

# Chapter 6

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## STATE OF THE ART KNOWLEDGE ON THE BUTTERFLIES OF NILGIRI BIOSPHERE RESERVE, INDIA

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## Introduction

India has a rich butterfly fauna comprising of 1501 species out of 16, 823 species recorded from all over the world (Gaonkar, 1996). Of the various butterfly habitats found in India, the Western Ghats is one of the most diversified areas containing a wide variety of species due to the typical eco-climatic and geographic features. In the Western Ghats, maximum diversity is observed in the Nilgiri Biosphere Reserve (NBR) region. Of 330 species recorded from the Western Ghats, 316 species have been reported from the NBR.

## Review of studies on butterflies of India

Studies on Indian butterflies were initiated by Fabricius and Cramer as early as 1775. Faunistic explorations by subsequent workers like Horsfield (1828-29), Moore (1881), Marshall and de Niceville (1883), de Niceville (1886, 1890), Moore and Swinhoe (1890-1913), Bingham (1905), Bell (1909-1927), Ormiston (1924), Evans (1932) and Yates (1935, 1946) have contributed much to our knowledge of these insects

During 1939 to 1947, Talbot published two volumes on butterflies in the Fauna of British India series viz., Butterflies, Vol. I and Vol. II, respectively (Talbot, 1939, 1947). The 1st volume contained descriptions of 199 species belonging to Papilionidae (94 spp.) and Pieridae (105 spp.). Among papilionids, 18 species were from peninsular India with 5 species specifically recorded as from the Nilgiris. In the case of Pieridae, 37 species were from peninsular India which contained a species - *Pieris canidia canis* Evans - specifically recorded from the Nilgiris. The volume II covered the families Danaidae, Satyridae, Amathusiidae and Acraeidae (all are now included under Nymphalidae). It contained descriptions of 38 species of Danaidae (9 species from peninsular India with one species, ie., *Danaus nilgiriensis* (Moore) from the Nilgiris); 186 species of Satyridae (28 species from peninsular India with 7 species from the Nilgiris); 26 species of Amathusiidae (2 species from peninsular India) as well as 2 species of Acraeidae (1 species from peninsular India). "Butterflies of the Indian Region", published by Wynter-Blyth (1957) contained a detailed account of the ecology and

**Table 1. Number of butterflies specifically recorded from south India and the Nilgiris.**

Family	No. of butterflies recorded	
	S. India	Nilgiris
Danaidae	11	1
Satyridae	23	6
Amathusiidae	2	0
Nymphalidae	47	12
Erycinidae	3	0
Lycaenidae	88	20
Papilionidae	19	4
Pieridae	29	3
Hesperiidae	51	19
<b>Total</b>	<b>273</b>	<b>65</b>



biology of Indian butterflies with good coverage for species from the W. Ghats (Table 1). Recently, Gunathilagaraj *et al.* (1998) have produced a book on the butterflies of south India.

### Butterflies of NBR

The most comprehensive study of butterflies of the Nilgiri hills was by Larsen (1987,1988) wherein he listed 299 species (indicating the endemic species) belonging to Papilionidae (19 endemic species), Pieridae (30 endemic species), Lycaenidae (91 endemic species), Nymphalidae (89 endemic species) and Hesperidae (70 endemic species). He also updated the ecological data on various species based on his own observations. Gaonkar (1996), in his study on the butterflies of W. Ghats, consolidated available information listing 17 additional species from the Kerala, Tamil Nadu and Karnataka regions of the W.Ghats (Table 2).

**Table 2. Butterflies of the Indian Region : W. Ghats and NBR**

Families	No. of species recorded		
	Indian Region	W. Ghats	NBR
Papilionidae	107	19	19
Pieridae	109	33	30 (+1)
Nymphalidae	521	96	89 (+5)
Lycaenidae	443	101	91 (+8)
Hesperidae	321	81	70 (+3)
Total	1501	330	299 (+17)

\*Numbers in brackets are the additional species recorded by Gaonkar(1996) which were not included in Larsen (1987-88).

A list of butterflies added by Gaonkar (1996) is given in Table 3. In this work, he gave complete details of 330 species belonging to 166 genera present in this area. Based on their distribution and host plant association, he also recognized three biogeographical zones for the W. Ghats fauna. Of the three zones, the NBR, which formed the southern and central region, was found to sustain maximum number of species including several endemics. The occurrence of such large number of endemic species was found to be correlated with the high endemism shown by the flora of this region.

Table. 3. List of additional butterflies (Gaonkar, 1996) recorded from Kerala, Tamil Nadu and Karnataka parts of W. Ghats that are not covered by Larsen (1987-88).



Family	Species
Pieridae	<i>Eurema nilgiriensis</i>
Nymphalidae	<i>Parantirhoea marshalli</i>
	<i>Mycalesis oculus</i>
	<i>Ypthima ypthimoides</i>
	<i>Phalanta alcippe</i>
	<i>Pantoporia sandaka</i>
Lycaenidae	<i>Logania distanti</i>
	<i>Tarucus indica</i>
	<i>Azonus uranus</i>
	<i>Udara singalensis</i>
	<i>Catochrysops panormus</i>
	<i>Arhopala bazaloides</i>
	<i>Arhopala atrax</i>
<i>Apharitis lilacinus</i>	
Hesperiidae	<i>Aeromachus pygmaeus</i>
	<i>Hyarotis microsticta</i>
	<i>Erionota thrax</i>

*Endemic and protected species*

The conservation value of any region depends on the extent of endemic and protected species present. From the NBR region, 48 endemic butterflies have been recorded (Larsen 1987, 1988).

With regard to the protected species, 41 species of butterflies recorded from NBR have protected status under the Wildlife (Protection) Act, 1972 (Anon., 1990). This include 8 species belonging to Schedule I, 26 species in Schedule II and 7 species in Schedule IV.

### Lacunae in the existing information and proposed future course of action

Other than their aesthetic value, butterflies have important roles in the functioning of forest ecosystems. Because of their diversity, wide distribution, specificity to vegetation type, rapid response to perturbation, taxonomic tractability, statistically significant abundance and ease of sampling, they have been considered useful organisms to monitor environmental changes. The occurrence of a large number of rare and endangered species in the NBR indicates the prevailing specialised environmental conditions in this area that support these butterflies. Detailed studies on the bioecology of various species found in this region are necessary for adopting appropriate conservation strategies. Recently, some studies have been made on the habitat preferences of butterflies found in the Kerala part of W. Ghats (Mathew, 1990; Mathew



and Rahamathulla, 1993).

Since it is not possible to create existing ecological conditions elsewhere, studies involving both *in situ* and *ex situ* conservation also may be attempted. For this, species specific details covering biology, host plant preferences, ecological requirements etc., of various species need to be generated. For *ex situ* conservation, prioritisation of species based on the ecological significance, aesthetic value and rarity is essential. It is also necessary to standardise techniques for mass rearing rare species for reintroduction in conservation programmes. Establishment of a captive breeding laboratory is essential for this purpose and KFRI has recently developed sufficient expertise in this area through assistance received from the Ministry of Environment and Forests, New Delhi. Creating public awareness for species conservation is all the more important for the success of such activities. A butterfly garden meant for *in situ* conservation and environmental education along with a captive breeding facility for helping in *ex situ* conservation programmes established at Peechi, have been found to be very successful and continued assistance for such activities is required.

## References

- Anonymous. 1990. The Indian Wildlife Act (Protection), 1972. Nataraj Publishers, Dehra Dun, 86 pp.
- Bell, T.R. 1909-1927. The common butterflies of the plains of India. J. Bombay Nat. Hist. Soc. Vols. 19-31, 1000 pp.
- Bingham, C.T. 1905. Butterflies Vol. II. Fauna of British India. 480 pp. London.
- Evans, W.H. 1932. The identification of Indian butterflies. Revised 2<sup>nd</sup> Ed., Bombay Natural History Society. 464 pp.
- Gaonkar, H. 1996. Butterflies of the Western Ghats, India, including Sri Lanka: A biodiversity assessment of a threatened mountain system. 51 pp.
- Gunathilagaraj, K., Perumal, T.N.A., Jayaram, K. and Ganesh Kumar, M. 1988. Some South Indian Butterflies, 274 pp. Nilgiri Wildlife and Environment Association, Nilgiris.
- Horsfield, T. 1828-29. A descriptive catalogue of the lepidopterous insects contained in the Museum of the Honourable East India Company, London. Part I, 80 pp. Part II, 81-144 pp.
- Larsen, T.B. 1987. The butterflies of the Nilgiri mountains of Southern India (Lepidoptera : Rhopalocera). *J. Bombay nat. Hist. Soc.* 84(1): 26-54; 84(2): 291-316; 84(3): 560-584.
- Larsen, T.B. 1988. The butterflies of the Nilgiri mountains of Southern India (Lepidoptera : Rhopalocera). *J. Bombay nat. Hist. Soc.* 85(1):26-43.
- Marshall, G.F.L. and de Niceville, L. 1883. Butterflies of India, Burmah and Ceylon.



- Vol. I, Repr.1979, New Delhi, 327 pp.
- Mathew, G. 1990. Studies on the Lepidopteran fauna. In: Ecological studies and long term monitoring of biological processes in the Silent Valley National Park. Report submitted to the Ministry of Environment, govt. of India, Kerala Forest Research Institute, 239. pp.
- Mathew, G., Rugmini, P. & Sudheendrakumar, V.V. 1998. Insect biodiversity in disturbed and undisturbed forests in the Kerala part of Western Ghats. KFRI Research Report No. 135. 113 pp.
- Mathew, G. and Rahamathulla, V.K. 1993. Studies on the butterflies of the Silent Valley National Park, Kerala, India, *Entomon*, 18(3&4): 185-192.
- Moore, F and Swinhoe, C. 1890-1913. *Lepidoptera Indica*. Vol. 1-10.
- Moore, F. 1881. *Lepidoptera of Ceylon*. Vol. I, 190 pp, London.
- Niceville, L. de. 1890. The butterflies of India, Burmah and Ceylon. Vol. 3. Repr. 1979, New Delhi, 503 pp.
- Niceville, L. de. 1886. Butterflies of India, Burmah and Ceylon. Vol.2. Repr. 1979, New Delhi, 332 pp.
- Ormiston, W. 1924. *The Butterflies of Ceylon*. Colombo.
- Talbot, G. 1939. *The Fauna of British India including Ceylon and Burma - Butterflies*, Vol. I (Repr. 1975). Today and Tomorrow's Printers and Publishers, New Delhi, 600pp.
- Talbot, G. 1947. *The Fauna of British India including Ceylon and Burma - Butterflies* Vol. II. (Repr. 1975). Today and Tomorrow's Printers and Publishers, New Delhi, 506 pp.
- Wynter-Blyth, M.A. 1957. *Butterflies of the Indian Region*, BNHS, Bombay, 523 pp.
- Yates, J.A. 1935. Butterflies of the Nilgiri District. *J. Bombay nat. Hist. Soc.* 38: 330-40.
- Yates, J.A. 1946. The butterflies of the Nilgiris – a supplementary note. *J. Bombay nat. Hist. Soc.* 46: 197-198.

