in male, but fore wing spots more prominent. *Wing expanse* : ♂ ♀ 95-100 mm.

*Intraspecific variation* : The subspecies is not known to display much variation. It has its two other following counterparts in India.

- i. *E. midamus rogenhoferi* Felder & Felder - India : Sikkim. *Elsewhere* : N. Myanmar.
- ii. *E. midamus chloee* (Guérin-Ménéville) - India : Andaman & Nicobar Islands (Nicobar Islands). *Elsewhere* : Myanmar, Tonkin and Thailand.

The subspecies *roepstorffi* has fore wing with short (5mm) and thin brand, thus, differs from both the above subspecies possessing long brand (10 mm).

*Distribution* : India : Andaman and Nicobar Islands (South Andaman Islands).

*Status* : Critically Endangered ( CR A1c, B1 2bc).

*Habitat and ecology* : This butterfly appears during April-May. The other habits and ecology are not known. "The collection of Colonel Ferrar contains eight males and four females of this rare species" (Talbot, 1947).



*Eupoea midamus roepstorffi* (Moore), (Upperside) - (Specimen in ZSI collection)



*Eupoea midamus roepstorffi* (Moore), (Underside) - (Specimen in ZSI collection)

**Threats** : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover is reduced to 21% from 96%, in Middle Andaman it is left with only 29% and in South Andaman it is all worked over Anonymous (1984-85). Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken** : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in an area of 1510.09 sq km in Andaman Islands sq km (Singh & Singh, 2002).

**Conservation measures proposed** : The efforts should be made to check the human activities posing any more threats in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : The subspecies is confined to South Andamans, in India. There has been significant decrease and degradation in its area of occurrence. "The type male is in the Calcutta Museum" (Talbot, 1947). "The collection of Colonel Ferrar contains eight males and four females of this rare species" (Talbot, 1947).

**Taxonomic Reliability** : The validity of the subspecies, *Eupoia midamus roepstorffi* (Moore) is relied upon after Talbot, 1947 who also included synonymy and other subspecies. D'Abrera (1982) mentioned its distribution ? Nicobars. If its occurrence in Nicobars is confirmed, then its status will be changed.

Compiled by : I. J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family DANAIDAE

**22. *Tirumala gautama gautamoides* (Doherty, 1886)  
THE SCARCE BLUE TIGER**

*Danais gautamoides* Doherty, 1886

*Tirumala gautamoides* (Doherty) : Moore, 1890

*Danais gautama* race *gautamoides* Doherty : Bingham, 1905

*Danaida gautama gautamoides* (Doherty) : Frustorfer, 1910

*Danais gautama gautamoides* Doherty : Evans, 1932

*Danaus gautama gautamoides* (Doherty) : Talbot, 1947

*Tirumala gautama gautamoides* (Doherty) : D'Abrera, 1982

**Diagnostic characters** : MALE - Ground colour fuliginous black. Fore wing discal cell with two white streaks, the upper one very short and ill-defined. Hind wing cell-streaks much broader, the lower one with short distal spur. FEMALE - As for male. *Wing expanse* : ♂ ♀ 75-85 mm.

**Intraspecific variation** : In India, this is the only subspecies so far known from the insular area and shows no marked variation.

**Distribution** : India : Andaman and Nicobar islands : Nicobar Islands.

**Status** : Critically Endangered ( CR A1c, B1 2bc).

**Habitat and ecology** : Little is known of the habits and ecology of this butterfly. Ackery & Vane Wright (1984) mentioned that in Nicobars it occurred only on the southern group of islands; it flew with its comimic, *Ideopsis juvenata nicobarica* (Wood-Mason) (Doherty, 1886b, as *gautamoides*; Ferrar, 1948). Doherty (1891) studied the egg of *gautamoides*.

**Threats** : The area of its occurrence is fragile and ecologically sensitive. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.



*Tirumala gautama gautamoides* (Doherty), female (Upperside) - (Specimen in ZSI collection)



*Tirumala gautama gautamoides* (Doherty), female (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The Wildlife Sanctuaries cover an area of 19.18 sq km in Nicobar Islands (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is restricted to Nicobar Islands in India. There has been considerable shrinkage and degradation in its area of occurrence. There are four examples (Great Nicobar) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The subspecies, *Tirumala gautama gautamoides* (Doherty) has been followed after Talbot (1947) with generic change as treated by Ackery & Vane Wright (1984). Talbot (1947) and Ackery & Vane Wright (1984) provided information on its synonymy, on morphology, bionomics, distribution and immature stages.

*Compiled by* : I. J. Gupta and D. K. Mondal

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**VULNERABLE**

Class: INSECTA

Order: LEPIDOPTERA

Family: SATYRIDAE

### 23. *Callerebia annada annada* (Moore, 1857) THE RINGED ARGUS

*Erebia annada annada* Moore, 1857

*Callerebia annada* (Moore): Moore, 1882; Marshall & de Niceville, 1883; Doherty 1886; De Niceville, 1894; Mackinnon & de Niceville 1897; Varshney, 1994.

*Erebia annada* Moore: Bingham, 1905; Hannington, 1910.

*Callerebia annada annada* (Moore) : Seitz, 1908; Fruhstorfer, 1916

*Erebia annada annada* Moore: Evans, 1832; Talbot, 1947

**Diagnostic characters :** MALE- *Upperside* dark velvety brown, broadly paler over distal areas, both wings with an obscure submarginal dark brown band; fore wing with a bipupilled ocellus, ringed with deep brownish-orange. *Underside* fore wing deep ochraceous red brown, inner margin broadly brown, apex and marginal area just below it dusted with grayish. Hind wing dark umber brown, thickly dusted with grey and marked with umber brown striae, the irroration becoming denser towards costa; two subternal fulvous ringed, pupilled ocelli; post-discal and submarginal more and less incomplete sinuous umber brown bands. Antennae, head, thorax and abdomen brown. FEMALE- Like male but larger and paler. *Wing expanse* : ♂ ♀ 60 - 70 mm.

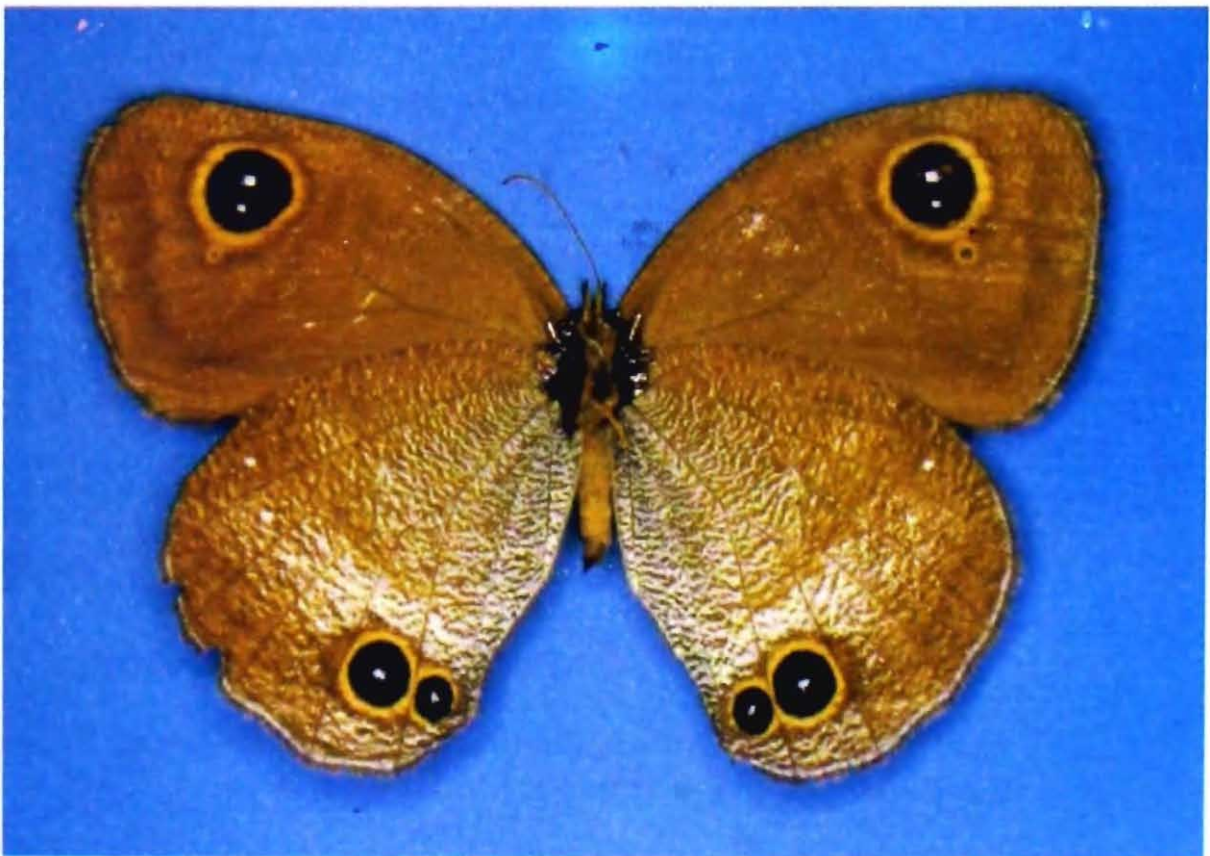
**Intraspecific variation :** The subspecies showing little variation has three other following counterparts in India.

- i. *Callerebia annada caeca* Watkins- Himachal Pradesh (Shimla), Jammu & Kashmir: Kashmir, Sikkim, Uttaranchal (Kumaon, Mussoorie). Elsewhere: Nepal.
- ii. *Callerebia annada orixa* Moore- Assam, Meghalaya (Khasi hills), Nagaland. *Elsewhere* : North Myanmar.
- iii. *Callerebia annada suroia* Tytler- Manipur (Suroi). *Elsewhere* : North-east Myanmar.

*Callerebia annada annada* is distinguished from the other three subspecies by the underside of hind wing bearing two distinct subternal fulvous ringed, pupilled ocelli.



*Callerebia annada annada* (Moore) (Upperside) - (Specimen in ZSI collection)



*Callerebia annada annada* (Moore) (Underside) - (Specimen in ZSI collection)

**Distribution:** India : Himachal Pradesh (Kangra), Uttaranchal (Kumaon, Mussorie), Sikkim. Elsewhere: Bhutan, Nepal.

**Status:** Vulnerable ( VU A1c, B1 2bc).

**Habitat and ecology :** This subspecies has overlapping distribution with its allied counterpart, *Callerebia annada caeca*. It is known from Kumaon at altitude of 1550-2500m. Marshall and De Niceville (1883) mentioned its collection from Kangra by Mr. Hocking. Mackinnon & de Niceville (1897) recorded it from Mussoorie and Fruhstorfer (1911) reported its wet season form. The other habits and ecology are not known.

**Threats :** Threats in area include expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, over-grazing; mining; over-utilization of biological resources; clearing of forests for wood for fuel expansion of industries; human settlements: urbanisation; construction of roads, dams and highways; active tourism in summer months; fragmentation of habitats; selective use of medicinal plants; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land , water and atmospheric pollution by using insecticides and pesticides. There is loss of forest cover of 17% (2,573 sq km) of the geographical area over a period of 14 years (1979-1993) for Himachal Pradesh.

**Conservation measures taken:** The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Sanctuaries cover a large protected area.

**Conservation measures proposed :** There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life - history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

**Rationale :** There are scarce records of this subspecies from its range of occurrence in India. There has been considerable decrease and degradation in its area of occurrence. It is represented by a few examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** The subspecies, *Callerebia annada annada* (Moore) has been followed after Talbot (1947) with generic change as treated by Varshney (1994). Talbot (*loc. cit.*) provided its synonymy and other subspecies and local forms occurring in India.

Compiled by : I. J. Gupta and D. K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**24. *Coelites nothis adamsoni* Moore, 1891**

**THE SCARCE CATSEYE**

*Coelites adamsoni* Moore, 1891

*Coelites adamsoni* Moore : Bingham, 1905

*Coelites nothis adamsoni* Moore : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D'Abbrera, 1985

*Diagnostic characters* : MALE - Ground colour rich purplish brown glossed with shining blue. Hind wing with a subapical black patch of androconia made of a tuft of long hairs; *underside* with ocelli very unequal in size and arranged in a brown-shaded row. Both wings *underside* dark brown basal area extending towards termen; postmedian fascia very slender but distinct. FEMALE - As for male. *Wing expanse* : ♂ ♀ 67-85 mm.

*Intraspecific variation* : Only this subspecies occurring in India shows little variation.

*Distribution* : India : Assam. *Elsewhere* : North Myanmar.

*Status* : Critically Endangered (CR A1c, B1 2bc).

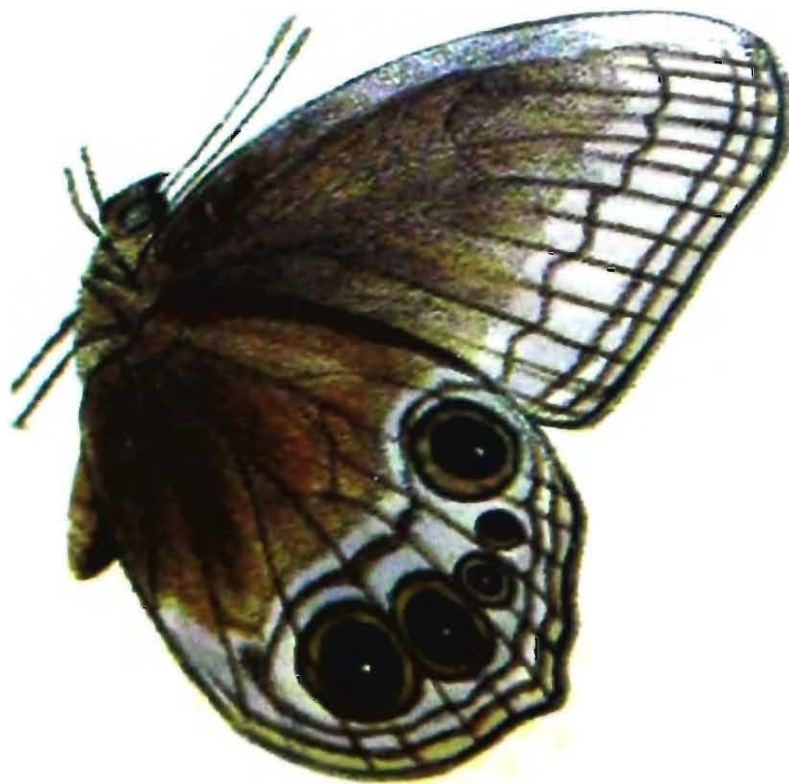
*Habitat and ecology* : The butterfly, that rests on ground of dense damp forests with wings closed, is hardly distinguishable from the decaying leaves covering its resting place. Wynter-Blyth (1957) stated its record in June. It remains on flight during September-October in Myanmar.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Coelites nothis adamsoni* Moore, male (Upperside) - After Moore (1890-1892)



*Coelites nothis adamsoni* Moore, female (Underside) - After Moore (1890-1892)

National Park and Wildlife Sanctuaries have been created in an area of 2851.75 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

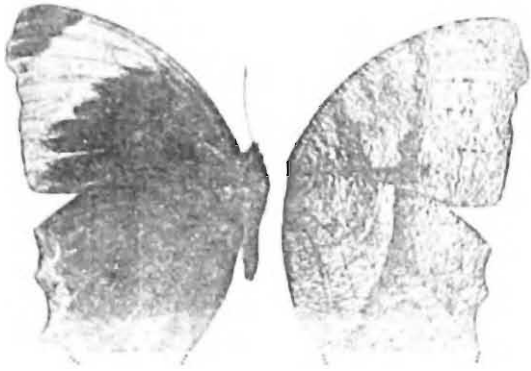
*Rationale* : Qualifies for its restricted distribution in Assam, in India. There has been a significant deterioration and decline in its area of occurrence.

*Taxonomic Reliability* : Talbot (1947) has been relied upon for the validity of subspecies, *Coelites nothis adamsoni* Moore.

Compiled by : I. J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**25. *Cyllogenes janetae* de Niceville, 1887**  
**THE SCARCE EVENING BROWN**

*Cyllogenes janetae* De Niceville, 1887

*Cyllogenes janetae* De Niceville : Elwes, 1891; Moore, 1893; De Niceville, 1894; Bingham, 1905; Fruhstorfer, 1911; Tytler, 1911; Evans, 1932; Talbot, 1947; D'Abrera, 1985; Varshney, 1994

*Diagnostic characters* : MALE - Ground colour vandyke-brown without a purple tinge. Fore wing preapical yellow band very much broad and reaching termen. Hind wing outer margin broadly but very obscurely yellow. Both wings *underside* very much darker. Sex-brand absent. FEMALE - As in male but upperside with faint tinge. Wing expanse : ♂ ♀ 90-98 mm.

*Intraspecific variation* : The species is not known to exhibit significant variation

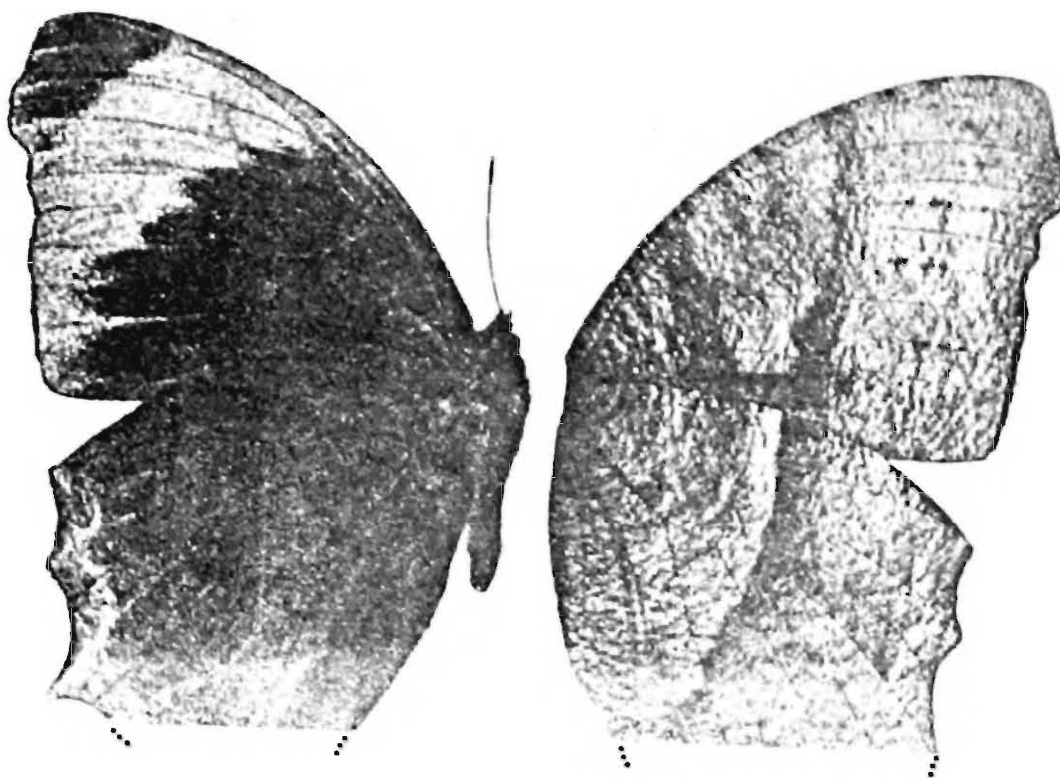
*Distribution* : India : Assam; Nagaland. *Elsewhere* : Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : This is a hilly univoltine butterfly (Fruhstorfer, 1911). Tytler (1911) collected a single female at altitude of 1830m. in September from Naga hills and mentioned that a male was secured by Mr. Doherty. The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Cyllogenes janetae* De Niceville, female (Upperside & Underside) - After Tyter (1911)

National Park and Wildlife Sanctuaries have been created in an area of 3174.11 sq. km (Singh & Singh, 2002).

**Consevation measures proposed :** Its area of occurrence should be properly monitored for any more threats. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for its restricted distribution in Assam and Nagaland. There has been a considerable loss and degradation in its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata and also two examples in the collection of Forest Research Institute, Dehra Dun.

**Taxonomic Reliability :** Talbot (1947) has been relied upon for the validity of the species, *Cyllogenes janetae* De Niceville.

*Compiled by :* I. J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**26. *Elymnias peali* Wood-Mason, 1883**

**THE PEAL'S PALMFLY**

*Elymnias peali* Wood-Mason, 1883

*Dyctis peali* (Wood-Mason) : Marshall and de Niceville, 1883

*Elymnias peali* Wood-Mason : Elwes, 1891

*Melynias peali* (Wood-Mason) : Moore, 1893

*Elymnias peali* Wood-Mason : Bingham, 1905; Fruhstorfer, 19011; Tytler, 1914

*Elymnias pealii* Wood-Mason : Evans, 1932; Tytler, 1939

*Elymnias peali* Wood-Mason : D'Abrera, 1985; Varshney, 1994

*Diagnostic characters* : MALE - Ground colour deep velvety purpurescent black. Fore wing termen broadly suffused with pale blue; costa transversely flecked. Hind wing with a subterminal narrow incomplete blue band; with sex-mark. FEMALE - Ground colour pale purpurescent brown. Fore wing much darker over cell area. Hind wing with anterior area pale and a prominent red quadrate tornal spot; tailed. *Wing expanse* : ♂ ♀ 75-85 mm.

*Intraspecific variation* : The species is not known to show significant variation.

*Distribution* : India : Assam (Sibsagar; Margherita); Manipur; Nagaland. *Elsewhere* : North Myanmar.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Fruhstorfer (1911) stated that its two specimens were collected at Margherita by Doherty during May and August-December. Tytler (1914) collected a few specimens of both sexes on Irang River (Western Manipur Hills), Sebong (Manipur Hills) during March-April and September-October; at Nichugaurd (Naga Hills) during March-April. The other habits and ecology of this butterfly are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Elymnias peali* Wood-Mason, male (Upperside) - After D' Abrera (1985)



*Elymnias peali* Wood-Mason, male (Underside) - After D' Abrera (1985)



*Elymnias peali* Wood-Mason, female (Upperside) - After D' Abrera (1985)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in an area of 2507.46 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : Human interference should be checked for causing any further threat in its area of occurrence. Efforts should be made to obtain more information on its habits, ecology, life-history and distribution.

*Rationale* : Only a few locality records of this butterfly are known in India. Its area of occurrence has significantly decreased and degraded over the years. There are two examples (Assam- Sibsagar and Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata .

*Taxonomic Reliability* : The species, *Elymnias peali* Wood-Mason has been followed after Talbot (1947).

*Compiled by* : I. J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**27. *Elymnias penanga chelensis* de Nicéville, 1890**

**THE POINTED PALMFLY**

*Elymnias chelensis* de Niceville, 1890

*Elymnias penanga* (Westwood) : Bingham, 1905

*Elymnias penanga chelensis* de Niceville : Fruhstorfer, 1911; Tytler, 1914; Evans, 1932; Talbot, 1947; D'Abbrera, 1985.

**Diagnostic characters** : MALE Ground colour dark chocolate-brown. Fore wing richly glossed with dark blue; postdiscal streaks of shining silvery blue; apex acute. Hind wing uniformly black; with sex-mark. FEMALE - Ground colour plumbeous blue. Fore wing postdiscal band broad, white, oblique and not reaching termen. *Wing expanse* : ♂ ♀ 70-80 mm.

**Intraspecific variation** : Only this subspecies occurs in India. Upperside of male is dark chocolate-brown and fore wing with postdiscal streaks silvery blue where as female is plumbeous blue and fore wing with white postdiscal band white.

**Distribution** : India : Meghalaya (Khasi Hills); Manipur (Western hills). *Elsewhere* : Myanmar; Peninsular Thailand.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : The subspecies flies in autumn, Wynter-Blyth (1957). The male is known to mimic *Euploea mazares* Moore (Talbot, 1947). Tytler (1914) captured a few specimens on the Irang River (Western Manipur Hills) in February and October. The other habits and ecology of the butterfly are not known.

**Threats** : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of



*Elymnias penanga chelensis* de Niceville, female (Underside) - (Specimen in ZSI collection)



*Elymnias penanga chelensis* de Niceville, female (Upperside) - (Specimen in ZSI collection)



*Elymnias penanga chelensis* de Niceville, male (Upperside) - (Specimen in ZSI collection)



*Elymnias penanga chelensis* de Niceville, male (Underside) - (Specimen in ZSI collection)

habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in an area of 735.03 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its short range of distribution in India. There has been significant decrease and degradation in its area of occurrence. There are two examples (Meghalaya-Khasia hills) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The subspecies, *Elymnias penanga chelensis* de Niceville has been followed after Talbot (1947) who also provided its synonymy.

*Compiled by* : I. J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**28. *Erebia narasingha narasingha* (Moore, 1857)**

**THE MOTTLED ARGUS**

*Ypthima narasingha* Moore, 1857

*Ypthima narasingha* Moore : Marshall & De Niceville, 1883

*Hemadara narasingha* (Moore) : Bingham, 1905; Varshney, 1994

*Erebia narasingha* (Moore) : Bingham, 1905

*Erebia narasingha narasingha* (Moore) : Evans, 1932; Talbot, 1947

*Diagnostic characters* : MALE Ground colour greyish brown. Fore wing with a very large preapical black ocellus bipupilled with white and ringed with pale olivascent ochraceous, subterminal band faint dark and incomplete; sex-brand prominent. Hind wing on both upper and *underside* without ocellus. FEMALE - As in male, but without sex-brand. *Wing expanse* : ♂ ♀ 55-62 mm.

*Intraspecific variation* : Only the nominate subspecies known in India shows little variation.

*Distribution* : India : Sikkim, Arunachal Pradesh (Abor Valley). *Elsewhere* : North Myanmar.

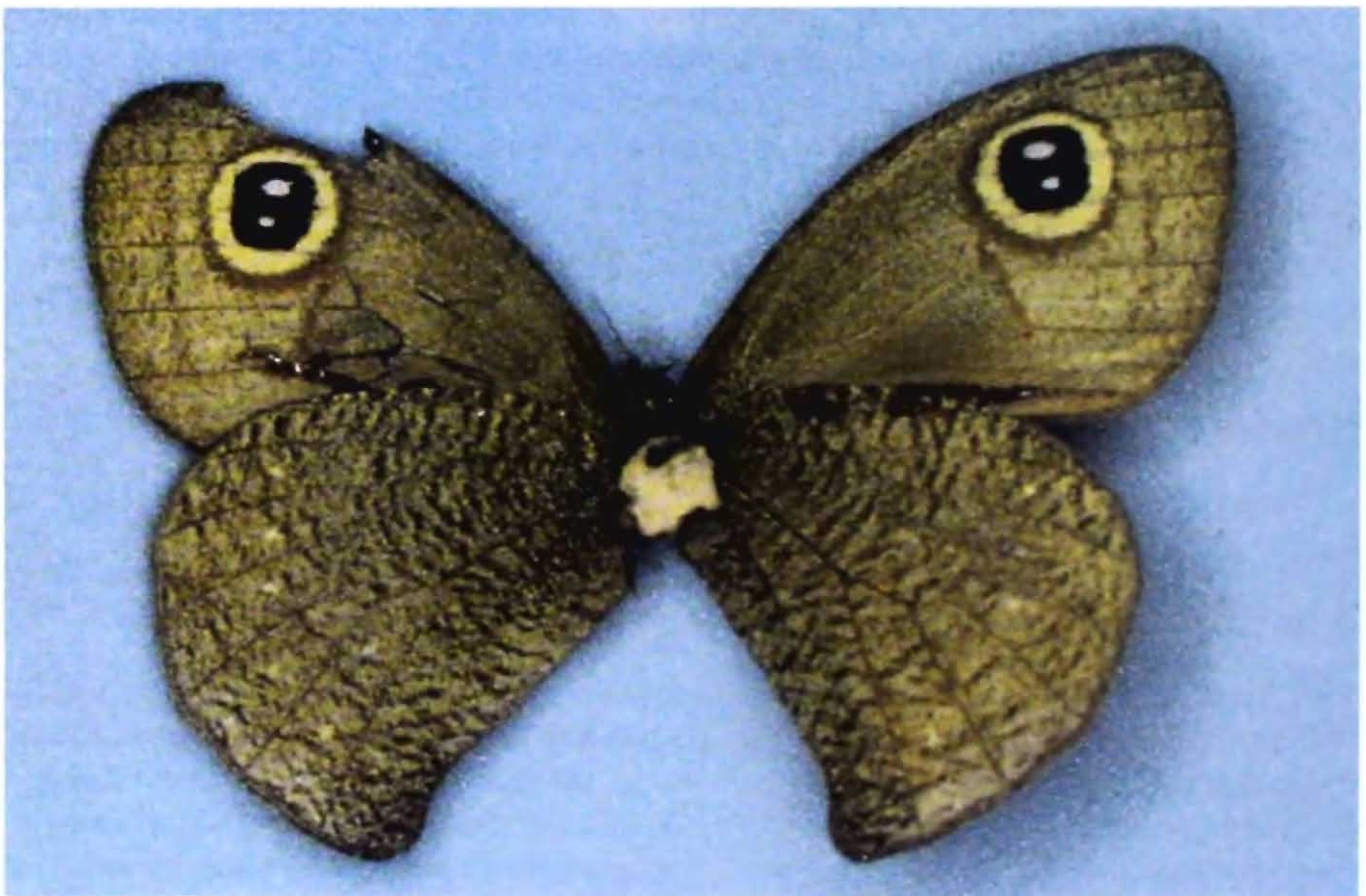
*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Wynter-Blyth (1957) mentioned its record from 1220m. at Tung in Sikkim during May. The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides



*Erebia narasingha narasingha* (Moore) (Upperside) - (Specimen in ZSI collection)



*Erebia narasingha narasingha* (Moore) (Underside) - (Specimen in ZSI collection)

and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. It gets further protection in the representative network of protected area of 4953.09sq km of National Parks and Wildlife Sanctuaries falling in its area of occurrence (Singh & Singh, 2002).

*Conservation measures proposed* : There should be check on human activities posing any more threat in its range of occurrence. Efforts should be made for information on its habits, ecology, life-history and distribution.

*Rationale* : In India, this subspecies is known from Sikkim and Arunachal Pradesh. There has been considerable shrinkage and degradation in its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata and also one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The nominate subspecies, *Erebia narasingha narasingha* (Moore) has been followed after Talbot (1947) who also provided its synonymy. Smith (2004) has treated it as *Dallacha narasingha narasingha* (Moore).

Compiled by : I. J. Gupta and D. K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**29. *Lethe distans* Butler, 1870**  
**THE SCARCE RED FORESTER**

*Lethe distans* Butler, 1870

*Lethe distans* Butler : Marshall & de Niceville, 1883

*Lethe (Debis) distans* Butler : De Niceville, 1894

*Debis distans* (Butler) : Moore, 1895

*Lethe distans* Butler : Bingham, 1905; Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D'Abrera, 1985

**Diagnostic characters** : MALE - Ground colour bright brown. Fore wing with 1-2 subapical pale spots; *underside* ochraceous yellow, basal and discal shadings brownish purple. Hind wing with apical half orange-red; postdiscal row of black spots; *underside* as that of fore wing. FEMALE - Mostly orange-red. Fore wing apical half dark brown; discal bar short and stout, with two detached white spots; *underside* deep brown. *Wing expanse* : ♂ ♀ 70-80 mm.

**Intraspecific variation** : The male and female can be distinguished by their upperside colouration of bright brown and orange-red, respectively, and wing markings.

**Distribution** : India : Sikkim; West Bengal (Darjiling); Meghalaya. *Elsewhere* : Bhutan; Myanmar.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : The habits and ecology of this butterfly are not much known.

**Threats** : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of



*Letho distans* Butler, male (Upperside) - After D'Abbrera (1985)

habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

**Conservation measures taken :** The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have a protected area of 5151.40 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** This species is known from a few localities in India. There has been significant reduction and degradation in its area of occurrence. There are four examples (Meghalaya, Bhutan and Myanmar) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** Talbot (1947) has been followed for the species, *Letho distans* Butler. He has also given its synonymy. Varshney (1994) treated it as *Nemetis distans* (Butler).

Compiled by : I.J. Gupta and D.K. Mondal



*Lethe distans* Butler, male (Underside) - After D'Abrera (1985)



*Lethe distans* Butler, female (Upperside) - After D'Abrera (1985)

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**30. *Lethe dura gammiei* (Moore, 1892)**

**THE SCARCE LILACFORK**

*Zophoessa gammiei* Moore, 1892

*Lethe dura* (Marshall) : Bingham, 1905

*Lethe dura gammiei* (Moore) : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947.

*Diagnostic characters* : MALE - Ground colour pale vandyke-brown. Fore wing distal border wide; *underside* ocelli outwardly broadly margined silvery white. Hind wing with minute black spots; *underside* as that of fore wing. FEMALE As in male. *Wing expanse* : ♂ ♀ 70-85 mm.

*Intraspecific variation* : This only Indian subspecies exhibits little variation.

*Distribution* : India : Sikkim; Meghalaya (Khasi Hills). *Elsewhere* : Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Wynter-Blyth (1957) mentioned its occurrence in the Teesta Valley (c 1400 m) between Gangtok and Dikchu during June. This is a woodland butterfly remaining on flight during September in Bhutan (Fruhstorfer, 1911).

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in an area of 2403.02 sq km in its area of occurrence.



*Lethe dura gammiei* (Moore), male (Upperside) - (Specimen in ZSI collection)



*Lethe dura gammiei* (Moore), male (Underside) - (Specimen in ZSI collection)



*Lethe dura gammiei* (Moore), female (Upperside) - (Specimen in ZSI collection)



*Lethe dura gammiei* (Moore), female (Underside) - (Specimen in ZSI collection)

*Conservation measures proposed* : There should be restraint on human interference causing further threats in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to a couple of localities in north eastern part of India. There has been significant loss and deterioration in the area of its occurrence. There are five examples (Sikkim and Bhutan) in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The subspecies, *Lethe dura gammiei* (Moore) has been followed after Talbot (1947) who also treated other non-Indian subspecies. However, Varshney (1994) treated the species *dura* Marshall under the genus *Zophoessa*.

Compiled by : I.J. Gupta and D.K. Mondal

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## CRITICALLY ENDANGERED

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

### 31. *Lethe europa tamuna* de Nicéville, 1887

#### THE BAMBOO TREEBROWN

*Lethe tamuna* de Niceville, 1887

*Lethe tamuna* de Niceville : Moore, 1892; Bingham, 1905;

*Lethe europa tamuna* de Niceville : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D' Abrera, 1985

**Diagnostic characters :** FEMALE Ground colour dull dark fulvous. Fore wing discal band ochraceous yellow. Hind wing with a submarginal series of lunules bright ochraceous, inwardly bordered dark. *Underside* of both wings dull brown. MALE - Unknown. *Wing expanse* : 70 mm.

**Intraspecific variation :** This subspecies has other three following counterparts occurring in India.

- i. *L. europa europa* (Fabricius) India : Peninsular India.
- ii. *L. europa niladana* (Fruhstorfer) India : Punjab. *Elsewhere* : Myanmar, Thailand, Tonkin.
- iii. *L. europa nudgara* Fruhstorfer India : Andaman Nicobar and Islands (Andaman Islands).

The subspecies *tamuna* differs from the above three species by the upperside fore wing discal band ochraceous-yellow.

**Distribution :** India : Andaman and Nicobar Islands (South Nicobar Islands).

**Status :** Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology :** Only a single female is known from the Nicobars (Fruhstorfer, 1911). Talbot (1947) stated "The male does not appear to be known" The habits and ecology of this butterfly are not much known.



*Lethe europa* (Fabricius), (Upperside) - (Specimen in ZSI collection)



*Lethe europa* (Fabricius), (Underside), (photograph of *Lethe europa tamuna* De Niceville not given) - (Specimen in ZSI collection)

**Threats** : Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken** : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries cover area of 19.18 sq km covers in Nicobar Islands.

**Conservation measures proposed** : There should be check on activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : This subspecies is restricted to South Nicobar Islands in India. There has been considerable reduction and deterioration in its area of occurrence. There is only one example (Little Andamans) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability** : Talbot (1947) has been relied upon for the subspecies, *Lethe europa tamuna* de Niceville and other subspecies found in India.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**32. *Lethe gemina gafuri* (Tytler, 1914)**

**THE TYTLER'S TREEBROWN**

*Pararge gafuri* Tytler, 1914

*Lethe gemina gafuri* (Tytler) : Evans, 1932; Talbot, 1947; D'Abrera, 1985

**Diagnostic characters** : MALE Ground colour pale brown to ochreous yellow. Fore wing apex and termen black; M<sub>2</sub> - area with a white-centred small ocellus; *underside* much yellow, with one apical and two tornal ocelli. Hind wing submarginal area with five ocelli of different pattern and size; *underside* also much yellow; submarginal band silvery-lilac with ocelli of different size. FEMALE As for male. *Wing expanse* : ♂ ♀ 60-70 mm.

**Intraspecific variation** : Only this subspecies occurs in India. The butterfly with its unusual markings and the period of occurring may be regarded as belonging to the wet-season form.

**Distribution** : India : Nagaland

**Status** : Critically Endangered (CR A1c, B1 2bc).

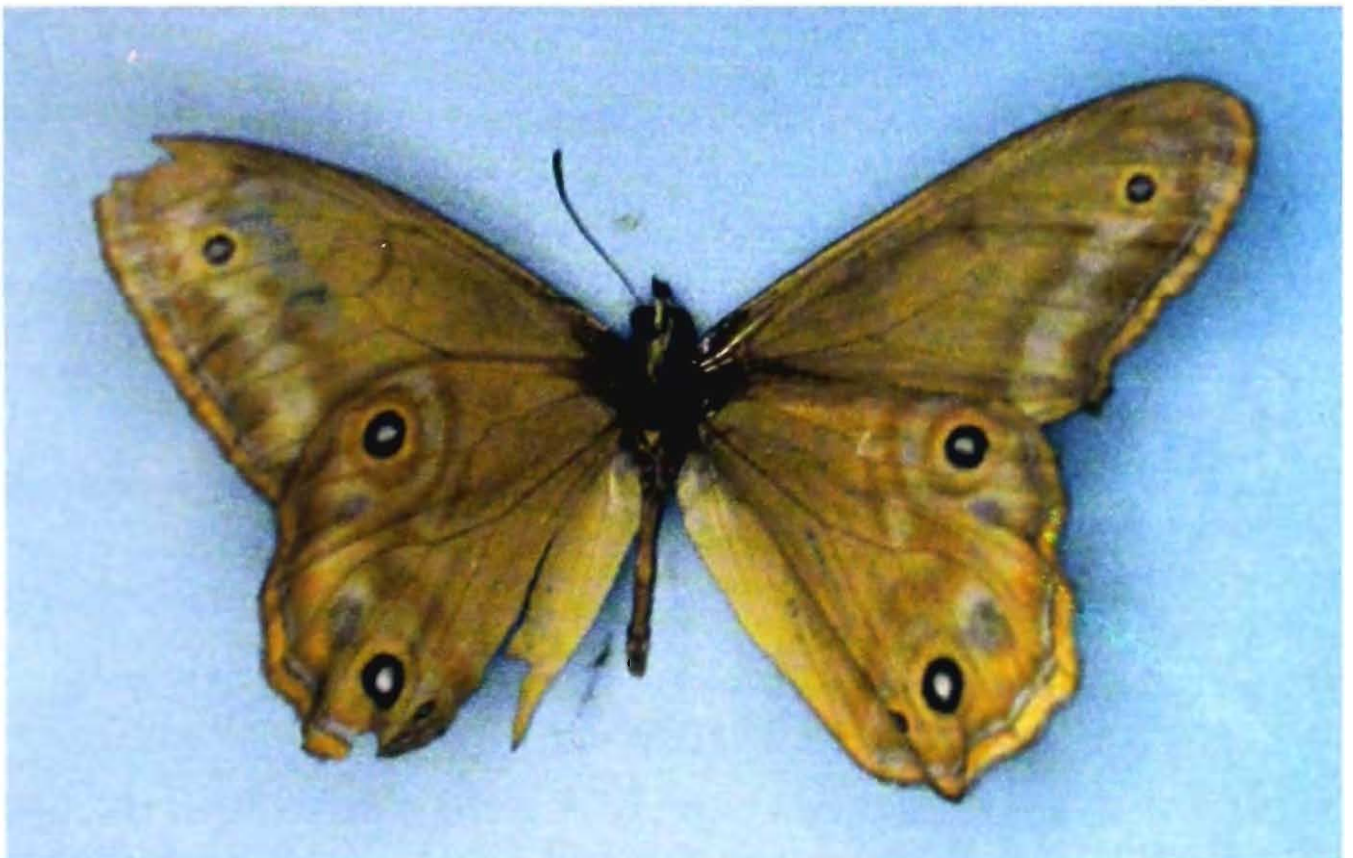
**Habitat and ecology** : Tytler (1914) described it on the basis of a large series of males and 11 females collected from Kirbari, Naga Hills at altitude of 1830-2230m. during late July and early October.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken** : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National



*Lethe gemina gafuri* (Tytler), male (Upperside) - (Specimen in ZSI collection)



*Lethe gemina gafuri* (Tytler), male (Underside) - (Specimen in ZSI collection)



*Lethe gemina gafuri* (Tytler), female (Underside) - After D'Abbrera (1985)

Park and Wildlife Sanctuaries cover an area of 222.36 sq. km. (Singh & Singh, 2002).

*Conservation measures proposed* : Its range of occurrence should be monitored so as to check any further threats. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is confined to Nagaland in India. There has been significant loss and degradation in its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun. A series of specimens of both sexes are in the British Museum (Talbot, 1947).

*Taxonomic Reliability* : The subspecies, *Lethe gemina gafuri* (Tytler) has been followed after Talbot (1947).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**33. *Lethe gulnihal gulnihal* de Nicéville, 1887**

**THE DULL FORESTER**

*Lethe gulnihal* de Niceville, 1887

*Rangbia gulnihal* (de Niceville) : Moore, 1892

*Lethe (Rangbia) gulnihal* de Niceville : de Niceville, 1894

*Lethe gulnihal* de Niceville : Bingham, 1905; Tytler, 1911

*Lethe gulnihal gulnihal* de Niceville : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D'Abrera, 1985

**Diagnostic characters** : MALE - Ground colour deep rich amber-brown. Fore wing unmarked, but with a sex-brand along middle of anal vein; dorsum excurved; *underside* golden brown. Hind wing ocelli without iris; *underside* with a sex-brand in basal half of M<sub>1</sub> and M<sub>2</sub> - areas; basal dark line very much irregular and interrupted. FEMALE - Fore wing with white discal and yellow postdiscal spots. *Wing expanse* : ♂ ♀ 58-64 mm.

**Intraspecific variation** : This is the only Indian subspecies showing little seasonal variation.

**Distribution** : India : Sikkim; Manipur, Nagaland. *Elsewhere* : Bhutan; N. Myanmar.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : This butterfly occurs in two sharply defined broods (Fruhstorfer, 1911). De Nicéville (1884) and Tytler (1911) recorded it from Sikkim and in July from Nagaland (Gaspani, 520m.), respectively. The other habits and ecology are not known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of



*Lethe gulnihal gulnihal* de Niceville, male (Upperside) - After D'Abrera (1985)



*Lethe gulnihal gulnihal* de Niceville, female (Underside) - After D'Abrera (1985)

forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been established in an area of 2323.70sq. km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to a few of localities in north eastern part of India. There has been significant loss as well as deterioration in the area of its occurrence. There are seven examples (Manipur, Sikkim; Bhutan and Upper Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata. and also two examples in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The nominate subspecies, *Lethe gulnihal gulnihal* de Niceville has been followed after Talbot (1947).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**34. *Lethe margaritae* Elwes, 1882**  
**THE BHUTAN TREEBROWN**

*Lethe* (?) *margaritae* Elwes, 1882

*Neorina margaritae* (Elwes) : Marshall & de Niceville, 1883

*Dionana margaritae* (Elwes) : Moore, 1892

*Lethe margaritae* Elwes : Bingham, 1905; Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D'Abrera, 1985; Varshney, 1994

*Diagnostic characters* : MALE - Ground colour rich dark brown. Fore wing discal band narrow ochraceous-white; postdiscal series of white-ringed dark brown spots; *underside* with an additional postdiscal series of black ocelli placed on a white band. Hind wing broadly caudate; distal pale area with a series of black white-pupilled ocelli of which the apical one being very large. FEMALE - Fore wing apical area much dark; discal band very much broad and pure white; *underside* banded white across cell. Other markings on both sides, as in male. *Wing expanse* : ♂ ♀ 85-95 mm.

*Intraspecific variation* : The upperside of hind wing with a postdiscal series of ochraceous ringed black spots having posterior one or two spots pupilled with white.

*Distribution* : India : Sikkim; Arunachal Pradesh (Mishmi Hills). *Elsewhere* : Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : This is a high altitude-dwelling butterfly occurring from c 1500-5000 m (Talbot, 1947). This is also a very handsome butterfly representing the largest species of the genus *Lethe* Huebner (Wynter-Blyth, 1957) and remains on flight possibly during August.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Lethe margaritae* Elwes, male (Upperside) - After D'Abrera (1985)



*Lethe margaritae* Elwes, female (Underside) - After D'Abrera (1985)



*Lethe margaritae* Elwes, female (Underside) - After D'Abrera (1985)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have a protected area of 11998.89 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to a couple of localities in north eastern part of India. This butterfly is very rare, especially female. There has been a significant loss and degradation in its area of occurrence. There are three examples (Bhutan) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Talbot (1947) has been followed for the validity of the species, *Lethe margaritae* Elwes.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**35. *Lethe ocellata lyncus* de Nicéville, 1897**

**THE DISMAL MYSTIC**

*Lethe (Kerrata) lyncus* de Niceville, 1897

*Lethe lyncus* de Niceville : Bingham, 1905

*Lethe tristigmata lyncus* de Niceville : Fruhstorfer, 1911

*Lethe lyncus* de Niceville : Tytler, 1914

*Lethe ocellata lyncus* de Niceville : Evans, 1932; Talbot, 1947

**Diagnostic characters** : MALE - Ground colour hair-brown, with a silky gloss. Fore wing discal irregular band and submarginal band deep brown, latter with a short subapical bar; sex-brand of four spots clothed with black scales; *underside* with a small post-discal costal patch formed of three bluish-white spots. Hind wing discal band obscure; postdiscal series of five round dark brown spots; submarginal series of ocelli black with white pupils and variegated rings. FEMALE Unknown. *Wing expanse* : ♂ ♀ 55-60 mm.

**Intraspecific variation** : This is the only subspecies occurring in India showing little variation.

**Distribution** : India : Sikkim; Manipur. *Elsewhere* : Bhutan.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : It flies during July-August. Both Bingham (1905) and Fruhstorfer (1911) stated that only two males were known from elevations of 2235-3050m. in Sikkim. Tytler (1914) obtained a single male specimen on Suroifoi, Eastern Manipur Hills at 2540-2840m. The other habits and ecology are not known.

**Threats** : The area of its occurrence is considered highly fragile and threats include over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and



*Lethe tristigmata* Elwes, male (Upperside) - After D'Abbrera (1985)



*Lethe tristigmata* Elwes, male (Underside) - After D'Abbrera (1985)



*Lethe tristigmata* Elwes, female (Upperside) - After D'Abbrera (1985)

active tourism in summer months; fragmentation of habitats, selective use of medicinal plants and collecting other forest commodities and animals.

**Conservation measures taken :** The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have a protected area of 2534.69 sq km (Singh & Singh, 2002).

**Conservation measures proposed :** The butterfly's area of occurrence should be monitored so as to check further threats. Efforts need to be made for information on its habits, ecology, life-history and distribution.

**Rationale :** Qualifies for its short range of distribution in India. Its area of occurrence has significantly decreased and deteriorated. There are two examples (Native Sikkim and Manipur) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** The subspecies, *Lethe ocellata lyncus* de Nicéville has been treated after Talbot (1947). D'Abbrera (1985) treated *lyncus* as synonym of *Lethe tristigmata* Elwes.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**36. *Lethe ramadeva* (de Nicéville, 1888)  
THE SINGLE SILVERSTRIPE**

*Zophoessa ramadeva* de Niceville, 1888

*Putlia ramadeva* (de Niceville) : Moore, 1892

*Patlia* (sic) *ramadeva* (de Niceville) : de Niceville, 1894

*Lethe ramadeva* (de Niceville) : Bingham, 1905 : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D'Abbrera, 1985

*Diagnostic characters* : MALE - Ground colour brown. Fore wing *underside* darker; with prominent discal ocelli and a pale line beyond. Hind wing margin caudate; sex-brand absent; *underside* with bands much white and broad; other markings absent. FEMALE - As for male. *Wing expanse* : ♂ ♀ 60-70 mm.

*Intraspecific variation* : The species is not known to show significant variation.

*Distribution* : India : Sikkim, Uttaranchal (Almora). *Elsewhere* : Bhutan, Myanmar.

*Status* : Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This butterfly was recorded from Sikkim and Bhutan where it flew during July-August (Fruhstorfer, 1911). There is also an example collected from Almora (Uttaranchal). The other habits and ecology are not known.

*Threats* : The area of its occurrence is considered highly fragile. Threats include over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities and animals.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. It gets



*Lethe ramadeva* (de Niceville), female (Underside) - (Specimen in ZSI collection)



*Lethe ramadeva* (de Niceville), female (Underside) - (Specimen in ZSI collection)



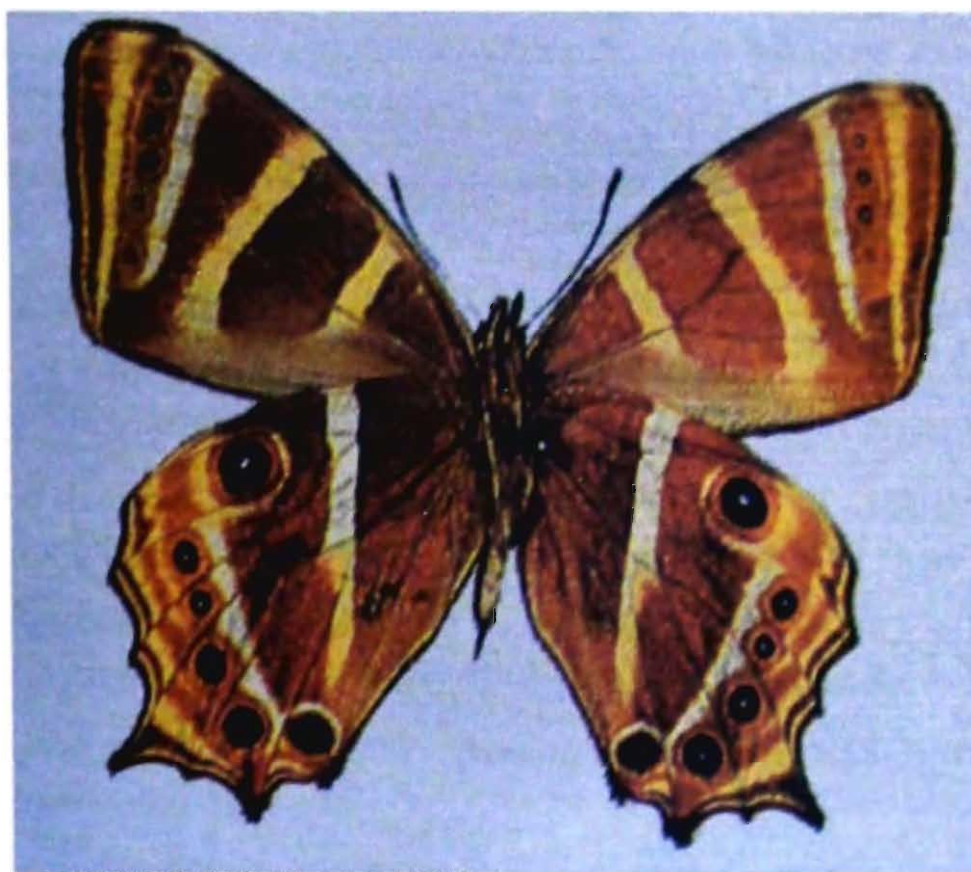
*Lethe ramadeva* (de Niceville), female (Upperside) - (Specimen in ZSI collection)



*Lethe ramadeva* (de Niceville), female (Underside) - (Specimen in ZSI collection)



*Lethe ramadeva* (de Niceville), male (Upperside) - After D'Abrera (1985)



*Lethe ramadeva* (de Niceville), male (Underside) - After D'Abrera (1985)

further protection National Park and Wildlife Sanctuaries have been created in an area of 2101.34 sq km. (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to a couple of localities in India. There has been significant reduction and deterioration in the area of its occurrence. There are four examples (Sikkim and Uttaranchal-Almora) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Lethe ramadeva* (de Nicéville) has been followed after Talbot (1947).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**37. *Lethe satyavati* de Nicéville, 1880**

**THE PALLID FORESTER**

*Lethe satyavati* de Niceville, 1880

*Lethe satyavati* de Niceville : Marshall & De Niceville, 1883

*Debis satyavati* (de Niceville) : Moore, 1890-1892

*Lethe satyavati* de Niceville : Bingham, 1905; Fruhstorfer, 1911; Tytler, 1914

*Lethe satavati* (sic) de Niceville : Evans, 1932

*Lethe satyavati* de Niceville : Talbot 1947

*Nemetis satyavati* (de Niceville) : Varshney, 1994

*Diagnostic characters* : FEMALE - Ground colour dull brown. Fore wing white discal band absent. Hind wing *underside* with basal line straight, discal line also rather straight, slightly bent in middle. MALE Unknown. *Wing expanse* : 65-75 mm.

*Intraspecific variation* : The species occurs in both wet and dry-season forms, the latter differing from the former by upperside greyish brown, marginal whitish area of wings more prominent and underside with pale marginal area rather non-lilacine and ocelli smaller.

*Distribution* : India : Assam, Manipur.

*Status* : Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Tytler (1914) collected a female of the dry season form on the Bark River, Western Manipur Hills during April. Earlier, two female specimens of this butterfly captured by Wood-Mason at Sibsagar, included holotype, a wet season form, taken in May. The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Letho satyavati* de Nicéville, female (Upperside) After Moore (1890-1892)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using use of insecticides and pesticides.

**Conservation measures taken :** The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created covering an area of 3285.10 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human activities posing further threats in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for its restricted distribution in India. There has been considerable shrinkage and deterioration in its area of occurrence. The male is not known. There is only one example (Assam-Sibsagar) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** The species, *Letho satyavati* de Niceville has been followed after Talbot (1947). Varshney (1994) treated it as *Nemetis satyavati* (de Niceville).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**38. *Mycalesis orseis nautilus* Butler, 1867**

**THE PURPLE BUSHBROWN**

*Mycalesis nautilus* Butler, 1867

*Calysime nautilus* (Butler) : Moore, 1880

*Mycalesis orseis* Hewitson : Bingham, 1905

*Mycalesis orseis nautilus* Butler : Fruhstorfer, 1911; Evans, 1932; Talbot, 1947; D' Abrera, 1985

**Diagnostic characters** : MALE Ground colour with a purple gloss. Fore wing ocelli showing through, but without pupil, sex-brand obsolete; *underside* sex-brand brown. Hind wing unmarked; sex-brand long ; a large black patch between  $M_3$  and  $Cu_{1b}$ . *Underside* of both wings basally deep brown and crossed by a sinuous line; postdiscal band with five ocelli. FEMALE Ground colour dull brown. Fore wing *underside* with six indistinctly pupilled ocelli. *Wing expanse* : ♂ ♀ 45-52 mm.

**Intraspecific variation** : This is the only subspecies occurring in India and shows little variation.

**Distribution** : India : Nagaland. *Elsewhere* : Myanmar; Malaya and Sumatra.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The habits and ecology of this butterfly are not much known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



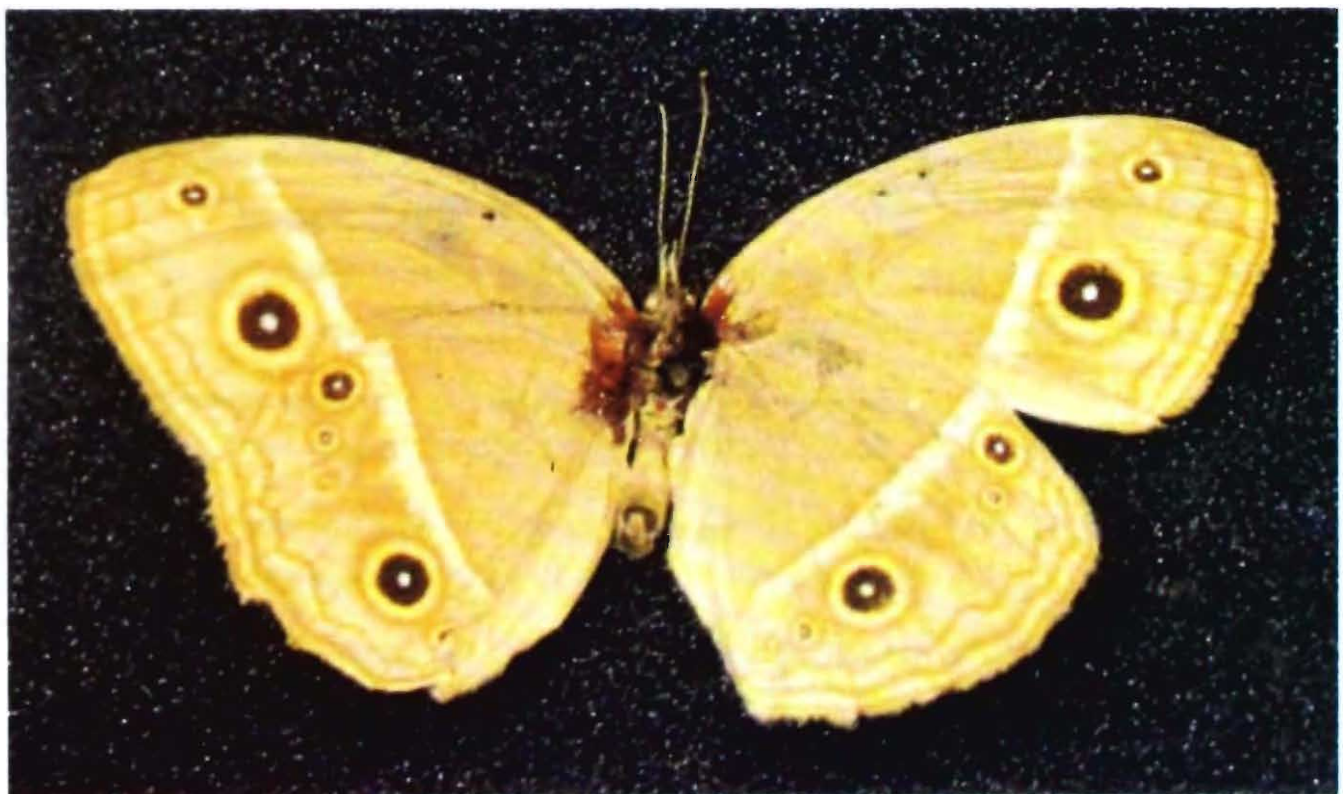
*Mycalesis orseis nautilus* Butler, male (Underside) - (Specimen in ZSI collection)



*Mycalesis orseis nautilus* Butler, male (Underside) - (Specimen in ZSI collection)



*Mycalesis orseis nautilus* Butler, female (Upperside) - (Specimen in ZSI collection)



*Mycalesis orseis nautilus* Butler, female (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 222.36 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is confined to Nagaland, in India. There has been significant loss and degradation in its area of its occurrence. There is only one example (Burma-Lenya Mergui) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Talbot (1947) has been relied upon for the validity of the subspecies, *Mycalesis orseis nautilus* (Butler).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**39. *Pararge menava maeroides* (C. & R. Felder, 1867)**

**THE DARK WALL**

*Lasiommata maeroides* C. & R. Felder, 1867

*Amecera maeroides* (C. & R. Felder) : Marshall & de Niceville, 1883

*Lasiommata maeroides* C. & R. Felder : Moore, 1892

*Satyrus menava* ? (C. & R. Felder) : Bingham, 1905

*Satyrus menava* ab. *maeroides* C. & R. Felder : Fruhstorfer, 1911

*Pararge maeroides* (C. & R. Felder) : Tytler, 1926

*Pararge menava maeroides* (C.& R. Felder) : Evans,1932; Talbot, 1947

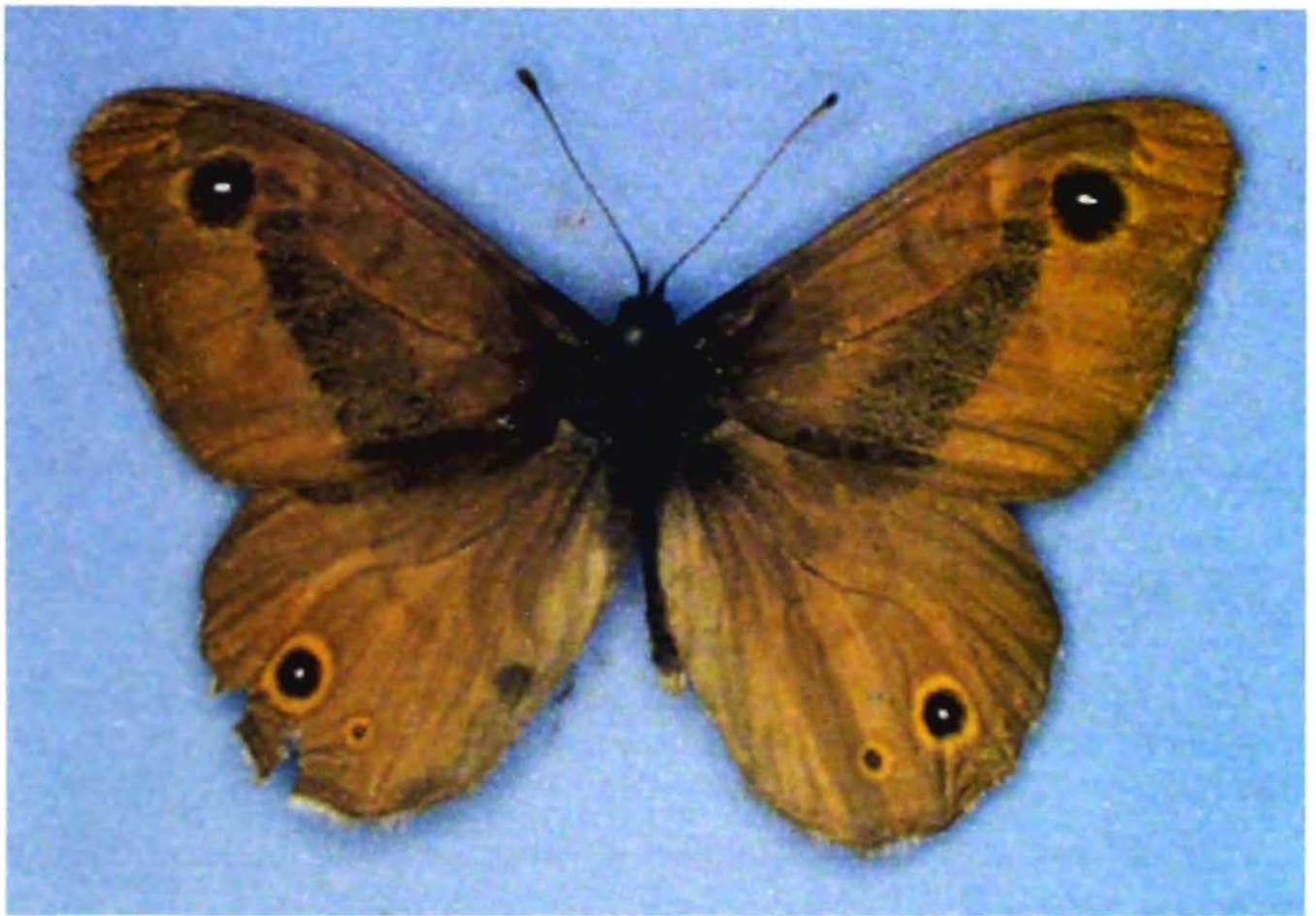
*Diagnostic characters* : MALE - Ground colour very dark ochraceous brown, markings on the *underside* showing through by transparency. Fore wing subapical ocellus black white-centred and enclosed by a fulvous area; sex-brand broadly black. Hind wing with two ocelli more broadly ringed, placed nearer to the margin; a fulvous spot annexed to the upper ocellus. *Underside* : hind wing with the streaks of the basal half fuscous. FEMALE - As in male, but fore wing with much broader and undivided yellow patch; sex-brand absent. *Wing expanse* : ♂ ♀ 50-60 mm.

*Intraspecific variation* : Only this subspecies showing little variation occurs in India.

*Distribution* : India : Jammu & Kashmir (Ladakh).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Three specimens, captured from Pangri in July in the collection of Major Marshall, contained two males but without male sexual streak on fore wing; also one female in August collected by Mr. Robert Ellis. Marshall & Niceville (1883) considered



*Pararge menava maeroides* (C.& R. Felder) (Upperside) - (Specimen in ZSI collection)



*Pararge menava maeroides* (C.& R. Felder) (Underside) - (Specimen in ZSI collection)

these two males certainly of *maeroides*; provided habitat of *maeroides* as - Dras, Ladakh; Chulichang, at 3650m. elevation; Pangi. The other habits and ecology are not known.

*Threats* : The area of its occurrence considered highly fragile and threats include over-grazing; clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities and animals. There is a loss of forest cover of 10.6% of the geographical area over a period of 12 years for Jammu & Kashmir.

*Conservation measures taken* : The subspecies is protected protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The Hemis National Park has been created in area of 4100 sq km in Ladakh. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is confined to Jammu & Kashmir (Ladakh). There has been considerable decrease and deterioration in its area of occurrence. There are two examples (Ladakh) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Talbot (1947) has been followed for the subspecies, *Pararge menava maeroides* (C.& R. Felder).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family SATYRIDAE

**40. *Ypthima dohertyi persimilis* Elwes & Edwards, 1893**  
**THE GREAT FIVERING**

*Ypthima persimilis* Elwes & Edwards, 1893

*Ypthima methora persimilis* Elwes & Edwards : Fruhstorfer, 1911

*Ypthima dohertyi persimilis* Elwes : Evans, 1932

*Ypthima dohertyi persimilis* Elwes & Edwards : Talbot, 1947

**Diagnostic characters** : MALE - Ground colour dark brown. Fore wing ocelli with obscure pupils; sex-brand absent. Hind wing anal ocelli geminate; *underside* with five ocelli, of which two in the anal region confluent and looking like a single bipupilled ocellus; yellow rings to ocelli very broad; ocellus in the M<sub>2</sub> - area inwardly shifted. FEMALE - As in male. **Wing expanse** : ♂ ♀ 50-55 mm.

**Intraspecific variation** : Only this subspecies occurring in India is known to exhibit little variation.

**Distribution** : India : Assam, Manipur. *Elsewhere* : Myanmar.

**Status** : Endangered (EN A1c, B1 2bc).

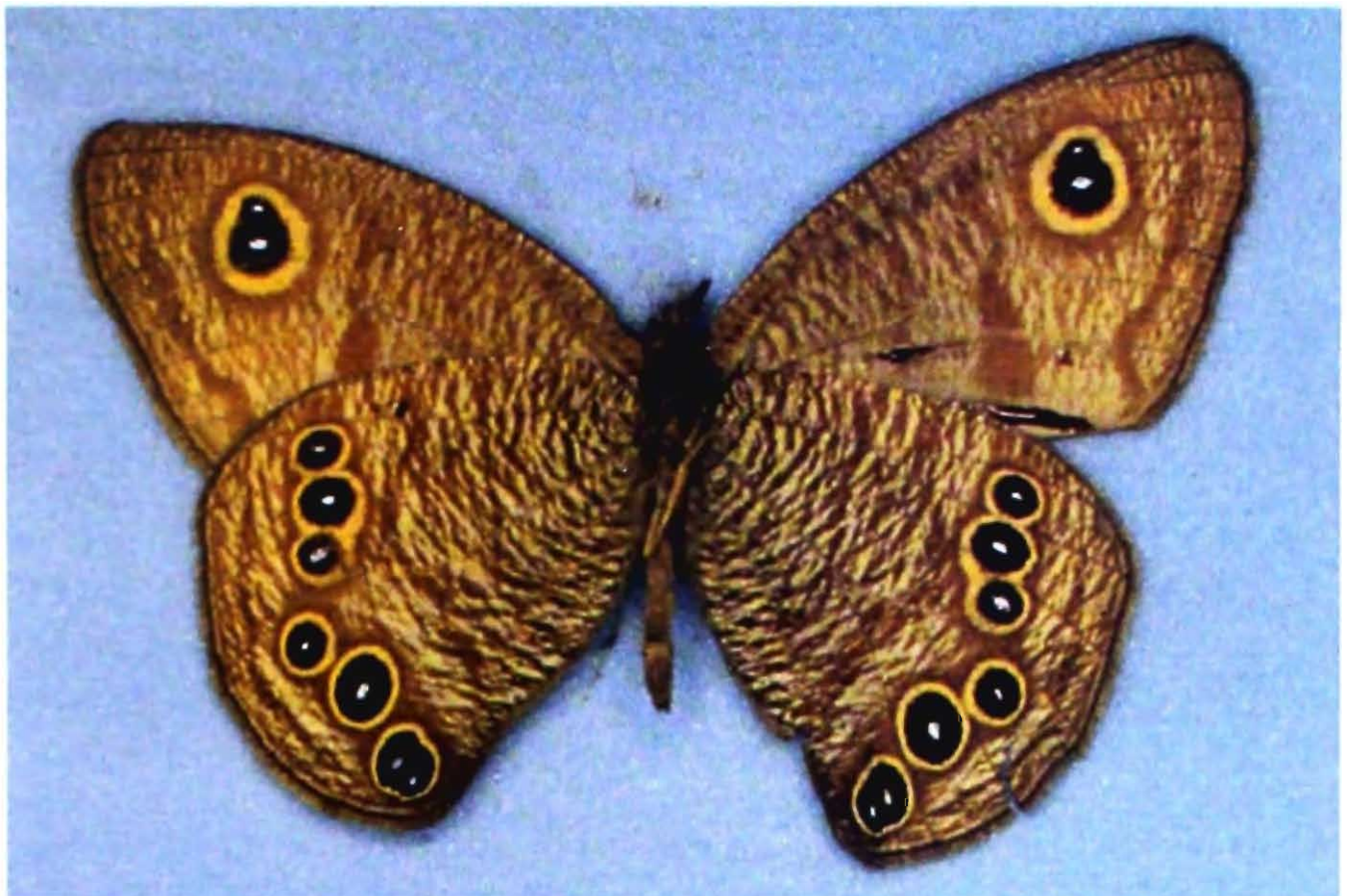
**Habitat and ecology** : This subspecies was identified from a pair of specimens from Mao (Mao, c 2000 m.), Manipur at altitude of 2230m. Its habits and ecology are not much known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken** : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Ypthima dohertyi persimilis* Elwes & Edwards, (Upperside) - (Specimen in ZSI collection)



*Ypthima dohertyi persimilis* Elwes & Edwards, (Underside) - (Specimen in ZSI collection)

National Park and Wildlife Sanctuaries have been established in area of 433.35 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is known from Manipur, in India. There has been considerable loss and deterioration in its area of occurrence. There are two examples (Central China) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Remarks* : The subspecies, *Ypthima dohertyi persimilis* Elwes & Edwards has been followed after Talbot (1947). However, D'Abbrera (1985) treated *persimilis* Elwes & Edwards as a distinct species with distribution - Assam, Manipur and Bhutan.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family AMATHUSIIDAE

**41. *Discophora deo deo* de Nicéville, 1898**

**THE BANDED DUFFER**

*Discophora deo* de Niceville, 1898

*Discophora deo deo* de Niceville : Frustorfer, 1911; Evans, 1932; Tytler, 1939 Talbot, 1947; D'Abbrera, 1985

**Diagnostic characters :** MALE Ground colour velvety brown, tinged violet. Fore wing with a broad postdiscal ochre-yellow band; inner area covered with modified scales; *underside* extremely dark brown, with red, violet and whitish patches. Hind wing band smaller, androconial spot broad; *underside* ocelli small, one posteriorly centred pure white. FEMALE - Fore wing band still broader; *underside* discal band broadly margined. Hind wing *underside* ocelli obsolete. *Wing expanse* : ♂ ♀ 80-90 mm.

**Intraspecific variation :** The subspecies is known for displaying little variation and it has only other following Indian counterpart.

*D. deo deoides* Tytler - India : Assam and Nagaland.

The nominate subspecies is distinguished from *deoides* by smaller wing expanse, fore wing with two large distal yellow spots and hind wing with band smaller.

**Distribution :** India : Manipur. *Elsewhere* : North Myanmar.

**Status :** Critically Endangered ( CR A1c, B1 2bc).

**Habitat and ecology :** It flies during March-April. The habits and ecology of this butterfly are not much known.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; use of



*Discophora deo deo* de Niceville, male, (Upperside) - (Specimen in ZSI collection)



*Discophora deo deo* de Niceville, male, (Underside) - (Specimen in ZSI collection)



*Discophora deo deo* de Niceville, female, (Upperside) - (Specimen in ZSI collection)



*Discophora deo deo* de Niceville, female, (Underside) - (Specimen in ZSI collection)

insecticides and pesticides; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The butterfly is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 433.35 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human interference causing any more threat in its area of occurrence. Efforts should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for its occurrence restricted in Manipur in India. Its area of occurrence has been reduced and deteriorated over the years. There are three examples (Shan states, Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The validity of the nominate subspecies, *Discophora deo deo* de Niceville has been followed after Talbot (1947) who also treated its other counterpart.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family AMATHUSIIDAE

**42. *Discophora sondaica muscina* Stichel, 1902**

**THE COMMON DUFFER**

*Discophora muscina* Stichel : Stichel, 1902

*Discophora sondaica muscina* Stichel : 1905

*Discophora tullia* Bell (non Cramer) : 1909

*Discophora tullia muscina* Stichel : Frustorfer, 1911; Evans, 1932

*Discophora sondaica muscina* Stichel : Talbot, 1947

**Diagnostic characters** : MALE - Ground colour black-grey, tinged brown. Fore wing with small blue spots arranged into three rows. FEMALE - Fore wing markings bluish-white. **Wing Expanse** : ♂ ♀ 80-90 mm.

**Intraspecific variation** : The subspecies shows little variation and there is another counterpart occurring in India.

*D. sondaica zal* Westwood - India : Sikkim. *Elsewhere* : Myanmar.

The subspecies *muscina* is distinguished from *zal* by the male upperside of fore wing with all three rows of black spots prominent and hind wing without spots.

**Distribution** : India : Karnataka : (North Kanara).

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The species *muscina* was described by Stichel (1902) from a single male from Karwar (North Kanara). Talbot (1947) stated it to be "Very rare, especially the female of which no specimen is known to the author" However, Frustorfer (1911-1912) mentioned about its early stages - larva (in shape resembled larva of *D. lepida* Moore) being light brown grey, with chocolate brown spots and rose coloured legs, hairs on body mouse-grey, living on bamboos; pupa almost analogous to that of *lepida*, bone-white or greenish



*Discophora sondaica muscina* Stichel, male (Upperside) - (Specimen in ZSI collection)



*Discophora sondaica muscina* Stichel, male (Underside) - (Specimen in ZSI collection)



*Discophora sondaica muscina* Stichel, female (Upperside) - (Specimen in ZSI collection)



*Discophora sondaica muscina* Stichel, female (Underside) - (Specimen in ZSI collection)

depending on its formation among dead leaves or green leaves; if the pupa is green, there are yellow lines on the wingsheaths, but if yellow then it is dotted with black. Wynter-Blyth (1957) also quoted from T. R. Bell' remarks on the race *muscina* of *tullia* from North Kanara.

*Threats* : Threats in the area are shifting cultivation, crop plantation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal, selective logging i.e, selective work of cutting down/making use of forest produces; setting up of railway lines, clearing of forests for human settlements. There has been loss of 50% of forest cover in 50 years (Goankar, 1996).

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of 6712.62 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing threat to bamboo plantation any further its area of occurrence. More information is required on habits, ecology, life-history and particularly distribution of this butterfly.

*Rationale* : This subspecies is so far known from North Kanara (Karnataka). Its area of occurrence is decreased considerably as well as degraded. There are three examples (North Kanara) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Talbot (1947) has been followed for the validity of the subspecies, *Discophora sondaica muscina* Stichel. Talbot (*loc. cit.*) provided synonymy, other subspecies and local forms occurring in India.

Compiled by : I.J. Gupta and D.K. Mondal

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**LEAST CONCERN**

Class INSECTA

Order LEPIDOPTERA

Famliy NYMPHALIDAE

### 43. *Calinaga buddha* Moore, 1857

#### THE FREAK

*Calinaga buddha* Moore, 1857

*Calinaga buddha* Moore : de Niceville, 1886; Moore, 1901; Bingham, 1905; Evans, 1932; Wynter-Blyth, 1957; D'Abbrera, 1985; Haribal, 1992; Varshney, 1994

*Diagnostic characters* : MALE - Ground colour crimson with pubescens not covering whole of thorax; underside brownish. Wings of papery texture, with transparent patches reduced; abdomen leathery and devoid of hairs like danaines. Antennae extremely short. FEMALE - Similar to male, but smaller in expanse. *Wing expanse* : ♂ ♀ 90-105 mm.

*Intraspecific variation* : The species is highly variable and its four following subspecies (Evans, 1932) occur in India.

- i. *C. buddha buddha* Moore India : Uttranchal (Kumaon). *Elsewhere* : Pakistan (Murree). Upperside of anterior part of thorax orange. Underside hind wing dull ochreous.
- ii. *C. buddha gautama* Moore - India : Sikkim. Darker; fore wing elongated; underside hind wing pale brown.
- iii. *C. buddha brahma* Butler - India : Assam (Manipur, Nagaland). Thorax entirely orange; dark with pale markings reduced; underside hind wing pale slate.
- iv. *C. buddha aborica* Tytler - India : Arunachal Pradesh (Abor valley). Upperside wing markings very much reduced but sharply defined.

*Distribution* : India : Arunachal Pradesh (Abor valley), Assam (Manipur, Nagaland), Jammu & Kashmir, Sikkim, Uttaranchal (Kumaon). *Elsewhere* : Eastern Tibet (de Niceville, 1886), North Mynamar.

*Status* : Least Concern (LC).



*Calinaga buddha buddha* Moore, male (Upperside) - (Specimen in ZSI collection)



*Calinaga buddha buddha* Moore, male (Underside) - (Specimen in ZSI collection)



*Calinaga buddha brahma* Butler, (Upperside) - (Specimen in ZSI collection)



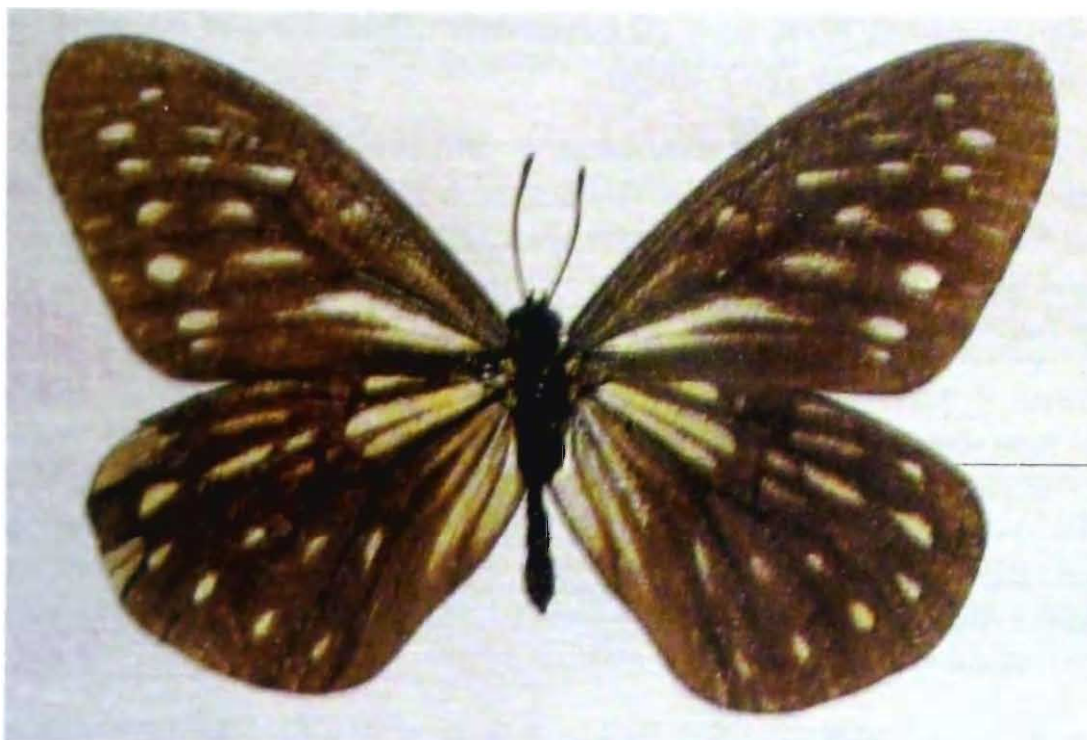
*Calinaga buddha brahma* Butler, (Underside) - (Specimen in ZSI collection)



*Calinaga buddha gautama* Moore, (Upperside) - (Specimen in ZSI collection)



*Calinaga buddha gautama* Moore, (Underside) - (Specimen in ZSI collection)



*Calinaga aborica* Tytler , male (Underside) - After D'Abbrera (1985)

**Habitat and ecology :** This hill-dwelling genus, to which the butterfly belongs, is extraordinary, with its wings like those of Snow Apollo, *Parnassius latreille*, or Tree Nymph, *Idea Fabricius*. Where the danaines are absent, it tends to mimic *Parnassius* and the Whites and Yellows in the neighbourhood. The butterfly appears in a single generation during spring. It has been recorded at elevation of 1050-1350m. in Himachal Pradesh from March to July; also from high hills in north-east India. The other habits and ecology of this species are not known.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals including butterflies (Khanna & Kumar, 2000); hybridization; land, water and atmospheric pollution by using pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002). There is loss of forest cover of 17% (2,573 sq km) of the geographical area over a period of 14 years (1979-1993) for Himachal Pradesh and a loss of 10.6% of the geographical area over a period of 12 years for Jammu & Kashmir.

**Conservation measures taken :** The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a large protected area.

**Conservation measures proposed :** There should be check on human activities causing any more threats in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be

followed while capturing butterflies from their habitat. The farming of this butterfly should be taken up with advantage.

*Rationale* : The species has a wide range of distribution in India. This entire area of its occurrence is significantly decreased and degraded. There are 16 examples (11 exs. from Murree and Kulu representing *C. buddha buddha*; three examples from Sikkim of *C. buddha gautama* and two examples of *C. buddha brahma*) in the National Zoological Collection of Zoological Survey of India, Kolkata.

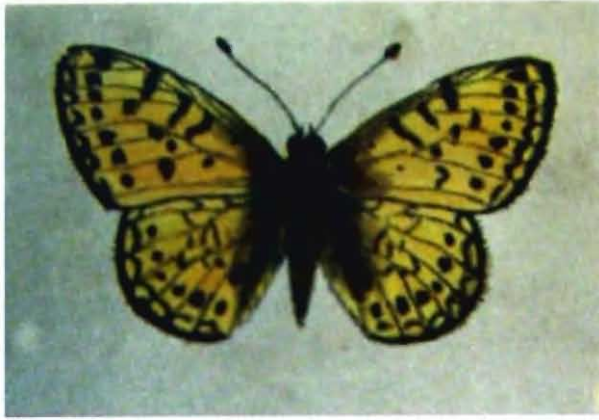
*Taxonomic Reliability* : The species, *Calinaga buddha* Moore along with its four subspecies represented in India has been followed after Evans (1932) and treated under subfamily Calinaginae after (Eliot, 1992). D' Abrera (1985) treated subspecies *buddha*, *gautama* and *aborica* as distinct three species following arrangement in the British Museum, provided distribution range "North western Himalayas to northern Burma. ? South western China" for *C. buddha* Moore. This range also includes Sikkim, Bhutan; and Northern Myanmar (Abor hills) where both *gautama* and *aborica* occur.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**44. *Argynnis hegemone* Staudinger, 1881**  
**THE WHITESPOT FRITILLIARY**

*Argynnis hegemone* Staudinger, 1881

*Boloria hegemone* (Staudinger) : Moore, 1900

*Argynnis hegemone* Staudinger : Bingham, 1905; Fruhstorfer, 1912; Evans, 1932; Varshney, 1994.

**Diagnostic characters** : MALE - Ground colour pale bright tawny with very small black markings. Fore wing with biangulated series of discal spots; termen traversed by a series of small lunules. Hind wing base and upper half of dorsal margin very broadly dusky brownish black, cell with a loop-like mark near apex; discal, postdiscal and subterminal spots present; *underside* yellow, white spotted and postdiscal row of spots bordered by a pale yellow band. FEMALE - As in male, but ground colour paler and markings larger, the white markings on the hind wing sometimes suffused with very pale blue. *Wing expanse* ♂ ♀ : 38-50 mm

**Intraspecific variation** : The species shows minor variations, viz., fore wing cell with one or two minute spots and inner area with a spot or a transverse line below cell; hind wing subterminal spots may or may not be coalescing with black margin along veins and *underside* transverse basal white spots may be two or three (Bingham, 1905).

**Distribution** : India : Jammu & Kashmir (North Ladakh). *Elsewhere* : Pakistan and Turkestan.

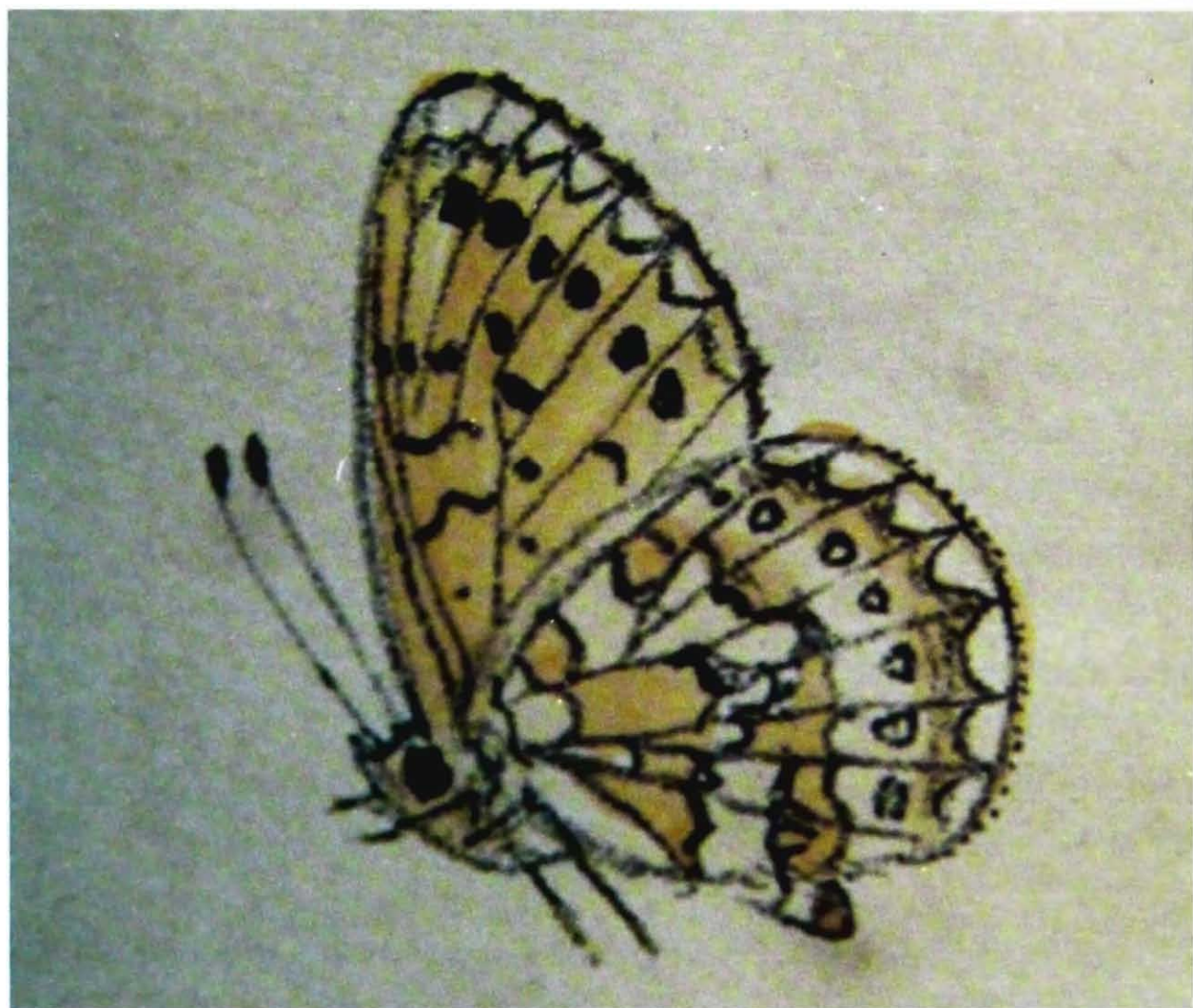
**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : This is a high altitude butterfly that flies at 5000 m during July-August (Fruhstorfer, 1912).

**Threats** : The area of its occurrence is considered highly fragile and threats include over-grazing (selective feeding); clearing of forests for wood for fuel; human settlements,



*Argynnis hegemone* Staudinger, male (Upperside) - After Moore (1899-1900)



*Argynnis hegemone* Staudinger, male (Underside) - After Moore (1899-1900)

construction of roads and active tourism in summer months; fragmentation of habitats. selective use of medicinal plants and collecting other forest commodities and animals. There is loss of forest cover of 10.6% of the geographical area over a period of 12 years for Jammu & Kashmir.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The Hemis National Park has been created in an area of 4100 sq km in Ladakh. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to North Ladakh, in India. There has been significant decrease and deterioration in its area of occurrence. There are three examples (two from Tian Schian and one from Turkestan) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Argynnis hegemone* Staudinger has been followed after Bingham (!905). It has been treated under the genus *Clossiana* Reuss by Varshney (1994).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**45. *Athyma jina jina* Moore, 1857**  
**THE BHUTAN SERGEANT**

*Athyma jina* Moore, 1857

*Pantoporia jina* (Moore) : Moore, 1857; Fruhstorfer, 1912

*Athyma jina* Moore : De Niceville, 1886; Bingham, 1905; Varshney, 1994

*Tharasia jina* (Moore) : Moore, 1898

*Pantoporia jina jina* (Moore) : Evans, 1932

*Athyma jina jina* Moore : D'Abbrera, 1985

**Diagnostic characters** : MALE Ground colour fuliginous black, with pale creamy-white markings. Eyes hairy. Fore wing upper cubital area with a discal spot, cell-streak undivided, distally broad and clear-white. *Underside* reddish brown, banded white and without spots. FEMALE - As for male. *Wing expanse* : ♂ ♀ 60-75 mm.

**Intraspecific variation** : Only the nominate subspecies known in India shows little variation.

**Distribution** : India : Sikkim. *Elsewhere* : Nepal and Bhutan.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The butterfly is found in dense forests at an altitude of c 2000-2500 m (1800-2525m.). It is on flight during April and July. The other habits and ecology are not known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining, cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of



*Athyma jina jina* Moore, (Upperside) - (Specimen in ZSI collection)



*Athyma jina jina* Moore, (Underside) - (Specimen in ZSI collection)

forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides

*Conservation measures taken* : The butterfly is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in an area of 2101.34 sq km.

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. Efforts should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : This nominate subspecies is confined to Sikkim, in India. Its area of occurrence is significantly shrunk and degraded. Fruhstorfer (1912) stated, “ since in the course of many years I have only found one specimen among at least 50-60000 butterflies sent to me from Sikkim” There are 13 examples (Sikkim and Nepal) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : This species, *Athyma jina jina* Moore has been followed after Evans (1932) with generic change after D’Abrera (1985)

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**46. *Athyma reta moorei* (Fruhstorfer, 1906)**

**THE MALAY STAFF SERGEANT**

*Pantoporia reta moorei*, Fruhstorfer, 1906-07

*Pantoporia reta moorei* Fruhstorfer : Evans, 1932

*Athyma reta moorei* (Fruhstorfer) : D'Abbrera, 1985

*Diagnostic characters* : MALE - Ground colour black. Fore wing with broad white bands; large subapical spots, coalesced to form a continuous band; discal streak twice divided. *Underside* bands brown yellow. Eyes naked. FEMALE - Both wings with markings pale-brown and confluent. Hind wing bands narrow. *Wing expanse* : ♂ ♀ 60-70 mm.

*Intraspecific variation* : This is the only known subspecies in India, displaying little variation.

*Distribution* : India : Assam. *Elsewhere* : Myanmar; Malay Peninsula; Singapore.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of the butterfly are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of 2851.75 sq km. (Singh & Singh 2002)



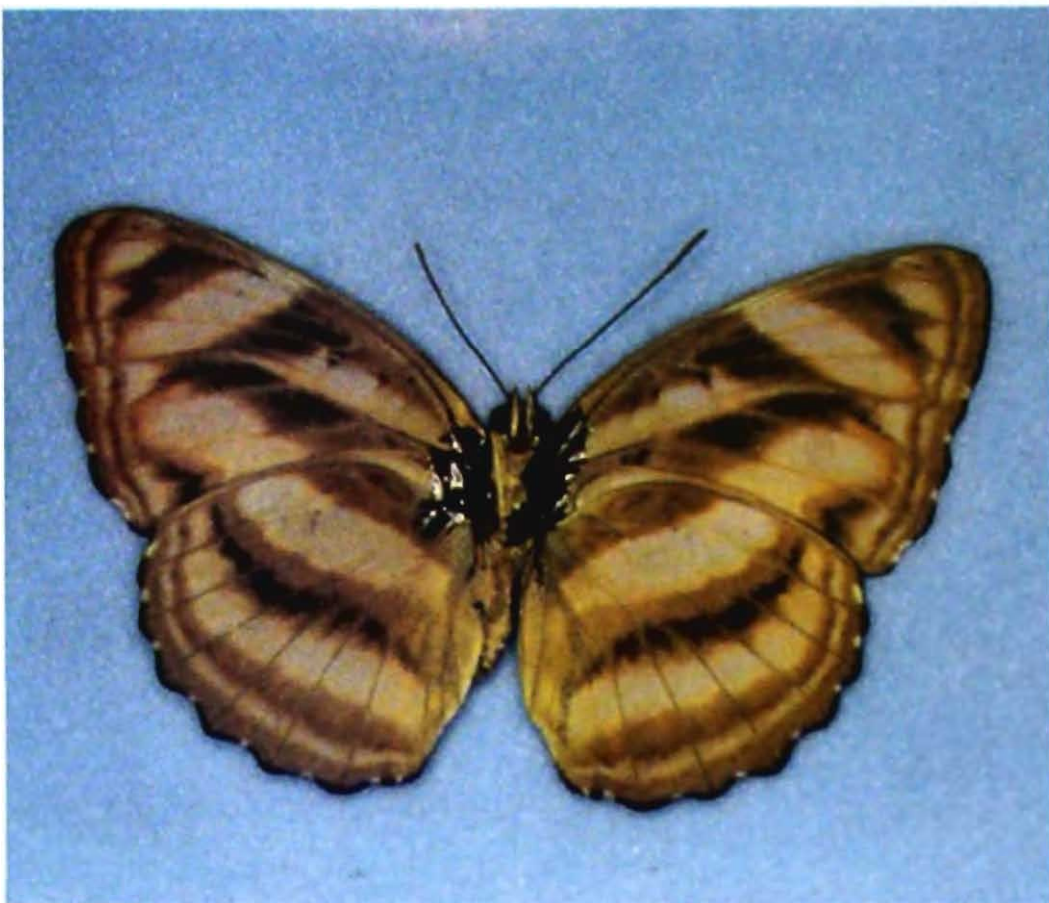
*Athyma reta moorei* (Fruhstorfer), male (Upperside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), male (Underside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), female (Upperside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), female (Underside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), male (Upperside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), male (Underside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), male (Upperside) - (Specimen in ZSI collection)



*Athyma reta moorei* (Fruhstorfer), male (Underside) - (Specimen in ZSI collection)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is restricted to Assam, in India. There has been considerable reduction and degradation in its area of occurrence. There are three examples (Andamans and Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Evans (1932) has been followed for subspecies, *Athyma reta moorei* (Fruhstorfer) but treated with generic change after D'Abrera (1985).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**47. *Bhagadatta austenia purpurascens* (Tytler, 1915)**

**THE GREY COMMODORE**

*Bhagadatta austenia purpurascens* Tytler, 1915

*Limenitis austenia purpurascens* Tytler : Evans, 1932

*Bhagadatta austenia* Moore : D'Abrera, 1985, Varshney, 1994

**Diagnostic characters** : MALE - Ground colour dark brown glossed purple. Fore wing postdiscal line double and highly zigzagged; subterminal lunules from apex to  $Cu_{1b}$ -area whiter and distinct, upper end of cell opposite the origin of  $Cu_{1a}$ ; lower discocellular ending at origin of  $Cu_{1a}$ ; marginal series of inverted V-shaped spots present; *underside* grey and markings darker. Hind wing margin with a series of spots and *underside* colouration as on fore wing. FEMALE - As in male. *Wing expanse* : ♂ ♀ 85-90 mm.

**Intraspecific variation** : This subspecies exhibiting variation in the intensity of the purple suffusion has its following nominal counterpart.

*Bhagadatta austenia austenia* Moore - India : Assam, Nagaland. *Elsewhere* : N. Myanmar.

The subspecies *purpurascens* is distinguished from *austenia* by the upperside of wings being purple glossed.

**Distribution** : India : Arunachal Pradesh (Abor valley).

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The eight males and a female were taken on the Dihang River, Abor Hills, at about 900m. in June and July (Tytler, 1915). The other habits and ecology of the butterfly are not known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism;



*Bhagadatta austenia austenia* Moore, male (Upperside) - After D'Abrera (1985)  
(Photograph of *Bhagadatta austenia purpurascens* (Tytler) not given)



*Bhagadatta austenia austenia* Moore, female (Underside) - After D'Abrera (1985)  
(Photograph of *Bhagadatta austenia purpurascens* (Tytler) not given)

fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 2851.75 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : Its range of occurrence should be monitored for any further threat. Efforts need to be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for its restricted distribution in Abor Valley in Arunachal Pradesh. There has been considerable shrinkage and deterioration in its area of occurrence.

*Taxonomic Reliability* : The subspecies, *Bhagadatta austenia purpurascens* Tytler has been followed after Evans (1932) with generic change as treated by D'Abrera (1985).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**48. *Bassarona iva* (Moore, 1857)**

**THE GRAND DUKE**

*Adolias iva* Moore, 1857

*Euthalia iva* (Moore) : de Niceville, 1886; Evans, 1932; Wynter-Blyth, 1957

*Mahaldia iva* (Moore) : Moore, 1896

*Dophla iva* (Moore) : Bingham, 1905; Tytler, 1915

*Bassarona iva* (Moore) : D'Abbrera, 1985; Varshney, 1994

*Diagnostic characters* : MALE Ground colour deep dark green. Fore wing median spots white and sharply pointed; *underside* green, tinged yellow. Hind wing with four white median dots; *underside* lovely green, with six rounded median spots. FEMALE - As in male. *Wing expanse* : ♂ ♀ 115-125 mm.

*Intraspecific variation* : The fore wing with two small white spots in inner area in male, may be absent in female; hind wing discal band bears anteriorly three or four pure white spots.

*Distribution* : India : Sikkim; Manipur, Nagaland.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Fruhstorfer (1913) stated of one female captured at altitude 2000 m at Daling in Sikkim in August and one pair collected from Manipur. Three males and a female were taken at Kirbari, Naga Hills at 1825m. in Nagaland from July-August (Tytler, 1915). The other habits and ecology of this butterfly are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of



*Bassarona iva* (Moore) (Upperside) - (Specimen in ZSI collection)



*Bassarona iva* (Moore) (Underside) - (Specimen in ZSI collection)

forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been established in an area of 2534.69 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for a few records in its short range of distribution in India. Its area of occurrence is significantly decreased and also deteriorated. There are two examples (Manipur) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Bassarona iva* (Moore) after generic change as treated by D'Abrera (1985).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**49. *Bassarona khama curvifascia* (Tytler, 1915)**

**THE NAGA DUKE**

*Dophla curvifascia* Tytler, 1915

*Euthalia khama curvifascia* (Tytler) : Evans, 1932

*Bassarona khama curvifascia* (Tytler) : Varshney, 1994

**Diagnostic characters** : MALE Ground colour dark green. Fore wing with discal band narrow, pale yellow and dusky at lower end, upper spots of band small but still smaller in  $M_3$ -area. Hind wing with a continuous curved band from costa to vein  $M_3$ . FEMALE Fore wing discal band white, otherwise same as in male. *Wing expanse* : ♂ ♀ 75-95 mm.

**Intraspecific variation** : The discal band pale yellow in male and white in female.

**Distribution** : India : Manipur and Nagaland.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : Tytler (1914) collected five males and three females in August and September at Yakama and Phesima in the Naga Hills 2225-2525m. in Nagaland and a single male at 2650m. on Kabur Peak, Manipur in August. The other habits and ecology of this species are not known.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. (Alfred *et al.*, 2002)

**Conservation measures taken** : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National



*Bassarona khama curvifascia* (Tytler), (Upperside) - (Specimen in ZSI collection)



*Bassarona khama curvifascia* (Tytler), (Underside) - (Specimen in ZSI collection)

Park and Wildlife Sanctuaries have been established in area of 655.71 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing any more threat in its range of occurrence. Efforts should be made for further information on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for a few records in its short range of distribution in India. There has been significant reduction and degradation in its area of occurrence.

*Taxonomic Reliability* : The subspecies, *Bassarona khama curvifascia* (Tytler) has been followed after Evans (1932) with generic change as treated by Varshney (1994).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**50. *Chitoria ulupi ulupi* (Doherty, 1889)**

**THE TAWNY EMPEROR**

*Potamis- Apatura ulupii* Doherty, 1889

*Dravira ulupi* (Doherty) : Moore, 1895

*Apatura ulupi* (Doherty) : Bingham, 1905; Evans, 1932

*Chitoria ulupi ulupi* (Doherty) : D'Abbrera, 1985

**Diagnostic characters** : MALE Ground colour dark greenish brown. Fore wing with two pale discal bands, inner one tawny and crossing cell; markings tawny. Hind wing unbanded; *underside* washed pale green and with a complete row of postdiscal ocelli. FEMALE - As in male, but fore wing inner discal band white and not crossing cell; markings white. *Wing expanse* : ♂ ♀ 50-70 mm.

**Intraspecific variation** : This subspecies displaying little variation occurs in India and has following another counterpart.

*Chitoria ulupi florenciae* (Tytler) India : Nagaland.

The nominate subspecies differs from *florenciae* by the upperside fore wing with outer discal band continuous, hind wing mostly tawny and underside of hind wing bearing a complete row of postdiscal ocelli.

**Distribution** : India : Assam (Margherita); Manipur (Dihang River).

**Status** : Endangered ( EN A1c, B1 2bc).

**Habitat and ecology** : Tytler (1915) collected a single male of this butterfly on the Dihang River, Abu Hills (Manipur) in June. Fruhstorfer (1913) stated ".....hitherto only one specimen is known, in the Elwes collection"

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Chitoria ulupi ulupi* (Doherty), male (Upperside) - After D'Abrera (1985)



*Chitoria ulupi ulupi* (Doherty), male (Underside) - After D'Abrera (1985)



*Chitoria ulupi ulupi* (Doherty), female (Upperside) - After D'Abreera (1985)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The butterfly is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of 3507.46 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies has a few records from its short range of distribution. There has been significant decrease and degradation in its area of occurrence.

*Taxonomic Reliability* : The nominate subspecies, *Chitoria ulupi ulupi* (Doherty) has been followed after Evans (1932) with generic change after d'Abreera (1985). D'Abreera (1985) treated *Chitoria ulupi florenciae* (Tytler) as wet season form of *ulupi ulupi*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**51. *Cirrochroa fasciata* (Felder, 1860)**

**THE BRANDED YEOMAN**

*Atella fasciata* Felder, 1860

*Cirrochroa fasciata* (Felder) : de Niceville, 1886

*Ducapa fasciata*(Felder) : Moore, 1900

*Cirrochroa fasciata* (Felder) : Bingham, 1905; Evans, 1932; Wynter-Blyth, 1957

*Paduca fasciata* (Felder) : D'Abbrera, 1985; Varshney, 1994

*Diagnostic characters* : MALE - Ground colour dark brown. Fore wing discal band pale and ending at M<sub>3</sub>; two yellow postdiscal spots in M<sub>1</sub> and M<sub>2</sub>; a dull ochreous brand on either side of basal half of M<sub>1</sub> and M<sub>2</sub>. Hind wing discal band not ending at M<sub>3</sub> ; two postdiscal rows of conjoined yellow spots. Characteristic sex mark in the form of a broad edging of pale specialised scales on each side of M<sub>1</sub> and M<sub>2</sub> on fore wing and R<sub>5</sub> and M<sub>1</sub> on hind wing, the broad edging extending from close to bases of those veins nearly up to postdiscal series of ochraceous spots. FEMALE - As in male, but without the sex-brand. *Wing expanse* : ♂ ♀ 45-55 mm.

*Intraspecific variation* : Basal half of wings may be brownish ochraceous and *underside*, pale yellow to greyish ochraceous.

*Distribution* : India : Andaman and Nicobar Islands : Andamans. *Elsewhere* : Myanmar; Malayan.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of the butterfly are not much known.

*Threats* : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover is reduced to 21% from 96%, in Middle Andaman it is left with only 29% forest cover and in South Andaman it is all worked over. Population influx and



*Cirrochroa fasciata* (Felder) (Upperside) - (Specimen in ZSI collection)



*Cirrochroa fasciata* (Felder) (Underside) - (Specimen in ZSI collection)

indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been established in area of 1510.09 sq km in Andaman & Nicobar Islands. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is known in India from Andamans only. There has been significant reduction and degradation in area of its occurrence. There are 27 examples (only one from Andamans, others from Myanmar, Java, North Borneo, Perak, the Phillipines and Sumatra ) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Cirrochroa fasciata* (Felder) has been followed after Evans (1932). D'Abbrera (1985) and Varshney (1994) has treated this species as *Paduca fasciata* (Felder).

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALDIAE

**52. *Diagora nicevillei* (Moore, 1895)**

**THE BRANDED YEOMAN**

*Parhestina nicevillei* Moore, 1895

*Parhestina nicevillei* Moore : Bingham, 1905

*Diagora nicevillei* (Moore) : Evans, 1932; Wynter-Blyth, 1957; D'Abbrera, 1985; Varshney, 1994

**Diagnostic characters** : MALE - Ground colour yellowish white. Both wings with veins and terminal areas heavily marked black, the latter bearing postdiscal and subterminal series of white spots. Hind wing *underside* suffused sulphur-yellow along anal margin. FEMALE - Unknown. *Wing expanse* : 75 mm.

**Intraspecific variation** : The species shows little geographical variation. The phenomenon of mimicry does not, however, follow any particular model, so that one cannot speak either of convergence or mimetism (Fruhstorfer, 1913).

**Distribution** : India : Himachal Pradesh (near Chumba, on a forestpath, Dalhousie)); Uttaranchal (Mussoorie). *Elsewhere* : Nepal.

**Status** : Vulnerable (Vu A1c, B1 2bc).

**Habitat and ecology** : Fruhstorfer (1913) mentioned that only a single male was taken by de Nicéville from the North-Western Himalaya at the end of May, 1879 near Chumba, on a forestpath. Smith (1990) stated "*Diagora nicevillei* is probably one of the rarest butterflies in the world. Described from a single specimen caught 100 years ago, it has only ever been found in three places, one of them Godavari where it has bred for the last 50 years. It closely resembles the Great Blackvein (*Aporia agathon* (Gray)) with which it flies. Looking so much like a common butterfly may have helped it to elude butterfly collectors." The other habits and ecology are not known.

**Threats** : Threats in the area include expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of



*Diagora nicevillei* (Moore) male (Upperside) - After Moore (1895)



*Diagora nicevillei* (Moore) male (Underside) - After Moore (1895)

biological resources; expansion of industries; human settlements : urbanisation; construction of dams, and highways; tourism; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2000); land, water and atmospheric pollution on account of using pesticides. Himachal Pradesh has lost a forest cover of 17% (2,573 sq km) its geographical area over a period of 14 years (1979-1993).

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of area of 26886.83 sq km. (Singh & Singh, 2002)

*Conservation measurements proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : The species is known by only a few records in its range of distribution. There has been a significant loss and deterioration in its area of occurrence. There is only one example (Chumba) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Diagora nicevillei* (Moore) has been followed after Bingham (1905) with generic change as treated by Evans (1932).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**NEAR THREATENED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**53. *Dilipa morgiana* (Westwood, 1850)**

**THE GOLDEN EMPEROR**

(Figs. 167-168)

*Apatura ? morgiana* Westwood, 1850

*Dilipa morgiana* (Westwood) : de Niceville, 1886; Moore, 1895; Bingham, 1905; Evans, 1932; D'Abrera, 1985; Bhattacharya, 1990; Haribal, 1992; Varshney, 1994.

**Diagnostic characters** : MALE Ground colour dark brown, suffused golden. Fore wing transverse central and discal apical bands of large golden-bronzy spots, apical spots white. Hind wing base and variable marginal area dark brown, otherwise golden-bronzy. FEMALE As in male, but with the markings white, faintly suffused with violet; hind wing discal area entirely white. *Wing expanse* : ♂ ♀ 70-82 mm.

**Intraspecific variation** : Wynter-Blyth (1957) mentioned that in one form of female described as male, the golden-bronzy colour of wing markings was quite duller or more reduced than that in male, while in the other form of female these spots are replaced by white.

**Distribution** : India : Arunachal Pradesh, Assam, Himachal Pradesh; Jammu and Kashmir (Kashmir); Nagaland, Sikkim, Uttaranchal (Mussoorie). *Elsewhere* : Nepal; North Myanmar; Vietnam.

**Status** : Near Threatened (NT).

**Habitat and ecology** : This hilly butterfly, particularly the male, is very fond of over-ripe fruits like apricot, peach and even mango. Both sexes are attracted to *Buddelia* blossoms. It has three annual broods, viz., spring, summer and monsoon because of its capture in March-June, August-October. It has been recorded from Kangra Valley at 1825m. and a female at Summer Hill in Simla in August, males from bare top of Tara Devi opposite Shimla (Himachal Pradesh), Mussoorie (Uttaranchal) and Nagaland (De Niceville, 1886); in September from Mussoorie (Uttaranchal), Sikkim in October, Margherita in Upper Assam (Fruhstorfer, 1913). Female is rarer than male.



*Dilipa morgiana* (Upperside) - (Specimen in ZSI collection)



*Dilipa morgiana* (Underside) - (Specimen in ZSI collection)

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals butterflies (Khanna & Kumar, 2000); land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997, Himachal Pradesh lost forest cover of 17% (2,573 sq km) of the geographical area over a period of 14 years (1979-1993) and Jammu & Kashmir lost 10.6% of the geographical area over a period of 12 years (Alfred *et al.*, 2002).

**Conservation measures taken :** The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a large protected area.

**Conservation measures proposed :** Its range of occurrence should be monitored for posing any further threat. More information is required on its habits, ecology, life-history and distribution.

**Rationale :** This species is considered scarce in its range of distribution. The female is rarer than male. There has been considerable decrease and degradation in its area of occurrence. There are a few examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** Bingham (1905) has been followed for the species, *Dilipa morgiana* (Westwood).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**54. *Doleschallia bisaltide andamanensis* Fruhstorfer, 1899**

**THE AUTUMN LEAF**

*Doleschallia bisaltide andamanensis* Fruhstorfer, 1899

*Doleschallia bisaltide andamanica* Moore, 1900

*Doleschallia bisaltide* race *andamanensis* Fruhstorfer : Bingham, 1905

*Doleschallia bisaltide andamanensis* Fruhstorfer : Fruhstorfer, 1912

*Doleschallia bisaltide andamana* Fruhstorfer : Evans, 1932

*Diagnostic characters* : Upperside : Ground colour bright red brown; fore wing with oblique yellow broader band, extending from middle of costal margin uninterruptedly to  $M_3$ -area, preapically constricted; hind wing with an inner as well as outer conspicuous subterminal narrow black band. *Underside* variable, ground-colour richer, almost metallic green, with basal snow white spots defined with black lines, clearly defined ocelli in  $Cu_{1b}$  and  $M_2$ -areas. Antennae blackish brown, ochraceous at apex; head, thorax and abdomen dark fulvous brown; *underside* thorax and abdomen pale brown. FEMALE : yellow bands much broader, placed on the fore wing in horizontal direction. *Wing expanse* : ♂ ♀ 71-82mm.

*Intraspecific variation* : This subspecies has other two following counterparts in India.

i. *Doleschallia bisaltide malabarica* Fruhstorfer : India : South India.

ii. *Doleschallia bisaltide indica* Moore : India : Sikkim. *Elsewhere* : Myanmar.

*D. bisaltide andamanensis* Fruhstorfer differs from the above two subspecies by the fore wing termen convex between veins  $R_5$  and  $R_3$ , concave in the middle, tornus much produced.

*Distribution* : India : Andaman & Nicobar Islands.

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Status* : Endangered (EN A1c, B1 2bc).



*Doleschallia bisaltide andamanensis* Fruhstorfer (Upperside) - (Specimen in ZSI collection)



*Doleschallia bisaltide andamanensis* Fruhstorfer (Underside) - (Specimen in ZSI collection)

**Threats** : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover is reduced to 21% from 96%, in Middle Andaman it is left with only 29% forest cover and in South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken** : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been created in area of 1510.09 sq km in Andaman Islands. (Singh & Singh, 2002)

**Conservation measures proposed** : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : This subspecies is known from Andaman and Nicobar Islands in India. There has been significant decrease and deterioration in its area of occurrence. It is represented in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability** : The subspecies, *D. bisaltide andamanensis* Fruhstorfer has been followed after Evans (1932) who treated other subspecies also.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**55. *Eulaceura manipurensis* (Tytler, 1915)**

**THE TYTLER'S EMPEROR**

*Apatura manipuriensis* Tytler, 1915

*Eulaceura manipuriensis* (Tytler) : Evans, 1932; D'Abbrera, 1985;

*Eulaceura manipurensis* (Tytler) : Wynter-Blyth, 1957; Varshney, 1994; Gupta, 2004

*Diagnostic characters* : MALE - Ground colour pale transparent brown. Fore wing costa dark brown; lower first cubital area with a large spot. Hind wing discal band and margin dark. FEMALE As for male but mostly brown. *Wing expanse* : ♂ ♀ 75-80 mm.

*Intraspecific variation* : This species is not known to exhibit significant variation.

*Distribution* : India : Manipur.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The species is single brooded, described from 15 males and one male taken at the foot of the hills near Sebong, Manipur, in April while flying in a deep shady nullah (Tytler, 1915). The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 433.35 sq km. (Singh & Singh, 2002)



*Eulaceura osteria manipuriensis*, male (Upperside) - D'Abbrera (1985)



*Eulaceura osteria manipuriensis*, female (Upperside) - D'Abbrera (1985)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution to Manipur where it is endemic. There has been shrinkage and deterioration in its area of occurrence.

*Taxonomic Reliability* : This species, *Eulaceura manipurensis* (Tytler) has been followed after Evans (1932) but as spelled by Wynter-Blyth (1957). D'Abbrera (1985) provided photograph as of subspecies *E. osteria manipuriensis*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**56. *Bassarona durga splendens* (Tytler, 1915)**

**THE BLUE DUKE**

*Dophla durga splendens* Tytler, 1915

*Euthalia durga splendens* (Tytler) : Evans, 1932, Wynter-Blyth, 1957

*Bassarona durga* (Moore) : D'Abbrera, 1985); Varshney, 1994

**Diagnostic characters** : MALE - Ground colour dark green. Fore wing white median band broad. Hind wing white median band outwardly black-edged; blue area formed into blue lunules throughout. **Underside** : both wings blue; distally grey-black; markings broader. FEMALE - As for male. **Wing expanse** : ♂ ♀ 95-105 mm.

**Intraspecific variation** : The subspecies has its nominal following counterpart.

*Bassarona durga durga* (Moore) - India : Arunachal Pradesh (Abor hills), Sikkim.

The subspecies *splendens* differs from the nominate one by the upperside of hind wing with blue area formed into blue lunules throughout.

**Distribution** : India : Nagaland.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : Tytler (1915) described this subspecies based on a single male specimen collected near the foot hills on the Ukral Road, about 45km. east of Imphal, in July at about 900m.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Bassarona durga splendens* (Tytler), (Upperside) - (Specimen in ZSI collection)



*Bassarona durga splendens* (Tytler), (Underside) - (Specimen in ZSI collection)

**Conservation measures taken** : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 222.36 sq km. (Singh & Singh, 2002)

**Conservation measures proposed** : There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : This species is confined to Nagaland where it is endemic. There has been significant loss and deterioration in its area of occurrence.

**Taxonomic Reliability** : The subspecies, *Bassarona durga splendens* (Tytler) has been followed after Evans (1932) with generic change as treated species *Bassarona durga* (Moore) by D'Abbrera (1985).

Compiled by : I.J. Gupta and D.K. Mondal

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## LEAST CONCERN

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

### 57. *Euthalia telchinia* (Menetries, 1857)

#### THE BLUE BARON

*Adolias telchinia* Menetries, 1857

*Euthalia telchinia* (Menetries) : de Niceville 1886

*Kirontisa telchinia* (Menetries) : Moore, 1896

*Euthalia telchinia* (Menetries) : Bingham, 1905; Evans, 1932; Gupta, 1988, 1997;

D'Abrera, 1985; Varshney, 1994

**Diagnostic characters** : MALE Ground colour rich dark brown. Terminal blue border from tornus to Cuia. Hind wing margin evenly convex and blue. FEMALE - Ground colour pale brown. Fore wing with two postdiscal rows of five dusky white spots, margin bordered dark brown from apex to two-thirds along dorsum and continued on hind wing to just beyond cell. *Wing expanse* : ♂ ♀ 76-100 mm.

**Intraspecific variation** : The species shows seasonal variations (Fruhstorfer, 1913). The smaller female belongs to the dry season, and the larger one (= *aphidas* Hewitson) to the wet-season; dry-season male is pale grey, and the wet-season one deep brown. Female of winter-form lacks brown submarginal band on hind wing.

**Distribution** : India : Arunachal Pradesh, Assam (Cachar); Karnataka (Coorg); Meghalaya ; Nagaland; Sikkim, West Bengal. *Elsewhere* : Bhutan, Nepal, North Myanmar.

**Status** : Least Concern (LC).

**Habitat and ecology** : The butterfly is a forest-dweller, occurring during April-October up to elevation of 1350m. The species is known from east Sikkim at 305-610m. (de Niceville, 1883), Assam (Cachar), (de Niceville, 1886), Sikkim (De Niceville, 1886; Fruhstorfer, 1913, Gupta, 2003), east Sikkim (Haribal, 1992), Khasi Hills in Meghalaya (Fruhstorfer, 1913), Coorg (Yates, 1931), Pite at 700m and Tasser puttu at 1350m (Betts, 1950) and West Bengal (Gupta,



*Euthalia telchinia* (Menetries), (Upperside)



*Euthalia telchinia* (Menetries), (Underside)

1997), Wynter-Blyth (1957) mentioned its record in July from Nagaland. The habits and ecology are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; selective logging i.e, selective work of cutting down/ making use of forest produces; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of railway lines and industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002). Karnataka has lost 50% of forest cover in 50 years (Goankar, 1996).

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover much protected area.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The farming of this butterfly should be taken up with advantage.

*Rationale* : The species is fairly distributed but still dependent on conservation measures observing the shrinkage and deterioration in its area of its occurrence. There are 20 examples. (Arunachal Pradesh, Sikkim, Darjeeling, Khasi hills, Shillong, and Bhutan) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Euthalia telchinia* (Menetries).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Clas INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**58. *Helcyra hemina* Hewitson 1864**

**THE WHITE EMPEROR**

*Helcyra hemina* Hewitson, 1864

*Helcyra hemina* Hewitson : de Niceville 1886; Moore, 1895; Bingham, 1905; Wynter-Blyth, 1957; D'Abbrera, 1985; Varshney, 1994.

*Diagnostic characters* : MALE - Ground colour silvery white. Fore wing apex broadly black and with two white spots; cell and lower cubital area each with a black spot. Hind wing with a few irregular discal black spots. All markings showing through by transparency on the underside. FEMALE - As in male. *Wing expanse* : ♂ ♀ 62-75 mm.

*Intraspecific variation* : The species does not exhibit significant variation.

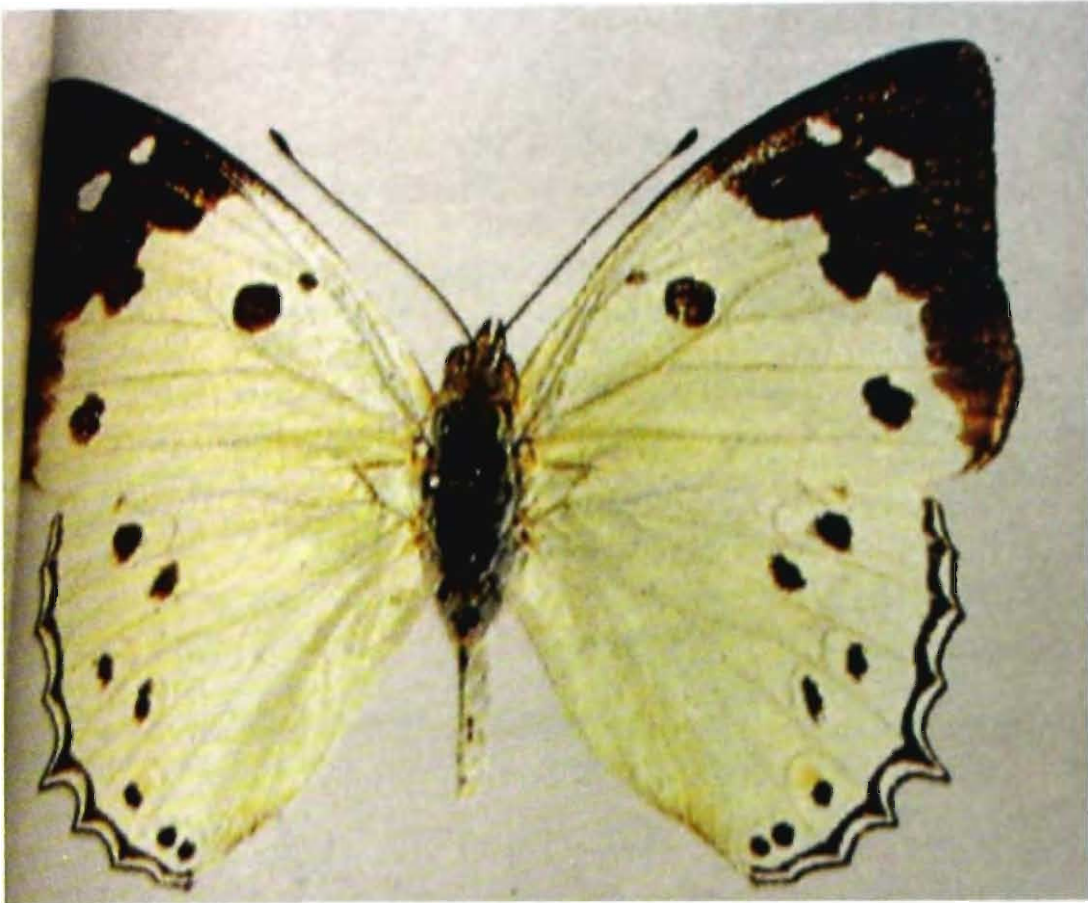
*Distribution* : India : Sikkim; Assam; Nagaland, West Bengal. *Elsewhere* : North Myanmar.

*Status* : Vulnerable (VU A1c, B1 2bc).

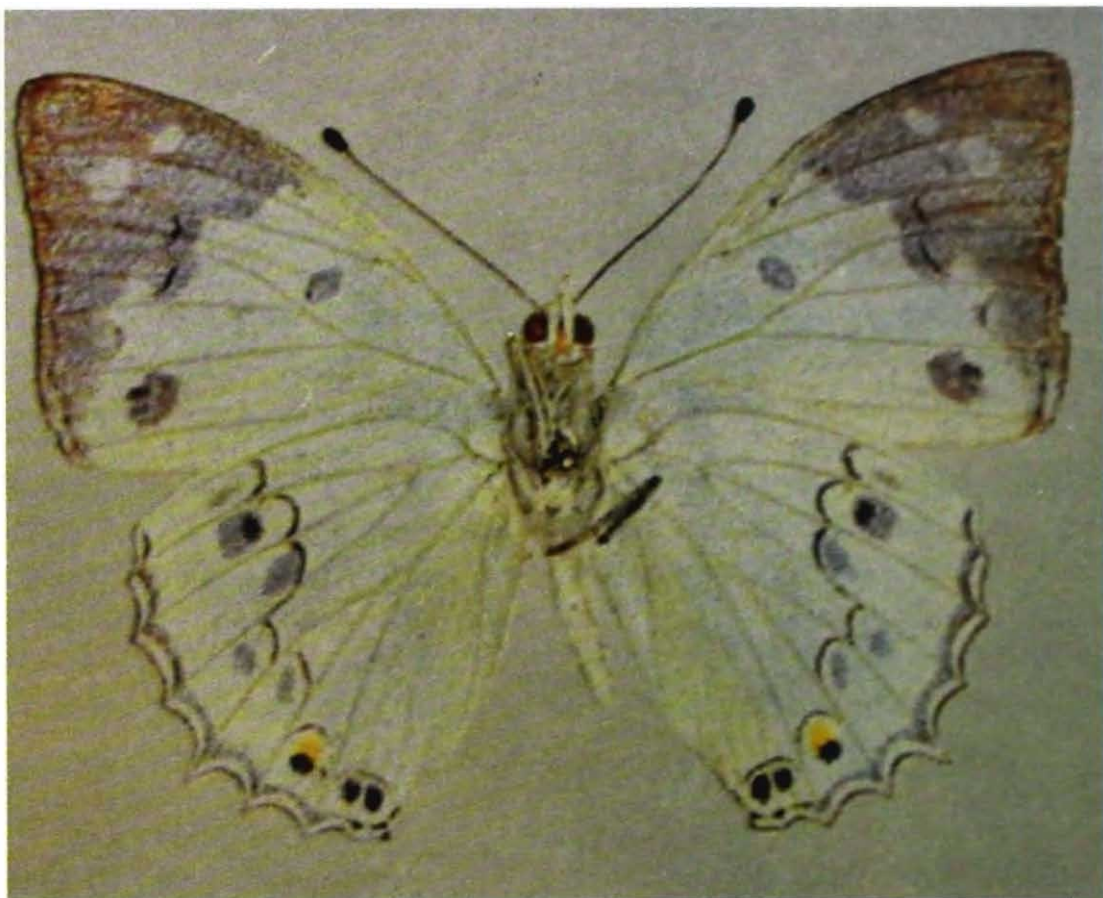
*Habitat and ecology* : The butterfly exhibits very rapid flight during summer at low elevations (c 900-1200 m) in Sikkim. There are records of a female from Singla (Darjiling) at 365m., a male from Naga Hills in Nagaland.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Helcyra hemina* Hewitson, male (Upperside) - After D'Abrera (1985)



*Helcyra hemina* Hewitson, female (Underside) - After D'Abrera (1985)

National Parks and Wildlife Sanctuaries have been established in area of 5175.45 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : Its range of occurrence should be monitored for any further threat. Efforts should be made for more information on its habits, ecology, life-history and distribution. “A Code for Insect Collecting” should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : Qualifies for a few records in its short range of distribution. There has been a considerable loss and deterioration in its area of occurrence. There are 11 examples in the National Zoological Collection of Zoological Survey of India, Kolkata and two examples in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Helcyra hemina* Hewitson.

Compiled by : I.J. Gupta and D.K. Mondal

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## LEAST CONCERN

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

### 59. *Hypolimnas misippus* (Linnaeus, 1764)

#### TEH DANAID EGGFLY

*Papilio misippus* Linnaeus, 1764

*Hypolimnas misippus* (Linnaeus) : De Niceville, 1886

*Apatura misippus* (Linnaeus) : Moore, 1899-1900

*Hypolimnas misippus* (Linnaeus) : Bingham, 1905; Fruhstorfer, 1912; Evans, 1932; Wynter-Blyth, 1957; D'Abbrera, 1985; Varshney, 1994

**Diagnostic characters** : MALE - Upperside dark indigo blue, a prominent large discal white patch on each wing on shot blue area of brownish black. **Underside** of hind wing with a prominent black costal spot in middle of area R<sub>5</sub>-area. FEMALE - tawny with white banded black apex on upperside of fore wing. **Wing expanse** : ♂ ♀ 70-93mm.

**Intraspecific variation** : The species shows sexual dimorphism as upperside of male is dark indigo blue and upperside of female is tawny. The female also exhibits significant variation and as such two following forms are known.

- i. *Hypolimnas misippus* f. *alcippoides* Butler - Upperside of hind wing is white on disc.
- ii. *Hypolimnas misippus* f. *inaria* Cramer - Upperside of fore wing lacks white banded black apex.

**Distribution** : Widely distributed in India. **Elsewhere** : Baluchistan, Myanmar, Sri Lanka.

**Status** : Least Concern (LC)

**Habitat and ecology** : The species is commonest in regions of moderate rainfall and in fairly open country, especially during the monsoon months. Abundant 2200m. in South India; not common above 1370m. in the north, but occasionally seen as high as 2380m. feet. The food-plant is *Portulaca oleracea* (Purslane) of the family Portulacaceae. The male is not



*Hypolimnas misippus* (Linnaeus), male (Upperside) (Specimen in ZSI collection)

so quarrelsome and flies and settles much closer to the ground. In Nilgiris, attracted by pungent smell, it settles down upon leaves of abundantly found Cypress trees. The female is wonderful mimic of the Plain Tiger, *Danaus chrysippus* f. *alcippoides* and *Danaus chrysippus* f. *dorippus* of the subfamily Danainae. It keeps out of sight in scrub and jungle.

**Threats :** Threats in the area include agricultural and horticultural activities, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; use of insecticides and pesticides; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using pesticides.

**Conservation measures taken :** The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a large protected area.

**Conservation measures proposed :** There should be check on human activities posing any further threat in its range of occurrence. More information is required on its habits, ecology, life-history and distribution of this butterfly. The farming of this butterfly should be taken up. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The farming of this butterfly should be taken up with advantage.

**Rationale :** The species is known from its several records in its range of distribution. There has been considerable loss and degradation in its area of occurrence. The species



*Hypolimnas misippus* (Linnaeus), male (Underside) - (Specimen in ZSI collection)



*Hypolimnas misippus* (Linnaeus), female (Upperside) - (Specimen in ZSI collection)



*Hypolimnas misippus* (Linnaeus), female (Underside) - (Specimen in ZSI collection)

is represented by several examples in the National Zoological Collection of Zoological Survey of India, Kolkata and a few examples in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Hypolimnas misippus* (Linnaeus).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**60. *Lasippa ebusa ebusa* (Felder, 1863)**

**THE FULIGINOUS SAILER**

*Neptis ebusa* Felder, 1863

*Neptis ebusa ebusa* Felder : Evans, 1932

*Lasippa ebusa ebusa* (Felder) : Eliot, 1969

*Diagnostic characters* : MALE - Ground colour dark brown. Fore wing discal spots complete; an additional spot in  $M_3$  - area; inner edge of submarginal line highly bent in the middle; apical markings whitish; *underside* with pale costal spots above end-cell streak, internal to upper discal spots and both wings with whitish markings. FEMALE - As for male. *Wing expanse* : ♂ ♀ 50-55mm.

*Intraspecific variation* : This nominate subspecies is not known to exhibit variation.

*Distribution* : India : Andaman and Nicobar islands (South Nicobars).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of the butterfly are not much known.

*Threats* : The area of its occurrence is considered fragile and ecologically sensitive. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The butterfly is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 19.18 sq km in Nicobar Islands. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.



*Neptis ebusa ebusa* Felder, male (Upperside) - After D'Abbrera (1985)



*Neptis ebusa ebusa* Felder, female (Underside) - After D'Abbrera (1985)

*Rationale* : This butterfly is restricted to South Nicobar islands. There has been considerable reduction and deterioration in its area of occurrence. It is represented in the collection of the British Museum.

*Taxonomic Reliability* : The species, *Lasippa ebusa ebusa* (Felder) has been followed after Eliot (1969) who considered it non-Indian. Evans (1932) mentioned its occurrence in South Nicobars in India.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**61. *Lasippa viraja nar* (de Nicéville, 1891)  
THE YELLOWJACK SAILER**

*Neptis nar* De Niceville, 1891

*Neptis (Bimbisara) sankara race nar* De Niceville : Fruhstorfer, 1912

*Neptis sankara nar* De Niceville : Evans, 1932

*Lasippa viraja nar* (De Niceville) : Eliot, 1969; D'Abrera, 1885

**Diagnositc characters** : MALE - Ground colour fuliginous dusky black. Fore wing markings pale orange, tinged with white, cell streaked yellow; lower and upper spots of discal series connate and forming separate short bands. Upperside hind wing post discal band consisting of narrow, detached, pure orange streaks. *Underside* of wings very dark brown, tinged violaceous; hind wing median fascia margined yellow and traversed by grey-blue subterminal bands. FEMALE .- As for male. *Wing expanse* : ♂ ♀ 65-75 mm.

**Intraspecific variation** : This subspecies showing little variation has following another two counterparts.

- i. *Lasippa viraja viraja* (Moore) : India : Uttranchal (Kumaon). *Elsewhere* : Myanmar.
- ii. *Lasippa viraja kanara* (Evans) : India : South India.

The subspecies *nar* is distinguished from the above two subspecies by upperside hind wing post discal band consisting of narrow, detached, pure orange streaks.

**Distribution** : India : Andaman and Nicobar Islands (Andamans).

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : Fruhstorfer (1912) mentioned of three females known from Andaman Islands. The habits and ecology of the butterfly are not much known.



*Lasippa viraja nar* (De Niceville), (Upperside) - (Specimen in ZSI collection)



*Lasippa viraja nar* (De Niceville), (Upperside) - (Specimen in ZSI collection)

*Threats* : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover is reduced to 21% from 96%, in Middle Andaman it is left with only 29% forest cover and in South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 1510.09 sq km in Anadaman Islands. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be check on human activities posing any further threat in its area of occurrence. More information is required on its habits, ecology, life-history and distribution.

*Rationale* : This subspecies is known from Andaman Islands only. Its area of occurrence has shrunk considerably and also deteriorated. There are two examples (Andamans) in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The subspecies, *Lasippa viraja nar* (de Niceville) has been followed after Eliot (1969).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**62. *Neptis armandia* (Oberthuer, 1876)**

**THE VARIEGATED SAILER**

*Limenites armandia* Oberthuer, 1876

*Neptis antilope* Leech : Evans, 1932

*Neptis armandia* (Oberthuer) : Eliot, 1969

*Diagnostic characters* : MALE Ground colour dark brown. fore wing discal spot in  $Cu_{1a}$ -area narrow and coalesced to spot in  $Cu_{1a}$ -area. FEMALE - As for male. *Wing expanse* : 55-60 mm.

*Intraspecific variation* : The species exhibits variations with two following subspecies in India.

- i. *Neptis armandia gafuri* Tytler, 1940 : India : Nagaland. Both wings with yellow markings.
- ii. *Neptis armandia melba* Evans, 1912 : India : Sikkim. Both wings with white markings.

*Distribution* : India : Sikkim and Nagaland.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) captured two males and two females of *N. armandia gafuri* at Kirbari, Naga Hills at about 2030m. in June and July. There are two specimens of *Neptis armandia melba* in the collection of Evans besides record of its one male from Sikkim (Fruhstorfer, 1915). The other habits and ecology are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Neptis arandina* (Oberthuer, 1876) - After Smart (1981)

**Conservation measures taken :** The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been established in area of 2323.70 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference causing any further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** This species is restricted to a couple of localities in north eastern part of India. There has been a significant loss and deterioration in its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata; one example in the collection of Forest Research Institute, Dehra Dun; male and female types are in the British Museum Natural History, London.

**Taxonomic Reliability :** Eliot (1969) has been followed for the validity of the species, *Neptis arandina* (Oberthuer) and its subspecies.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**63. *Neptis cydippe kirbariensis* Tytler, 1915  
THE CHINESE YELLOW SAILER**

*Neptis kirbariensis* Tytler, 1915

*Neptis cydippe kirbariensis* Tytler : Evans, 1932

*Neptis cydippe kirbariensis* Tytler : Eliot, 1969; D'Abbrera, 1985

*Diagnostic characters* : MALE Ground colour dark-brown. Fore wing with discal spot in  $M_3$   $Cu_{1a}$  area and not coalescing to cell-streak. Both wings with yellow markings. FEMALE As for male. *Wing expanse* : ♂ ♀ 80 mm.

*Intraspecific variation* : The subspecies is not known to show significant variation.

*Distribution* : India : Nagaland (Naga Hills).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) described this species on the basis of specimens collected from Kirbari (2230m.) in Nagaland. The habits and ecology of this butterfly are not known.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in area of 222.36 sq km. (Singh & Singh, 2002)



*Neptis cydippe* Leech - After Smart (1985)

**Conservation measures proposed :** There should be check on human interference posing any further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** This species is confined to Nagaland where it is endemic. There has been considerable reduction and degradation in its area of its occurrence. Type of male is represented in the collection of British Museum Natural History.

**Taxonomic Reliability :** The validity of the subspecies, *Neptis cydippe kirbariensis* Tytler has been followed after (Eliot, 1969).

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**64. *Neptis manasa manasa* Moore, 1857**  
**THE PALE HOCKEYSTICK SAILER**

*Neptis manasa* Moore, 1857

*Neptis manasa* Moore : de Niceville, 1886

*Stabrobates manasa* (Moore) : Moore, 1899

*Neptis manasa* Moore : Bingham, 1905; Fruhstorfer, 1915; Evans, 1932; Varshney, 1994

*Neptis manasa manasa* Moore : Stichel, 1909; D'Abrera, 1985

*Diagnostic characters* : MALE Ground colour dark brown. Both wings with cream to orange markings. Fore wing without postdiscal spot in space M<sub>3</sub>. Hind wing *underside* with a transparent appearance. FEMALE - As for male. *Wing expanse* : ♂ ♀ 65 mm.

*Intraspecific variation* : Only the nominate subspecies occurs in India. Fruhstorfer (1912) mentioned that *manasa* possibly represented an individual aberration, especially as it was described in 1857 only from one specimen from unknown locality, though its colour-pattern would point to North-west Himalaya as its place of origin. Fruhstorfer (1915) stated “*Neptis nycteus* Niceville is not a race, but only the male of *N. manasa* Moore” Evans (1932) has ascertained the identity of the two forms.

*Distribution* : India : North India, Sikkim, West Bengal (Darjiling). *Elsewhere* : North Myanmar; North Thailand.

*Status* : Vulnerable (Vu A1c, B1 2bc).

*Habitat and ecology* : This is a hill species occurring up to an altitude of c 3500 m in the East Himalaya. After the capture of one specimen in 1857, from unknown locality, three more specimens were taken from Darjiling, flying in association with certain widespread species like *N. zaida* Doubleday (The Pale-Green Sailer) and *N. narayana* Moore (The Broadstick Sailer).

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric



*Neptis manasa manasa* Moore, male, (Upperside) - After D'Abrera (1985)



*Neptis manasa manasa* Moore, female, (Underside) - After D'Abrera (1985)

plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. There are National Parks and Wildlife Sanctuaries covering a certain protected area.

*Conservation measures proposed* : There should be restraint on human interference posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : This species is known, in India, from a few localities of north eastern area. There has been significant loss and deterioration in its area of occurrence.

*Taxonomic Reliability* : Eliot (1969) has been followed for the nominate subspecies, *Neptis manasa manasa* Moore.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**65. *Neptis nycteus* De Nicéville, 1890**  
**THE HOCKEYSTICK SAILER**

*Neptis nycteus* De Niceville, 1890

*Stabrobates nycteus* (De Niceville) : Moore, 1899

*Neptis nyctea* (sic) De Niceville : Bingham, 1905

*Neptis nycteus nycteus* De Niceville; Fruhstorfer, 1913; Evans, 1932

*Neptis nycteus* De Niceville : Eliot, 1969

*Diagnostic characters* : MALE - Ground colour brown. Wings with markings white. Fore wing with a discal spot in area  $Cu_{1a}$  but not at base of area  $Cu_{1a}$ . *Underside* of hind wing with prominent mother-of-pearl markings in basal area. FEMALE - Like that of male. *Wing expanse* : 60 mm.

*Intraspecific variation* : The species shows variation from white to yellow in specimens from Lachin Lachoong.

*Distribution* : India : Sikkim. *Elsewhere* : Bhutan.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The butterfly is found in months of June and July at altitudes of between 1825–4875m. in Sikkim.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National



*Neptis nycteus* De Niceville, (Upperside) - (Specimen in ZSI collection)



*Neptis nycteus* De Niceville, (Upperside) - (Specimen in ZSI collection)

Park and Wildlife Sanctuaries have been established in area of 2101.34 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. Efforts should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : In India, this subspecies is known from Sikkim only. There has been considerable shrinkage and degradation in its area of occurrence. There are three examples (Sikkim) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Eliot (1969) has been relied upon for the validity of the species, *Neptis nycteus* de Niceville.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**66. *Nymphalis antiopa yedanula* (Fruhstorfer, 1909)**

**THE CAMBERWELL BEAUTY**

*Vanessa antiopa yedanula* Fruhstorfer, 1909

*Vanessa antiopa yedanula* Fruhstorfer : Evans, 1932

*Vanessa antiopa* (Linnaeus) : Wynter-Blyth, 1957

*Nymphalis antiopa* (Linnaeus) : Varshney, 1994

*Diagnostic characters* : MALE - Ground colour deep maroon. Fore wing with two pale yellow costal spots. Both wings with broad pale yellow black-dusted margins bearing internally a row of small violet-blue spots. FEMALE - As for male. *Wing expanse* : ♂ ♀ 70-80 mm.

*Intraspecific variation* : This is the only Indian subspecies showing little variation.

*Distribution* : India : Chumbi Valley (east of Sikkim); Manipur. *Elsewhere* : Bhutan; Siao-Lu (Fruhstorfer, 1912).

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : This butterfly was collected during July-August at the Chumbi Pass in the East Himalaya (Fruhstorfer, 1912).

*Threats* : The high elevated zone is considered highly fragile. Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. There is protected



*Vanessa antiopa yedanula* Fruhstorfer (Upperside) - (Specimen in ZSI collection)



*Vanessa antiopa yedanula* Fruhstorfer (Underside) - (Specimen in ZSI collection)



*Vanessa antiopa yedanula* Fruhstorfer (Upperside)

area of 2534.69 sq km covered by National Parks and Wildlife Sanctuaries. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for its restricted distribution in Sikkim and Manipur. There has been significant decrease and degradation in its area of occurrence. There are eight examples (Sikkim, Chumbi, and Europe in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

**Taxonomic Reliability :** The subspecies, *Nymphalis antiopa yedanula* (Fruhstorfer) has been followed after Evans (1932) with generic change as treated by Varshney (1994).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**67. *Pantoporia beiti paona* (Tytler, 1915)**

**THE TYTLER'S LASCAR**

*Rahinda paona* Tytler, 1915

*Neptis paona* (Tytler) : Evans, 1932

*Neptis paona* (Tytler) : Wynter-Blyth, 1957

*Pantoporia beiti paona* (Tytler) : Eliot, 1969; D'Abrera, 1985

*Diagnostic characters* : MALE - Ground colour dark brown. Fore wing discal spots well separated in  $Cu_{1a}$  anal areas. Hind wing postdiscal band narrow and yellow; margin dark with an ochreous line. FEMALE - Unknown. *Wing expanse* : ♂ ♀ 45-50 mm.

*Distribution* : India : Nagaland (Naga Hills).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Two males and two females of this butterfly were collected at Kirbari, Naga Hills, at about 2230m in June and July. The other habits and ecology are not known.

*Threats* : Threats in area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries cover a protected area of 222.36 sq. km. (Singh & Singh, 2002)



*Pantoporia beiti paona* (Tytler) After D'Abbrera (1985)

**Conservation measures proposed :** Its habitat should be monitored so as to check any further threat in its range of occurrence. More information is required on its habits, ecology, life-history and distribution.

**Rationale :** This species is confined to Nagaland where it is endemic. Its area of occurrence has shrunk considerably and deteriorated.

**Taxonomic Reliability :** Eliot (1969) has been relied upon for the validity of the subspecies, *Pantoporia beiti paona* (Tytler).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**68. *Phaedyma aspasia* (Leech, 1890)  
THE GREAT HOCKEYSTICK SAILER**

*Neptis aspasia* Leech, 1890

*Neptis aspasia* Leech : Fruhstorfer, 1913; Tytler, 1915; Evans, 1932; Wynter-Blyth, 1957

*Phaedyma aspasia falda* Eliot, 1969; D'Abrera, 1985.

**Diagnostic characters** : Upperside dark brown with markings yellow or yellow suffusion round edges of white markings. Fore wing discal spot filling base of cubital area, discal spot joined with cell streak to form a hockey stick. Hind wing with discal band running from mid of cell to the dorsum; this discal band may be wider in beginning or of uniform width. Wing expanse : 85mm.

**Intraspecific variation** : The species exhibits variation in color markings and variable width of discal band in hind wing. Two following subspecies occur in India.

- i. *Neptis aspasia aspasia* leech : Upperside with yellow markings. Hind wing with uniformly broad discal band. Distribution Nagaland.
- ii. *Neptis aspasia falda* Eliot, 1969

**Distribution** : Arunachal Pradesh, Bhutan Upperside with white markings with suffusion of yellow round the edges. hind wing with discal band broader in beginning and then narrowing towards dorsum.

**Distribution** : India : Arunachal Pradesh, Nagaland (Tytler, 1915). *Elsewhere* : North East Myanmar; Indo-China, Central and Western China

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : A single male of this species was collected at Kirbari, Naga Hills at about 2230m. in June (Tytler, 1915). Eliot (1969) collected three male specimen from Bhutan



*Neptis aspasia* Leech, (Upperside) - (Specimen in ZSI collection)



*Neptis aspasia* Leech, (Underside) - (Specimen in ZSI collection)



*Neptis aspasia* Leech, (Upperside) After Colin Smith (1990)

and Dafla Hills, Apotani, 1520m. (Arunachal Pradesh) on 15.viii.1947. The other habits and ecology of this butterfly are not known.

**Threats :** Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in area of 10119.91 sq km. (Singh & Singh, 2002)

**Conservation measures proposed :** There should be restraint on human interference posing any more threat in its range of occurrence. Efforts should be made for information on its habits, ecology, life-history and distribution.

**Rationale :** This species is restricted to a couple of localities in north eastern part of India. There has been significant loss and deterioration in its area of occurrence. There is only one example (Mou Pin in Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** This species, *Phaedyma aspasia* (Leech) has been followed after Eliot, (1969), Fruhstorfer (1912) stated it to be a Chinese species and mentioned

relationship of *Neptis aspasia* Leach with *Phaedyma* but Evans (1932) and Wynter-Blyth (1957) stated its occurrence in Nagaland and N. Myanmar.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**69. *Phaedyma columella binghami* (Fruhstorfer, 1905)  
THE SHORT-BANDED SAILER**

*Neptis columella binghami* Fruhstorfer, 1905

*Neptis columella kankena* Evans, 1912

*Neptis jumbah binghami* Fruhstorfer : Fruhstorfer, 1913

*Neptis columella kankena* Evans : Fruhstorfer, 1915; Evans, 1932

*Phaedyma columella binghami* (Fruhstorfer) : Eliot, 1969; D'Abbrera, 1985

*Diagnostic characters* : MALE - Upperside black with whitish markings. Fore wing with a discal row of fine spots; *Underside* chocolate brown, fore wing bearing broader and diffused post discal markings; hind wing having terminal margin beyond discal row completely and heavily laced with bluish white traversed by an outer post discal and subanal series of black lunules. Female A As for male. *Wing expanse* : ♂ ♀ 75 mm.

*Intraspecific variation* : The subspecies showing little variation has following two other counter parts occurring in India.

- i. *P. columella ophiana* Moore. *Distribution* : India : Uttaranchal, Uttlar Pradesh. *Elsewhere* : Myanmar.
- ii. *P. columella nilgirica* (Moore). *Distribution* : India : Nilgiris

The subspecies *binghami* (Fruhstorfer) differs from the above two subspecies by the upperside of fore wing bearing a discal row of only five spots and underside with characteristic chocolate brown colouration.

*Distribution* : India : Andaman and Nicobar Islands (Nicobars).

*Status* : Critically Endangered (CR A1c, B1 2bc).



*Neptis columella binghami* (Fruhstorfer) (Upperside) - (Specimen in ZSI collection)



*Neptis columella binghami* (Fruhstorfer) (Underside) - (Specimen in ZSI collection)



*Neptis columella binghami* (Upperside) - (Specimen in ZSI collection)



*Neptis columella binghami* (Underside) - (Specimen in ZSI collection)

**Habitat and ecology** : The habits and ecology of this butterfly are not much known.

**Threats** : This is fragile and ecologically sensitive ecosystem. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken** : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. Wildlife Sanctuaries have been established in an area of 19.18 sq km in Nicobar Islands. (Singh & Singh, 2002)

**Conservation measures proposed** : There should be restraint on human interference causing any further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : This subspecies is restricted to Nicobar islands. There has been considerable decrease and degradation in its area of occurrence. There is only one example (Great Nicobars) in the National Zoological Collection of Zoological Survey of India, Kolkata. Type in British Museum." (Fruhstorfer, 1912).

**Taxonomic Reliability** : Eliot (1969) has been followed for the subspecies *Phaedyra columella binghami* (Fruhstorfer).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**70. *Sasakia funebris* Leech, 1891**

**THE EMPRESS**

*Sasakia funebris* Leech, 1891

*Euripus funebris* (Leech) : Tytler, 1915

*Sasakia funebri* (Leech) : Fruhstorfer, 1913; Evans, 1932; Wynter-Blyth, 1957; Varshney, 1994

*Diagnostic characters* : MALE Ground colour black. Fore wing cell with narrow basal red streak, the latter wider on the *underside*. Hind wing *underside* with basal red markings below costa. Both *wings* outer half prominently streaked. FEMALE As for male. *Wing expanse* ♂ ♀ 125-130 mm.

*Intraspecific variation* : This species exhibits little variation.

*Distribution* : India : Nagaland. *Elsewhere* : China; Taiwan; Yunnan.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Four specimens of this species were collected at Yakama, Naga Hills at 1520m. feet in July in 1911 and 1912 (Tytler, 1915). The habits and ecology are not much known.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The



*Sasakia funebris* Leech After Lewis (1973)

National Park and Wildlife Sanctuaries cover a protected area of 222.36 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : In India, this species is known from Nagaland only. There has been considerable shrinkage and deterioration in its area of occurrence.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Sasakia funebris* (Leech).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**NEAR THREATENED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**71. *Sephis chandra* (Moore, 1858)**

**THE EASTERN COURTIER**

*Castalia chandra* Moore, 1858

*Sephis chandra* (Moore) : De Niceville, 1886; Moore, 1895; Bingham, 1905; Evans, 1932; Wynter-Blyth, 1957; Varshney, 1994

**Diagnostic characters** : MALE Ground colour deep velvety black. Fore wing with a curved median series of four large rich tawny-yellow spots, followed by an oblique discal series of five, and two preapical smaller snow-white dots, and a submarginal row of blue dots. Hind wing with pale yellow patches, the latter distally whitish. FEMALE - As in male, but variable. *Wing expanse* : ♂ ♀ 75-100 mm.

**Intraspecific variation** : The female exhibits much variation and its following three forms are represented in India.

f. *chandra* resembling the male;

f. *chandrana* Evans, with broad white bar across apex of fore wing;

f. *albina* Evans, with all the spots white except the yellow one in cell. The females mimic Blue Crows, *Euploea* spp. of the family Danaidae.

**Distribution** : India : Assam, Manipur, Meghalaya, Nagaland, West Bengal, Sikkim. *Elsewhere* : Nepal; North Myanmar; Thailand; Taiwan and South China.

**Status** : Near Threatened (NT)

**Habitat and ecology** : Tytler (1909) mentioned about the collection of males and females at the foot of the hills and also near Kohima in September and October and, December. This is a hilly butterfly, the female of which mimicks the Blue Crows (*Euploea* Fabricius). Wynter-Blyth (1957) mentioned its food-plant, *Quercus incana* (Cupuliferae). The other habits and ecology are not known.



*Sephisa chandra* (Moore), male (Upperside) - After D'Abrera (1985)



*Sephisa chandra* (Moore), female (Upperside) - After D'Abrera (1985)

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/ felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken** : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries falling cover a protected area of 4952.09 sq km. (Singh & Singh, 2002)

**Conservation measures proposed** : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. “A Code for Insect Collecting” should be followed while capturing butterflies from their habitat. Both ranching and farming up this butterfly should be undertaken.

**Rationale** : There are several records of this species from North-East parts of India. There has been considerable shrinkage and deterioration in its area of occurrence. The female of *f. chandra* and *f. albina* are very rare. There are 16 examples (Assam, Sikkim, Manipur, Meghalaya and West Bengal (India), Nepal and Fort Loonglah) in the National Zoological Collection of Zoological Survey of India, Kolkata and two examples in the collection of Forest Research Institute, Dehra Dun.

**Taxonomic Reliability** : Evans (1932) has been followed for the species, *Sephisia chandra* (Moore).

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**72. *Sumalia zulema* (Doubleday & Hewitson, 1850)**

**THE SCARCE WHITE COMODORE**

*Limenitis zulema* Doubleday & Hewitson, 1850

*Limenitis zulema* Doubleday & Hewitson : de Niceville, 1886

*Sumalia zulema* (Doubleday & Hewitson) : Moore, 1898

*Liminitis* (sic) *zulema* (Doubleday & Hewitson) : Bingham, 1905

*Limenitis zulema* (Doubleday & Hewitson) : Evans, 1932; Wynter-Blyth, 1957

*Sumalia zulema* (Doubleday & Hewitson) : Eliot *et al.*, 1992; Haribal, 1992; Varshney, 1994; Gupta, 1997

**Diagnostic characters** : MALE - Ground colour rich dark brown. fore wing discal band prominent white; with two rows of black spots beyond discal band; termen without pale wavy line. Hind wing discal band tinted blue. FEMALE - As in Male. *Wing expanse* : ♂ ♀ 80-85 mm.

**Intraspecific variation** : This species has at least one seasonal form, i.e., the large wet-season form, with very narrow discal band on wings.

**Distribution** : India : Meghalaya (Cherrapunji; Khasi Hills); Sikkim, West Bengal. *Elsewhere* : Myanmar.

**Status** : Vulnerable (Vu A1c, B1 2bc).

**Habitat and ecology** : There are records this species from Chherrapunji in Meghalaya; at altitude of upto 1200 in Sikkim *e.g.* at Sivoke in April, Daling at altitude of 500-1500m in May and June.

**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Sumalia zulema* (Moore), (Upperside) - (Specimen in ZSI collection)



*Sumalia zulema* (Moore), (Underside) - (Specimen in ZSI collection)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a considerable part of protected area.

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : This species is known, in India, from a few localities of north eastern area. There has been significant loss and deterioration in the area of its occurrence. There are 10 examples (Sikkim, Cherrapunjee, Kurseong, Khasi Hills India; and West Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Evans (1932) has been followed for the species, *Sumalia zulema* (Doubleday & Hewitson) under the genus *Sumalia* Moore after Varshney (1994).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**VULNERABE**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**73. *Symbrenthia silana* de Niceville, 1885**

**THE SCARCE JESTER**

*Symbrenthia silana* De Niceville, 1885

*Symbrenthia silana* De Niceville : De Niceville, 1886; Moore, 1899

*Symbrenthia niphanda* race *silana* De Niceville : Bingham, 1905

*Symbrenthia silana* De Niceville : Evans, 1932; Varshney, 1994

**Diagnostic characters** : MALE - Ground colour black with pale fulvous markings. Fore wing preapical band zigzag, narrow and extending to costa; *underside* pinkish pearly white showing up prominently as discoidal and preapical streaks and black striations well restricted. Hind wing postdiscal band very narrow; *underside* black striations also restricted, but pinkish pearly white showing up as transverse subbasal and postdiscal bands, and subterminal lunules of metallic cerulean blue. FEMALE - As for male. *Wing expanse* : ♂ ♀ 50-60 mm.

**Intraspecific variation** : This species has two forms, dry-season form and wet-season form; the former differing the latter in being, smaller and upperside of fore wing with slightly broader markings.

**Distribution** : India : West Bengal (Darjiling); Sikkim; Manipur Nagaland. *Elsewhere* : Bhutan.

**Status** : Vulnerabe (Vu A1c, B1 2bc).

**Habitat and ecology** : Tytler (1915) obtained males and females of wet season form at about 1825m at Kirbari, Naga Hills from July-October, 13 males of dry season form near Sebong, Eastern Manipur hills, on Irang River, Manipur Hills at low elevations from February-April. Its specimens were collected at low elevations in Sikkim (de Niceville, 1886). The other habits and ecology are not known.

**Threats** : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric



*Symbrenthia silana* De Niceville, (Upperside) - After Moore (1899-1900)



*Symbrenthia silana* De Niceville, (Underside) - After Moore (1899-1900)

plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries are created in a considerable protected area.

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : Qualifies for a short range of its distribution in India. There has been a considerable loss and deterioration in its area of occurrence. There are 11 examples (Sikkim-Buxa) in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The species, *Symbrenthia silana* De Niceville has been followed after Evans (1932).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**74. *Charaxes durnofordi nicholii* (Grose-Smith, 1886)**

**THE CHESTNUT RAJAH**

*Nymphalis nicholii* Grose-Smith, 1886

*Haridra nicholii* (Grose-Smith) : Moore, 1895

*Charaxes nicholii* (Grose-Smith) : Niceville, 1899

*Charaxes durnofordi nicholii* (Grose-Smith) : Rothschild & Jordan, 1900 ; Evans, 1932;  
D'Abbrera, 1985

*Charaxes durnofordi* Distant : Bingham, 1905

**Diagnostic characters** : MALE - Ground colour chestnut brown. Fore wing submarginal spots most indistinctly white, otherwise white area most extensive. Hind wing ocelli minute, margin greenish white and very broad. *Underside* very dark. FEMALE - Unknown. *Wing expanse* : ♂ 95-105 mm.

**Intraspecific variation** : Only this subspecies showing little variation occurs in India.

**Distribution** : India : Meghalaya (Khasi hills). *Elsewhere* : Myanmar.

**Status** : Critically Endangered ( CR A1c, B1 2bc).

**Habitat and ecology** : There is record of male specimens from Khasi Hills in Meghalaya. It flies during March, April and October. The other habits and ecology are not known.

**Threats** : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Charaxes durnofordi nicholii* (Grose-Smith), (Upperside) - (Specimen in ZSI collection)



*Charaxes durnofordi nicholii*, (Grose-Smith), (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 4952.09 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. More information is required on its habits, ecology, life-history and distribution

*Rationale* : In India, this species is restricted to Meghalaya. There has been greater loss and deterioration in its area of occurrence. The female is still unknown (Fruhstorfer, 1913). There is only one example (Burma) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The subspecies, *Charaxes durnfordi nicholii* (Grose-Smith) has been followed after Evans (1932).

Compiled by : I.J. Gupta and D.K. Mondal

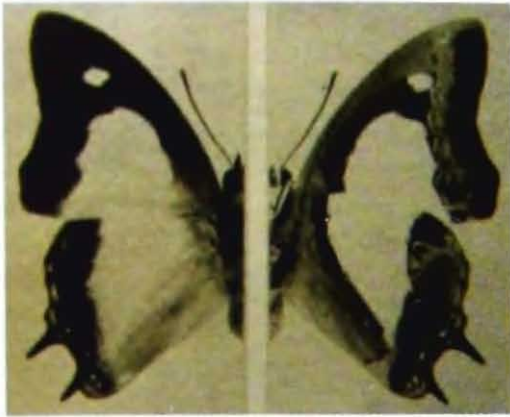
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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**75. *Polyura moori sandakanus* (Fruhstorfer, 1898)**

**THE MALAYAN NAWAB**

*Charaxes sandakanus* Fruhstorfer, 1895

*Eulepis attalus sandakanus* (Fruhstorfer) : Fruhstorfer, 1898

*Eulepis moori* (Distant) : Rothschild & Jordan 1898; Bingham, 1905

*Eriboea moori sandakanus* (Fruhstorfer) : Fruhstorfer, 1914; Evans, 1924, 1927, 1932

*Polyura moori sandakanus* (Fruhstorfer) : Stichel, 1939; D'Abbrera, 1985

*Eriboea moori* (Distant) : Wynter-Blyth, 1957

*Polyura moori sandakana* (Fruhstorfer) : Smiles, 1982

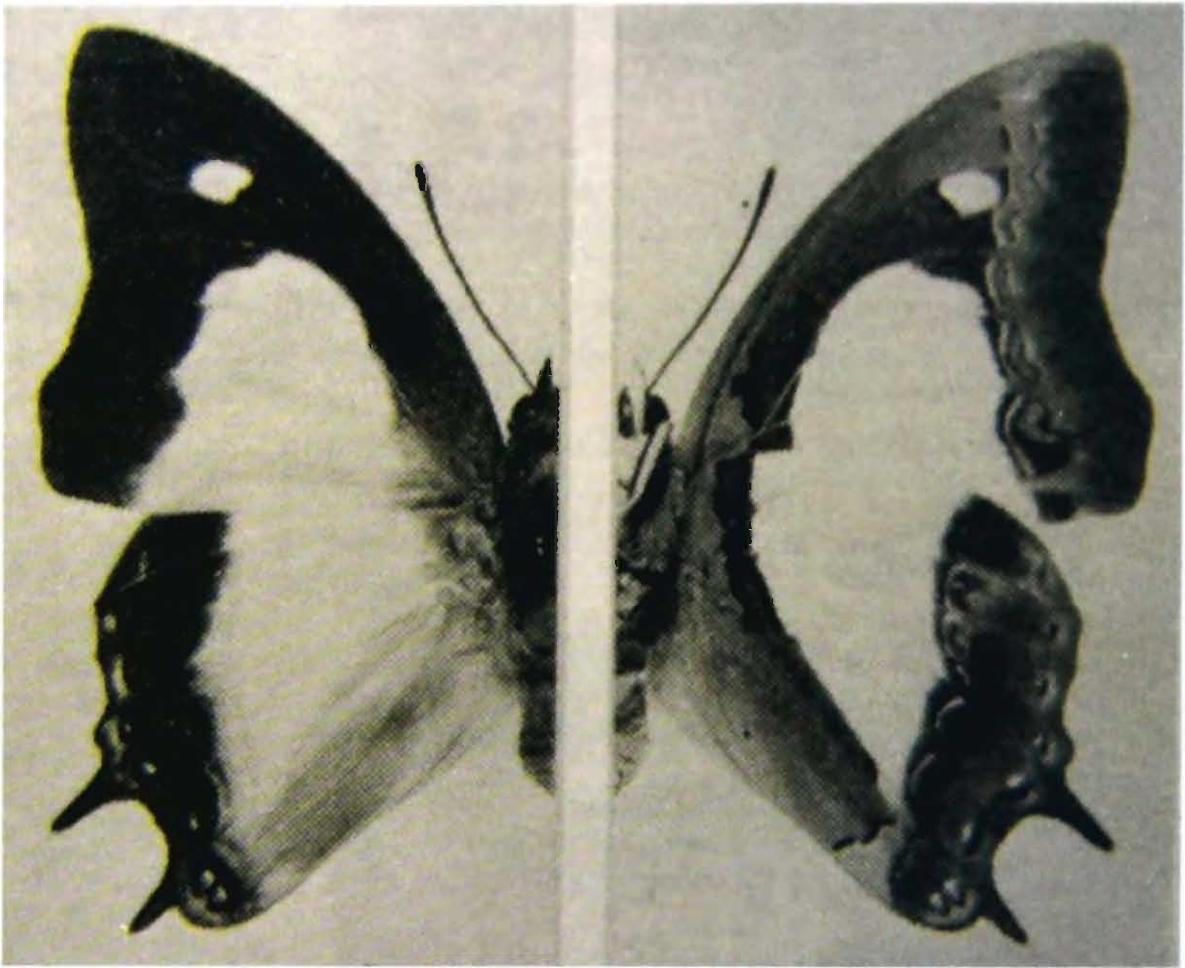
**Diagnostic characters** : MALE - *Upperside*. Light pinkish brown. Fore wing with black margin not decreasing towards tornus; subapical patch larger; discal band extended slightly along veins  $Cu_{1b}$  and 2A. FEMALE - Larger with pale area more extensive Wing expanse : ♂ ♀ 80-85 mm.

**Intraspecific variation** : The subspecies exhibits variation and following are its two forms.

- i. *Polyura moori sandakana* f. *sandakana* (Fruhstorfer) Hind wing pale areas slightly more extensive.
- ii. *Polyura moori sandakan* f. *marginalis* (Rothschild) Hind wing with a continuous black strip distal to the pale discal band and the submarginal white spots are very much smaller.

**Distribution** : India : Sikkim; Assam (Dafla Hills); Meghalaya (Garo Hills, Khasi hills); Nagaland (Naga Hills, Nighguard). *Elsewhere* : Myanmar.

**Status** : Endangered ( EN A1c, B1 2bc).



*Polyura moori sandakanus* (Fruhstorfer), (Upperside and Underside) - After Smiles (1982)



*Polyura moori sandakanus* f. *marginalis* (Rothschild) (Upperside and Underside)  
- After Smiles (1982)

*Habitat and ecology* : This is a hill-dwelling butterfly. There are records in the British Museum Natural History for its capture during February, June, July and November-December. Its other habits are not known.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. There are National Parks and Wildlife Sanctuaries covering a considerable protected area.

*Conservation measures proposed* : There should be check on human activities posing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for a few of its records in its short range of distribution. There has been a significant reduction and degradation in its area of occurrence. The holotypes and paratypes, other male and females of f. *sandakana* are in the British Museum Natural History and a female of f. *marginalis* is in Staudinger's collection.

*Taxonomic Reliability* : Smiles (1982) has been relied upon for the validity of the subspecies, *Polyura moori sandakana* (Fruhstorfer). He has provided its synonymy and local forms.

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**76. *Polyura schreiber* (Godart, 1823)**

**THE BLUE NAWAB**

*Nymphalis schreiber* Godart, 1823

*Papilio schreiber* (Godart) : Horsfield, 1829

*Charaxes schreiberi* (sic) (Godart) : de Niceville, 1886

*Eulepis schreiberi* (Godart) Distant, 1883; Moore, 1895; Bingham, 1905; Tytler, 1915

*Eulepis schreiber* (Godart) : Rorthchild & Jordan, 1899

*Eriboea schreiberi* (Godart) : Evans, 1932

*Polyura schreiber* (Godart) : Smiles, 1982; D'Abrera, 1985; Varshney, 1994

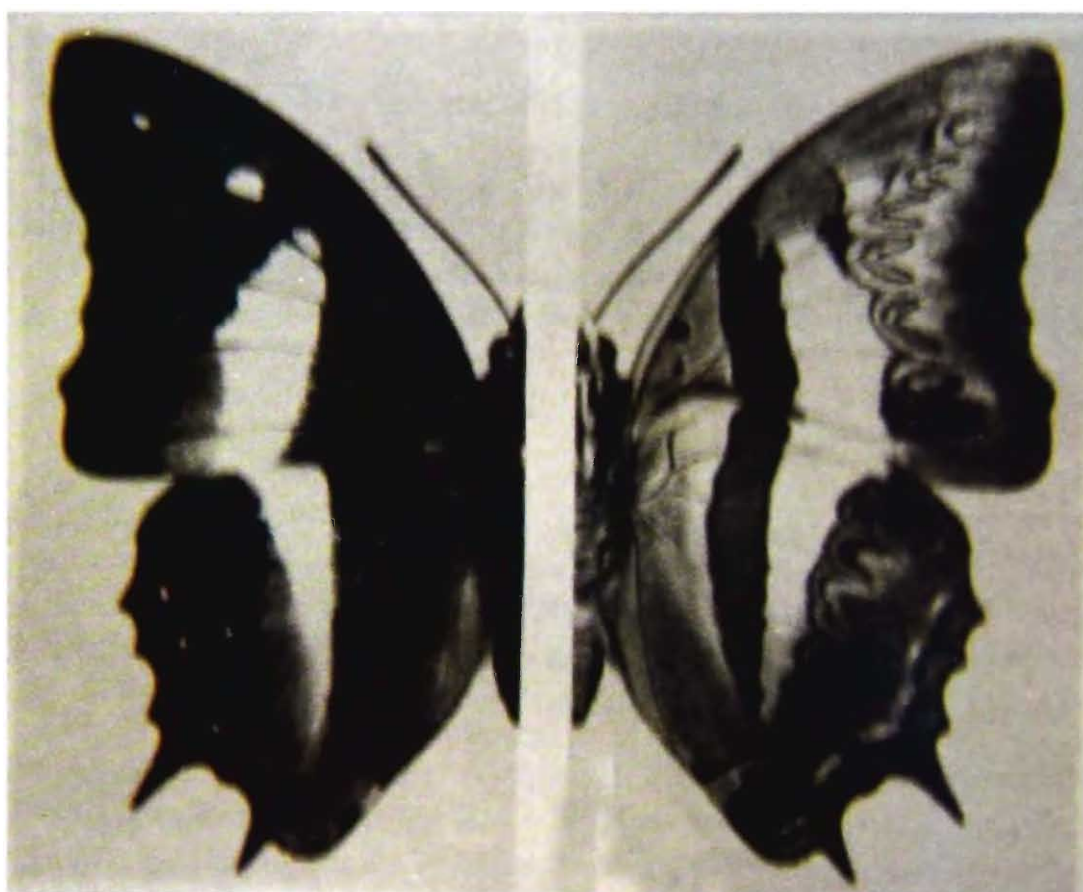
**Diagnostic characters** : MALE Ground colour dark brown. Both wings with pale whitish white median band not reaching inner margin, outwardly margined with light blue. Fore wing cell with two elongate maculae. FEMALE - As for male, but fore wing cell with two larger maculae joined to the median band. *Wing expanse* : ♂ ♀ 90-100 mm.

**Intraspecific variation** : The species is variable and its following subspecies occur in India.

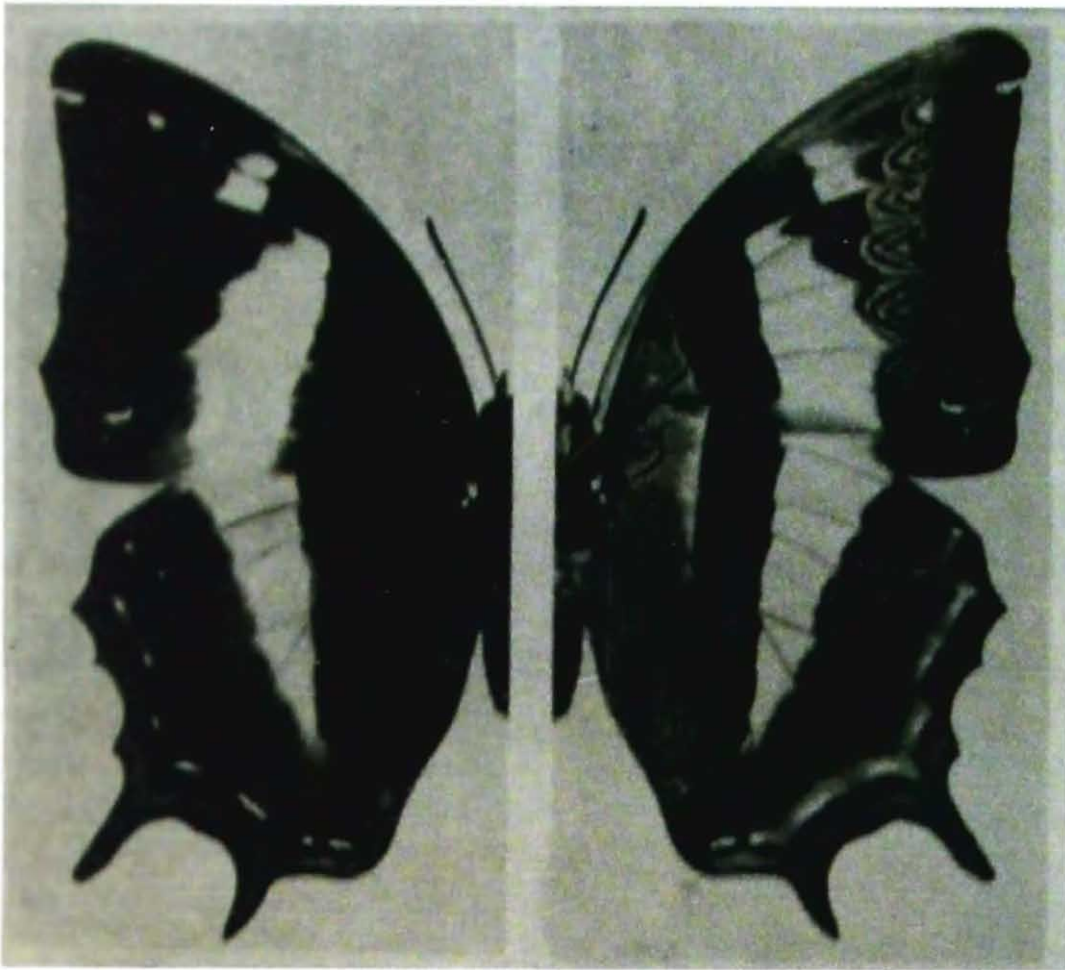
- i. *Polyura schreiber wardii* (Moore, 1896) Kerala : Calicut; Tellicherry, Anjirucady. Kanara : Karwar; Nilkund; (Arbail); (Gairoppa); (Haitockeri. Coorg). *Male, Female* : Upperside - fore wing with subapical and postdiscal spots absent. Discal white spots present in cells; R<sub>5</sub> and M<sub>1</sub> forming a stepped continuation of the discal band. *Underside* with black lines heavily marked.
- ii. *Polyura schreiber assamensis* (Rothschild, 1899) - Assam : Cachar Margherita; Meghalaya : Cherrapunji, Jaintia Hills, Khasi Hills, Shillong; Nagaland : Naga Hills. Myanmar, Thailand and Vietnam. *Male, female*. Fore wing with small, white, subapical



*Papilio schreiber wardii* (Upperside and Underside) - After Smiles (1982)



*Papilio schreiber assamensis* (Upperside and Underside) - After Smiles (1982)



*Papilio schreiber andamanica* (Upperside and Underside) After Smiles (1982)

spot in cell  $M_1$ . Discal band more dentate on its distal edge, and normally extending to beyond  $M_2$ . *Underside* with black markings heavy as in *P. schreiber wardii*.

- iii. *Polyura schreiber andamanica* Tasukada, 1991. Andaman Islands : Port Blair. *Female*. Upperside The white discal spots in cells  $R_5$  and  $M_1$  are displaced distally, and a subapical white spot is present in cell  $R_5$ .

*Distribution* : India : Andaman & Nicobar Islands, Southern Peninsula; East Himalaya. *Elsewhere* : Myanmar; Macromalayan.

*Status* : Vulnerable (Vu A1c, B1 2bc).

*Habitat and ecology* : There are records of 37 specimens of both sexes of *wardii*, one female of *andamanica* from Port Blair and 52 specimens of *assamensis* collected from localities of distribution given under subspecies. The males of subspecies *wardii* are often found basking during hottest part of the day on chosen trees about certain rocky peaks. Fruhstorfer (1914) mentions that it is fond of fluttering around isolated trees on rocky ledges during hottest hours of the day. Moore (1896) stated its record of capture at 1130m. Its adult larva is with yellow crescent on third abdominal segment. Rothschild and Jordan (1899) observe : 'A larva, which emerged from the egg on October 25<sup>th</sup>, did not become a pupa until January 26<sup>th</sup>, and no part of this time was passed in hibernation' Its pupa is green with

lighter markings and a light line laterally connecting the abdominal spiracles, which are brown; as is the top of the head and the tail. The larval food plants are *Rourea santaloides* (Connaraceae) and *Wagatea spicata* (Leguminosae) (Davidson, Bell & Aitken, 1896). On the basis of records in the British Museum Natural History, the subspecies *assamensis* is found throughout the year except April and July.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. In Peninsula, there has been a massive habitat loss for the past few decades.

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife sanctuaries cover a considerable protected area.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. The ranching and farming of this butterfly can be taken up with advantage. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : Qualifies for a few of its records in its range of distribution. Its area of occurrence has considerably decreased and degraded. The most notable is perhaps its random killing in the natural setting for parlour decor, as this butterfly is considered as one of the most beautiful kinds particularly in South India. There are nine examples (six examples from Jorhat, North Kanara India; three examples from Burma and Java) in the National Zoological Collection of Zoological Survey of India, Kolkata. The holotypes, paratypes and lectotypes are represented in the collection of British Museum Natural History (Smiles, 1982).

*Taxonomic Reliability* : The validity of the species, *Polynra schreiber* (Godart) has been followed after Smiles (1982) who has treated its synonymy, subspecies, bionomics, early stages and food-plants.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family NYMPHALIDAE

**77. *Prothoe franck regalis* Butler, 1885**

**THE BLUE BEGUM**

*Prothoe regalis* Butler, 1885

*Prothoe regalis* Butler : De Niceville, 1886; Bingham, 1905

*Prothoe frankii regalis* Butler : Evans, 1932

*Prothoe franck regalis* Butler : D'Abrera, 1985

*Diagnostic characters* : MALE Ground colour black. Fore wing discal band blue, very broad and irregular, and entirely devoid of white markings except two preapical dots; *underside* dark. Hind wing anal lobe short and with an additional inner appendage sharply pointed; *underside* also dark, but with deep green subterminal lunules and prominent black spots. FEMALE - As for male. *Wing expanse* : ♂ ♀ 70-80 mm. (male - 84 mm, Bingham, 1905).

*Intraspecific variation* : Only this subspecies showing little variation occurs in India.

*Distribution* : India : Assam (Sadiya); Manipur.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : There are records of this subspecies from Sadiya near Magherita in Assam and also Manipur. The other habits and ecology are not known.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in area of 2534.69 sq km.



*Prothoe frankii regalis* male, (Uppersdie)

*Conservation measures proposed* : There should be check on human activities causing any further threat in its area of occurrence. More information is required on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for its restricted distribution in north east part of India. There has been considerable shrinkage and degradation in its area of occurrence.

*Taxonomic Reliability* : The subspecies, *Prothoe franck regalis* Butler has been followed after Evans (1932) but as spelled by D' Abrera (1985).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**78. *Simiskina phalena harterti* (Doherty, 1889)**

**THE BROAD BANDED BRILLIANT**

*Massaga harterti* Doherty, 1889

*Poritia hartertii* (sic) (Doherty) : De Niceville, 1890

*Poritia harterti* (Doherty) : Bingham, 1907

*Simiskina phalena harterti* (Doherty) : Evans, 1932 : Cantlie; 1962; D'Abrera, 1986

*Simiskina phalena* (Hewitson) : Wynter-Blyth, 1957; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour black with brilliant greenish blue markings. Both wings *underside* dark ferruginous brown; fore wing with discal band white widening to dorsum and continued on hind wing through end-cell. FEMALE - Dark Brown. Fore wing discal spot circular and prominently white. *Wing expanse* : ♂ ♀ 28-34 mm.

*Intraspecific variation* : Only this subspecies, showing sexual dimorphism, occurs in India. The female is distinct in having upperside fore wing with a discal spot circular and prominently white.

*Distribution* : India : Assam and Manipur. *Elsewhere* : South Myanmar; ? Indo-China and Thailand.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Doherty (1889) described the species *harterti* after the name of Hartert who captured a single male specimen only from Upper Assam. Norman (1953) collected a good number of specimens of both sexes, in October, at Moreh on Manipur-Burma Frontier.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements



*Simiskina phalena harterti* (Doherty), (Upperside) - (Specimen in ZSI collection)



*Simiskina phalena harterti* (Doherty), (Underside) - (Specimen in ZSI collection)



*Simiskina phalena harterti* (Doherty), (Upperside) (Specimen in ZSI collection)

and tourism; fragmentation of habitats; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been created in an area of 3285.10 sq km. (Singh & Singh, 2002)

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. There has been a considerable decline in the area of its occurrence and quality of its habitat. The subspecies is represented by three examples in the National Zoological Collection of Zoological Survey of India, Kolkata and one in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Evans (1932) has been relied upon for the validity of subspecies, *Simiskina phalena harterti* (Doherty).

·Compiled by : I.J. Gupta and D.K. Mondal

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**NEAR THREATENED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**79. *Allotinus drumila drumila* (Moore, 1865)**

**THE CRENULATE DARKIE**

*Miletus drumila* Moore, 1865

*Allotinus multistrigatus* de Niceville, 1886 : de Niceville 1890; Fruhstorfer, 1915; Evans, 1932; Wynter-Blyth, 1957; Arora, 1995

*Miletus insgnis* Staudinger, 1888

*Allotinius drumila* (Moore) : deNiceville, 1890; Bingham, 1907; Swinhoe, 1905-1910; Fruhstorfer, 1915; Evans, 1932

*Allotinus multistrigatus multistrigatus* de Niceville : Evans, 1932

*Allotinius drumila drumila* (Moore) : Cantlie, 1962

*Allotinius drumila* (Moore) : Wynter-Blyth, 1957; D'Abrera, 1986; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour dark brown; underside of both wings with catenulated markings, small dots and irregular postdiscal band. FEMALE - As for male (at least from India). *Wing expanse* : ♂ ♀ 45-54 mm.

*Intraspecific variation* : This is the only Indian subspecies showing seasonal variations : dry-season form *drumila* differing from the wet-season form, *multistrigatus* de Nicéville by fore wing apex projected as a fine long tooth, termen crenulate and in male discal fascia prominent.

*Distribution* : India : Assam, Nagaland, Manipur, Meghalaya, Mizoram. Nagaland, Sikkim, Uttaranchal (Kumaon). *Elsewhere* : Bangladesh, Bhutan, Myanmar.

*Status* : Near Threatened (NT).

*Habitat and ecology* : This magnificent butterfly is recognised as the giant of the genus *Allotinus* Felder. It remains on flight during February-May. It inhabits jungle at low elevations,



*Allotinius drumila drumila* (Moore) male (Upperside) - (Specimen in ZSI collection)



*Allotinius drumila drumila* (Moore) male (Underside) - (Specimen in ZSI collection)



*Allotinius drumila drumila* (Moore) female (Upperside) - (Specimen in ZSI collection)



*Allotinius drumila drumila* (Moore) female (Underside) - (Specimen in ZSI collection)

in the very wet regions. The male is fond of sitting on tops of leaves at moderate height from the ground, while the female flutters about among the bushes at the edge of forest (Fruhstorfer, 1915; Wynter-Blyth, 1957).

*Threats* : Threats in the area are expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements; urbanisation; construction of dams and highways; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land, water and atmospheric pollution on account of using insecticides and pesticides. North-eastern states have lost 783sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The butterfly is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been created in an area of 13458.02 sq km.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. Both ranching and farming up this butterfly should be undertaken.

*Rationale* : The nominate subspecies is fair number of records from its distributional range. There has been considerable loss degradation of its area of occurrence. There are 14 examples in the National Zoological Collection of Zoological Survey of India, Kolkata and two examples in Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The subspecies, *Allotinus drumila drumila* (Moore), has been followed after Cantlie (1962) who mentioned *drumila multistrigatus* de Niceville also but considered it only a wet season form of *drumila* with a note "Also in the B.M. arrangement *multistrigatus* is now merely the the WSF of *drumila*."

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**80. *Allotinus panormis panormis* Elwes, 1892**

**THE ANGLED DARKIE**

*Allotinus panormis* Elwes, 1892

*Allotinus panormis* Elwes : Bingham, 1907; Swinhoe, 1905-1910; Fruhstorfer, 1915

*Allotinus fabius* (Distant) : Wynter-Blyth, 1957

*Allotinus fabius panormis* Elwes : Evans, 1932

*Allotinus panormis panormis* Elwes : Cantlie, 1962

*Diagnostic characters* : MALE Ground colour dark brown. Fore wing base never with bluish markings; discal streak obsolete; apex not produced; *underside* striated grey and uniform. Hindwing *underside* also striated or obscurely spotted; mid-costal spot normal. Body much longer than wings. FEMALE - As in male, but fore wing with discal pale area always obsolete, apex produced; hind wing margin prominently toothed at  $M_3$ . *Wing expanse* : ♂ ♀ 34-40 mm.

*Intraspecific variation* :

*Distribution* : India : Nagaland (Naga Hills). *Elsewhere* : Myanmar.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This butterfly is earlier reported from Nagaland but its habits and ecology are not much known.

*Threats*. Threats in the include shifting cultivation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Allotinus panormis panormis*  
Elwes, male (Upperside)  
- After Swinhoe (1905-1910)



*Allotinus panormis panormis*  
Elwes, male (Underside)  
- After Swinhoe (1905-1910)



*Allotinus panormis panormis*  
Elwes, female (Upperside)  
- After Swinhoe (1905-1910)

*Conservation measures taken* : The butterfly finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been created in an area of 222.36 sq km.

*Conservation measures proposed* : Its range of occurrence should be monitored to check any of the threats. Studies should be undertaken on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This nominate subspecies is restricted in its distribution to Nagaland. Its area of occurrence has decreased and deteriorated.

*Taxonomic Reliability* : The nominate subspecies, *Allotinus panormis panormis* Elwes has been followed after Cantlie (1962). Bridges (1988) and Varshney (1997), however, mentioned *panormis* as a synonym of *Allotinus taras* (Doherty).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

81. *Logania marmorata watsoniana* de Nicéville, 1898

**THE WATSON'S MOTTLE**

*Logania watsoniana* de Niceville, 1898

*Logania watsoniana* de Niceville : Bingham, 1907; Wynter-Blyth, 1957

*Logania watsoniana fasciata* Tytler : Evans, 1932

*Logania watsoniana watsoniana* de Niceville : Evans, 1932

*Logania marmorata watsoniana* de Niceville : Cantlie, 1962

*Diagnostic characters* : MALE - Ground colour dark brown. Fore wing discal area bordered dark and inwardly angled at M<sub>3</sub>, otherwise white dusted faintly with violaceous blue. Hind wing dark grey. FEMALE - Grey. Fore wing *underside* with a discal whitish large area. *Wing expanse* : ♂ ♀ 24-32 mm.

*Intraspecific variation* : Only this subspecies known in India. Upperside of hind wing is usually dark, sometimes grey or dusky grey in male but it is grey in female. In male, underside of fore wing bears a large whitish area on disc or only whitish streaks on the lower postdiscal area or even these streaks may be obsolete.

*Distribution* : India : Manipur. *Elsewhere* : Myanmar.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Logania marmorata watsoniana* De Niceville, (Upperside) - (Specimen in ZSI collection)



*Logania marmorata watsoniana* De Niceville, (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Park and Wildlife Sanctuaries have been established in 433.35 sq km area (Singh & Singh, 2002).

*Conservation measures proposed* : There should be check on any activity posing further threat in its area of occurrence. More information is required on habits, ecology, life - history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. There has been marked shrinkage and degradation of its area of occurrence. There are five examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been relied up on for the validity of subspecies, *L. marmorata watsoniana* de Nicéville. Bridges (1988) treated as *L. watsoniana watsoniana* de Nicéville.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

CLASS INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**82. *Miletus nymphis porus* Eliot, 1961**

**THE BIGG'S BROWNIE**

*Gerydus biggsii* Distant, 1882

*Gerydus biggsii* Distant : de Niceville, 1890; Evans, 1932; Wynter-Blyth, 1957

*Miletus nymphis porus* Eliot, 1961

*Miletus nymphis porus* Eliot : Cantlie, 1962

*Miletus nymphis* (Fruhstorfer) : Varshney, 1997

**Diagnostic characters** : MALE - Fore wing with a continuous more or less even white oblique band entering end-cell; dorsum almost straight. FEMALE - Fore wing with oblique white band slightly broader than in male, reaching almost in the middle of the cell and prominently dentate. *Wing expanse* : ♂ ♀ 32-38 mm.

**Intraspecific variation** : Only this subspecies is found in India. In female, discal white fascia on upper side of fore wing is narrower and ground colour on underside being paler than in the male.

**Distribution** : India : Karnataka (Coorg). *Elsewhere* : Myanmar.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : This butterfly inhabits wet forests at low elevations. While the male is fond of sitting on the tops of leaves at no great height from the ground and of making short circling flight, the female shows fluttering flight amidst undergrowth at the edge of forest

**Threats** : Threats in the are shifting cultivation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of



*Miletus nymphis porus* Eliot, (Upperside) - (Specimen in ZSI collection)



*Miletus nymphis porus* Eliot, (Underside) - (Specimen in ZSI collection)

habitats; selective logging i.e, selective work of cutting down/making use of forest produces; setting up of railway lines; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Park and Wildlife Sanctuaries have been established in an area of 6712.62 sq km. (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat further in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is restricted to Karnataka in India. There has been a considerable loss and deterioration in the area of occurrence. There are 16 examples in the National Zoological Collection of Zoological Survey of India.

*Taxonomic Reliability* : Cantlie (1962) has been followed for the validity of the subspecies, *Miletus nymphis porus* Eliot.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**83. *Miletus symethus petronius* Distant & Pryer, 1887**

**THE GREAT BROWNIE**

*Miletus petronius* Distant & Pryer, 1887

*Gerydus symethus* (Cramer) : de Niceville, 1890; Bingham, 1907; Wynter-Blyth, 1957

*Gerydus symethus diopeithes* Fruhstorfer, 1915 : Evans, 1932

*Miletus symethus petronius* Distant & Pryer : Cantlie, 1962

*Miletus symethus* (Cramer) : Varshney, 1997

**Diagnostic characters** : MALE - Ground colour greyish white. Fore wing base strongly dusted bluish grey, a discal white band angled at  $Cu_{1b}$  and reaching inner margin. Hind wing overlaid with bluish grey scales throughout. FEMALE - As for male. *Wing expanse* : ♂ ♀ 20-25 mm.

**Intraspecific variation** : This is the only known Indian subspecies amongst a dozen of counterparts of the widely distributed species in the Indo-Australian Region.

**Distribution** : India : Nagaland (Naga hills). *Elsewhere* : Myanmar; Sumatra.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : A preponderantly low land forest inhabitant, this butterfly is fond of the skirts of the woods and rest on upper surface of leaves where it performs jerky movements, but soon disappears in thickets if disturbed. Larva is attended by ants (Fruhstorfer, 1915).

**Threats** : Threats in the area are shifting cultivation, grazing; mining; cutting and felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using insecticides and pesticides.



*Miletus symethus petronius* Distant & Pryer, (Upperside) - (Specimen in ZSI collection)



*Miletus symethus petronius* Distant & Pryer, (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been created in an area of 222.36 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : Careful management of habitat of the butterfly should be encouraged. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in Nagaland. There has been shrinkage and degradation of its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The subspecies, *Miletus symethus petronius* Distant & Pryer has been followed after Cantlie (1962). Its occurrence in Nagaland as mentioned by Fruhstorfer (1915) and Evans (1932) was doubted by Cantlie (1962).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**84. *Acytolepis puspa prominens* (de Nicéville, 1890)**

**THE DE NICEVILLE'S HEDGE BLUE**

*Cyaniris cyanascens* race *prominens* de Niceville, 1890

*Cyaniris cyanascens* race *prominens* de Niceville : Bingham, 1907

*Lycaenopsis puspa prominens* (de Niceville) : Fruhstorfer, 1917/1922 Evans, 1932

*Celastrina puspa prominens* (de Niceville) : Cantlie, 1962

*Acytolepis puspa prominens* (de Niceville) : Eliot & Kawazoe, 1983

*Diagnostic characters* : FEMALE - Fore wing extensively blue with border narrow (about 1.5 mm from tornus to vein M<sub>3</sub>, and not running along dorsum, rich blue without whitish areas. Hind wing pale blue as far as the submarginal lunules; marginal spots prominent. Both wings *underside* with markings larger and more distinct. MALE - Unknown. Wing expanse : ♀ 34 mm.

*Intraspecific variation* : This subspecies is known by a single specimen only. The other three subspecies in India are :

- i. *Acytolepis puspa felderi* Toxopeus. *Distribution* : India : Maharashtra ("Bombay" now Mumbai) and South India.
- ii. *Acytolepis puspa gisca* (Fruhstorfer). *Distribution* : India : Northern India, Andaman Islands, Bangladesh, Campuchia (Cambodia), Hong Kong, Laos, Myanmar, North-east Afghanistan (Logar Valley), Pakistan, South China (Guangdong (Kwantung), Hainan, Yunnan), Thailand, Vietnam,
- iii. *Acytolepis puspa cyanescens* (de Nicéville). *Distribution* : India : Andaman Nicobar Islands, (Car Nicobar and Central Nicobar Islands).

The subspecies *Acytolepis puspa prominens* differs from the foregone counterparts by fore wing border narrow and rich blue without whitish areas.



*Acytolepsis puspa cyanescens* (de Nicéville) male (Upperside) After Swinhoe (1905-1910)  
(Photograph of *Acytolepsis puspa prominens* (De Niceville) is not given)

**Distribution :** India : Andaman and Nicobar Islands (Little Nicobars/South Nicobars).

**Status :** Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology :** The habits, ecology, etc. of this subspecies are unknown as only a single female specimen collected is on record.

**Threats :** This is fragile and ecologically sensitive area. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

**Conservation measures taken :** The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. Wildlife Sanctuaries have been created in an area of 19.18 sq km in Nicobar Islands.

**Conservation measures proposed :** There should be restraint on human interference causing any further inits area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

**Rationale :** This subspecies described from a single female from Little Nicobar (South Nicobars) only where it is endemic. Male is still unknown. There has been significant

degradation in the area of its occurrence. Only one female holotype specimen of this subspecies is represented in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The subspecies *Acytolepsis puspa prominens* (de Nicéville) as recognised by Eliot and Kawazoe (1983) has been followed.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**85. *Agriades jaloka leela* (de Nicéville, 1884)**

**THE GREENISH MOUNTAIN BLUE**

*Plebejus ? leela* de Niceville, 1884

*Lycaena leela* de Niceville : de Niceville, 1890

*Lycaena orbitulus* race *jaloka* (Moore) : Bingham, 1907

*Lycaena orbitulus leela* (de Niceville) : Seitz, 1924; Evans, 1932

*Agriades jaloka leela* (de Niceville) : Cantlie, 1962

**Diagnostic characters** : MALE - Ground colour dark brown. Both wings covered with greenish blue scales up to post discal white spots. Hind wing *underside* with costal and discal spots separated from border. FEMALE - As for male. *Wing expanse* : ♂ ♀ 25-30 mm.

**Intraspecific variation** : Upperside of fore wing with variable number of whitish spots of a discal series in male and female, with indistinct dark centers. The underside of both wings in female variable in tone of colour, being much darker in some specimens than in others; whitish spots of a discal series also vary in male. Bingham (1907) could not observe “a double series of coalescing white lunules (lunules, white)” on upperside of hind wing in any of the specimens.

The other following subspecies occurs in India :

*Agriades jaloka ellisi* De Niceville. *Distribution* : India : Jammu & Kashmir (Pangi).

The subspecies *Agriades jaloka leela* differs from *ellisi* by the underside fore wing with white spots faint or very large.

**Distribution** : India : Jammu & Kashmir (Ladakh).

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : De Niceville collected a female specimen near the top of the Zojila on the Ladakh side at about 3350m. elevation on June 27<sup>th</sup> 1879; on July 2<sup>nd</sup> seven



*Agriades jaloka leela* (De Niceville), (Upperside) - (Specimen in ZSI collection)



*Agriades jaloka leela* (De Niceville), (Underside) - (Specimen in ZSI collection)

specimens of both sexes on the Mamyika Pass, Ladakh, 3960m.; and on July 3<sup>rd</sup> seven more specimens on the Fotu-la, Ladakh, at about the same elevation.

**Threats** : This zone is highly fragile. Threats include over-grazing, clearing of forests for wood for fuel; human settlements, construction of roads and active tourism in summer months; fragmentation of habitats; selective use of medicinal plants and collecting other forest commodities and animals.

**Conservation measures taken** : The subspecies is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. Hemis National Park covers an area of 4100 sq km in Ladakh (Singh & Singh, 2002).

**Conservation measures proposed** : Further studies on habitats and biology of this butterfly should be undertaken. There should be restraint on human interference causing any threat in its range of occurrence.

**Rationale** : This subspecies is restricted to Ladakh (Jammu & Kashmir). There has been considerable loss and decline of its area of occurrence. There are three examples (one from Ladakh) in the National Zoological Collection of Zoological Survey of India, Kolkata

**Taxonomic Reliability** : Cantlie (1962) has been followed for the validity of the subspecies, *Agriades jaloka leela* (de Niceville) and other subspecies in India. Bridges (1988) considered this subspecies as *Plebejns jaloka leela* De Niceville.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**86. *Amblypodia avidiena* (Hewitson, 1877)**

**THE CHINESE HAIRSTREAK**

*Amblypodia avidiena* Hewitson, 1877

*Amblypodia avidiena* (Hewitson) : Evans, 1932; Wynter-Blyth, 1957; Cantlie, 1962; D'Abbrera, 1986; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour metallic blue. Fore wing  $M_2$  - area with orange discal spot; borders broadly dark brown; *underside* pale brown with a sliver bar at end-cell and discal line, apex and termen chestnut. Hind wing *underside* chestnut, with a sliver curved band from mid-costa to anal angle and forming a 'Y' with another concolourous band from costal base to the origin of  $M_3$ . FEMALE - Like male. *Wing expanse* : 32 mm.

*Intraspecific variation* : The species is not known to exhibit significant variation.

*Distribution* : India : Nagaland (Naga Hills). *Elsewhere* : Nepal

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : This butterfly inhabits hilly forests. Uchida (1985) recorded its food plant, *Albizia julibrissin*.

*Threats* : Threats in the area are shifting cultivation, grazing; mining; cutting/ felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using of insecticides and pesticides.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Park and Wildlife Sanctuaries have been created in an area of 222.36 sq km (Singh & Singh, 2002).



*Amblypodia avidiena* (Hewitson), female (Upperside) - After D'Abrera (1986)



*Amblypodia avidiena* (Hewitson), female (Underside) - After D'Abrera (1986)



*Amblypodia avidiena* (Hewitson), male (Upperside) - After D'Abrera (1986)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its area of occurrence. The food-plants of *Albizia* spp. should be searched for its habits, ecology, life-history and distribution in India.

*Rationale* : The species is confined to Nagaland, in India. There has been considerable shrinkage and decline in quality of area in its occurrence.

*Taxonomic Reliability* : The validity of the species, *Amblopala avidiena* (Hewitson) has been followed after Cantlie (1962).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**87. *Callophrys leechii* (de Nicéville, 1893)**  
**THE FERRUGINOUS HAIRSTREAK**

*Thecla leechii* de Niceville, 1893

*Callophrys leechii* (de Niceville) : Evans, 1932; Wynter-Blyth, 1957; Cantlie, 1962; Varshney, 1997

*Diagnostic characters* : Ground colour pale blue. Fore wing margin and apex dark broad; *underside* bright ferruginous. Hind wing *underside* with base darker; discal line dark, narrow and irregular. *Wing expanse* : 30 mm.

*Intraspecific variation* : The species is not known to show significant variation.

*Distribution* : India : Assam; Meghalaya (Khasi Hills).

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Habits and ecology of this butterfly are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in an area of 3153.43 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any more threat in its range of occurrence. The studies should be undertaken on habits, ecology and biology of this species for its future conservation.



*Callophrys leechii* (De Niceville), (Upperside) - (Specimen in ZSI collection)



*Callophrys leechii* (De Nicevilla), (Underside) - (Specimen in ZSI collection)

**Rationale** : Qualifies for its restricted distribution in India. There has been a considerable loss and degradation in its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India.

**Taxonomic Reliability** : The species, *Callophrys leechii* (de Niceville) has been followed after Cantile (1962). Bridges (1988) treated it *Ahlbergia leechii* (de Niceville).

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**88. *Castalius rosimon alarbus* Fruhstorfer, 1922**

**THE COMMON PIERROT**

*Castalius rosimon alarbus* Fruhstorfer, 1922; Evans, 1932; Cantlie, 1962; Bridges, 1988

**Diagnostic characters :** MALE - *Upperside* white with several larger black spots on the white areas of fore wing and hind wing; bases metallic blue, suffused with dark scales in female, hind wing costa dark brown. *Underside* with several irregularly arranged black spots; fore wing basal markings consist of a long basal streak, spot end cell and a spot in area 1A + 2A, all well separated. FEMALE - Like male but *upperside* metallic blue at bases of fore and hind wing suffused with dark scales.

**Distribution :** India : Andaman and Nicobar Islands : Andamans and Nicobars.

**Intraspecific variation :** This is variable subspecies and it has following another counterpart in India.

*Castalius rosimon rosimon* Fabricius Widely distributed in India. *Elsewhere :* Myanmar, Pakistan and Sri Lanka

The subspecies *alarbus* differs from the nominate by the black spots on wings larger. The black markings on wings show variation in intensity of black colour of markings, width varies without changing the shape of markings. These black markings on wings, sometimes, become spread and joined on one another that very little of the ground colour is left.

**Habitat and ecology :** Fruhstorfer (1923) described it from the Andamans. The darkest specimens found in Andamans are in the collection of the British Museum. The other habits and ecology of this butterfly are not much known.

**Status :** Vulnerable (Vu A1c, B1 2bc).

**Threats :** This is fragile and ecologically sensitive ecosystem. In North Andaman rain forest cover is much reduced to 21% from 96%, in Middle Andaman it is left with only 29% forest cover and in South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.



*Castalius rosimon alarbus* Fruhstorfer, (Upperside) - (Specimen in ZSI collection)



*Castalius rosimon alarbus* Fruhstorfer, (Underside) - (Specimen in ZSI collection)

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 1529.27 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. “A Code for Insect Collecting” should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

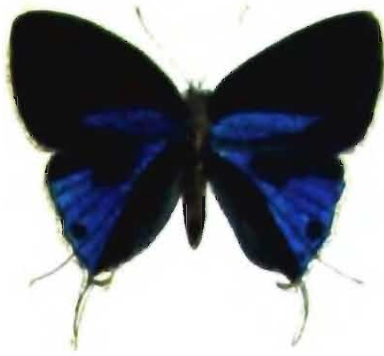
*Rationale* : Qualifies for its restricted distribution in Andamans and Nicobars. There has been a significant loss and degradation in its area of occurrence. There are a few examples in the National Zoological Collection of Zoological Survey of India.

*Taxonomic Reliability* : The subspecies, *Castalius rosimon alarbus* Fruhstorfer has been followed after Cantlie (1962)

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**89. *Charana cepheis* (de Nicéville, 1894)**

**THE CACHAR MANDARIN BLUE**

*Tajuria cepheis* de Niceville, 1894; Seitz, 1924

*Charana cepheis* (de Niceville) : Evans, 1932; Wynter-Blyth, 1957; Cantlie, 1962; D' Abrera, 1986; Bridges, 1998; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour rich deep blue except in the cell. Fore wing blue patch sparse on anal area near base. FEMALE - Fore wing white partly in middle, borders dark. Hind wing costa and apex dark, rest shaded white with dark veins. *Underside* colouration sullied white. *Wing expanse* : ♂ ♀ 45 mm.

*Intraspecific variation* : The species does not exhibit significant variation.

*Distribution* : India : Assam (Cachar Hills); Meghalaya (Khasi Hills).

*Status* : Endangered (EN A1c, B1 2bc).

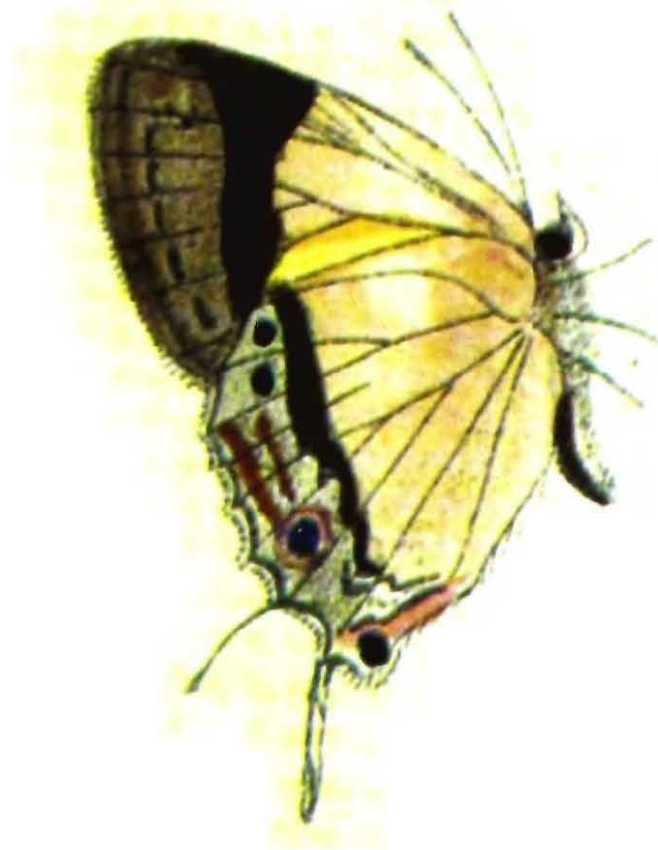
*Habitat and ecology* : This hilly butterfly is known to fly along with *Tajuria mandarina* (Hewitson) at low elevations (Seitz, 1926).

*Threats* : Threats in the area are shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in an area of 3153.43 sq km (Singh & Singh, 2002).



*Charana cepheis* (de Nicéville), male (Upperside) - After Swinhoe (1911-1912)



*Charana cepheis* (de Nicéville), male (Underside) - After Swinhoe (1911-1912)



*Charana cepheis* (de Nicéville), female (Upperside) After Swinhoe (1911-1912)

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. There has been a considerable decrease and deterioration in its area of occurrence. The species is represented by only one example (Assam) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The validity of the species *Charana cepheis* (de Nicéville) is relied up on Cantlie (1962).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**LEAST CONCERN**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**90. *Chliaria othona* (Hewitson, 1865)**

**THE ORCHARD TIT**

*Hypolycaena othona* Hewitson, 1865

*Chliaria othona* Hewitson : De Niceville, 1890; Swinhoe, 1911-1912; Evans, 1932; Wynter-Blyth, 1957; Cantlie, 1962; D'Abbrera, 1985; Bridges, 1988; Varshney, 1997

**Diagnostic characters** : MALE - *Upperside* of wings pale blue with broad black apex and termen of fore wing, narrow black costa and apex of hind wing; the black apex of fore wing shot deep purple blue, blue colour on fore wing very variable. *Underside* of fore wing with small black costal spot above the middle of the cell. *Underside* of wings white, faint bars at end cells, markings ochreous black edged; fore wing with upper part of discal band much wider than the lower part; hind wing with discal band broken in areas  $M_3$  and  $M_1$ ; tornal spots prominent, orange crowned; tails delicate being 4 mm at vein 3A and 2 mm at vein 1A + 2A. FEMALE - like male except, *upperside* of wings brown, fore wing with lower part of disc whitish; hind wing with tornal area broadly bluish white and veins darkened. **Wing expanse** : Male and female 24-27 mm.

**Distribution** : India : Andaman and Nicobar Islands : (Andaman Islands), Assam, Meghalaya, Sikkim, South India (Western Ghats), Uttaranchal (Dehra Dun), West Bengal (Kolkata). *Elsewhere* : Myanmar, Nepal.

**Intraspecific variation** : The species shown variation in blue colouration in fore wing.

**Habitat and ecology** : De Niceville (1890) mentioned records of its both sexes from Kumaon (Uttaranchal); both sexes during March and males during July and October from Sikkim; a female from Khasi Hills (Meghalaya); also males from North Kanara and Andamans. De Niceville (*loc. cit.*) also stated about its rearing from a larva feeding on an orchid hanging in the verandah of a bungalow on the Rhenock Ridge, Sikkim. The larva is green, and of the usual onisciform shape.

The butterfly is of heavy, wet jungle. It is seldom seen except round its host plants – species of orchids. Its flight is weak and settles occasionally on the leaves of trees, on



*Chliaria othona* (Hewitson), (Upperside) - (Specimen in ZSI collection)



*Chliaria othona* (Hewitson), (Underside) - (Specimen in ZSI collection)

flowers and on damp patches. It occurs upto 1520 m. in Sikkim. The larva feeds on the flower buds of epiphytic orchids (*i.e.*, those that grow on trees).

*Status* : Least Concern (LC).

*Threats* : Threats include expansion of arable land, shifting cultivation, grazing; mining; over-utilization of biological resources; fragmentation of habitats expansion of industries; human settlements : urbanisation; construction of dams and highways; setting up of railway lines, illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land, water and atmospheric pollution on account of using pesticides. selective logging *i.e.*, selective work of cutting down/making use of forest produces; There has been loss of 50% of forest cover in 50 years Goankar (1996). The eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred et al, 2002). Andaman & Nicobars are in a fragile and ecologically sensitive ecosystem. North Andaman forest cover reduced to 21% from 96%, Middle Andaman left with only 29% forest cover and South Andaman forest is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National and Wildlife Sanctuaries cover a considerable protected area.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. The farming of this butterfly should be taken up with advantage. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The farming of this butterfly should be taken up with advantage.

*Rationale* : The species is known from several localities in its range of distribution. There has been considerable loss and degradation in its area of occurrence. The species is represented by several examples in the the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Chliaria othona* (Hewitson) has been followed after Cantlie (1962).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**91. *Chrysozephyrus ataxus zulla* (Tytler, 1915)  
THE WONDERFUL HAIRSTREAK**

*Zephyrus ataxus zulla* Tytler, 1915

*Thecla ataxus zulla* Tytler : Evans, 1932

*Neophyrus ataxus zulla* (Tytler) : Howarth, 1957

*Chrysozephyrus ataxus zulla* (Tytler) : Cantlie, 1962

*Neophyrus ataxus zulla* (Tytler) : D'Abbrera, 1986

*Diagnostic characters* : MALE - Ground colour metallic green. Fore wing black terminal border much narrow; *underside* silvery white; end-cell bar present; narrow brown postdiscal band rather obsolete and without submarginal marking. Hind wing *underside* as on fore wing, but with submarginal markings and orange-crowned spots at anal angle and in  $Cu_{1B}$ -area. FEMALE - Brown. Fore wing terminal black border also narrow; disc posteriorly violet; end-cell and  $Cu_{1a}$ -area with an orange spot each; *underside* with dark discal and submarginal bands separated by a broad silver band. Hind wing *underside* white, sub-basally pale brown, wide dark discal patch and also a silver band across, followed by a submarginal one of dark tinge. *Wing expanse* : ♂ ♀ 40-46 mm.

*Intraspecific variation* : The following other subspecies occurs in India.

*Chrysozephyrus ataxus ataxus* (Doubleday & Hewitson) : India (Kumaon). *Elsewhere* : Pakistan (Murree).

The subspecies *zulla* is distinguished from the nominate one by the upperside of fore wing, in male, with border much narrower and not widening at apex.

*Distribution* : India : Nagaland. *Elsewhere* : Western China.

*Status* : Critically Endangered (CR A1c, B1 2bc).



*Chrysozephyrus ataxus zulla* (Tytler), male (Upperside) - (Specimen in ZSI collection)



*Chrysozephyrus ataxus zulla* (Tytler), male (Underside) - (Specimen in ZSI collection)



*Chrysozephyrus ataxus zulla* (Tytler), female (Upperside) - (Specimen in ZSI collection)



*Chrysozephyrus ataxus zulla* (Tytler), female (Underside) - (Specimen in ZSI collection)

*Habitat and ecology* : This shade-loving butterfly inhabits woods and forests and never visits flowers. This is perhaps the most beautiful butterfly of the genus and flies above 1500 m between May and September (Wynter-Blyth, 1957). A female and a male were collected on Paona Hill above Kirbari, Naga Hills, at 7000 feet at the end of June and in the middle of July (Tytler, 1915).

*Threats* : The threats in the area are shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Park and Wildlife Sanctuaries have been created in an area of 222.36 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : More information on biology and ecology is required for further conservation measures. There should be restraint on human interference causing any further threat in its range of occurrence.

*Rationale* : This subspecies is confined to Nagaland, in India. There has been considerable loss and deterioration in area of its occurrence. The type specimens of this species collected from Naga hills are in the British Museum Natural History, London.

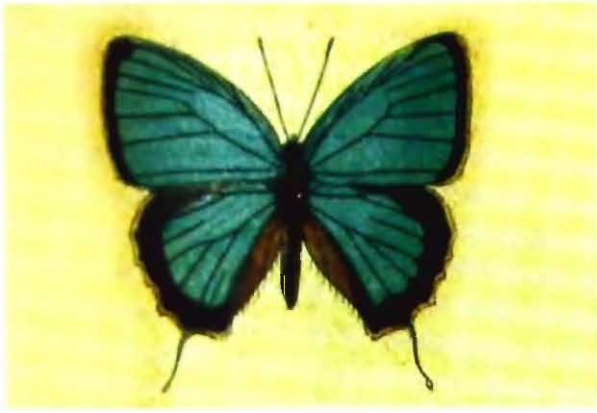
*Taxonomic Reliability* : The name of the subspecies, *Chrysozephyrus ataxus zulla* (Tytler) has been followed after Cantlie (1962). Bridges (1988) treated it as *Chrysozephyrus zulla* (Tytler).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**92. *Chrysozephyrus disparatus pseudoletha* (Howarth, 1957)**

**THE WATSON'S HAIRSTREAK**

*Ruralis letha* Watson : Swinhoe, 1911

*Thecla letha* Watson : Evans, 1932

*Chrysozephyrus disparatus letha* Watson : Howarth, 1957

*Neozephyrus disparatus pseudoletha* Howarth, 1957

*Chrysozephyrus disparatus pseudoletha* (Howarth) : Cantlie, 1962; Bridges, 1988.

*Neozephyrus disparatus pseudoletha* (Howarth) : D'Abbrera, 1986

*Chrysozephyrus disparatus* (Howarth) : Varshney, 1997

**Diagnostic characters** : MALE Ground colour brilliant green. Fore wing terminal border narrowly black; *underside* with area between postdiscal and submarginal lines drab coloured. Hind wing base with a blue sapphire line; *underside* as on fore wing. FEMALE - Unknown. **Wing expanse** : 40 mm.

**Intraspecific variation** : The following other subspecies occurs in India is :

*Chrysozephyrus disparatus interpositus* (Howarth) – India : Sikkim

The subspecies *pseudoletha* differs from *interpositus* by black border of wings broader.

**Distribution** : India : Meghalaya (Khasia Hills).

**Status** : Critically Endangered ( CR EN A1c, B1 2bc).

**Habitat and ecology** : The habits and ecology of the butterfly are not known. The subspecies is represented by a single male specimen

**Threats** : Threats in the area include shifting cultivation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Chrysozephyrus disparatus pseudoletha* (Howarth, 1957), male (Upperside)  
- After Swinhoe (1910-1911)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 301.68 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its area of occurrence. Efforts should be made to collect more specimens as well as to obtain information on its habits, ecology and life-history.

*Rationale* : Qualifies for its restricted distribution in Meghalaya, in India. There has been reduction and degradation in area of its occurrence.

*Taxonomic Reliability* : Cantlie (1962) has been followed for the species *Chrysozephyrus disparatus pseudoletha* (Howarth).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**93. *Chrysozephyrus paona* (Tytler, 1915)  
THE PAONA HAIRSTREAK**

*Thecla paona* Tytler, 1915

*Thecla paona* Tytler : Evans, 1932; Wynter-Blyth, 1957

*Neozephyrus paona* (Tytler) : Howarth, 1957

*Chrysozephyrus paona* (Tytler) : Cantlie, 1962; Bridges, 1988; Varshney, 1997

*Neozephyrus paona* (Tytler) : D'Abbrera, 1986

*Diagnostic characters* : MALE Ground colour brilliant green. Fore wing terminal border broadly black. Hind wing blue terminal line extended on either side of tail; *underside* discal band irregular and bowed in opposite to cell; lunar strigae anteriorly in M<sub>2</sub> and M<sub>3</sub> - areas and posteriorly in M<sub>1</sub> - area; tornus indistinctly orange. FEMALE - Both wings blue, with more extensive white. Hind wing white streaks in M<sub>1</sub>-M<sub>3</sub> areas. *Wing expanse* : ♂ ♀ 46-47 mm.

*Intraspecific variation* : The species shows variation in ground colour being green in male but blue in female.

*Distribution* : India : Manipur (Paona Peak and Mt. Kabru).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) reported that a male and a female were captured from Kabru Mountain in Manipur (2650m.) and Paona Peak (2530m.), respectively, in the month of June. The other habits of this butterfly are unknown.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting and felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of



*Chrysozephyrus paona* (Tytler), (Upperside) - (Specimen in ZSI collection)



*Chrysozephyrus paona* (Tytler), (Underside) - (Specimen in ZSI collection)



*Chrysozephyrus paona* (Tytler), female (Underside) After D'Abbrera (1986)

forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in an area of 433.35 sq km (Singh & Singh, 2002).

**Conservation measures proposed :** There is a need for information on its biology and ecology for future conservation measures. There should be restraint on human interference causing any further threat in its area of occurrence.

**Rationale :** Qualifies for its restricted distribution in Manipur where it is endemic. There has been considerable shrinkage and degradation in its area of occurrence. Holotype and paratype from Manipur are represented in the collection of British Museum (Natural History), London.

**Taxonomic Reliability :** Cantlie (1962) is relied up on for the validity of the species, *Chrysozephyrus paona* (Tytler).

Compiled by : I.J. Gupta and D.K. Mondal

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**VULNERABLE**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**94. *Deudorix epijarbus amatius* Fruhstorfer, 1912**

**THE CORNELIAN**

*Deudorix epijarbus amatius* Fruhstorfer, 1912

*Deudorix epijarbus amatius* Fruhstorfer : Seitz, 1924; Evans, 1932; Cantlie, 1962; D'Abbrera, 1986; Bridges, 1988

*Diagnostic characters* : MALE - *Upperside* of fore and hind wings scarlet with broad dark brown border; hind wing lobe black. *Underside* with markings brown, very broad, continuous and black edged. FEMALE - *upperside* brown, sometimes with disc paler. *Wing expanse* : ♂ ♀ 36-44 mm.

*Intraspecific variation* : This subspecies has other two following counterparts in India.

- i. *Deudorix epijarbus epijarbus* (Moore)- Wing expanse (34-38 mm), underside rather dark brown. *Distribution* : India : South India, Orissa, West Bengal (Kolkata). *Elsewhere* : Sri Lanka.
- ii. *Deudorix epijarbus ancus* (Fruhstorfer) - Wing expanse (38-43 mm), underside rather pale brown. *Distribution* : India : Uttaranchal (Kumaon). *Elsewhere* : Nepal, Pakistan (Chitral).

*D. epijarbus amatius* differs from the above two subspecies by the underside of wings showing much variation in wing expanse and colouration. Consequently, there is a recognized form *diara* Swinhoe (*Deudorix epijarbus amatius* f. *diara* Swinhoe) with *underside* dark brown, outer part of disc in fore wing and upper half of hind wing white, crossed by black veins.

*Distribution* : India : Andaman and Nicobar Islands (Andaman Islands, South Nicobar Islands), Sikkim. *Elsewhere* : Myanmar.

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.



*Deudorix epijarbus amatius* Fruhstorfer, (Upperside) - ZSI specimen



*Deudorix epijarbus amatius* Fruhstorfer, (Underside) - ZSI specimen

*Status* : Vulnerable (Vu A1c, B1 2bc).

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using pesticides. Insular ecosystem is fragile and ecologically sensitive ecosystem. In North Andaman forest cover is reduced to 21% from 96%, Middle Andaman left with only 29% forest cover and in South Andaman forest it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 3630.61 sq km. Add Sikkim (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : The subspecies is known by a few records from its range of distribution. There has been significant loss and deterioration in its area of occurrence. It is represented by a few examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been followed for the subspecies, *Deudorix epijarbus amatius* (Fruhstorfer).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**95. *Drupadia scaeva cyara* (Hewitson, 1878)**

**THE BLUE POSY**

*Myrina cyara* Hewitson, 1878

*Biduanda cyara* (Hewitson) : De Niceville, 1890; Seitz, 1924

*Biduanda melisa cyara* (Hewitson) : Evans, 1932

*Marmessus scaeva cyara* (Hewitson) : Cantlie, 1962

*Drupadia scaeva cyara* (Hewitson) : Cowan, 1974; D'Abrera, 1986; Bridges, 1988

*Diagnostic characters* : MALE - Ground colour pale. Fore wing with a sharply defined white patch at base of upper cubital area; *underside* markings pale. Hind wing costa orange; anal half pale blue. FEMALE - Ground colour dark brown. Fore wing discal patch orange. Hind wing anal area faintly grey-scaled. *Wing expanse* ♂ ♀ : 20-25 mm.

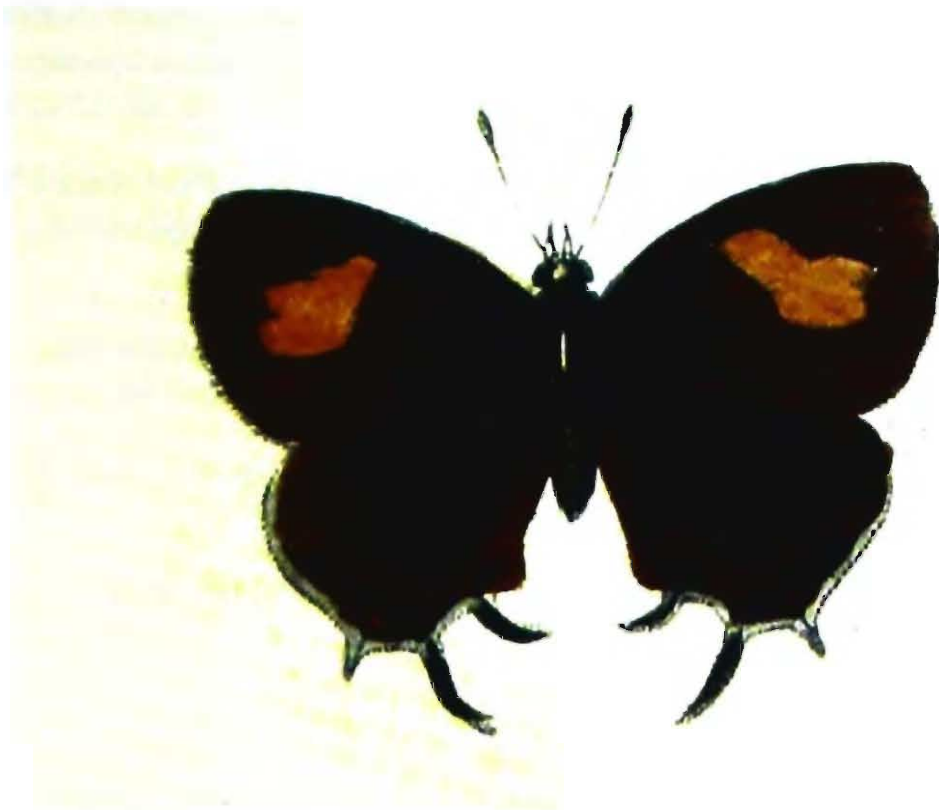
*Intraspecific variation* : Only this subspecies occurs in India and it exhibits variation in colouration which is pale in male and dark brown in female.

*Distribution* : India : Assam, Sikkim and West Bengal (Darjiling). *Elsewhere* : North Myanmar, Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : This hilly butterfly is known to visit flowers. Other habits, ecology and biology are not known. Evans (1932) and Cantlie (1962) mentioned its occurrence in Sikkim; de Niceville (1890) referred its distribution Darjiling (West Bengal); and D'Abrera (1986) added Assam also.

*Threats* : Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Drupadia scaeva cyara* (Hewitson), female, (Upperside) - After Swinhoe (1911-1912)



*Drupadia scaeva cyara* (Hewitson), female, (Underside) - After Swinhoe (1911-1912)

**Conservation measures taken :** The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 7701.57 sq km.

**Conservation measures proposed :** There should be check on any more threats in its range of occurrence. Attempts should also be made for information on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for only a few records of this subspecies from the area of its occurrence. There has been significant decrease and degradation of area of its occurrence.

**Taxonomic Reliability :** The validity of subspecies, *Drupadia scaeva cyara* is after Cowan (1974) subsequently, followed by Varshney (1997).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**96. *Esakiozephyrus mandara mandara* (Doherty, 1886)**

**THE INDIAN PURPLE HAIRSTREAK**

*Thecla mandara* Doherty, 1886

*Zephyrus mandara* (Doherty) : de Niceville, 1890

*Ruralis mandara* Swinhoe, 1910-11

*Thecla beiti mandara* Doherty : Evans, 1932

*Thecla beiti* Oberthuer : Seitz, 1924; Arora, 1995

*Teratozephyrus mandara mandara* (Doherty) : Howarth, 1957

*Esakiozephyrus mandara mandara* (Doherty) : Cantlie, 1962, Varshney, 1997

*Diagnostic characters* : MALE Ground colour purple. Wings rounded. Fore wing base violet, *underside* marked ferruginous; discal band of even width, outwardly sliver-edged and angled at  $Cu_{1a}$ . Hind wing dark brown; *underside* also marked ferruginous; discal band straight up to  $Cu_{1b}$ , then zigzagged to inner margin; tornal spots very obscure. FEMALE - Unknown. *Wing expanse* : 40 mm.

*Intraspecific variation* : The following other subspecies occurs in India.

*E. mandara dohertyi* de Nicéville - India : Jammu & Kashmir (Kulu), Uttaranchal (Garhwal).

The nominate subspecies differs from *dohertyi* by the with fore wing base only being violet and hind wing entirely dark brown.

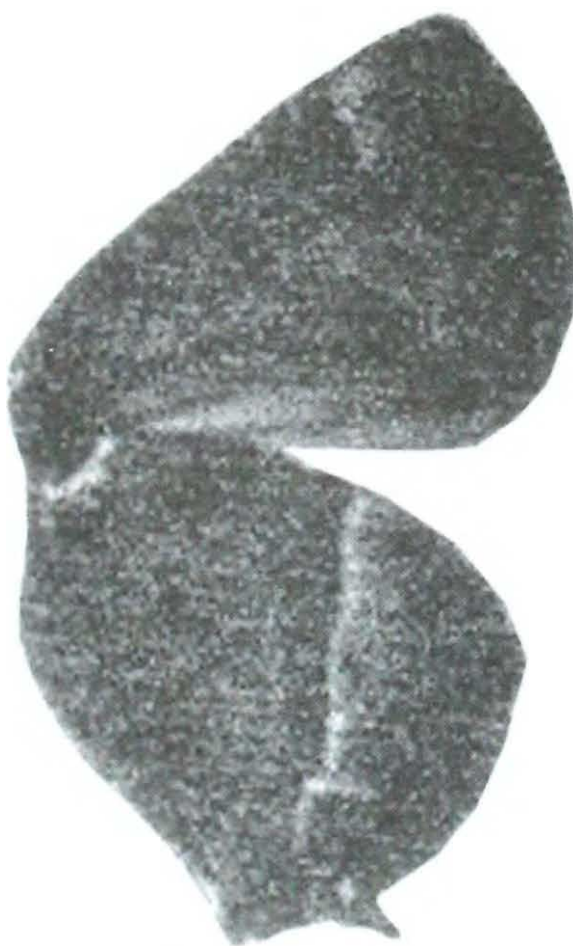
*Distribution* : India : Uttaranchal (Kumaon)

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habits, ecology etc., of this alpine butterfly are largely unknown. Arora *et al.*, (1995) recorded it from Nainital (Kumaon).



*Esakiozephyrus bieti* (Oberthuer) - After Lewis (1973)



*Esakiozephyrus mandara dohertyi* (De Niceville), (Upperside) - After Evans (1932)  
(Photograph of *Esakiozephyrus mandara mandara* (Doherty) is not included)

**Threats** : Threats in the area are expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements : urbanisation; construction of dams and highways; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2000); land, water and atmospheric pollution on account of using insecticides and pesticides.

**Conservation measures taken** : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a protected area of 6466.54 sq km. (Singh & Singh, 2002).

**Conservation measures proposed** : There should be check on any more threats in its range of occurrence. Attempts should also be made for information on habits, ecology, life-history and distribution of this butterfly.

**Rationale** : Qualifies for its restricted distribution to Kumaon in Uttaranchal. There has been a considerable loss and degradation in the area of its occurrence.

**Taxonomic Reliability** : Cantlie (1962) has been relied up on for the validity of the nominate subspecies *Esakiozephyrus mandara mandara* (Doherty). Bridges (1988) treated it as *Esakiozephyrus beiti mandara* (Doherty).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**97. *Euspa pavo* (de Nicéville, 1887)**

**THE PEACOCK HAIRSTREAK**

*Zephyrus pavo* de Niceville, 1887

*Zephyrus pavo* de Niceville : de Niceville, 1890, Elwes, 1892

*Ruralis pavo* (de Niceville) : Swinhoe, 1910-11

*Thecla pavo* (de Niceville) : Evans, 1932

*Teratozephyrus pavo* (de Niceville) : Howarth, 1957

*Euspa pavo* (de Niceville) : Cantlie 1962; D'Abbrera, 1986; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE Ground colour peacock purple. Both wings with apical third black, quadrate orange spot beyond cell and another elongated one in  $Cu_{1a}$ -area; *underside* dark brown. Fore wing underside discal band from costa to  $Cu_{1b}$  obscure dark, outwardly edged narrow white and beyond sprinkled pale violet; also with a dark fascia from subornus to  $M_1$ . Hind wing *underside* sprinkled violet; discal band broad, irregular, wedge-shaped and without violet, being followed by another band inwardly white-edged; tornal spots orange-crowned. Tailed.

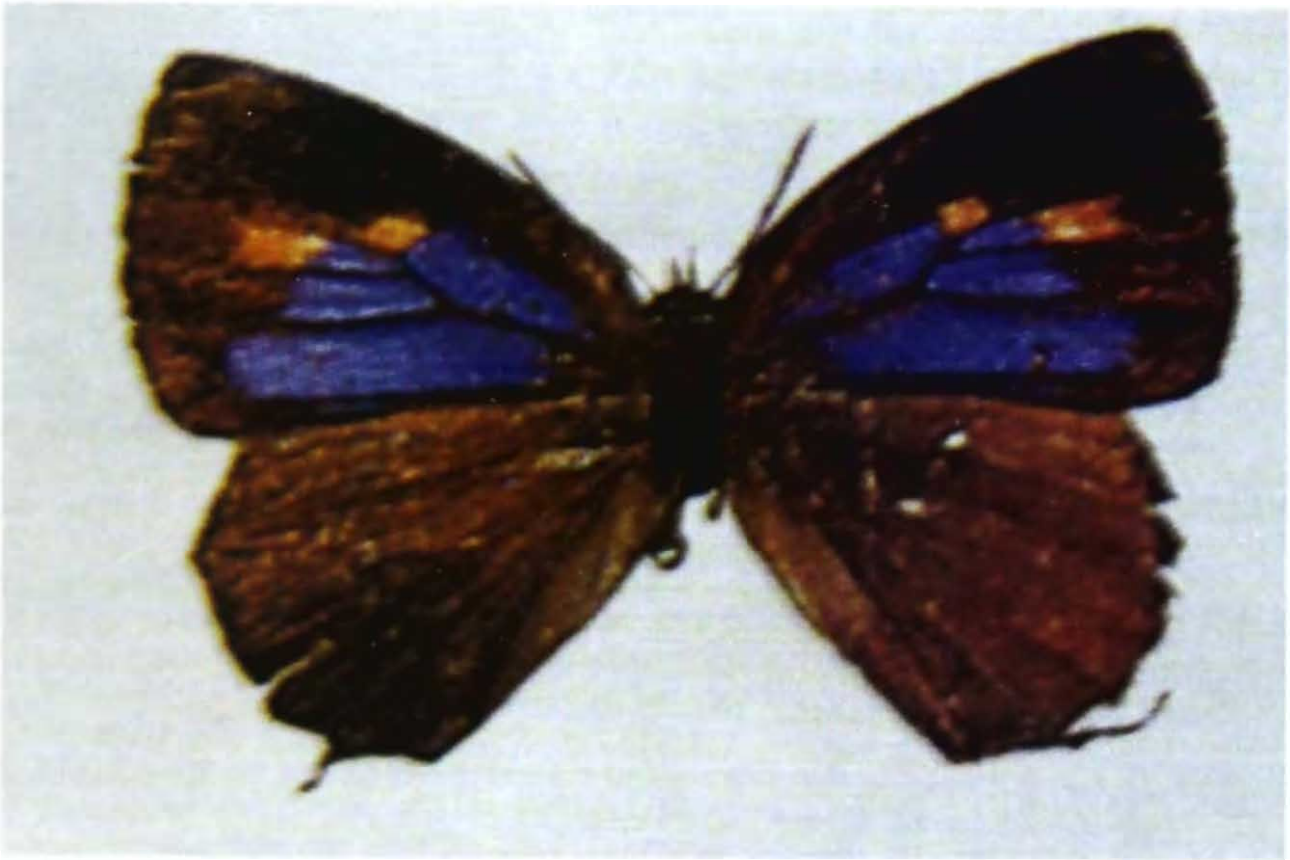
FEMALE - Fore wing with a quadrate orange spot beyond cell; elongate spot in  $Cu_{1a}$ -area larger and coalesced with the former. *Wing expanse* : ♂ ♀ 35-39 mm.

*Intraspecific variation* : The female differs from male in having on the underside of the fore wing an orange discal patch beyond the cell in interspaces  $Cu_{1b}$  and  $Cu_{1a}$ .

*Distribution* : India : Assam (Margherita), Nagaland. *Elsewhere* : Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : De Niceville (1890) mentioned that a male specimen was collected by Mr. W. Doherty near Margherita in Upper Assam, at an elevation of 120m (appears to be error in literature). Tytler (1915) collected male and female specimens at Kirbari, Naga



*Euaspa pavo*, male (De Niceville), (Upperside) After D'Abrera (1986)

Hills, at elevation of about 2230m. and also above Kohima and Jakama. He stated that the species did not occur below 1820m. It remains on flight from June to September.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in 3074.11 sq km area.

**Conservation measures proposed :** There should be restraint on human interference causing any further threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for its restricted distribution in India. There has been a significant loss of its area of occurrence and its degradation

**Taxonomic Reliability :** Cantlie (1962) has been followed for the validity of the species, *Euaspa pavo* (de Niceville).

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**98. *Heliophorus hybrida* (Tytler, 1912)**

**THE HYBRID SAPPHIRE**

*Ilerda hybrida* Tytler, 1912

*Heliophorus hybrida* (Tytler) : Evans, 1932; Cantlie, 1962; D'Abrera, 1986; Varshney, 1997

*Diagnostic characters* : MALE Ground colour brassy green. Upperside hind wing with a marginal band narrow. *Wing expanse* : 34 mm.

*Intraspecific variation* : The species is not known to display significant variation.

*Distribution* : India : Sikkim; Nagaland; and West Bengal (Darjiling)

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of the species are largely not known. Tytler (1912) mentioned it an aberration of *Heliophrus brahma* (Moore) which was found by him as very common at elevation of 1220-2230m.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using of insecticides and pesticides.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in 5072.18 sq km area (Singh & Singh, 2002).

*Conservation measures proposed* : There should be careful monitoring of the habitat for any additional threats. More information is required on habits, ecology, life-history and distribution of this butterfly.



*Heliophorus hybrida* (Tytler), male (Upperside) - After D'Abbrera (1986)



*Heliophorus hybrida* (Tytler), male (Underside) - After D'Abbrera (1986)

*Rationale* : In India, this species is known from a few localities of north-eastern states. There has been considerable loss in the area of its occurrence and also its deterioration.

*Taxonomic Reliability* : The taxonomic status of this butterfly is doubtful as Tytler (1912) stated *hybrida* to be an aberrant form of *Heliophorus brahma* (Moore). Evans (1932) and Cantlie (1962) though listed *hybrida* as species yet held it to be a hybrid between *H. brahma* (Moore) and *H. androcles* (Hewitson). D'Abbrera (1986) mentioned that 'in B.M.N.H. *hybrida* is treated as an aberrant form of *Heliophorus brahma* (Moore). Similarly, Bridges (1988) also treated *hybrida* as aberrant form of *Heliophorus brahma* (Moore). Varshney (1997) listed *Heliophorus hybrida* (Tytler) as species. If *hybrida* is treated as aberrant form of *H. brahma* then the former will be no longer of status 'Endangered' as *brahma* has wide range of distribution from Kumaon to Sikkim, Assam, Nagaland, West Bengal and Myanmar.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**99. *Horaga albimacula* (Wood-Mason & de Nicéville, 1881)**

### **THE VIOLET ONYX**

*Sithon albimacula* Wood-Mason & de Niceville, 1881

*Horaga albimacula* (Wood-Mason & de Niceville) : de Niceville, 1890; Seitz, 1924; Evans, 1932; Cantlie, 1962; D'Abbrera, 1986; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour dark brown. Fore wing with a white patch nearly to 1A+2A; white discal band not extending to M<sub>1</sub> on fore wing, being straight and outwardly diffused on hind wing. Sex-brand absent. *Underside* dark ochreous brown, paler outwardly; hind wing violet blue and bordered black. FEMALE As for male. *Wing expanse* : ♂ ♀ 25-27 mm.

*Intraspecific variation* : The species is not known to exhibit significant variation.

*Distribution* : India : Andaman and Nicobar Islands (Andamans).

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits, ecology etc., of this insular butterfly are not much known. De Niceville (1890) stated its habitat as South Andaman Islands and he also referred to seven males captured from Andaman Islands.

*Threats* : The area of its occurrence is fragile and ecologically sensitive. The rainforest in North Andaman is reduced to 21% from 96%, Middle Andaman left with it only 29% and South Andaman rainforest is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in area of 1510.09 sq km in Andaman Islands (Singh & Singh, 2002).



*Horaga albimacula*, male (Upperside) - (Specimen in ZSI collection)



*Horaga albimacula*, male (Underside) - (Specimen in ZSI collection)



*Horaga albimacula*, female (Upperside) - (Specimen in ZSI collection)



*Horaga albimacula*, female (Underside) - (Specimen in ZSI collection)

*Conservation measures proposed* : Necessary measures should be taken to check any further threat in its are of its occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. “A Code for Insect Collecting” should be followed while capturing butterflies from their habitat. The ranching of butterfly may be initiated so as to take up farming programme in future.

*Rationale* : This species is known, in India, from Andaman islands. There has been significant decline in the quality and area of its occurrence. The subspecies is represented by four examples (one from Andamans) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been followed for the species, *Horaga albimacula* (Wood-Mason & de Niceville) without its any subspecies. However, D’Abrera (1986) and Bridges (1988) treated two subspecies, *Horaga albimacula albimacula* and *Horaga albimacula viola* (Moore), the latter found in India (Sikkim, Assam) Sri Lanka and Myanmar. Varshney (1977) treated *albimacula* and *viola* as two distinct species.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

100. *Jamides ferrari ferrari* Evans, 1932

**THE FERRAR'S CERULEAN**

*Jamides ferrari* Evans, 1932; Varshney, 1997

*Jamides ferrari ferrari* Evans : Cantlie, 1962; D'Abrera, 1986

*Diagnostic characters* : MALE - Ground colour shiny blue. Fore wing margin narrowly bordered. Hind wing with a decreasingly row of marginal black spots; *underside* markings dull, narrow and basally obsolete, anal spot in Cu<sub>1b</sub>-area and orange crown very wide. Androconia long and widening evenly. FEMALE - pale shiny blue. *Wing expanse* : ♂ ♀ 34-40 mm.

*Intraspecific variation* : Only the nominate subspecies occurs in India and it shows variation in ground colouration which is shiny blue in male and pale shiny blue in female.

*Distribution* : India : Andaman and Nicobar Islands (Central and South Nicobars).

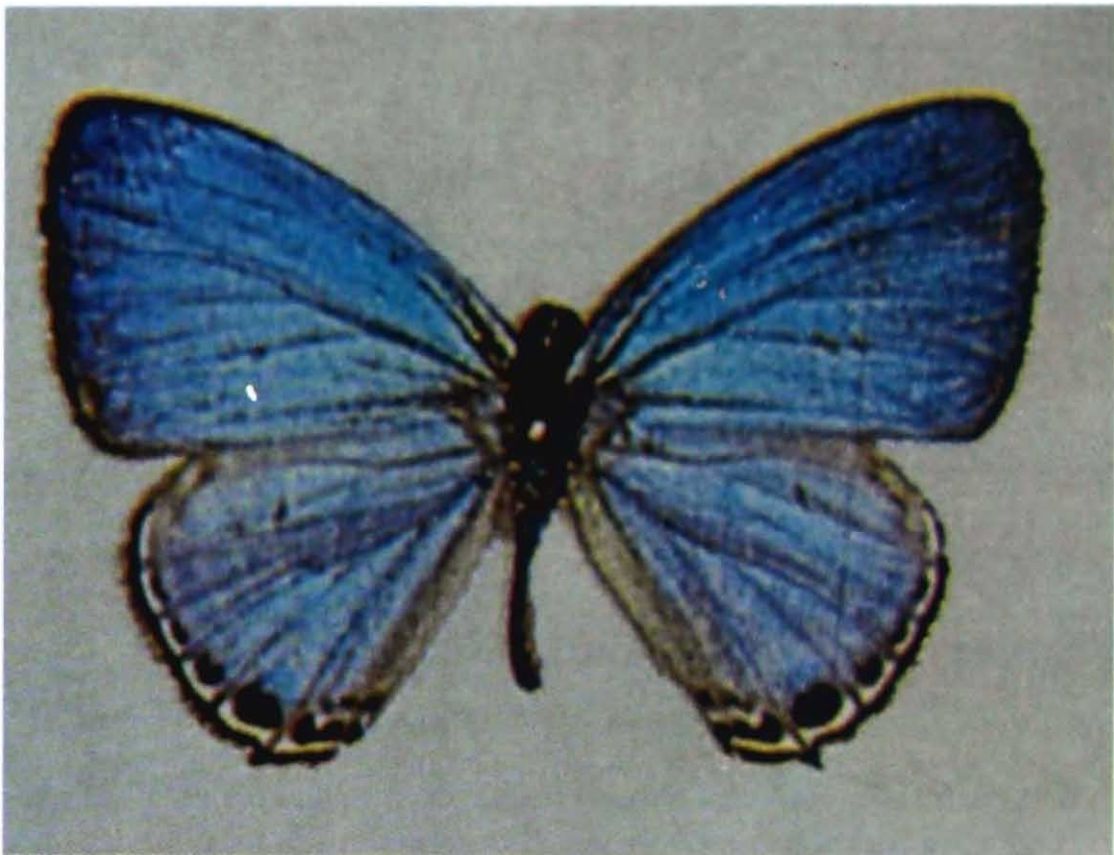
*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

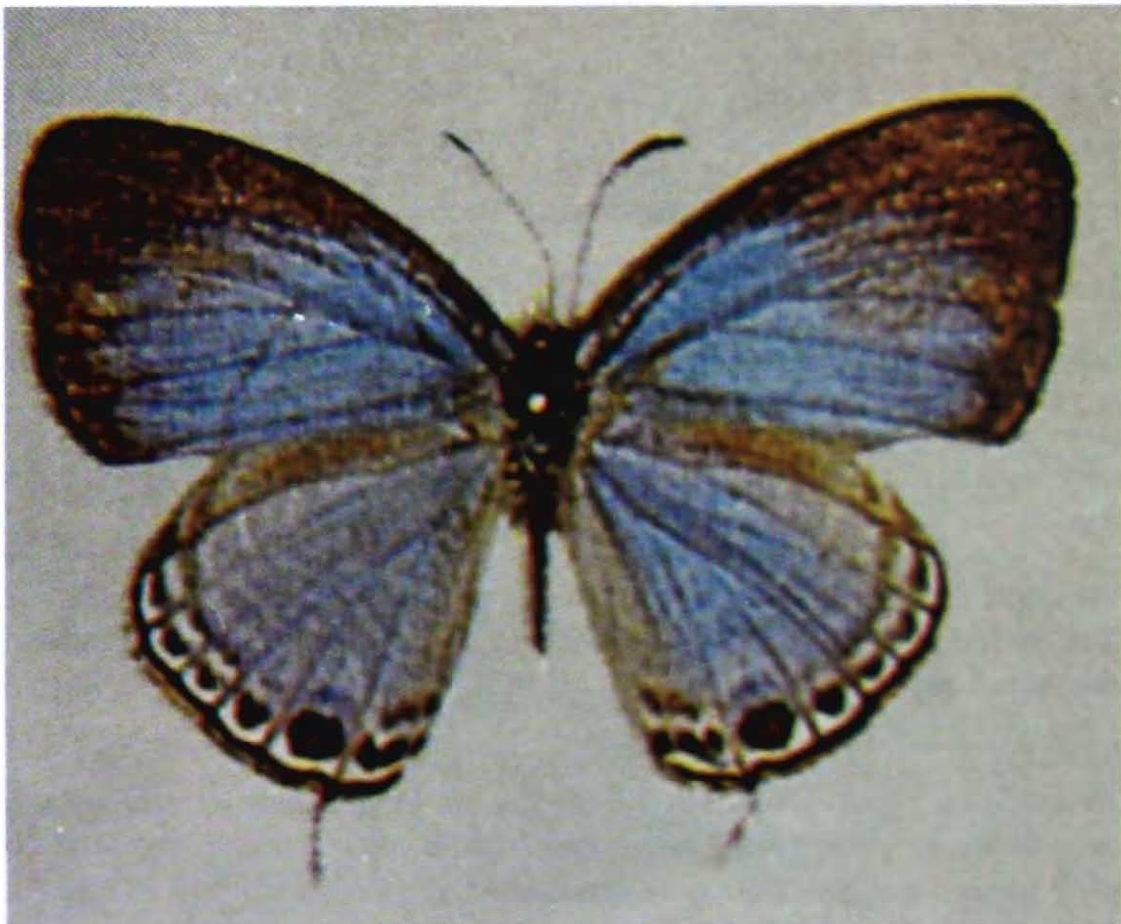
*Threats* : The area of its occurrence is is fragile and ecologically sensitive. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The butterfly is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. Wildlife Sanctuaries have been established in area of 19.18 sq km in Nicobar Islands (Singh & Singh, 2002).

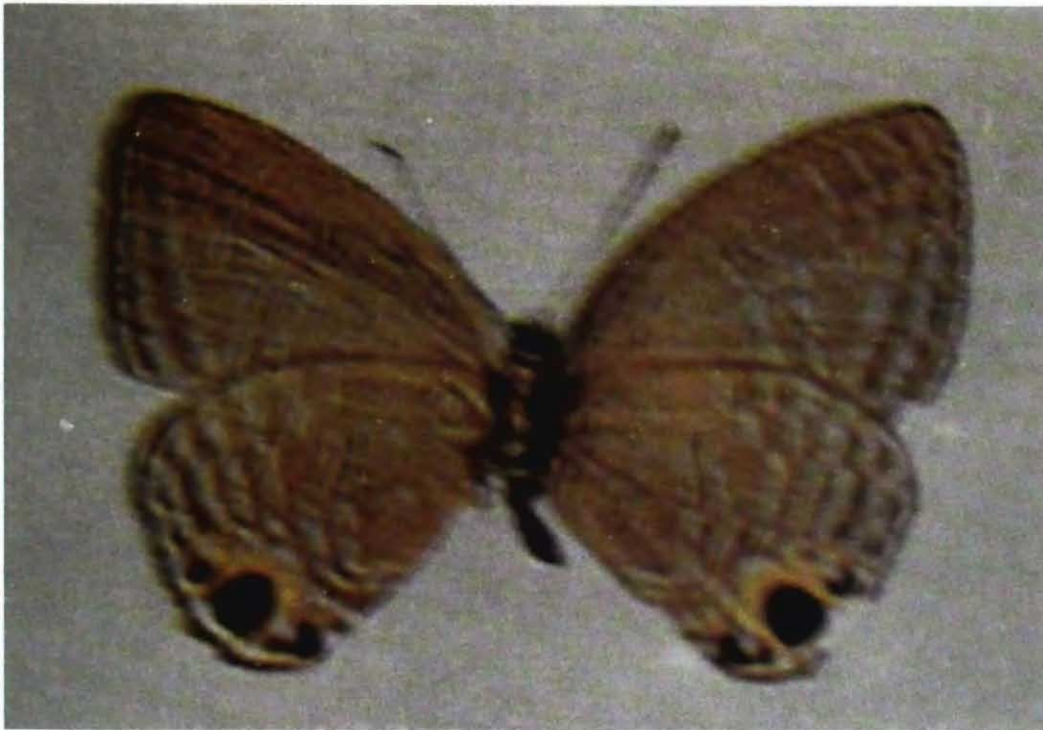
*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.



*Jamides ferrari ferrari* Evans, male (Upperside) - After D'Abbrera (1986)



*Jamides ferrari ferrari* Evans, female (Upperside) - After D'Abbrera (1986)



*Jamides ferrari ferrari* Evans, male (Underside) After D'Abrera (1986)

**Rationale :** This nominate subspecies has restricted insular distribution. There has been considerable decrease and deterioration in its area of occurrence.

**Taxonomic Reliability :** The validity of nominate subspecies, *Jamides ferrari ferrari* Evans has been followed after Cantlie (1962).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**101. *Liphyra brassolis brassolis* Westwood, 1864**

**THE MOTH BUTTERFLY**

*Liphyra brassolis* Westwood, 1864

*Liphyra brassolis* Westwood : de Niceville, 1890; Bingham, 1907; Swinhoe, 1910-1911; Evans, 1932; Wynter-Blyth, 1957; Cantlie, 1962; Varshney, 1997

*Liphyra brassolis brassolis* Westwood : Fruhstorfer, 1915; D'Abrera, 1986;

*Diagnostic characters* : Moth like appearance. MALE - Ground colour blackish brown. Fore wing with a large black spot at end-cell. Hind wing with a black spot at end-cell in addition to large spots at bases of  $Cu_{1a}$ -areas. Both wings with irregular broad black borders and *underside* dull yellow, otherwise marked as on *upperside*. FEMALE - Reddish ochreous yellow; fore wing border broad blackish brown extending to mid-proximal margin; hind wing with this border extending to the anal angle. *Wing expanse* : ♂ ♀ 86-92 mm.

*Intraspecific variation* : Only the nominate subspecies occurs in India (D'Abrera, 1986). It is considered variable showing upperside of wings brown to rich yellow.

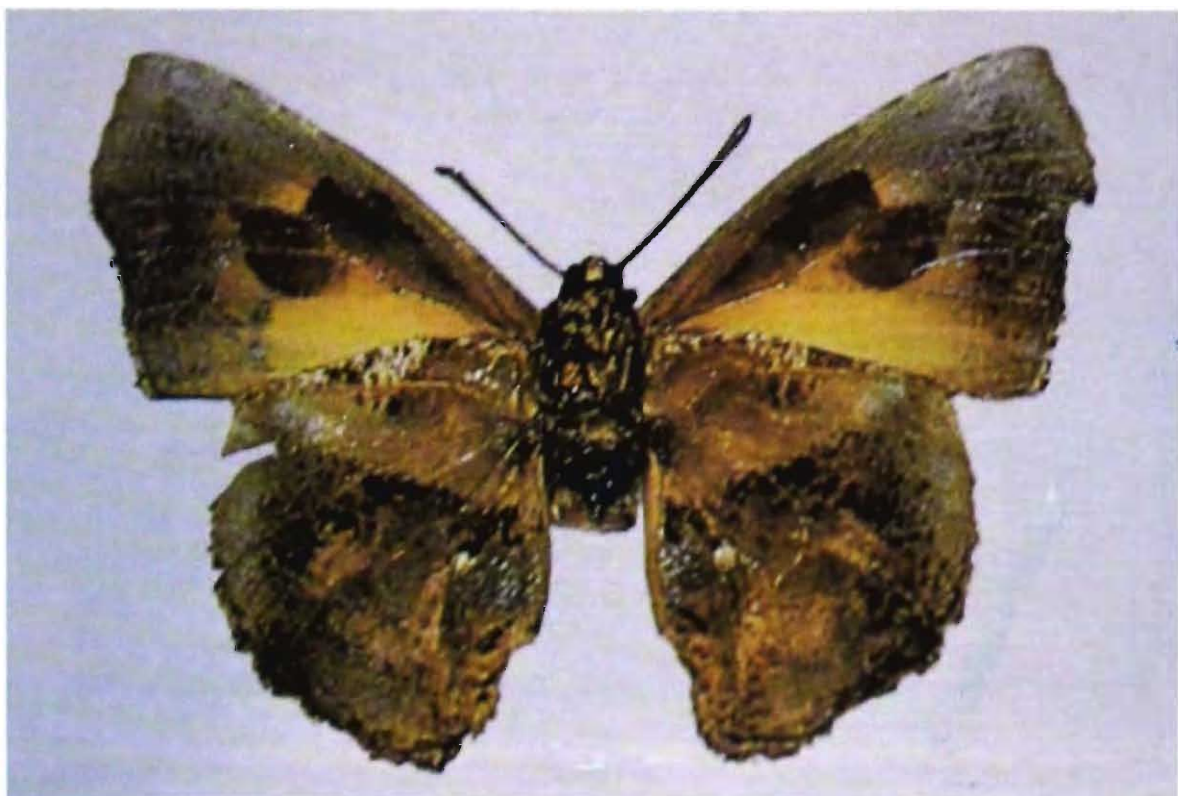
*Distribution* : India : Assam; Sikkim. *Elsewhere* : Myanmar; Thailand.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : It is known to be the largest butterfly among all the lycaenids. This hilly butterfly, perhaps one of the ugliest of the kinds, is the most remarkable carnivorous member of the family. It flies slowly with a distinct humming sound and uncertain circling flight, hesitating for a long time before alighting. The larva is known to feed on leaves of a small tree *Sarcocephalus cordatus* in Myanmar. The curious larva is known to associate constantly with a green tree-ant species, *Ocecophylla smaragdina* which is preyed upon by the former. The pharate butterfly is covered with innumerable loosely attached scales that serve as protection against the said ant-brood. Entirely crepuscular in habit, the butterfly exhibits slow and tardy flight which is quite unlike that of a day-flying butterflies (Bingham, 1907; Fruhstorfer, 1915; Wynter-Blyth, 1957). De Nicéville (1890) and Bingham



*Liphyra brassolis brassolis* Westwood, female, (Upperside) - After D'Abrera (1986)



*Liphyra brassolis brassolis* Westwood, male, (Underside) - After D'Abrera (1986)



*Liphyra brassolis* Westwood, female, (Upperside) - (Specimen in ZSI collection)



*Liphyra brassolis* Westwood, female, (Underside) - (Specimen in ZSI collection)

(1907) provided information on its variations, habits, and early life-stages. Still more information is needed on early stages of this butterfly found in India as also suggested by de Niceville (1890) “It is not unlikely that its life history when known will be as remarkable as is the structure and general appearance of the imago”

**Threats :** Threats include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

**Conservation measures taken :** The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in 4953.09 sq km area (Singh & Singh, 2002).

**Conservation measures proposed :** There should be restraint on human interference causing any further threat in its range of occurrence. Further information on biology of the species from the eastern part of its area of occurrence is needed.

**Rationale :** Qualifies for a few records of distribution in India. There has been considerable shrinkage and degradation in its area of occurrence. There are three examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** D’Abrera (1986) has been followed for the nominate subspecies, *Liphyra brassolis brassolis* Westwood occurring in India. Earlier, Fruhstorfer (1915) also treated other subspecies found outside India.

*Compiled by :* I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**102. *Narathura ace arata* (Tytler, 1914)**

**THE TYTLER'S DULL OAKBLUE**

*Arhopala arata* Tytler, 1915

*Amblypodia ace arata* (Tytler) : Evans, 1932

*Narathura ace arata* (Tytler) : Evans, 1957

*Arhopala ace race arata* (Tytler) : D'Abbrera, 1986

*Diagnostic character* : MALE Ground colour shiny violet-blue. Fore wing apex narrowly bordered; *underside* dark brown, with markings much wider and prominently white-outlined, discal band sinuous and R<sub>2</sub> area without spot. Hind wing apex also narrowly bordered; veins prominently black; *underside* as for fore wing, but with a discal row of large spots and anal green scales diffused. FEMALE Unknown. *Wing Expanse* : 44 mm.

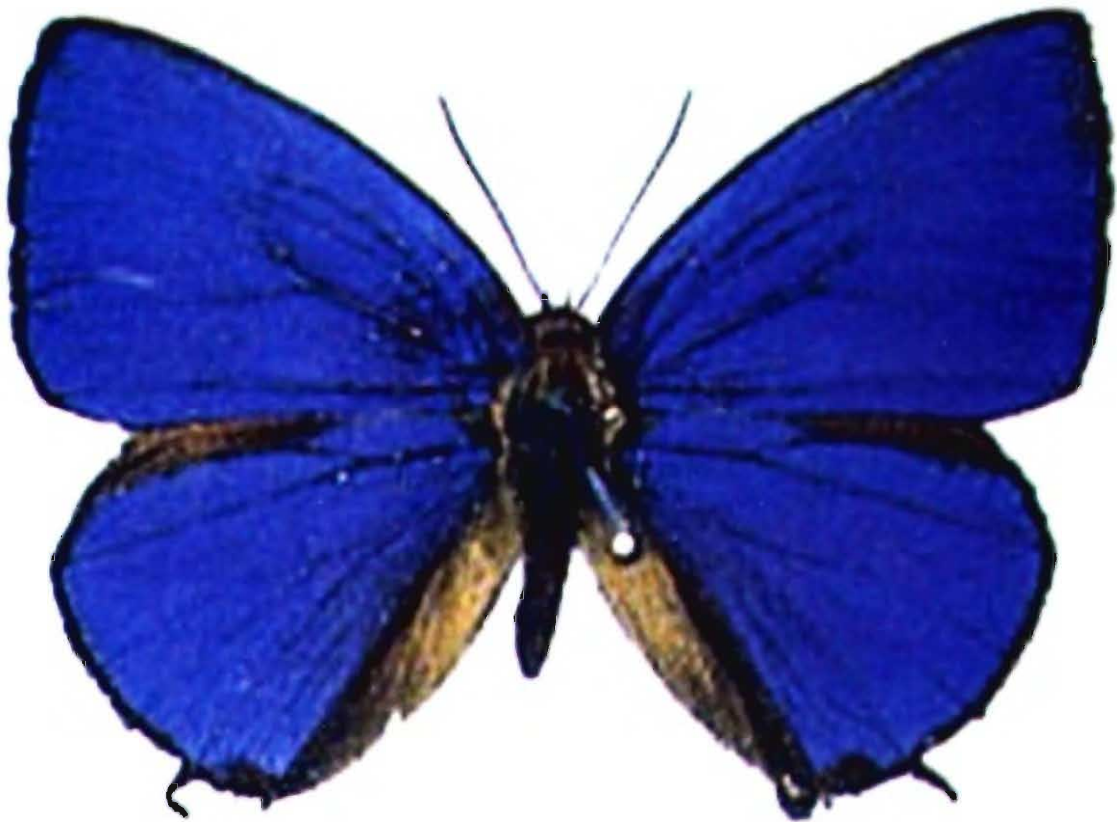
*Intraspecific variation* : Only this subspecies occurs in India and it is not known to exhibit significant variation.

*Distribution* : India : Manipur and Nagaland (Naga Hills). *Elsewhere* : North Myanmar.

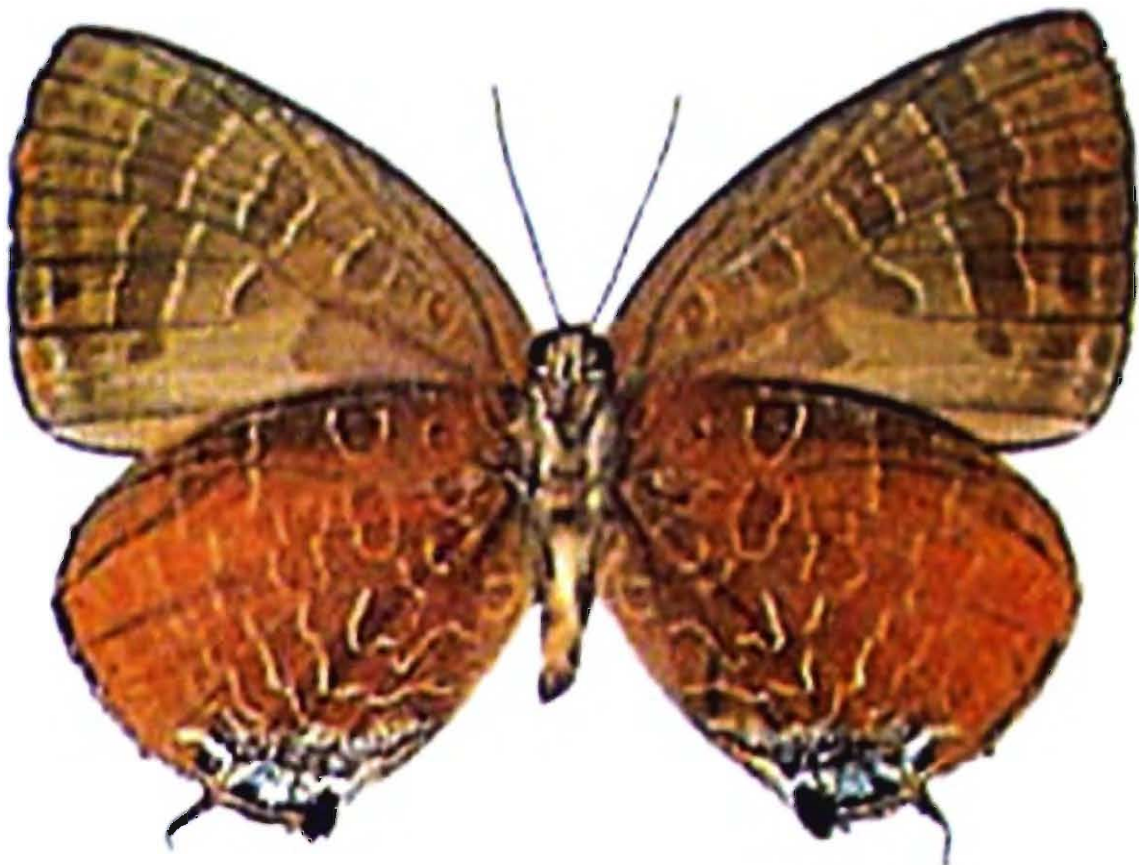
*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) obtained three males from Western and Eastern Manipur Hills during March and April. The habits and ecology of this butterfly are not much known.

*Threats to survival* : Threats in the area are - shifting cultivation, grazing; mining; cutting and felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.



*Arhopala ace ace*, (De Niceville) male (Upperside) - After Corbet & Pendlebury (1992)  
(Photograph of *Narathura ace arata* (Tytler) is not given)



*Arhopala ace ace*, (De Niceville) male (Underside) - After Corbet & Pendlebury (1992)  
(Photograph of *Narathura ace arata* (Tytler) is not given)

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of 655.71 sq km. (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. Its area of occurrence has shrunk and degraded. There are four examples in British Museum Natural History, London.

*Taxonomic Reliability* : Evans (1957) has been relied upon for the validity of the subspecies, *Narathura ace arata* (Tytler). Bridges (1988) and Corbet & Pendlebury (1992) treated species *ace* de Niceville under the genus *Arhopala*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**103. *Narathura selta constanceae* (de Nicéville, 1894)**

### **THE ROSY OAKBLUE**

*Arhopala constanceae* de Niceville, 1894

*Arhopala constanceae* de Niceville : Swinhoe, 1910-1911

*Amblypodia alea constanceae* (de Niceville) : Evans, 1932

*Narathura selta constanceae* (de Niceville) : Evans, 1957

*Arhopala selta* race *constanceae* : (de Niceville) : D'Abrera, 1986

**Diagnostic characters** : MALE Ground colour bright lustrous dark blue. Fore wing *underside* dark purple brown; basal spots very small; discal band straight and narrow. Hind wing tailed; *underside* as for fore wing, but with faint anal green scales. FEMALE - As in male, but *underside* darker; fore wing with ring-shaped spots; hind wing postmedian band more curved. *Wing expanse* : ♂ ♀ 34-40 mm.

**Intraspecific variation** : This subspecies is not known to exhibit much variations.

**Distribution** : India : Andaman & Nicobar Islands (Andamans).

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : This is a jungle-dwelling butterfly showing rapid flight.

**Threats** : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover has reduced to 21% from 96%. Middle Andaman left it with only 29% forest cover and South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused the habitat destruction and alteration.

**Conservation measures taken** : The subspecies is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries have been established in an area of 1510.09 sq km in Andaman Islands.



*Narathura selta* race *constanceae* (De Niceville), (Upperside) - (Specimen in ZSI collection)



*Narathura selta* race *constanceae* (De Niceville), (Underside) - (Specimen in ZSI collection)

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is restricted to Anadaman Islands. There has been significant reduction and degradation in the the area of its occurrence. There is only one example (Andamans) in the the National Zoological Collection of Zoological Survey of India, Kolkata and seven examples from South Andamans in British Museum Natural History, London.

*Taxonomic Reliability* : Evans (1957) is relied up on for the validity of subspecies *Narathura selta constanceae* (de Niceville). Bridges (1988) treated it under the genus *Arhopala*.

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**104. *Narathura arvina ardea* (Evans, 1932)  
THE PURPLE BROWN TAILLESS OAKBLUE**

*Amblypodia arvina ardea* Evans, 1932

*Narathura arvina ardea* (Evans) : Evans, 1957

*Narathura arvina ardea* (Evans) : D'Abbrera, 1986

*Diagnostic characters* : MALE - Ground colour rich shiny dark purple blue. Both wings without border. FEMALE - Ground colour purple blue. Fore wing with much broad borders; *underside* discal band more evenly curved. Hind wing purple blue confined to cell. *Wing expanse* : ♂ ♀ 40 mm.

*Intraspecific variation* : This is the only known Indian subspecies showing little variation.

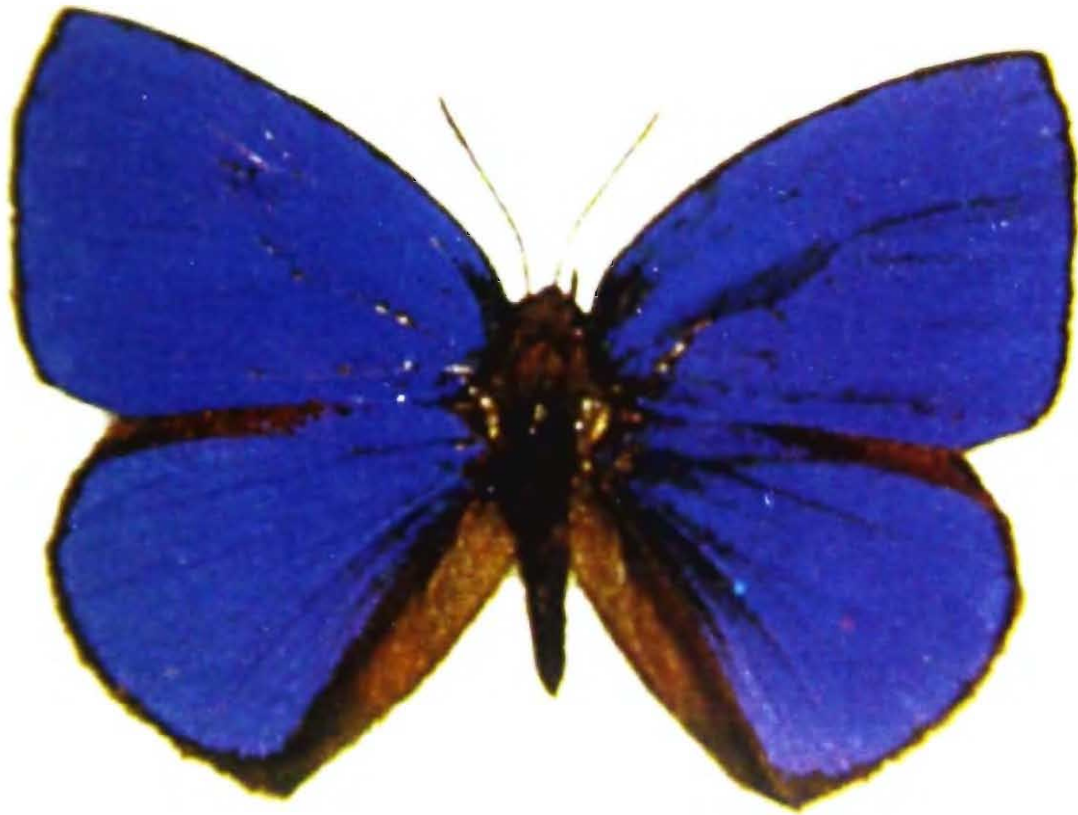
*Distribution* : India : Assam. *Elsewhere* : Hainan.

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : The habit and ecology of this butterfly are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; use of insecticides and pesticides; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 2851.75 sq km (Singh & Singh, 2002).



*Narathura arvina ardea* (Evans), male (Upperside) - After D'Abrera (1986)



*Narathura arvina ardea* (Evans), female (Upperside) - After D'Abrera (1986)

*Conservation measures proposed* : There should be check on activities causing any further threat in its area of occurrence. Effort should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : This subspecies is restricted to Assam, in India. There has been considerable reduction and deterioration in area of its occurrence. There is only one example (Assam) in the National Zoological Collection of Zoological Survey of India, Kolkata and 10 examples in the British Museum Natural History, London..

*Taxonomic Reliability* : Evans (1957) has been followed for the validity of the subspecies, *Narathura arvina ardea* (Evans). Bridges (1988) considered it under the genus *Arhopala*.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**105. *Narathura asinarus tounguva* (Grose-Smith, 1887)**

**THE PLAIN TAILLESS OAKBLUE**

*Amblypodia tounguva* Grose-Smith, 1887

*Arhopala tounguva* (Grose-Smith) : de Niceville, 1890

*Amblypodia asopia asopia* Hewitson : Evans, 1932

*Narathura asinarus tounguva* (Grose-Smith) : Evans, 1957

*Narathura asinarus toungva* (sic) (Grose-Smith) : D'Abrera, 1986

*Diagnostic characters* : MALE - Ground colour dark violet-blue. Fore wing marginal band blackish brown, broader at apex and narrower at dorsum. *Underside* dark brown. Hind wing as for the fore wing. FEMALE - Blue border as in male. *Wing expanse* : ♂ ♀ 42-46 mm.

*Intraspecific variation* : Only this subspecies occurs in India. In female, the purple colouration on upperside of fore wing does not extend into the upper discoidal interspace, while in the male it extends one-tenth of an inch along that space.

*Distribution* : India : Andaman and Nicobar Islands (Andamans). *Elsewhere* : Myanmar.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover has reduced to 21% from 96%. Middle Andaman left it with only 29% forest cover and South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments.



*Narathura asinarus tounguva* (Grose-Smith), male, (Upperside) - (Specimen in ZSI collection)



*Narathura asinarus tounguva* (Grose-Smith), male, (Underside) - (Specimen in ZSI collection)



*Narathura asinarus tounguva* (Grose-Smith), female, (Upperside) After D'Abrera (1986)

National Parks and Wildlife Sanctuaries have created in an area of 1510.09 sq km in Andaman Islands.

*Conservation measures proposed* ∴ There should be restraint on human interference causing any more threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This subspecies is restricted to Andaman Islands, in India. There has been considerable decrease and deterioration in its area of occurrence. There are 10 examples in the National Zoological Collection of Zoological Survey of India, Kolkata and 34 examples (only one male from Andamans) in British Museum Natural History, London.

*Taxonomic Reliability* : The validity of the subspecies, *Narathura asinarus tounguva* (Grose-Smith) is after Evans (1957). Bridges (1988) treated it under the genus *Arhopala*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**106. *Narathura comica* (de Nicéville, 1900)**

**THE COMIC OAKBLUE**

*Arhopala comica* de Niceville, 1900

*Amblypodia comica* (de Niceville) : Evans, 1932; Seitz, 1926; Wynter-Blyth, 1957

*Narathura comica* (de Niceville) : Evans, 1957

*Arhopala comica* de Niceville : D'Abbrera, 1986

*Narathura comica* (de Niceville) : Varshney, 1997

**Diagnostic characters** : MALE Ground colour shiny purple. Fore wing apex widely bordered; end-cell spot present; *underside* with two costal spots and discal band very irregular and broken. Hind wing purple only at base; *underside* markings rather obscure and discal band completely broken at  $Cu_{1b}$ . FEMALE - As for male. *Wing expanse* ♂ ♀ : 42 mm.

**Intraspecific variation** : The species is not known to display significant variation.

**Distribution** : India : Manipur. *Elsewhere* : Myanmar; Thailand.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : Tytler (1914) collected two females of this species from Sebong in Manipur in the month of March. The habits and ecology are not much known.

**Threats** : Threats in the area include shifting cultivation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken** : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Park and Wildlife Sanctuaries have created in an area of 433.35 sq km (Singh & Singh, 2002).



*Narathura comica* (De Niceville), male (Upperside) - After D'Abbrera (1986)



*Narathura comica* (De Niceville), (Underside) - After D'Abbrera (1986)

*Conservation measures proposed* : Any such activity should not be permitted so as to pose further threat in its area of occurrence. Attempts should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for its restricted distribution in India. There has been significant shrinkage and degradation in its area of occurrence. This species is represented by one example in the National Zoological Collection of Zoological Survey of India, Kolkata and six examples ( two examples from Manipur) in British Museum Natural History, London.

*Taxonomic Reliability* : Evans (1957) is relied upon for the validity of the species *Narathura comica* (de Niceville). Bridges (1988) considered it under the genus *Arhopala*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**107. *Narathura opalina opalina* (Moore, 1883)**

### **THE OPAL OAKBLUE**

*Nilasera opalina* Moore, 1883

*Arhopala opalina* (Moore) : De Niceville, 1890

*Amblypodia opalina* (Moore) : Evans, 1932; Wynter-Blyth, 1957

*Narathura opalina opalina* (Moore) : Evans, 1957

*Narathura opalina* (Moore) : Varshney, 1997

**Diagnostic characters** : MALE - Ground colour pale purplish lilacine blue. Fore wing without irrorated white discal patch; *underside* spots irregular, less prominent and distally unbordered. Hind wing as for fore wing, but with cell bearing a whitish spot. FEMALE - Like male. *Wing expanse* : ♂ ♀ 38-48 mm.

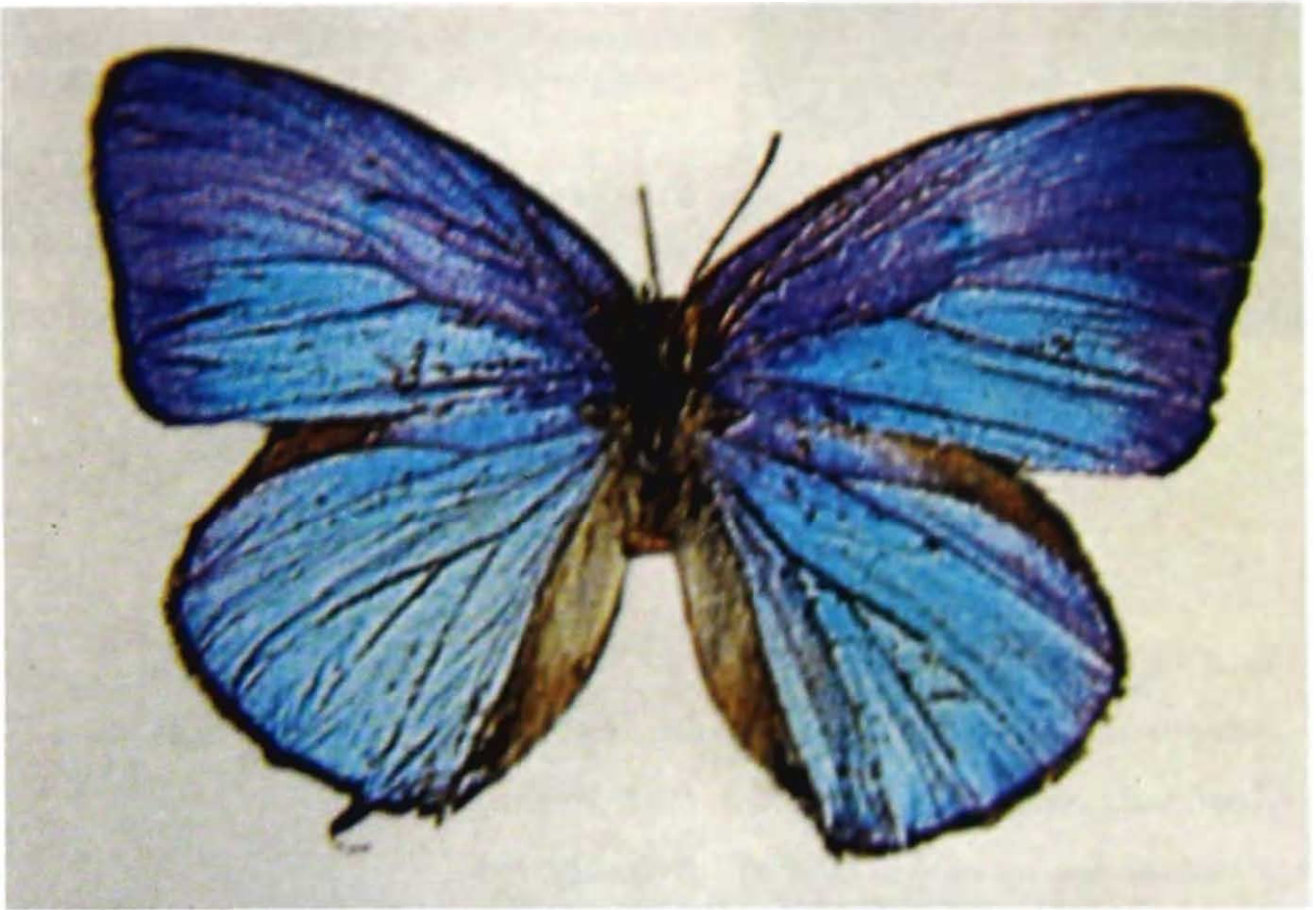
**Intraspecific variation** : The species is not known to exhibit significant variation.

**Distribution** : India : Meghalaya (Khasi Hills). *Elsewhere* : Myanmar; Thailand.

**Status** : Endangered (EN A1c, B1 2bc).

**Habitat and ecology** : This species was described by Moore (1883) on the basis of a single male collected from Khasia Hills in Meghalaya. The habits and ecology of the butterfly are not much known.

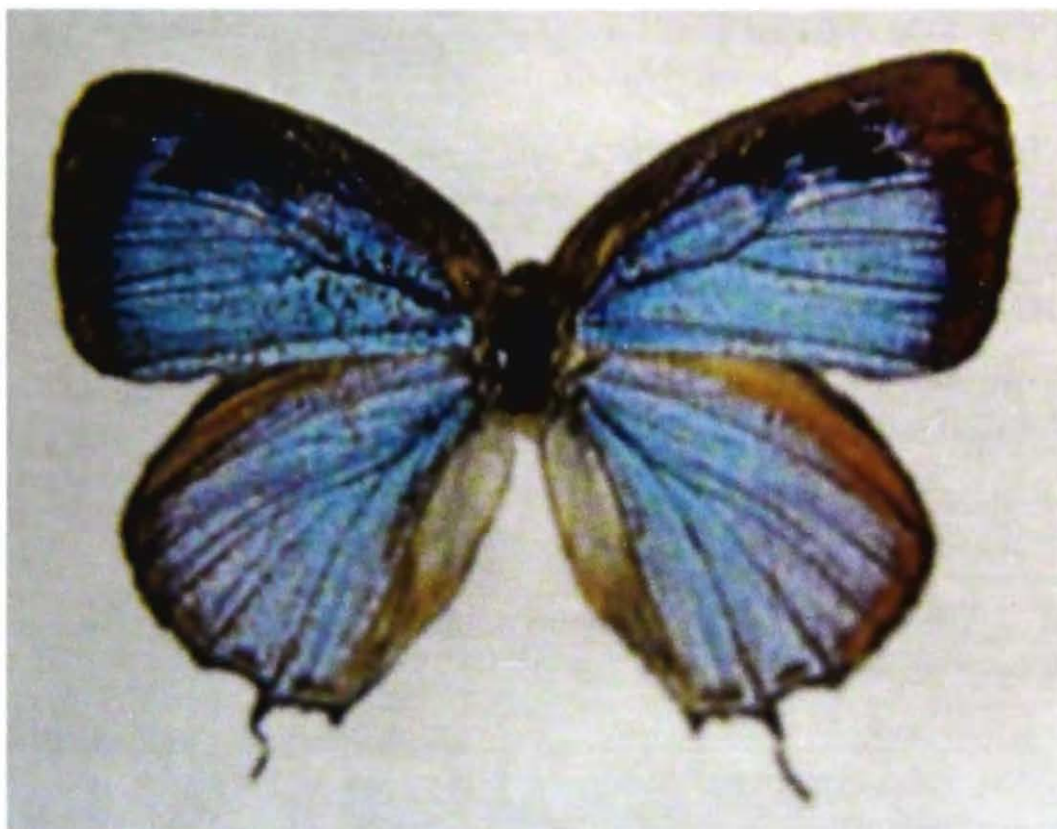
**Threats** : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; hybridization; land, water and atmospheric pollution by using insecticides and pesticides.



*Narathura opalina opalina* (Moore), male (Upperside) - After D'Abrera (1986)



*Narathura opalina opalina* (Moore), male (Underside) - After D'Abrera (1986)



*Narathura opalina opalina*, female (Upperside) - After D'Abrera (1986)

*Conservation measures taken* : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have created in an area of 3586.78 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its area of occurrence. Attempts should be made for more information on its habits, ecology, life-history and distribution.

*Rationale* : Qualifies for its short range of distribution where its area of occurrence has decreased and degraded. There are five examples (one example from "Assam" should be read "Meghalaya" as only one male from Khasi hills was available at the time of its original description) of this species) in the British Museum Natural History, London.

*Taxonomic Reliability* : The validity of the nominate subspecies *Narathura opalina opalina* (Moore) is after Evans (1957). Bridges (1988) treated it under the genus *Arhopala*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**108. *Narathura zeta* (Moore, 1877)  
THE ANDAMAN TAILLESS OAKBLUE**

*Amblypodia zeta* (Moore, 1877; Evans, 1932; Wynter-Blyth, 1957)

*Satadra zeta* (Moore) : Moore, 1884

*Arhopala zeta* (Moore) : De Niceville, 1890; D'Abrera, 1985

*Narathura zeta* (Moore) : Evans, 1957; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour silvery shining purple. Fore wing cell-spot small, oval; discal band broad and dentate; *underside* grey brown. Hind wing cell-spot larger; discal band less dentate. FEMALE - Much lighter blue. *Wing expanse* : ♂ ♀ 30-36 mm.

*Intraspecific variation* : The species is not known to display significant variation.

*Distribution* : India : Andaman and Nicobar Islands (Andamans). *Elsewhere* : Borneo.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this species are not known.

*Threats* : The area of its occurrence is fragile and ecologically sensitive. In North Andaman rainforest cover has reduced to 21% from 96%, Middle Andaman left it with only 29% and South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

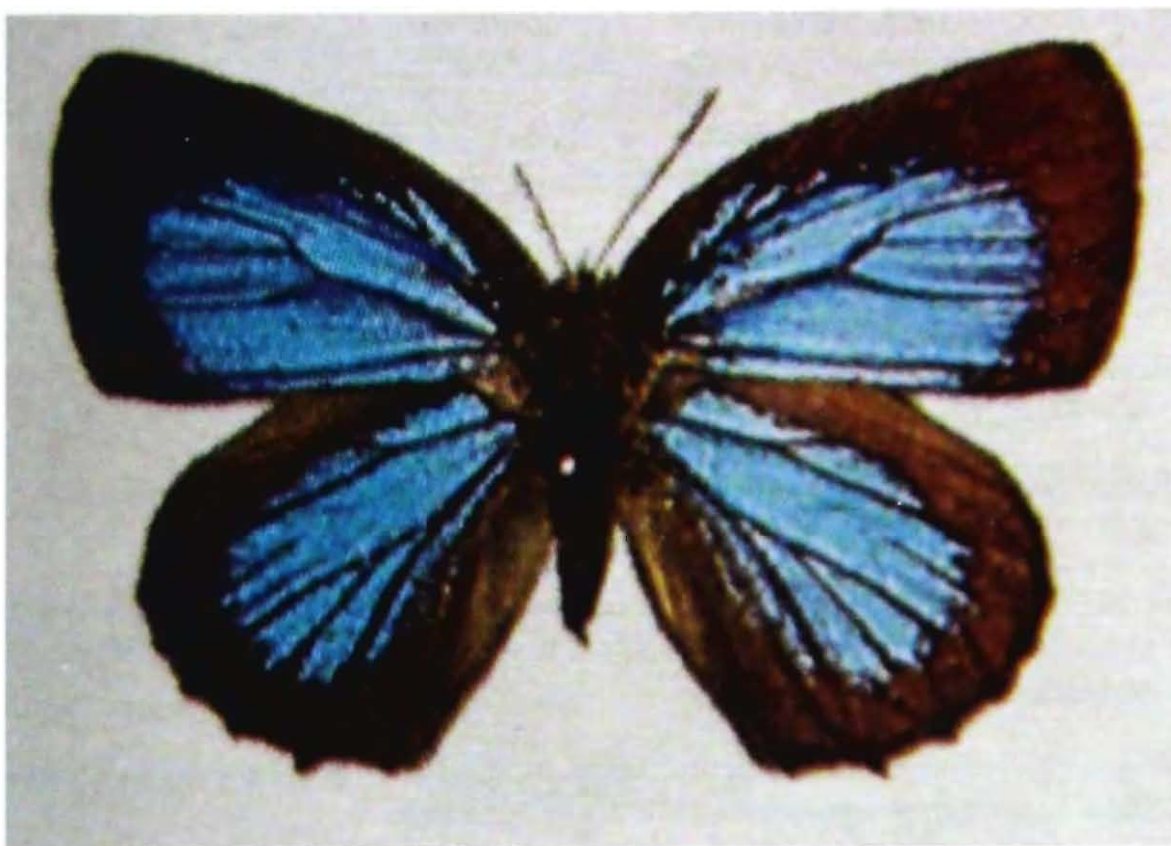
*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have created in an area of 1510.09 sq km in Andaman Islands (Singh & Singh, 2002).



*Narathura zeta* (Moore), male, (Upperside) - (Specimen in ZSI collection)



*Narathura zeta* (Moore), male, (Underside) - (Specimen in ZSI collection)



*Narathura zeta* (Moore), female, (Upperside) - After D'Abbrera (1986)

*Conservation measures proposed* : The area of occurrence of this species requires careful monitoring for any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : This species is restricted to Andaman islands only, in India. There has been reduction and degradation in the area of its occurrence. There are four examples in the National Zoological Collection of Zoological Survey of India, Kolkata and 16 examples (12 examples from Andamans) in the British Museum Natural History, London.

*Taxonomic Reliability* : Evans (1957) has been followed for the validity of the species *Narathura zeta* (Moore). Bridges (1988) treated this species under the genus *Arhopala*.

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**109. *Notarthurinus binghami* Chapman, 1908**

**THE CHAPMAN'S HEDGE BLUE**

*Notarthurinus binghami* Chapman, 1908

*Notarthurinus binghami* Chapman, 1909

*Lycaenopsis dilecta* (Moore) : sensu Swinhoe, 1910

*Lycaenopsis binghami* (Chapman) : Evans, 1932

*Celastrina binghami* (Chapman) : Cantlie, 1962; Varshney, 1997

*Notarthurinus binghami* Chapman : Eliot & Kawazoe, 1983; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour violet blue. Wings marked with fuscous borders. Hind wing border broken down into diffused, conjoined marginal spots surmounted by submarginal lunules. *Underside* very pale brown except a stria always present in area of fore wing. FEMALE - Dark. *Wing expanse* : 30 mm.

*Intraspecific variation* : The species is not known to exhibit significant variation.

*Distribution* : India : Meghalaya (Shillong); Manipur. *Elsewhere* : Myanmar.

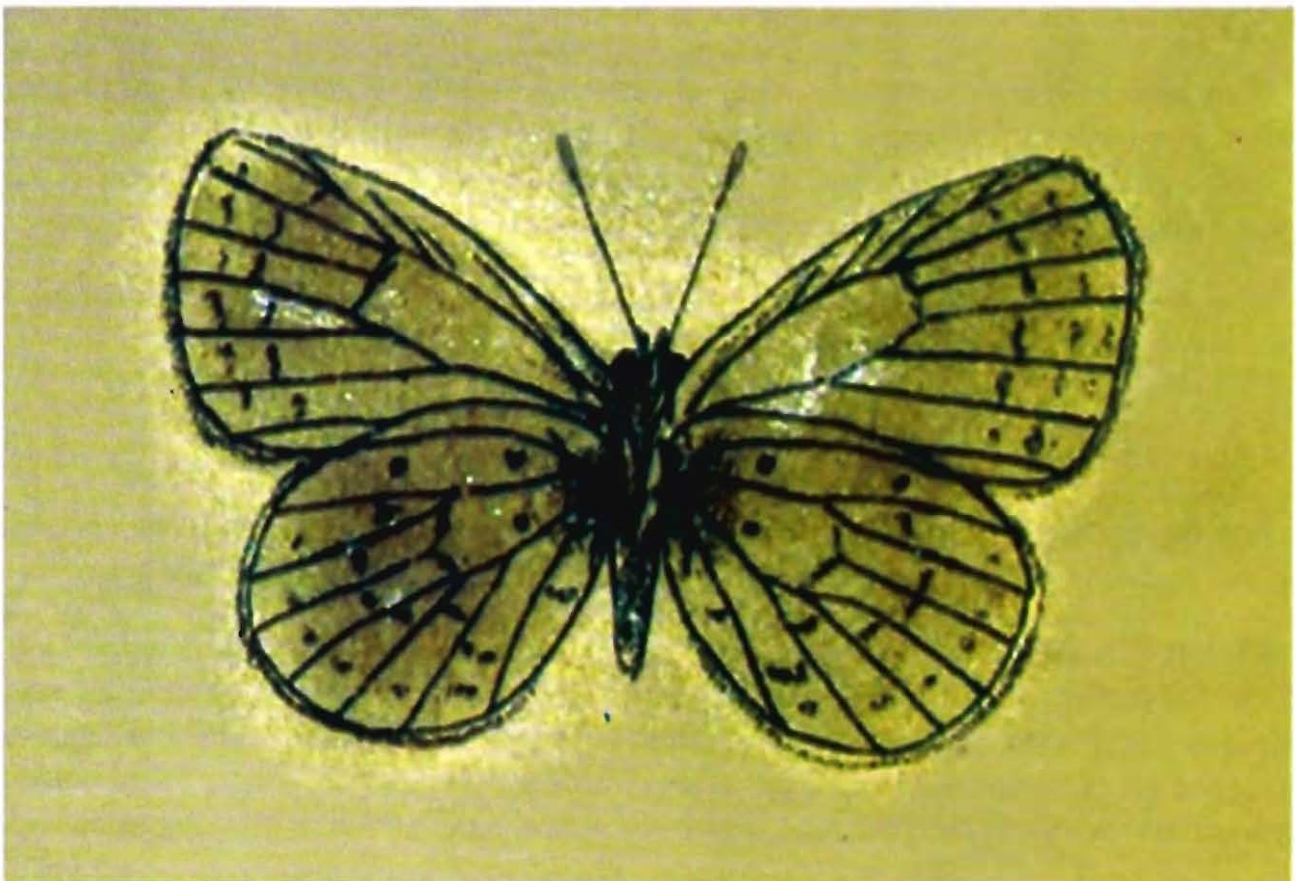
*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Tytler (1914) collected two males (one from Sebong) from Manipur in April and July. The habits and ecology of this butterfly are not much known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides



*Notarthrinus binghami* (Chapman), male, (Upperside) - After Swinhoe (1905-1910)



*Notarthrinus binghami* (Chapman), male, (Underside) - After Swinhoe (1905-1910)

and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been established in an area of 3285.10 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for a few known records of its distribution in India. There has been marked shrinkage and degradation of its area of occurrence. There are two examples in the Collection of British Museum Natural History, London.

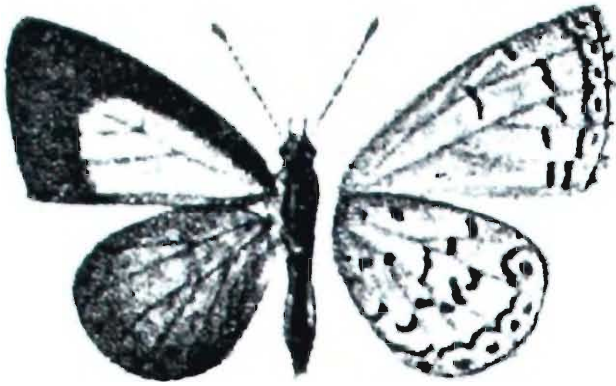
*Taxonomic Reliability* : The validity of the species, *Notarthrinus binghami* Chapman is after Eliot and Kawazoe (1983).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**110. *Oreolyce dohertyi dohertyi* (Tytler, 1915)  
THE NAGA HEDGE BLUE**

*Cyaniris dohertyi* Tytler, 1915

*Lycaenopsis dohertyi* (Tytler) : Fruhstorfer, 1922

*Oreolyce dohertyi* (Tytler) : Toxopeus, 1927

*Lycaenopsis quadriplaga dohertyi* (Tytler) : Evans, 1932

*Celastrina dohertyi dohertyi* (Tytler) : Cantlie, 1962

*Oreolyce (Oreolyce) dohertyi* (Tytler) : Eliot & Kawazoe, 1983; Bridges, 1988; Varshney, 1997

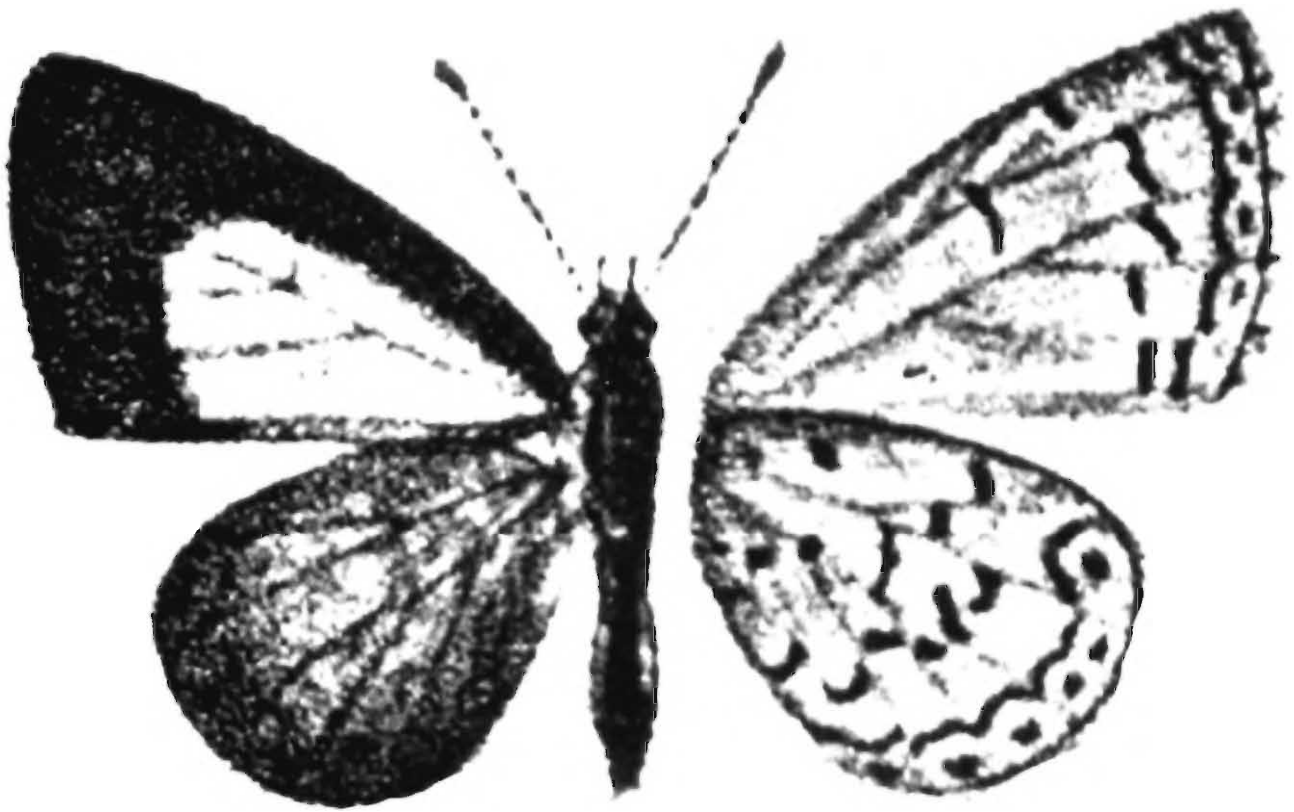
**Diagnostic characters** : MALE Fore wing base dull blue; costa and termen broadly dark brown; disc white. Hind wing dark brown; base leaden blue; discal patch narrow white; *underside* with a spot at base of IA and another oblique elongate one at M<sub>1</sub>. FEMALE Unknown. *Wing expanse* : 32 mm.

**Intraspecific variation** : In dry- season form, border narrow in fore wing and a white discal patch present; hind wing below vein M<sub>2</sub>, dusted with bluish scales, most thickly in basal half; a series of submarginal lunules and marginal spots present.

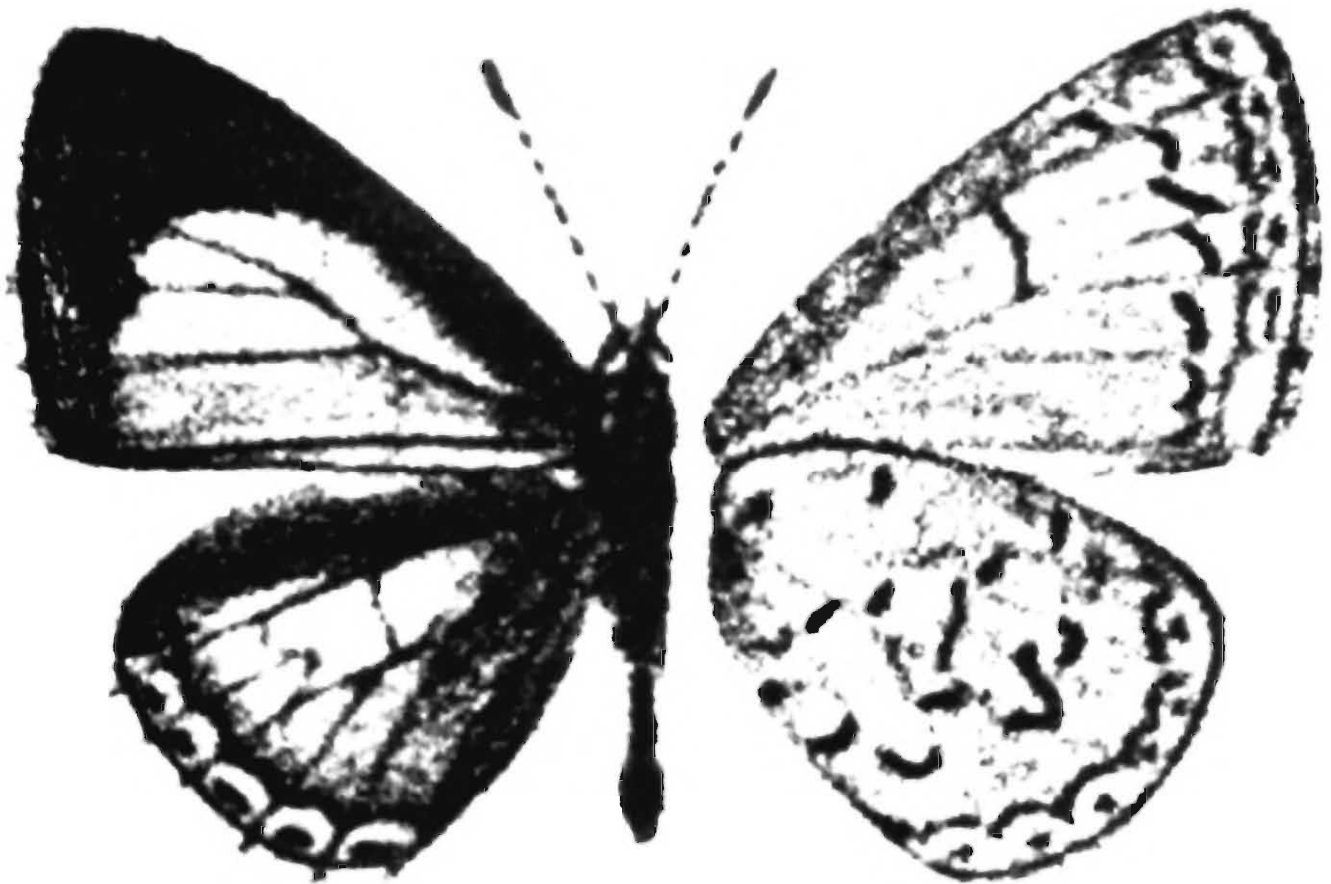
**Distribution** : India : Nagaland.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : This hilly butterfly is bivoltine in habit : the wet-season form is encountered between July-October and the dry-season form from end of October. Tytler (1914) mentioned collection of three wet season males from Kirbari (1820m.) (2230m. Eliot & Kawazoe, 1983 ) in July, September and early October and also a single male of dry-season form from the same place at the end of October. The other habits and ecology are not known.



*Oreolyce dohertyi dohertyi* (Tytler), male, wet season (Upperside & Underside)



*Oreolyce dohertyi dohertyi* (Tytler), male, dry season (Upperside & Underside)

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The butterfly is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Park and Wildlife Sanctuaries have been established in an area of 222.36 sq km (Singh & Singh, 2002).

**Conservation measures proposed :** There should be restraint on human interference causing any threat in its range of occurrence. More information on the biology and ecology of this butterfly are required for further conservation measures.

**Rationale :** This species described from four male specimens collected from Kirbari in Naga Hills is endemic to Nagaland. Female is still unknown. There has been significant loss and deterioration in its area of occurrence. All these four examples are in the British Natural History Museum, London.

**Taxonomic reliability :** The valid name of the species is *Oreolyce dohertyi* (Tytler) after Eliot and Kawazoe (1983).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**111. *Pamela dudgeoni* (de Nicéville, 1894)**

**THE LISTER'S HAIRSTREAK**

*Listeria dudgeoni* de Niceville, 1894

*Listeria dudgeonii* (sic) de Niceville : Seitz, 1926; Evans, 1932

*Listeria dudgeoni* de Niceville : Evans, 1932

*Pamela dudgeoni* (de Niceville) : Cantlie, 1962; Varshney, 1997

*Pamela dudgeoni* (de Niceville) : Bridges, 1988

*Diagnostic characters* : MALE - Ground colour bright blue. Fore wing apex broad black; *underside* smoky brown, outer fourth with a wide but obscure fascia and with a pale end-cell spot. Hind wing *underside* with basal third black, remaining part reddish brown; markings very obscure. FEMALE - As for male, but dull coloured. *Wing expanse* : ♂ ♀ 26-28 mm.

*Intraspecific variation* : The upperside of male is bright blue but duller in female.

*Distribution* : India : Sikkim, Uttaranchal (Mussoorie, Kumaon) *Elsewhere* : Bhutan.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Wynter-Blyth (1957) mentioned its record from Siuni (Kumaon) at ca 1675m. in April. The habits and ecology of this butterfly are largely not known.

*Threats* : Threats in the area are expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements; urbanisation; construction of dams and highways; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2000); land, water and atmospheric pollution by of using insecticides pesticides.



*Pamela dudgeoni* (de Nicéville), male, (Upperside) - After Swinhoe (1910-1911)



*Pamela dudgeoni* (de Nicéville), female, (Underside) - After Swinhoe (1910-1911)

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a protected area of 8567.88 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any further threat in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly for further conservation measures.

*Rationale* : Qualifies for only a few records in its area of occurrence. There has been a considerable reduction and deterioration in the area of its occurrence. There is only one example represented in the collection of Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : Cantlie (1962) has been followed for the validity of the species, *Pamela dudgeoni* (de Niceville).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**112. *Panchala ariel* (Doherty, 1891)  
THE MALAYAN BUSH BLUE**

*Acesina zephyretta ariel* Doherty, 1891

*Acesina ariel* Doherty : Elwes, 1892

*Amblypodia ariel* Doherty, 1891; Seitz, 1926

*Arhopala ariel* (Doherty) : Bethune-Baker, 1903; Tytler, 1915; D'Abrera, 1986

*Amblypodia ammon ariel* (Doherty) : Evans, 1932

*Amblypodia ammon* (Hewitson) : Wynter-Blyth, 1957

*Panchala ariel* (Doherty) : Evans, 1957; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour lustrous dark blue. Both wings with margin prominent black; *underside* grey-blue, with white markings enclosing cinnamon-brown bands and spots. FEMALE - As in male. *Wing expanse* : ♂ ♀ 29-31 mm.

*Intraspecific variation* : The species is not known to exhibit significant variation.

*Distribution* : India : Assam; Manipur; Nagaland. *Elsewhere* : Borneo, Malaya

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) collected several examples from Sebong in Manipur. The habits and ecology of this butterfly are largely not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using



*Panchala ariel* (Doherty), (Upperside) - (Specimen in ZSI collection)



*Panchala ariel* (Doherty), (Underside) - (Specimen in ZSI collection)

insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a protected area of 3507.46 sq km of

*Conservation measures proposed* : Further studies on biology of this species are required for conservation measures. There should be restraint on human interference causing any more threat in its range of occurrence.

*Rationale* : This species is known, in India, from a few localities of north eastern area. There has been significant decrease and deterioration in the area of its occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata and six examples (two examples from Assam) in the Collection of the British Museum Natural History, London.

*Taxonomic Reliability* : Evans (1957) has been followed for the validity of the species *Panchala ariel* (Doherty).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**113. *Pratapa icetas mishmia* Evans, 1925**

**THE DARK BLUE ROYAL**

*Pratapa icetas mishmia* Evans, 1925

*Pratapa icetas mishmia* Evans : Evans, 1932; Cantlie; 1962

*Diagnostic characters* : MALE Ground colour pale blue tinged extensively greenish. Both wings with greenish entirely filling cell and extending to base of  $Cu_{1a}$ -area; border not angled at middle of area 1A + 2A nor continued along inner margin. FEMALE - Unknown. *Wing expanse* : 30-37 mm.

*Intraspecific variation* : The following other two subspecies occur in India :

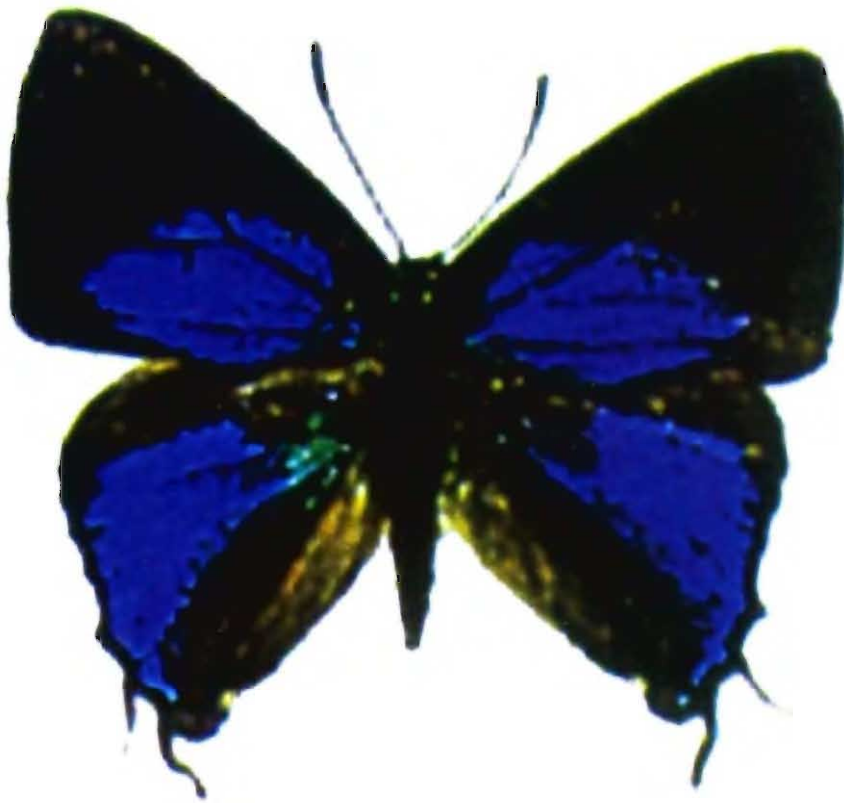
- i. *Pratapa icetas icetas* (Hewitson) : India : Himachal Pradesh (Kangra)-Uttaranchal (Kumaon). Nepal.
- ii. *Pratapa icetas extensa* Evans : India : Sikkim. Mynamar (Dawnas).

The subspecies, *mishmia* differs from the above two subspecies by the upperside of male being blue paler with greenish tinge, much more extensive, entirely filling cell, extending to base of  $Cu_{1a}$ -area; border not angled at middle of area 1A + 2A nor continued along inner margin.

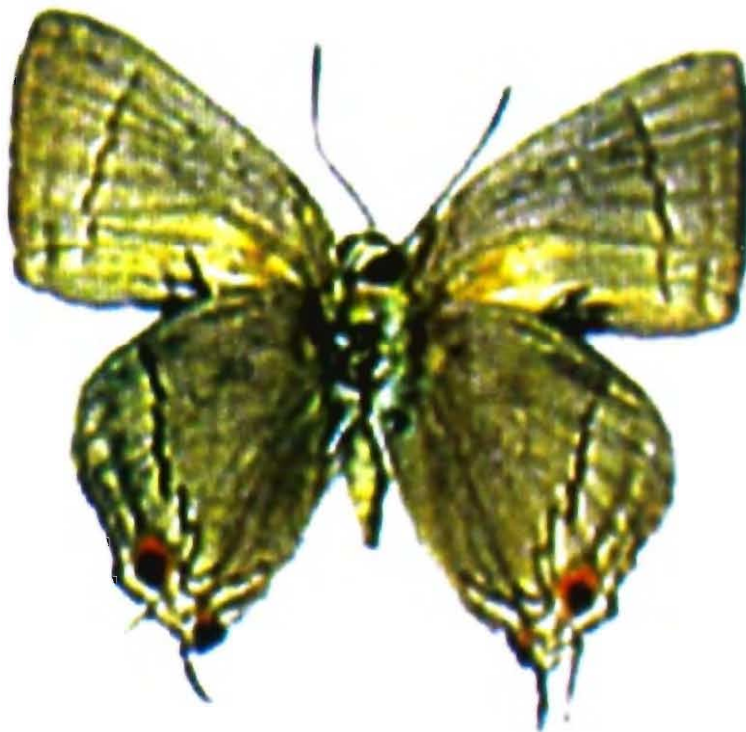
*Distribution* : India : Arunachal Pradesh (Mishmi Hills).

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using; insecticides and pesticides.

*Status* : Critically Endangered (CR A1c, B1 2bc).



?*Pratapa icetas extensa* Evans, male (Upperside) - After D'Abrera (1986)  
(Photograph of *P. icetas mishmia* Evans is not given)



?*Pratapa icetas extensa* Evans, male (Underside) - After D'Abrera (1986)



?*Pratapa icetas extensa* Evans, female (Upperside) After D'Abrera (1986)  
(Photograph of *P. icetas mishmia* Evans is not given)

*Habitat and ecology* : The Habits and ecology of this butterfly are not much known.

*Conservation measures taken* : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries cover protected an area of 9897.55 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be check on human activities posing any more threat in its range of occurrence. Efforts should be made to collect individuals of both sexes and also to obtain more information on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in Arunachal Pradesh in India. There has been significant shrinkage and degradation in its area of occurrence.

*Taxonomic Reliability* : The subspecies, *Pratapa icetas mishmia* Evans has been followed after Evans (1932).

Compiled by : I.J. Gupta and D.K. Mondal

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**NEAR THREATENED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**114. *Prosotas noreia hampsonii* (de Nicéville, 1885)**

**THE WHITE-TIPPED LINE BLUE**

*Nacaduba hampsonii* de Niceville, 1885

*Nacaduba hampsoni* de Niceville : Hampson, 1888

*Nacaduba hampsoni* de Niceville : de Niceville, 1890; Bingham, 1907

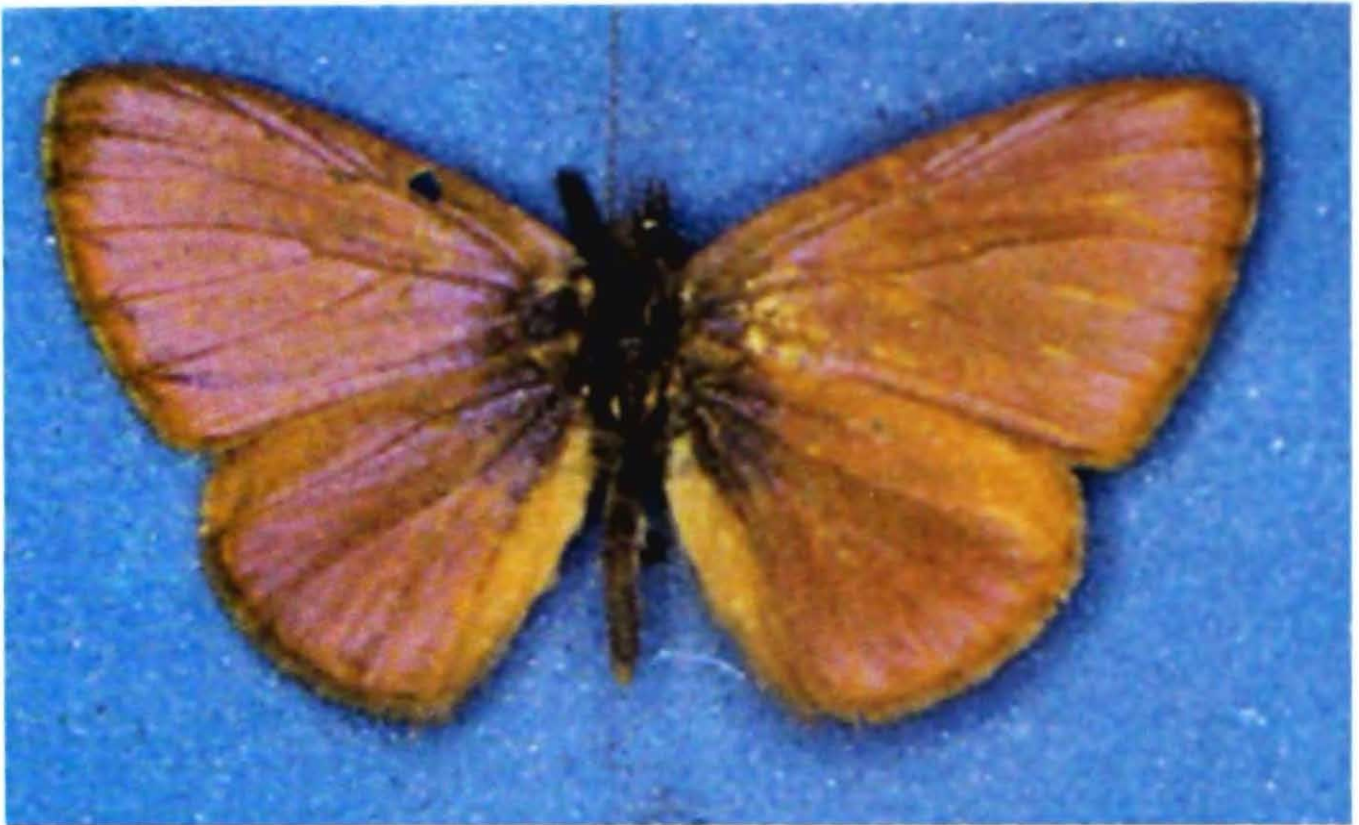
*Nacaduba noreia hampsoni* de Niceville : Evans, 1932; Cantlie, 1962

*Prosotas noreia hampsoni* (de Niceville) : Tite, 1963; Varshney, 1997

*Prosotas noreia hampsoni* de Niceville : Bridges, 1988

*Diagnostic characters* : MALE - Ground colour intense lustrous purple. Fore wing apex quite pointed, termen straight, with cilia markedly white at apex; *underside* basal band confined to cell. Both wings with broad black borders and *underside* prominently marked. FEMALE - Upperside blue (not purple) on discs of both wings; cilia blackish at endings of veins. *Wing expanse* : 26-29 mm. Bean (1985) provided following information on subspecies *hampsonii* :

In seven examples of *hampsoni* the prominent postdiscal spots on the fore wing below are joined almost to form a band, especially in the males. In both male and female the spots in spaces  $Cu_{1b}$  and  $1A + 2A$  are either not shifted inwards at all or not completely, so that the bandlike effect is produced. The upperside colour of the male is intense lustrous purple as stated in Evans & Cantlie (1962) but that does not apply to female. Of the seven examples three are females which are blue but definitely not purple, on the discs of both wings, as noted by Woodhouse & Henry (1942). In two perfect males, the cilia at the tips of the fore wings prominently white, but distinguish this with top lighting under low magnification. Upperside of each of three females there is some darkening of the cilia of both wings in line with the vein ends.



*Prosotas noreia hampsoni* (de Niceville), - After D'Abrera (1986)



*Prosotas noreia hampsoni* (de Niceville), - After D'Abrera (1986)

**Intraspecific variation** : This is the only known Indian subspecies and it displays colour variation being intense lustrous purple on upperside both wings in male and cilia white at apex but blue on discs of both wings and cilia blackish at endings of veins in female.

**Distribution** : India : Southern Peninsula (Nilgiri Hills Udagamandalam in Tamil Nadu); Madhya Pradesh; Uttaranchal (Dehra Dun, Mussoorie).

**Status** : Near Threatened (NT)

**Habitat and ecology** : De Niceville (1890) mentioned that a good number of specimens were collected by Mr. G. F. Hampson on the southern slopes of Nilgiri hills and also a single male was captured on 29<sup>th</sup> August, 1888 by Mr. P.W. Mackinson at Dehra Dun. It inhabits thickly wooded regions in the hills from low to moderate elevations (Satyamurti, 1966).

**Threats** : Threats are shifting cultivation; construction of dams, setting up of railway lines and deliberate forest fires. There has been a massive habitat loss for the past few decades. There are demands of increasing population pressure leading to clearing of forests for human settlements, construction of roads, dams and hydroelectric plants, setting up of industries; fragmentation of habitat; industrial pollutants causing land, water and atmospheric pollution.

**Conservation measures taken** : The subspecies is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries cover a considerable protected area.

**Conservation measures proposed** : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. Both ranching and farming up this butterfly should be undertaken.

**Rationale** : This subspecies is fairly distributed but still dependent on conservation measures observing the shrinkage and deterioration in its area of its occurrence. There are seven examples in the National Zoological Collection of Zoological Survey of India, Kolkata; one example in the Collection of Forest Research Institute, Dehra Dun and one example in Madras Museum Collection.

**Taxonomic Reliability** : The valid name of the subspecies, *Prorsotas noreia hampsoni* (de Niceville) is after Tite (1963).

Compiled by : I.J. Gupta and D.K. Mondal

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## CRITICALLY ENDANGERED

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

### 115. *Shijimia moorei* (Leech, 1889)

#### THE MOORE'S CUPID

*Lycaena moorei* Leech, 1889

*Everes moorei* (Leech) : Evans, 1932; Cantlie, 1962;

*Shijimia moorei* (Leech) : Bridges, 1988; Varshney, 1997

**Diagnostic characters** : MALE Ground colour dark brown. Both wings *underside* ground colour nearly white; markings irregular and of unequal size; hind wing without orange at anal angle and tailless. FEMALE - As for male. *Wing expanse* : ♂ ♀ 20-23 mm.

**Intraspecific variation** : This species is not known to show significant variation.

**Distribution** : India : Assam.

**Status** : Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology** : The habits and ecology of this butterfly are not much known.

**Threats** : Threats in area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, dams and hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken** : The species is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 2851.75 sq km (Singh & Singh, 2002).

**Conservation measures proposed** : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.



*Shijimia moorei* (Leech), (Upperside) - (Specimen in ZSI collection)



*Shijimia moorei* (Leech), (Underside) - (Specimen in ZSI collection)

**Rationale** : Qualifies for its restricted distribution in India. There has been a significant decrease and deterioration in the area of its occurrence. There are four examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability** : The species, *Everes moorei* (Leech) has been followed after Cantlie (1962) with generic change as treated by Bridges (1988).

Compiled by : I.J. Gupta and D.K. Mondal

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**NEAR THREATEND**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**116. *Sinthusa virgo* (Elwes, 1887)**

**THE PALE SPARK**

*Hypolycaena virgo* Elwes, 1887

*Hypolycaena* (? *Sinthusa*) *virgo* Elwes : 1888

*Sinthusa virgo* (Elwes) : de Niceville, 1890; Elwes, 1892; Bingham, 1907; Evans, 1932 : Cantlie 1962; D'Abbrera, 1986; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour greyish white. fore wing base suffused dark brown and border very broad; *underside* with an orange oval patch of modified scales along IA. Hind wing single-tailed; underside with a dark bar in mid-cell and another in R<sub>1</sub>-area; tornal spots prominent, obscure orange and metallic blue in cubital area. Both wings *underside* white with markings yellow-centred and black-edged, discal band catenulated and broken at M<sub>1</sub>. FEMALE - As for male, but paler and hind wing lobe ochreous. *Wing expanse* : ♂ ♀ 32-36 mm.

*Intraspecific variation* : The species has an aberrative form of female, *i.e.*, *f. confusa* Tytler, showing shiny light blue instead of greyish white colouration.

*Distribution* : India : Assam, Manipur, Nagaland, Sikkim, West Bengal (Darjiling : Ghum and Senchal, alt. *ca* 1980-2530m. in June). *Elsewhere* : Myanmar

*Status* : Near Threatened (NT).

*Habitat and ecology* : Elwes (1887) described the species on the basis of a single fresh female captured on 27th May, 1886 at Mihi in Sikkim. Subsequently, male was described which was collected by A.V. Knyvett from Observatory Hill at altitude of 2380m. in Darjiling, on 20<sup>th</sup> June, 1888. It was also recorded at altitude of 1980-2530m. around Ghum and Senchal (Darjiling) in June (Wynter-Blyth, 1957).

*Threats* : Threats in area are shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Sinthusa virgo* (Elwes), male (Upperside) - (Specimen in ZSI collection)



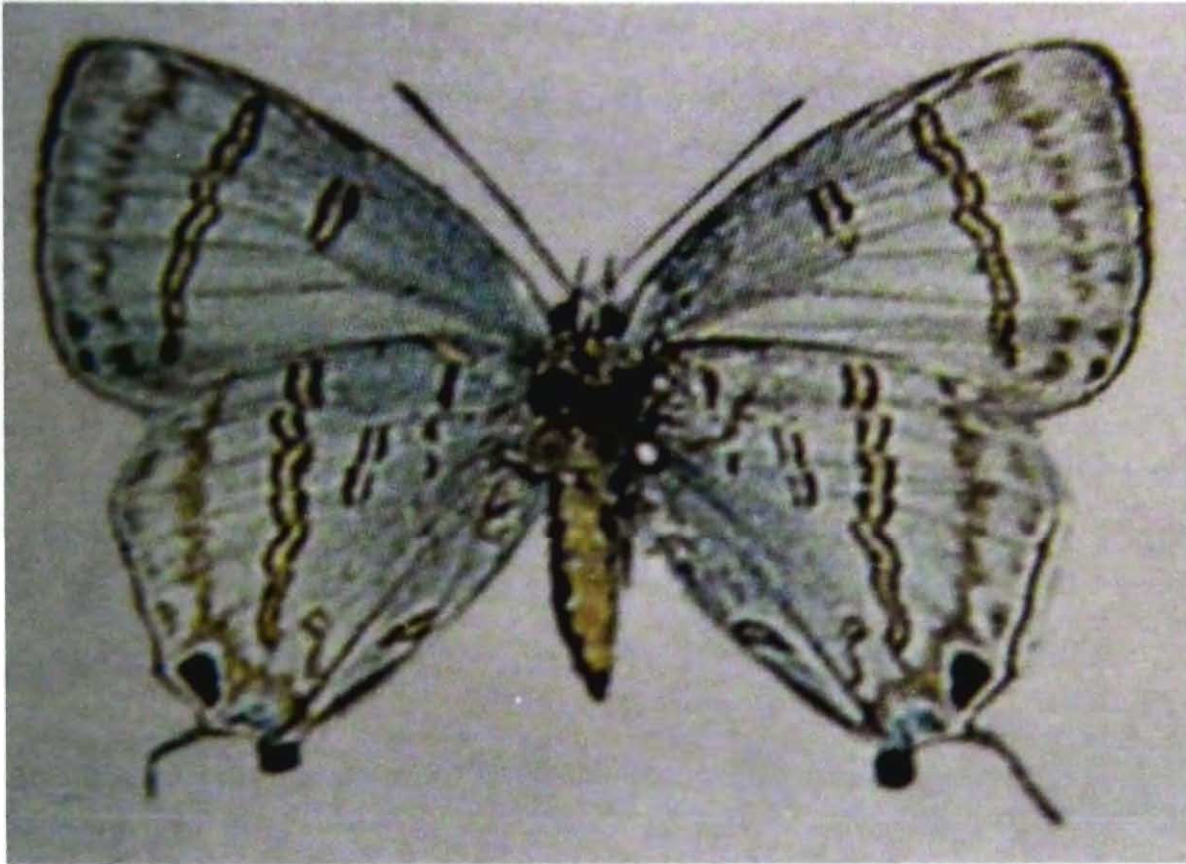
*Sinthusa virgo* (Elwes), male (Underside) - (Specimen in ZSI collection)



*Sinthusa virgo* (Elwes), female (Upperside) - (Specimen in ZSI collection)



*Sinthusa virgo* (Elwes), female (Underside) - (Specimen in ZSI collection)



*Sinthusa virgo* (Elwes) female (Upperside) After D'Abrcera

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

**Conservation measures taken :** The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a considerable protected area.

**Conservation measures proposed :** There should be check on activities posing any more threats in its range of occurrence. Attempts should also be made for more information on its habits, ecology, life - history and distribution of this butterfly. "A Code for Insect Collecting" should be followed while capturing butterflies from their habitat. Both ranching and farming up this butterfly should be undertaken.

**Rationale :** The species is known by a few records from its area of occurrence. There has been shrinkage and degradation in its area of occurrence. There are three examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Remarks :** The species, *Sinthusa virgo* (Elwes) has been followed after Cantlie (1962), Bridges (1988) treated this species under the genus *Pseudochliaria*.

Compiled by : I.J. Gupta and D.K. Mondal

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**NEAR THREATENED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**117. *Spindasis elwesi* Evans, 1925**

**THE ELWES' SILVERLINE**

*Spindasis elwesi* Evans, 1925

*Spindasis elwesi* Evans : Evans, 1932 : Cantlie, 1962; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE Ground colour shot blue. Fore wing with a small orange spot. Both wings *underside* pale yellow with broad black bands. FEMALE - Brown; both wings with broad orange area. *Wing expanse* : 27-42 mm.

*Intraspecific variation* : The upperside blue in male but brown in female; a small orange spot on fore wing in male where as broad orange area in female.

*Distribution* : India : Uttaranchal (Kumaon), Assam.

*Status* : Near Threatened (NT).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : Threats in the area are expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements : urbanisation; construction of dams and highways; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land, water and atmospheric pollution on account of using insecticides and pesticides.

*Conservation measures taken* : The species is protected under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover an area of 9318.29 sq km.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly. "A Code for Insect Collecting" should



*Spindasis elwesi* (Evans), male (Underside) After D'Abrera

be followed while capturing butterflies from their habitat. Both ranching and farming up this butterfly should be undertaken.

*Rationale* : Qualifies for a few records from its range of distribution observing the shrinkage and deterioration in its area of its occurrence. There are a few examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been relied upon for the validity of the species, *Spindasis elwesi* Evans.

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**118. *Spindasis rukmini* (de Nicéville, 1888)**

**THE KHAKI SILVERLINE**

*Aphnaeus rukmini* de Niceville, 1888

*Aphnaeus rukmini* de Niceville : de Niceville, 1890

*Spindasis rukmini* (de Niceville) : Evans, 1932 : Cantlie 1962; D'Abrera, 1986; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE Ground colour dark brown with blue shot. Fore wing orange patch absent. Hind wing anal lobe dull ochreous. Both wings *underside* khaki; dark bands obsolete. FEMALE - Like male but upperside dull coloured, an orange patch on disc bearing 2-3 dark brown spots on it. *Wing expanse* : ♂ 33-38 mm.

*Intraspecific variation* : In fore wing of male, the short streak at the base of the cell and a ring spot beyond may be present or entirely absent. Underside with dull yellow bands narrowed down to very small stripes, proximal ones only indicated by small dots.

*Distribution* : India : Assam, Nagaland, Sikkim.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : De Niceville (1890) described this species on basis of two males captured by Mr. Otto Mueller from Sikkim. Later on, he also saw more specimens from Sikkim in the collections of Knyvett and Dudgeon. The other habits and ecology of the butterfly are not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides



*Spindasis rukmini* (De Niceville), (Upperside) - (Specimen in ZSI collection)



*Spindasis rukmini* (De Niceville), (Underside) - (Specimen in ZSI collection)

and pesticides. The north-eastern states have lost 783 sq km forest cover during 1995-1997 (Alfred *et al.*, 2002).

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 4953.09 sq km.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in the area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. There has been a considerable decrease and degradation of its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : The species, *Spindasis rukmini* (de Niceville) has been followed after Cantlie (1962).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**119. *Satyrium mackwoodi* (Evans, 1914)  
THE MACKWOOD'S HAIRSTREAK**

*Thecla mackwoodi* Evans , 1914

*Thecla saitua* Tytler, 1915

*Strymon mackwoodi* (Evans) : Evans, 1932; Cantlic, 1962

*Strymonidia mackwoodi* (Evans) : D'Abbrera, 1986

*Strymonidia saitua* (Tytler) : D'Abbrera, 1986

*Satyrium mackwoodi* (Evans) : Bridges, 1988

**Diagnostic characters :** MALE Ground colour dark shiny brown and unmarked. Fore wing with a narrow oblique discal white line inwardly black-edged. Hind wing discal line distorted to a 'W' - shaped mark near inner margin. Tailed at Cu<sub>1a</sub> and Cu<sub>1b</sub>. FEMALE - As for male. *Wing expanse* : ♂ ♀ 34 mm.

**Intraspecific variation :** The species is not known to exhibit significant variation.

**Distribution :** India : Manipur. *Elsewhere* : Myanmar.

**Status :** Critically Endangered (CR A1c, B1 2bc).

**Habitat and ecology :** Tytler (1915) stated capture of a single female at Saitu village at altitude of 120m. at the northern end of the Manipur Valley, in May. The other habits and ecology of the butterfly are not known.

**Threats :** Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism;



*Strymonidia mackwoodi* (Evans), male (Upperside) - After D'Abbrera (1986)



*Strymonidia mackwoodi* (Evans), male (Underside) - After D'Abbrera (1986)



*Strymonidia saitua* (Tyter), male (Underside) - After D'Abbrera (1986)

fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is afforded protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 433.35 sq km.

*Conservation measures proposed* : There should be check on any activities posing any more threats in its area of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for its restricted distribution in India. There has been considerable shrinkage and degradation of its area of occurrence.

*Taxonomic Reliability* : Bridges (1988) has been followed for the nomenclature of the species *styrium mackwoodi* (Evans).

Compiled by : I.J. Gupta and D.K. Mondal

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TYTLER, H. C. 1915. Notes on some new and interesting butterflies from Manipur and the Naga Hills. *J. Bombay nat. Hist. Soc.*, **24** : 119-155, 2pls. (132)

VARSHNEY, R. K. 1997. Index Rhopalocera Indica. Part III. Genera of butterflies from India and neighbouring countries [Lepidoptera (C) Lycaenidae]. *Oriental Insects*, **31** : 83-138. (132)

WYNTER-BLYTH, M. A. 1957. *Butterflies of the Indian Region*. First Edition. xx + 523pp., 4 text figs., 72 pls. Bombay Natural History Society. (306)



**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**120. *Tajuria ister* (Hewitson, 1865)**

**THE UNCERTAIN ROYAL**

*Iolaus ister* Hewitson, 1865

*Carmena ister* (Hewitson), De Niceville, 1890

*Pratapa ister* (Hewitson) : Swinhoe 1911-1912

*Tajuria ister* (Hewitson) : Tytler, 1915; Evans, 1932; Cantlie, 1962; D' Abrera, 1986; Bridges, 1988; Varshney, 1997

*Diagnostic characters* : MALE - Ground colour pale blue, rather powdery. Both wings powdery blue extending to about basal half  $Cu_{1b}$ -area; *underside* pale brown, with discal line prominently white-edged. Hind wing anal lobe orange-crowned; *underside* tornal markings large, orange and continuous from  $Cu_{1a}$  to IA area. FEMALE - As for male, but powdery blue extending to base of  $Cu_{1a}$ -area and most of  $Cu_{1b}$ -area. *Wing expanse* : ♂ ♀ 32-39 mm.

*Intraspecific variation* : The species exhibits seasonal variation in that the ochreous tinges of costal base on underside of fore wing is nearly obsolete in dry-season form. The specimens of wet-season form are darker and blue is more restricted on upperside of fore wing; underside of hind wing may be with well developed or restricted yellow area round the anal spots.

*Distribution* : India : Assam; Manipur (Imphal). *Elsewhere* : Myanmar., Thailand.

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : Tytler (1915) referred to collection of males and females of dry season form at Imphal from March to June and those of wet season forms from July to November. Norman (1953) also captured a few individuals at Moreh on the Eastern-Manipur – Burma boundary. The other habits and ecology of the butterfly are largely not known.

*Threats* : Threats in the area include shifting cultivation, grazing; mining; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads,



*Tajuria ister* (Hewitson), (Upperside) - (Specimen in ZSI collection)



*Tajuria ister* (Hewitson), (Underside) -- (Specimen in ZSI collection)

hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The species is provided protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 3285.10 sq km (Singh & Singh, 2002).

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. More information is required on habits, ecology, life-history and distribution of this butterfly.

*Rationale* : Qualifies for a few known records of its distribution in India. There has been considerable shrinkage and degradation in its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been relied up on for the validity of the species, *Tajuria ister* (Hewitson).

*Compiled by* : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENDIAE

**121. *Tajuria luculentus nela* Swinhoe, 1896**

**THE CHINESE ROYAL**

*Tajuria nela* Swinhoe, 1896

*Tajuria luculentus nela* (Swinhoe) : Evans, 1932 : Cantlie 1962; Varshney, 1997

*Tajuria luculentus nela* (Swinhoe) : Bridges, 1988

*Diagnostic characters* : MALE Ground colour pale blue. Fore wing blue extending to termen in IA-area, filling basal two-thirds of Cu<sub>1b</sub>-area; *underside* discal line concave in IA-area. FEMALE - Fore wing blue extending to Cu<sub>1a</sub>-area and turning whitish on disc, terminal border broad dark. Hind wing costal border also broad dark. *Wing expanse* : ♂ ♀ 38-41 mm.

*Intraspecific variation* : This is the only subspecies known in India and it displays little variation.

*Distribution* : India : Assam; Meghalaya. *Elsewhere* : Nepal. (Meghalaya- Khasi Hills given by Gunathlagaraj)

*Status* : Endangered (EN A1c, B1 2bc).

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : Threats in the area are shifting cultivation, grazing; mining; cutting and felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; illegal trade of forest commodities and animals; land, water and atmospheric pollution by using insecticides and pesticides.

*Conservation measures taken* : The subspecies finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 3153.43 sq km (Singh & Singh, 2002).



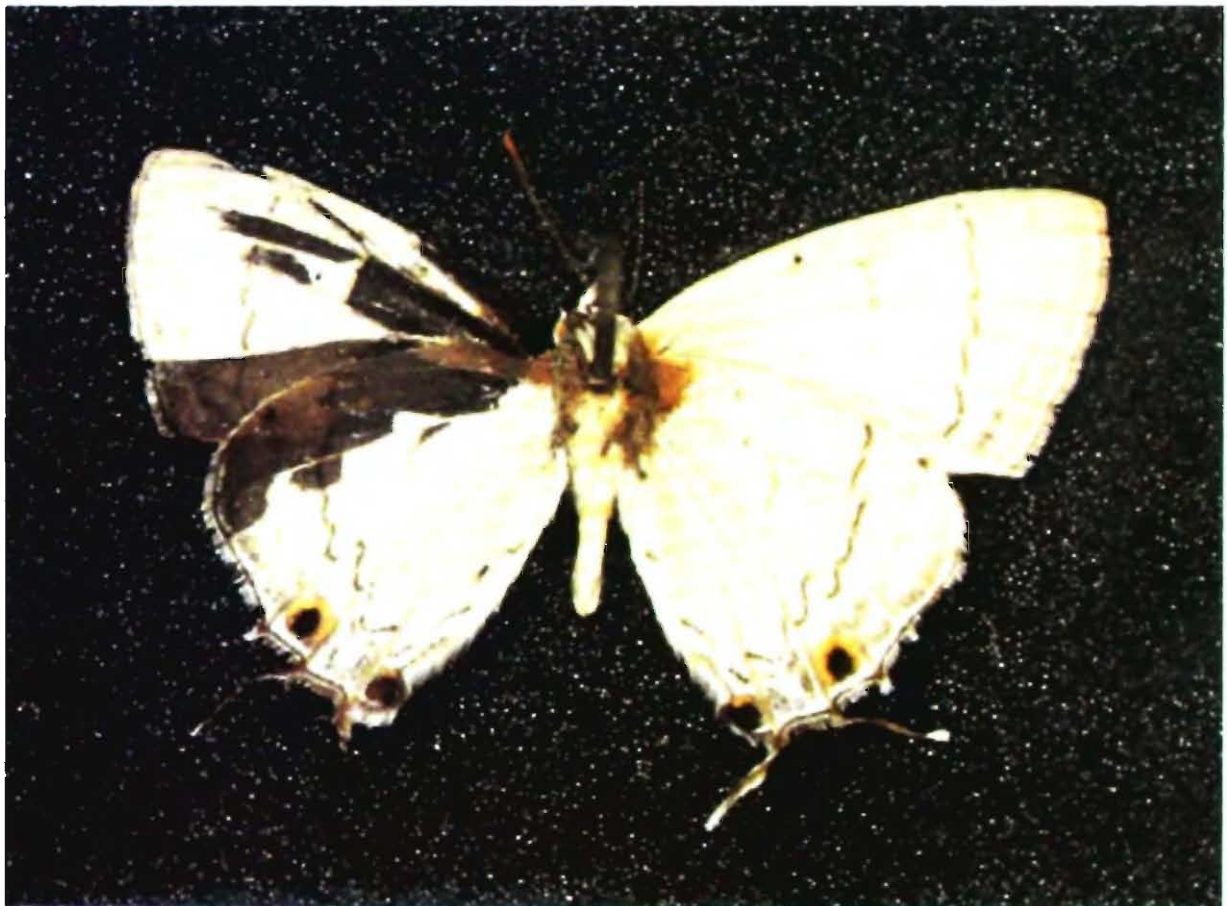
*Tajuria luculentus nela* (Swinhoe), male (Upperside) - (Specimen in ZSI collection)



*Tajuria luculentus nela* (Swinhoe), male (Underside) - (Specimen in ZSI collection)



*Tajuria luculentus nela* (Swinhoe), female (Upperside) - (Specimen in ZSI collection)



*Tajuria luculentus nela* (Swinhoe), female (Underside) - (Specimen in ZSI collection)

*Conservation measures proposed* : There should be check on activities posing any more threat in its area of occurrence. More information on biology and ecology of this subspecies is required for further conservation measures.

*Rationale* : Qualifies for its restricted distribution in India. There has been a considerable shrinkage and degradation of its area of occurrence. There are two examples in the National Zoological Collection of Zoological Survey of India, Kolkata and one example in the Forest Research Institute, Dehra Dun.

*Taxonomic Reliability* : The subspecies, *Tajuria luculentus nela* (Swinhoe) has been followed after Cantlie (1962).

Compiled by : I.J. Gupta and D.K. Mondal

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**CRITICALLY ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**122. *Tajuria yajna yajna* (Doherty, 1886)  
THE CHESTNUT AND BLACK ROYAL**

*Remelana yajna* Doherty, 1886

*Remelana yajna* Doherty : Doherty, 1889

*Tajuria yajna* (Doherty) : de Niceville, 1890; Arora, 1995; Varshney, 1997

*Tajuria yajna yajna* (Doherty) : Evans, 1932 : Cantlie 1962; D'Abrera, 1986; Bridges, 1988.

*Diagnostic characters* : MALE Fore wing black; *underside* chestnut, with discal line sinuous and nearer end-cell than termen. Hind wing costa pale blue, this colour reaching  $M_2$  and cell; *underside* chestnut; no white line along irrorated tornal area. FEMALE Unknown. *Wing expanse* : 34 mm.

*Intraspecific variation* : It includes another following subspecies occurring in India.

*Tajuria yajna istroidea* de Niceville India : Assam and Sikkim. *Elsewhere* : Nepal.

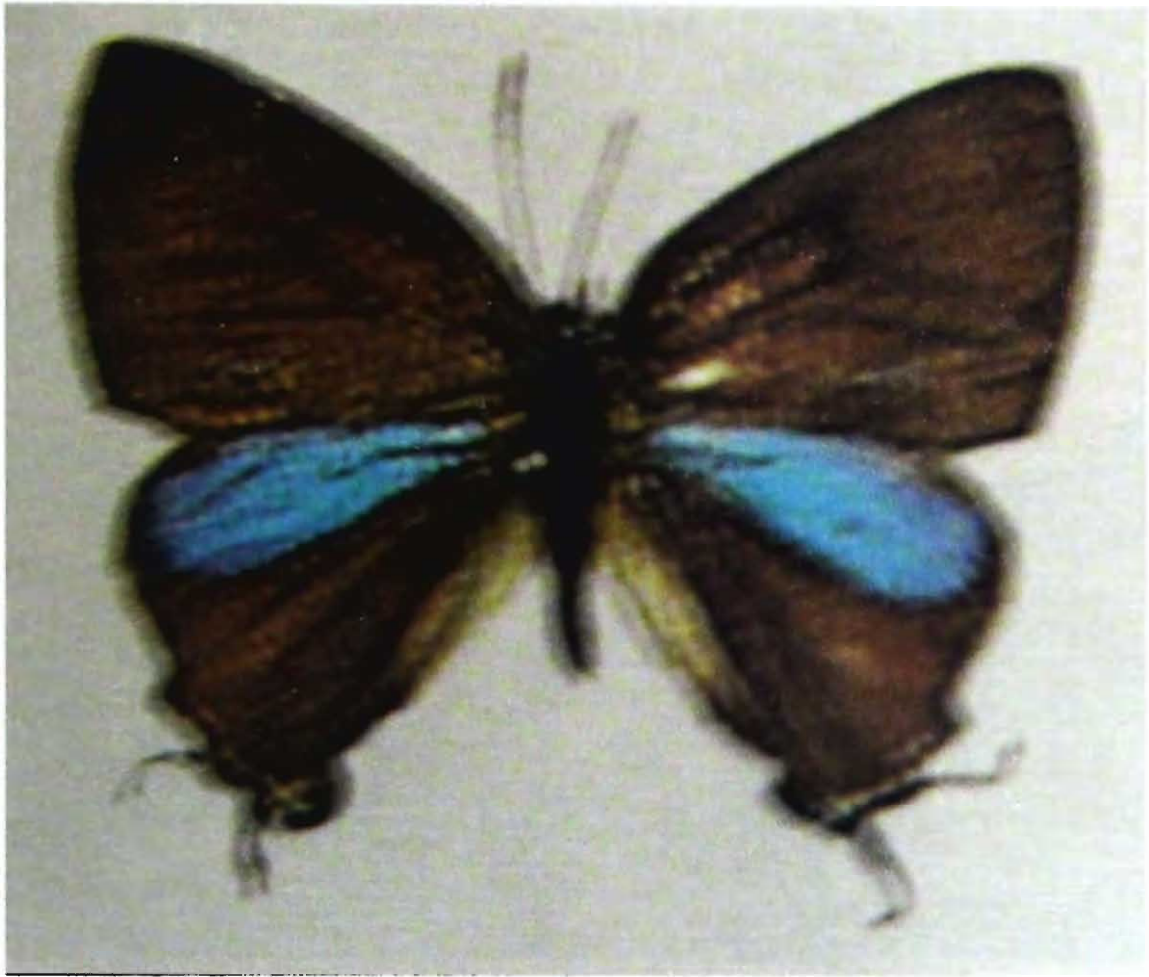
The nominate subspecies is distinguished from *istroidea* by upperside of hind wing costa only pale blue, extending to vein  $M_2$  and *underside* of fore wing with discal line sinuous.

*Distribution* : India : Uttaranchal (Mussoorie-Kumaon).

*Status* : Critically Endangered (CR A1c, B1 2bc).

*Habitat and ecology* : Wynter-Blyth (1957) mentioned the record of this subspecies from Kumaon in May and August. Arora *et al.* (1995) recorded it from Nainital in Uttaranchal. The other habits and ecology of this butterfly are not known.

*Threats* : Threats in area are expansion of arable land, shifting cultivation, farming, livestock ranching, crop and timber plantations, grazing; mining; over-utilization of biological resources; expansion of industries; human settlements : urbanisation; construction of dams



*Tajuria yajna yajna* (Doherty) male (Upperside) - After D'Abreara (1986)



*Tajuria yajna yajna* (Doherty) female (Upperside) - (Specimen in ZSI collection)



*Tajuria yajna yajna* (Doherty) female (Underside) (Specimen in ZSI collection)

and highways; illegal trade of forest commodities and wild animals including butterflies (Khanna & Kumar, 2002); land, water and atmospheric pollution by using insecticides and pesticides.

**Conservation measures taken :** The butterfly is given protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. National Parks and Wildlife Sanctuaries have been created in an area of 6466.54 sq km (Singh & Singh, 2002).

**Conservation measures proposed :** There should be restraint on human interference causing any threat in its range of occurrence. Efforts should be made to collect more individuals and to conduct studies on habits, ecology, life-history and distribution of this butterfly.

**Rationale :** Qualifies for its restricted distribution in Uttaranchal in India. There has been a considerable decrease and degradation of its area of occurrence. There is only one example in the National Zoological Collection of Zoological Survey of India, Kolkata.

**Taxonomic Reliability :** Cantlie (1932) has been relied up on for the valid name of subspecies, *Tajuria yajna yajna* (Doherty).

Compiled by : I.J. Gupta and D.K. Mondal

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**ENDANGERED**

Class INSECTA

Order LEPIDOPTERA

Family LYCAENIDAE

**123. *Virachola smilis* (Hewitson, 1863)**

**THE SCARCE GUAVA BLUE**

*Deudorix smilis* Hewitson, 1863

*Virachola smilis* (Hewitson) : de Niceville, 1890

*Virachola similis* (sic) (Hewitson) : Swinhoe 1910-1911

*Deudorix smilis* Hewitson : Seitz, 1926,

*Virachola smilis* (Hewitson) : Evans, 1932; Cantlie, 1962

**Diagnostic characters** : MALE Fore wing ochreous; *underside* paler with prominently dark markings; cell-spot always present; discal band partially or completely dislocated, with posterior part shifted in. Hind wing *underside* prominently marked; basal spot at R<sub>S</sub>-area. FEMALE As for male. *Wing expanse* : ♂ ♀ 48-52 mm.

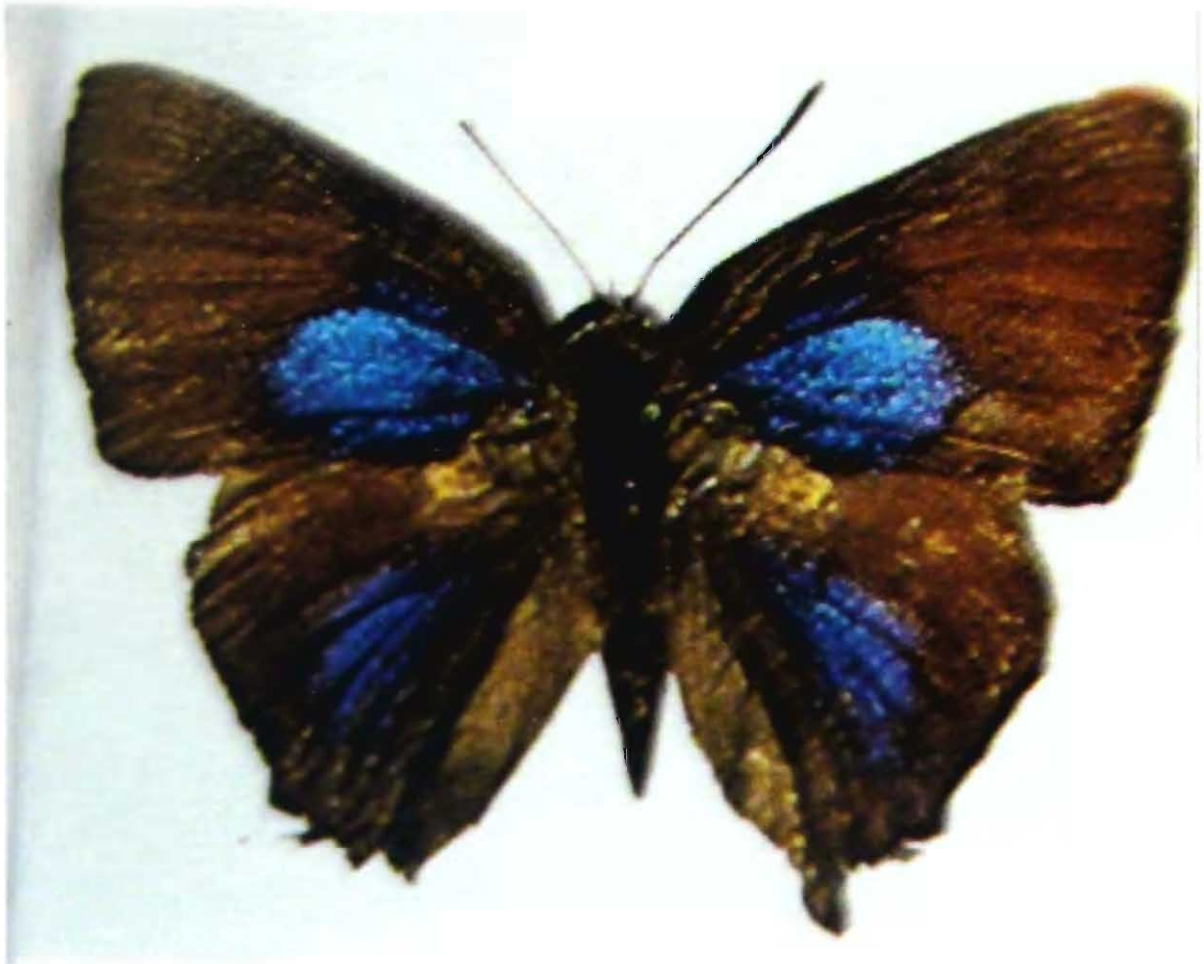
**Intraspecific variation** : The species is represented in India by the following two subspecies

- i. *Virachola smilis smilis* (Hewitson) : India : Meghalaya (Jaintia Hills). *Elsewhere* : South Myanmar.
- ii. *Virachola smilis maseas* (Fruhstorfer, 1912) India : Andaman & Nicobar Islands (Andamans)

The subspecies *smilis* differs from *maseas* by fore wing underside with discal band completely dislocated.

**Distribution** : India : Meghalaya (Jaintia Hills), Andaman & Nicobar Islands (Andamans). *Elsewhere* : South Myanmar.

**Status** : Endangered (EN A1c, B1 2bc).



*Virachola smilis smilis* (Hewitson), male (Upperside) - After D'Abbrera (1986)



*Virachola smilis smilis* (Hewitson), female (Upperside) - After D'Abbrera (1986)



*Virachola smilis smilis* (Hewitson), female (Underside) After D'Abbrera (1986)

*Habitat and ecology* : The habits and ecology of this butterfly are not much known.

*Threats* : In Meghalaya, threats include shifting cultivation, grazing; cutting/felling of trees for timber, wood for fuel and charcoal; clearing of forests for construction of roads, hydroelectric plants, setting up of industries, for human settlements and tourism; fragmentation of habitats; selective use of medicinal and ornamental plants; land, water and atmospheric pollution by using insecticides and pesticides. In Andaman rainforest cover is reduced to 21% from 96%, Middle Andaman left it with only 29% and South Andaman it is all worked over. Population influx and indiscriminate exploitation of biological resources have caused habitat destruction and alteration.

*Conservation measures taken* : The species finds protection under Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and subsequent amendments. The National Parks and Wildlife Sanctuaries cover a protected area of 1830.95 sq km.

*Conservation measures proposed* : There should be restraint on human interference causing any threat in its range of occurrence. Efforts should be made to obtain more information on its habits, ecology, biology and distribution for further conservation measures.

*Rationale* : Qualifies for both of its subspecies having restricted distribution in India. There has been a considerable decrease and deterioration in its area of occurrence. There is only one example of *Virachola smilis smilis* (Hewitson) in the National Zoological Collection of Zoological Survey of India, Kolkata.

*Taxonomic Reliability* : Cantlie (1962) has been species, *Virachola smilis* (Hewitson). Bridges (1988) treated it as *Deudorix (Virachola) smiles* Hewitson.

Compiled by : I.J. Gupta and D.K. Mondal

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## APPENDIX - A

### NAMES OF SPECIES AND SUBSPECIES OF BUTTERFLIES INCLUDED IN SCHEDULE-I (PART-IV) OF THE INDIAN WILDLIFE (PROTECTION) ACT, AND THOSE FOLLOWED IN THIS RED DATA BOOK

Sl. No.	Name of species/subspecies as used in Schedule-I	Name of species/subspecies followed in this Red Data Book	Common Name
	Family PAPILIONIDAE	Family PAPILIONIDAE	
		Subfamily PARNASSINAE	
1.	<i>Parnassius acco geminifer</i>	<i>Parnassius acco gemmifer</i> Fruhstorfer	Varnished Apollo
2.	<i>Parnassius delphius</i>	<i>Paranassius delphius</i> (Eversmann)	Banded Apollo
3.	<i>Parnassius imperator augustus</i>	<i>Parnassius imperator augustus</i> Fruhstorfer	Imperial Apollo
4.	<i>Parnassius hannyingtoni</i>	<i>Parnassius hannyingtoni</i> Avinoff	Hannyington's Apollo
5.	<i>Parnassius stoliczkanus</i>	<i>Parnassius stoliczkanus</i> Felder	Ladak Banded Apollo
		Subfamily PAPILIONINAE	
6.	<i>Chilasa clytea clytea f. commixtus</i>	<i>Chilasa clytia clytia f. commixtus</i> Rothschild	Common Mime
7.	<i>Papilio elephenor</i>	<i>Papilio elephenor</i> Doubleday	Yellow Crested Spangle
8.	<i>Papilio liomedon</i>	<i>Papilio liomedon</i> Moore	Malabar Banded Swallowtail
9.	<i>Polydorus coon sambilanga</i>	<i>Atrophaneura coon sambilanga</i> (Doherty)	Common Clubtail
10.	<i>Polydorus crassipes</i>	<i>Atrophaneura crassipes</i> (Oberthuer)	Black Windmill
11.	<i>Polydorus hector</i>	<i>Pachliopta hector</i> (Linnaeus)	Crimson Rose
12.	<i>Polydorus nevillei</i>	<i>Atrophaneura nevillei</i> (Wood-Mason)	Nevil's Windmill
13.	<i>Polydorus plutonius pembertonii</i>	<i>Atrophaneura plutonius pembertonii</i> (Moore)	Pemberton's Chinese Windmill
14.	<i>Polydorus polla</i>	<i>Atrophaneura polla</i> (de Nicéville)	De Nicéville's Windmill
	Family PIERIDAE	Family PIERIDAE	
		Subfamily PIERINAE	
15.	<i>Baltia butleri sikkima</i>	<i>Baltia butleri sikkima</i> Fruhstorfer	Butler's Dwarf
16.	<i>Delias sanaca</i>	<i>Delias sanaca</i> (Moore)	Pale Jezebel
17.	<i>Pieris krueperi devta</i>	<i>Pieris krueperi devta</i> (de Nicéville)	Green Banded White
		Subfamily COLIADINAE	
18.	<i>Colias Colias thrasibulus</i>	<i>Colias cocandica thrasibulus</i> Fruhstorfer	Lemon Cloude Yellow
19.	<i>Colias dubia</i>	<i>Colias dubia</i> Elwes	Dwarf Clouded Yellow
	Family DANAIDAE	Family NYMPHALIDAE	
		Subfamily DANAINAE	
20.	<i>Danaus gautama gautamoides</i>	<i>Tirumala gautama gautamoides</i> (Doherty)	Scarce Blue Tiger
21.	<i>Euploea crameri nicévillei</i>	<i>Euploea crameri nicévillei</i> (Moore)	Spotted Black Crow
22.	<i>Euploea midamus roepstorffi</i>	<i>Euploea midamus roepstorffi</i> (Moore)	Andaman King Crow

Sl. No.	Name of species/subspecies as used in Schedule-I	Name of species/subspecies followed in this Red Data Book	Common Name
	Family SAYRIDAE	Family NYMPHALIDAE	
		Subfamily SATYRINAE	
23.	<i>Coelitis mothis adamsoni</i>	<i>Coelitis nothis adamsoni</i> Moore	Scarce Catseye
24.	<i>Cyllogenes janetae</i>	<i>Cyllogenes janatae</i> de Nicéville	Scarce Evening Brown
25.	<i>Elymnias peali</i>	<i>Elymnias peali</i> Wood-Mason	Peal's Palmfly
26.	<i>Elymnias penanga chilensis</i>	<i>Elymnias penanga chelensis</i> de Nicéville	Pointed Palmfly
27.	<i>Erebia annada annada</i>	<i>Callerebia annada annada</i> (Moore)	Ringed Argus
28.	<i>Erebia narasingha narasingha</i>	<i>Erebia narasingha narasingha</i> (Moore)	Mottled Argus
29.	<i>Lethe distans</i>	<i>Lethe distans</i> Butler	Scarce Red Forester
30.	<i>Lethe dura gammiei</i>	<i>Lethe dura gammiei</i> (Moore)	Scarce Lilacfork
31.	<i>Lethe europa tamuna</i>	<i>Lethe europa tamuna</i> de Nicéville	Bamboo Treebrown
32.	<i>Lethe gemina gafuri</i>	<i>Lethe gemina gafuri</i> (Tytler)	Tytler's Treebrown
33.	<i>Lethe gulunihal gulunihal</i>	<i>Lethe gulnihal gulnihal</i> de Nicéville	Dull Forester
34.	<i>Lethe margaritae</i>	<i>Lethe margaritae</i> Elwes	Bhutan Treebrown
35.	<i>Lethe ocellata lyncus</i>	<i>Lethe ocellata lyncus</i> de Nicéville	Dismal Mystic
36.	<i>Lethe remadeva</i>	<i>Lethe ramadeva</i> (de Nicéville)	Single Silverstripe
37.	<i>Lethe satyabati</i>	<i>Lethe satyavati</i> de Nicéville	Pallid Forester
38.	<i>Mycalesis orseis nautilus</i>	<i>Mycalesis orseis nautilus</i> Butler	Purple Bushbrown
39.	<i>Pararge menava maeroides</i>	<i>Pararge menava maeroides</i> (C. & R. Felder)	Dark Wall
40.	<i>Ypthima dohertyi persimilis</i>	<i>Ypthima dohertyi persimilis</i> Elwes & Edwards	Great Fivering
	Family AMATHUSIIDAE	Family NYMPHALIDAE	
		Subfamily MORPHINAE	
41.	<i>Discophora deo deo</i>	<i>Discophora deo deo</i> de Nicéville	Banded Duffer
42.	<i>Discophora sondaica muscina</i>	<i>Discophora sondaica muscina</i> Stichel	Common Duffer
	Family NYMPHALIDAE	Family NYMPHALIDAE	
		Subfamily CALINAGINAE	
43.	<i>Calinaga buddha gautama</i>	<i>Calinga buddha gautama</i> Moore	Freak
	Family NYMPHALIDAE	Family NYMPHALIDAE	
		Subfamily NYMPHALINAE	
44.	<i>Apatura ulupi ulupi</i>	<i>Chitoria ulupi ulupi</i> (Doherty)	Tawny Emperor
45.	<i>Argynnis hegemone</i>	<i>Argynnis hegemone</i> Staudinger	Whitespot Fritillary
46.	<i>Cirrochroa fasciata</i>	<i>Cirrochroa fasciata</i> (Felder)	Branded Yeoman
47.	<i>Diagora nicévillei</i>	<i>Diagora nicévillei</i> (Moore)	Scarce Siren
48.	<i>Dilipa morgiana</i>	<i>Dilipa morgiana</i> (Westwood)	Golden Emperor
49.	<i>Doleschallia bisaltide andamana</i>	<i>Doleschallia bisaltide andamanensis</i> Fruhstorfer	Autumn Leaf
50.	<i>Eulaceura manipurensis</i>	<i>Eulaceura manipurensis</i> (Tytler)	Tytler's Emperor
51.	<i>Euthalia durga splendens</i>	<i>Bassarona durga splendens</i> (Tytler)	Blue Duke
52.	<i>Euthalia iva</i>	<i>Bassarona iva</i> (Moore)	Grand Duke
53.	<i>Euthalia khama curvifascia</i>	<i>Bassarona khama curvifascia</i> (Tytler)	Naga Duke
54.	<i>Euthalia telchinia</i>	<i>Euthalia telchinia</i> (Ménétriés)	Blue Baron
55.	<i>Helcyra hemina</i>	<i>Helcyra hemina</i> Hewitson	White Emperor
56.	<i>Hypolimnas missipus</i>	<i>Hypolimnas misippus</i> (Linnaeus)	Danaid Eggfly

Sl. No.	Name of species/subspecies as used in Schedule-I	Name of species/subspecies followed in this Red Data Book	Common Name
57.	<i>Limenitis austenia purpurascens</i>	<i>Bhagadatta austenia purpurascens</i> (Tytler)	Grey Commodore
58.	<i>Limenitis zulema</i>	<i>Sumalia zulema</i> (Doubleday & Hewitson)	Scarce White Commodore
59.	<i>Neptis antilope</i>	<i>Neptis armandia</i> (Oberthuer)	Variiegated Sailer
60.	<i>Neptis aspasia</i>	<i>Phaedyma aspasia</i> (Leech)	Great Hockeystick Sailer
61.	<i>Neptis cydippe kirbariensis</i>	<i>Neptis cydippe kirbariensis</i> Tytler	Chinese Yellow Sailer
62.	<i>Neptis ebusa ebusa</i>	<i>Lasippa ebusa ebusa</i> (Felder)	Fuliginous Sailer
63.	<i>Neptis manasa</i>	<i>Neptis manasa manasa</i> Moore	Pale Hockeystick Sailer
64.	<i>Neptis nycteus</i>	<i>Neptis nycteus</i> de Nicéville	Hockeystick Sailer
65.	<i>Neptis sankara nar</i>	<i>Lasippa viraja nar</i> (de Nicéville)	Yellow Jack Sailer
66.	<i>Neptis poona</i>	<i>Pantoporia beiti paona</i> (Tytler)	Tytler's Lascar
67.	<i>Neptis sankara nar</i>	<i>Lasippa viraja nar</i> (de Nicéville)	Yellow Jack Sailer
68.	<i>Panthoporia jina jina</i>	<i>Athyma jina jina</i> Moore	Bhutan Sergeant
69.	<i>Panthoporia reta moorei</i>	<i>Athyma reta moorei</i> (Fruhstorfer)	Malay Staff Sergeant
70.	<i>Sasakia funebris</i>	<i>Sasakia funebris</i> (Leech)	Empress
71.	<i>Sephisa chandra</i>	<i>Sephisa chandra</i> (Moore)	Eastern Courtier
72.	<i>Symbrenthia silana</i>	<i>Symbrenthia silana</i> de Nicéville	Scarce Jester
73.	<i>Vanessa antiopa yedunula</i>	<i>Nymphalis antiopa yedanula</i> (Fruhstorfer)	Camberwell Beauty
Subfamily CHARAXINAE			
74.	<i>Charaxes durnfordi nicholi</i>	<i>Charaxes durnofordi nicholii</i> (Grose-Smith)	Chestnut Rajah
75.	<i>Eriboea moorei sandakanus</i>	<i>Polyura moori sandakanus</i> (Fruhstorfer)	Malayan Nawab
76.	<i>Eriboea schreiberi</i>	<i>Polyura schreiber</i> (Godart)	Blue Nawab
77.	<i>Prothoe franckii regalis</i>	<i>Prothoe franck regalis</i> Butler	Blue Begum
Family LYCAENIDAE			
Subfamily PORITIINAE			
78.	<i>Simiskina phalena harterti</i>	<i>Simiskina phalena harterti</i> (Doherty)	Broad Banded Brilliant
Subfamily MILETINAE			
79.	<i>Allotinus drumila</i>	<i>Allotinus drumila drumila</i> (Moore)	Crenulate Darkie
80.	<i>Allotinus fabius panormis</i>	<i>Allotinus panormis panormis</i> Elwes	Angled Darkie
81.	<i>Logania watsoniana subfasciata</i>	<i>Logania marmorata watsoniana</i> de Nicéville	Watson's Mottle
82.	<i>Gerydus biggsii</i>	<i>Miletus nymphis porus</i> Eliot	Bigg's Brownie
83.	<i>Gerydus symethus diopeithes</i>	<i>Miletus symethus petronius</i> Distant & Pryer	Great Brownie
Subfamily LYCAENINAE			
84.	<i>Amblopala avidiena</i>	<i>Amblopala avidiena</i> (Hewitson)	Chinese Hairstreak
85.	<i>Amblypodia ace arata</i>	<i>Narathura ace arata</i> (Tytler)	Tytler's Dull Oakblue
86.	<i>Amblypodia alea constanceae</i>	<i>Narathura selta constanceae</i> (de Nicéville)	Rosy Oakblue
87.	<i>Amblypodia ammon ariel</i>	<i>Panchala ariel</i> (Doherty)	Malayan Bush Blue
88.	<i>Amblypodia arvina ardea</i>	<i>Narathura arvina ardea</i> (Evans)	Purple Brown Tailless Oakblue
89.	<i>Amblypodia asopia</i>	<i>Narathura asinarus tounguva</i> (Grose Smith)	Plain Tailless Oakblue
90.	<i>Amblypodia comica</i>	<i>Narathura comica</i> (de Nicéville)	Comic Oakblue

Sl. No.	Name of species/subspecies as used in Schedule-I	Name of species/subspecies followed in this Red Data Book	Common Name
91.	<i>Amblypodia opalina</i>	<i>Narathura opalina opalina</i> (Moore)	Opal Oakblue
92.	<i>Amblypodia zeta</i>	<i>Narathura zeta</i> (Moore)	Andaman Tailless Oakblue
93.	<i>Biduanda melisa cyara</i>	<i>Drupadia scaeva cyara</i> (Hewitson)	Blue Posy
94.	<i>Callophrys leechi</i>	<i>Callophrys lechii</i> (de Nicéville)	Ferruginous Hairstreak
95.	<i>Castalius rosimon alarbus</i>	<i>Castalius rosimon alarbus</i> Fruhstorfer	
96.	<i>Charana cepheis</i>	<i>Charana cepheis</i> (de Nicéville)	Cachar Mandarin Blue
97.	<i>Chliaria othona</i>	<i>Chliaria othona</i> (Hewitson)	Orchid Tit'
98.	<i>Deudoryx epijarbas amatius</i>	<i>Deudorix epijarbas amatius</i> Fruhstorfer	Scarce Cornelian
99.	<i>Everes moorei</i>	<i>Shijimia moorei</i> (Leech)	Moore's Cupid
100.	<i>Heliophorus hybrida</i>	<i>Heliophorus hybrida</i> (Tytler)	Hybrid Sapphire
101.	<i>Horaga albimacula</i>	<i>Horaga albimacula</i> (Wood-Mason & de Nicéville)	Violet Onyx
102.	<i>Jamides ferrari</i>	<i>Jamides ferrari ferrari</i> Evans	Ferrar's Cerulean
103.	<i>Liphyra brassolis</i>	<i>Liphyra brassolis</i> Westwood	Moth Butterfly
104.	<i>Listeria dugenni</i>	<i>Pamela dudgeoni</i> (de Nicéville)	Lister's Hairstreak
105.	<i>Lycaenopsis binghami</i>	<i>Notarthrismus binghami</i> (Chapman)	Chapman's Hedge Blue
106.	<i>Lycaenopsis puspa prominens</i>	<i>Acytolepis puspa prominens</i> (de Nicéville)	de Niceville's Hedge Blue
107.	<i>Lycaenopsis quadriplaga dohertyi</i>	<i>Oreolyce dohertyi dohertyi</i> (Tytler)	Naga Hedge Blue
108.	<i>Nacaduba noreia hampsoni</i>	<i>Prosotas noreia hampsonii</i> (de Nicéville)	White Tipped Line Blue
109.	<i>Polyommatus orbitulus leela</i>	<i>Agriades jaloka leela</i> (de Nicéville)	Astor
110.	<i>Pratapa icetas mishmia</i>	<i>Pratapa icetas mishmia</i> Evans	Dark Blue Royal
111.	<i>Sinthus virgo</i>	<i>Sinthus virgo</i> (Elwes)	Pale Spark
112.	<i>Spindasis elwesi</i>	<i>Spindasis elwesi</i> Evans	Elwes' Silverline
113.	<i>Spindasis rukmini</i>	<i>Spindasis rukmini</i> (de Nicéville)	Khaki Silverline
114.	<i>Strymon mackwoodi</i>	<i>Satryrium mackwoodi</i> (Evans)	Mackwood's Hairstreak
115.	<i>Tajuria ister</i>	<i>Tajuria Lister</i> (Hewitson)	Uncertain Royal
116.	<i>Tajuria luculentus nela</i>	<i>Tajuria luculentus nela</i> Swinhoe	Chinese Royal
117.	<i>Tajuria yajna yajna</i>	<i>Tajuria yajna yajna</i> (Doherty)	Chestnut and Black Royal
118.	<i>Thecla ataxus zulla</i>	<i>Chrysozephyrus ataxus zulla</i> (Tytler)	Wonderful Hairstreak
119.	<i>Thecla bieti mendera</i>	<i>Esakiozephyrus mandara mandara</i> (Doherty)	Indian Purple Hair streak
120.	<i>Thecla lethia</i>	<i>Chrysozephyrus disparatus pseudoletia</i> (Howarth)	Watson's Hairstreak
121.	<i>Thecla paona</i>	<i>Chrysozephyrus paona</i> (Tytler)	Paona Hairstreak
122.	<i>Thecla pavo</i>	<i>Euaspo pavo</i> (de Nicéville)	Peacock Hairstreak
123.	<i>Virachola smilis</i>	<i>Virachola smilis</i> Hewitson	Scarce Guava Blue

## APPENDIX B

### SPECIES/SUBSPECIES EXCLUDED FROM THE BUTTERFLY RED DATA BOOK

The following species/subspecies, found synonyms or those not occurring in India but included in the Schedule-I (Part-IV) of the Indian Wildlife (Protection) Act, 1972, and amended subsequently, are excluded in this Red Data Book :

#### Family AMATHUSIIDAE

1. *Faunis faunula faunuloides* (de Nicéville) – Not known in India.

#### Family NYMPHALIDAE

2. *Melitaea shandura* Evans – Not known in India.
3. *Neptis columella kankena* Evans is synonym of *Phaedyma columella binghami* (Fruhstorfer)
4. *Neptis jumbah binghami* (Fruhstorfer) is synonym of *Phaedyma columella binghami* (Fruhstorfer)

#### Family PIERIDAE

5. *Aporia harrietae harrietae* (de Nicéville) – Not known in India.

#### Family LYCAENIDAE

6. *Lycaenopsis haraldus ananga* Felder – Not known in India.

## APPENDIX - C

### THREAT TYPES USED IN THE IUCN RED LIST OF THREATENED SPECIES

The hierarchical structure of the major threat types used in the documentation of the 2000 Red List is shown here. The SSC's Species Information Service in consultation with the SSC network and key partners like BirdLife International developed these categories of threats in order to investigate major threatening processes.

#### 1. **Habitat Loss (primarily human induced)**

##### 1.1. Agriculture

1.1.1. Arable farming/horticulture

1.1.2. Small-holder farming

1.1.3. Shifting agriculture

1.1.4. Livestock ranching

1.1.5. Grazing

1.1.6. Timber plantations

1.1.7. Crop plantations

1.1.8. Aquaculture

1.1.9. Other

##### 1.2. Extraction

1.2.1. Mining

1.2.2. Fisheries

1.2.3. Timber

1.2.3.1. Clear-cutting

1.2.3.2. Selective logging

1.2.3.3. Firewood and charcoal production

1.2.4. Harvesting - non-woody vegetation

1.2.5. Mangrove removal

1.2.6. Coral reef removal

1.2.7. Groundwater extraction

1.2.8. Other

##### 1.3. Development

1.3.1. Industry

1.3.2. Human settlement

1.3.3. Tourism

1.3.4. Infrastructure (roads, dams, power lines etc.) 1.3.5. Other

1.4. Unspecified causes

1.4.1. Fragmentation

1.4.2. Deforestation

1.4.3. Drainage/filling in of wetlands/coastlines 1.4.4. Replacement by ground waste

1.4.5. Soil loss/erosion

1.4.6. Deliberate fires

1.4.7. Other

**2. Direct Loss/Exploitation**

2.1. Hunting and collecting

2.1.1. Food

2.1.2. Sport

2.1.3. Cultural Use

2.1.4. Traditional medicine

2.1.5. Persecution

2.1.5.1. Intentional poisoning (control)

2.1.6. Other

2.2. Trade

2.2.1. Legal

2.2.1.1. Food

2.2.1.2. Commodities

2.2.1.3. Traditional medicine

2.2.1.4. Other

2.2.2. Illegal

2.2.2.1. Food

2.2.2.2. Commodities

2.2.2.3. Traditional medicine

2.2.2.4. Other

2.2.3. Legality unknown

2.2.3.1. Food

2.2.3.2. Commodities

2.2.3.3. Traditional medicine

2.2.3.4. Other

- 2.3. Accidental mortality
  - 2.3.1. Trapping
  - 2.3.2. Hooking
  - 2.3.3. Netting
  - 2.3.4. Dynamite/explosives
  - 2.3.5. Poisoning
  - 2.3.6. Entanglement
  - 2.3.7. Pylon collision
  - 2.3.8. Air strikes
  - 2.3.9. Other

### **3. Indirect Effects**

- 3.1. Human caused
  - 3.1.1. Recreation/tourism
  - 3.1.2. Research
  - 3.1.3. Deliberate fires
  - 3.1.4. Other
- 3.2. Alien invasive species
  - 3.2.1. Competitors
  - 3.2.2. Predators
  - 3.2.3. Hybridizers
  - 3.2.4. Pathogens/parasites
  - 3.2.5. Habitat loss
  - 3.2.6. Other
- 3.3. Ecological imbalance (changes in native species dynamics)
  - 3.3.1. Competitors
  - 3.3.2. Predators
  - 3.3.3. Hybridizers
  - 3.3.4. Pathogens/parasites
  - 3.3.5. Habitat loss
  - 3.3.6. Loss of prey base
  - 3.3.7. Lack of pollinators
  - 3.3.8. Other

### **4. Natural disasters**

- 4.1. Volcanoes
- 4.2. Drought
- 4.3. Wildfire

4.4. Storms/flooding

4.5. Other

**5. Atmospheric pollution**

5.1. Global warming/oceanic warming

5.2. Acid precipitation

5.3. Ozone hole effects

5.4. Other

**6. Land Water pollution**

6.1. Pesticides/chemical pollution

6.2. Industrial pollution

6.3. Oil slicks

6.4. Other

**7. Intrinsic Factors**

7.1. Poor dispersal

7.2. Poor recruitment/reproduction/regeneration

7.3. High juvenile mortality

7.4. Inbreeding

7.5. Other

**8. Other**

**9. Unknown**

## APPENDIX - D

### A CODE FOR INSECT COLLECTING

Joint Comminee for the Conservation of British Insects

A Code for Insect Collecting

This Committee believes that with the ever-increasing loss of habitats resulting from forestry, agriculture, and industrial urban and recreational development, the point has been reached where a code for collecting should be considered in the interests of conservation of the British insect fauna; particularly macrolepidoptera. The Committee considers that in many areas this loss has gone so far that collecting, which at one time would have had a trivial effect, could now affect the survival in them of one or more species if continued without restraint.

The Committee also believes that by subscribing to a code of collecting, entomologists will show themselves to be a concerned and responsible body of naturalists who have a positive contribution to make to the cause of conservation. It asks all entomologists to accept the following Code in principle and to try to observe it in practice.

#### 1. Collecting – General

- 1.1 No more specimens than are strictly required for any purpose should be killed.
- 1.2 Readily identified insects should not be killed if the object is to 'look them over' for aberrations or other purposes: insects should be examined while alive and then released where they were captured.
- 1.3 The same species should not be taken in numbers year after year from the same locality.
- 1.4 Supposed or actual predators and parasites of insects should not be destroyed.
- 1.5 When collecting leaf-mines, galls and seed heads never collect all that can be found; leave as many as possible to allow the population to recover.
- 1.6 Consideration should be given to photography as an alternative to collecting, particularly in the case of butterflies.
- 1.7 Specimens for exchange, or disposal to other collectors, should be taken sparingly or not at all.
- 1.8 For commercial purposes insects should be either bred or obtained from old collections. Insect specimens should not be used for the manufacture of 'jewellery'

#### 2. Collecting - Rare and endangered species

- 2.1 Specimens of Macrolepidoptera listed by this Committee (and published in the entomological journals) should be collected with the greatest restraint. As a guide, the

Committee suggests that a pair of specimens is sufficient, but that those species in the greatest danger should not be collected at all. The list may be amended from time to time if this proves to be necessary

- 2.2 Specimens of distinct local forms of Macrolepidoptera, particularly butterflies, should likewise be collected with restraint.
- 2.3 Collectors should attempt to break new ground rather than collect a local or rare species from a well-known and perhaps over-worked locality.
- 2.4 Previously unknown localities for rare species should be brought to the attention of this Committee, which undertakes to inform other organizations as appropriate and only in the interests of conservation.

### **3. Collecting - lights and light-traps**

- 3.1 The 'catch' light, particularly in a trap, should not be killed casually for subsequent examination.
- 3.2 Live trapping, for instance in traps filled with egg-tray material, is the preferred method of collecting. Anaesthetics are harmful and should not be used.
- 3.3 After examination of the catch the insects should be kept in cool, shady conditions and released away from the trap site at dusk. If this is not possible the insects should be released in long grass or other cover and not on lawns or bare surfaces.
- 3.4 Unwanted insects should not be fed to fish or insectivorous birds and mammals.
- 3.5 If a trap used for scientific purposes is found to be catching rare or local species unnecessarily it should be re-sited.
- 3.6 Traps and lights should be sited with care so as not to annoy neighbours or cause confusion.

### **4. Collecting - Permission and conditions**

- 4.1 Always seek permission from landowner or occupier when collecting on private land.
- 4.2 Always comply with any conditions laid down by the granting of permission to collect.
- 4.3 When collecting on nature reserves, or sites of known interest to conservationists, supply a list of species collected to the appropriate authority.
- 4.4 When collecting on nature reserves it is particularly important to observe the code suggested in section 5.

## 5. Collecting - Damage to the environment

- 5.1 Do as little damage to the environment as possible. Remember the interests of other naturalists; be careful of nesting birds and vegetation, particularly rare plants.
- 5.2 When 'beating' for lepidopterous larvae or other insects never thrash trees and bushes so that foliage and twigs are removed. A sharp jarring of branches is both less damaging and more effective.
- 5.3 Coleopterists and others working dead timber should replace removed bark and worked material to the best of their ability. Not all the dead wood in a locality should be worked.
- 5.4 Overturned stones and logs should be replaced in their original positions.
- 5.5 Water weed and moss which has been worked for insects should be replaced in its appropriate habitat. Plant material in litter heaps should be replaced and not scattered. about.
- 5.6 Twigs, small branches and foliage required as foodplants or because they are galled, *e.g.* by clearwings, should be applied neatly with secateurs or scissors and not broken off.
- 5.7 'Sugar' should not be applied so that it renders tree trunks and other vegetation unnecessarily unsightly.
- 5.8 Exercise particular care when working for rare species, *e.g.* by searching for larvae rather than beating for them.
- 5.9 Remember the Country Code!

## 6. Breeding

- 6.1 Breeding from a fertilized female or pairing in captivity is preferable to taking a series of specimens in the field.
- 6.2 Never collect more larvae or other livestock than can be supported by the available supply of foodplant.
- 6.3 Unwanted insects that have been reared should be released in the original locality, not just anywhere.
- 6.4 Before attempting to establish new populations or 'reinforce' existing ones please consult this Committee.