



Some notes on the butterflies (Lepidoptera: Papilionoidea) of Tantirimale Archaeological Site, Anuradhapura District, Sri Lanka

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Sri Lanka is an island situated between 05°54'-09°52'N & 79°39'-81°53'E. The Western Ghats and Sri Lanka comprise one of the biodiversity hotspot of the world (Meegaskumbura et al. 2002; Bossuyt et al. 2004). The total extent of natural forests in Sri Lanka constitutes over 12% of the total land area (Tan 2005). The natural forests in the island are rapidly diminishing as a result of the expansion of settlements and agricultural land, leading to adverse impacts on the rich biodiversity (Senanayake et al. 1977; Bambaradeniya et al. 2003).

Butterflies comprise a group of charismatic insects in Sri Lanka, which forms a major component of the island's biodiversity. The total number of butterfly species recorded from Sri Lanka is 243, of which 20 species are endemic to the island (Woodhouse 1952; D' Abrera 1998; van der Poorten 2005; Perera & Bambaradeniya 2006). The butterfly fauna of the study area has not been studied previously. The main objective of the present study was to conduct a brief survey so as to achieve an understanding of the butterfly species diversity at Tantirimale Archaeological Forest Area (TAF).

Study area

Tantirimale Archaeological Forest Area (120 ha.) is situated in the Maha Villachchiya Divisional Secretariat in

Anuradhapura district at 8°40'13"N & 80°17'27"E. Tantirimale is 24km from Anuradhapura and can be reached via Anuradhapura Maha Villachchiya road from Sri Vimalagnana Mawatha junction or Meadavachchiya - Mannar road from Gajasinghapura junction. The boundaries of Tantirimale are demarcated by Malwathu Oya in the north and east, Wilpattu National Park in the west and by Maha Villachchiya main road in the south (Chandarathana 2004).

The forest in the area is classified as "Tropical dry mixed evergreen forest" dominated by *Manilkara* sp. (Gunathilake & Gunathilake 1990). Geographically it is in the dry zone of Sri Lanka.

Archaeological findings from this location have revealed that this area has been inhabited by humans in the pre-Buddhist era (about 2600 years ago). Therefore, it is one of the earliest human habitations of Sri Lanka.

Methods

The study duration was for nine days, from 9 July 2005 to 17 July 2005. Observations were carried out for 7.5hrs per day, consisting of three sessions of 2.5hr each: 0600 to 0830, 1100 to 1330 and 1530 to 1800 hrs. The weather was dry and sunny with no precipitation or cloudy sky. Identification of butterflies was done in the field. Smaller butterflies were caught using a hand net and after identification, the specimens were released to the same habitat from where they were caught. Some small butterflies were closely observed after placing them in a clear glass bottle. They were identified using Banks & Banks (1985), D' Abrera (1998) and Woodhouse (1952) field guides. Plants were identified with Ashton et al. (1997) and plant nomenclature is based on Senaratna (2001).

Results & Discussion

Based on the species composition and structure of plants, three major vegetation types were identified in the study area. These comprise (a) Dry zone forest area, (b) Rock outcrop forests with water pools and (c) scrublands (Fig. 1). Twelve species of butterflies were found in the forest area, seven species in the Rock outcrop area and 28 species in the scrubland (Table 2).

The forest canopy is relatively high rising to 20m. The overall canopy cover is about 60%. The dry zone evergreen forest is mainly composed of Palu *Manilkara hexandra*, Weera *Drypetes septari*, Kon *Schleichera oleosa* and a few Ebony *Diospyros ebenum* trees. It is a small, disturbed forest patch with a lot of scattered scrubland plant species. The average height of the scrubland vegetation is about 2.5m and is dominated by Korakaha *Memecylon umbellatum*, Eraminiya *Zizyphus oenopila*, Diwul *Limonia acidissima*, Kohomba *Azadirachta indica*, Ehala *Cassia fistula*, Kala Wel *Derris trifoliata* and Myla *Bauhinia racemosa*.

In the rock outcrop forests the number of plant species is low. Nabada *Vitex leucozyllon*, Kumbuk *Terminalia arjuna* and Timbiri *Diospyros malabarica* grow near water. Some *Acacia* plants were observed in the rock outcrop forests.

During the study period 37 butterfly species belonging to four families were observed. We could not record a single endemic butterfly during the field survey. The highest diversity of butterflies was recorded in scrubland which was

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Table 1. Checklist of butterfly species observed at Tanthirimale Archaeological Forest Area

No.	Scientific name	English name	Habitat	Status
Order: Lepidoptera				
Family: Papilionidae				
1.	<i>Pachliopta hector</i> Linnaeus, 1758	Crimson Rose	F, R	
2.	<i>Papilio polymnestor</i> Cramer, 1775	Blue Mormon	F, R	
3.	<i>Papilio polytes</i> Linnaeus, 1758	Common Mormon	S	
4.	<i>Papilio crino</i> Fabricius, 1792	Banded Peacock	S	
5.	<i>Papilio demoleus</i> Linnaeus, 1758	Lime Butterfly	S	
6.	<i>Graphium agamemnon</i> Linnaeus, 1758	Tailed Jay	F, R	
Family: Pieridae				
7.	<i>Appias paulina</i> Cramer, 1777	Lesser Albatross	F	TR
8.	<i>Ixias pyrene</i> Linnaeus, 1764	Yellow Orange Tip	S	
9.	<i>Catopsilia pyranthe</i> Linnaeus, 1758	Mottled Immigrant	S, R	
10.	<i>Catopsilia pomona</i> Fabricius, 1775	Lemon Migrant	F	
11.	<i>Pareronia ceylanica</i> Felder & Felder, 1865	Dark Wanderer	S	
12.	<i>Colotis amata</i> Fabricius, 1775	Small Salmon Arab	S	
13.	<i>Colotis danae</i> Fabricius, 1775	Crimson Tip	S	
14.	<i>Eurema hecabe</i> Linnaeus, 1764	Common Grass Yellow	S, F	
Family: Nymphalidae				
15.	<i>Tirumala septentrionis</i> Butler, 1865	Dark Blue Tiger	S, R	
16.	<i>Danaus chrysippus</i> Linnaeus, 1758	Plain Tiger	S, R	
17.	<i>Danaus genutia</i> Cramer, 1779	Common Tiger	S	
18.	<i>Euploea core</i> Cramer, 1779	Common Crow	F, S	
19.	<i>Phalanta phalantha</i> Drury, 1773	Leopard	S	
20.	<i>Cethosia nietneri</i> Felder & Felder, 1867	Ceylon Lacewing	F	
21.	<i>Junonia atlites</i> Linnaeus, 1758	Grey Pansy	R	
22.	<i>Junonia lemonias</i> Linnaeus, 1758	Lemon Pansy	S	
23.	<i>Junonia almana</i> Linnaeus, 1758	Peacock Pansy	S	
24.	<i>Junonia iphita</i> Cramer, 1779	Chocolate Soldier	S	
25.	<i>Hypolimnys misippus</i> Linnaeus, 1758	Danaid Eggfly	S	
26.	<i>Neptis hylas</i> Linnaeus, 1758	Common Sailer	S	
27.	<i>Neptis jumbah</i> Moore, 1857	Chestnut Streaked Sailer	S	
28.	<i>Acraea violae</i> Fabricius, 1807	Tawny Coster	S	
29.	<i>Melanitis phedima</i> Cramer, 1780	Dark Evening Brown	F	
30.	<i>Orsotriaena medus</i> Fabricius, 1775	Nigger	S, F	
31.	<i>Nissanga patnia</i> Moore, 1857	Gladeye Bush-brown	S, F	
32.	<i>Ypthima ceylonica</i> Hewitson, 1864	White Four-Ring	S, F	
Family: Lycaenidae				
33.	<i>Jamides celeno</i> Cramer, 1775	Common Cerulean	S	
34.	<i>Castalius rosimon</i> Fabricius, 1775	Common Pierrot	S	
35.	<i>Zizina otis</i> Fabricius, 1787	Lesser Grass Blue	S	
36.	<i>Neopithecops zalmora</i> Butler, 1865	Quaker	S	TR
37.	<i>Tajuria cippus</i> Fabricius, 1798	Peacock Royal	S	

F - Forest; S - Scrubland; R - Rock outcrop; TR - Threatened species (IUCN SL, 2000).

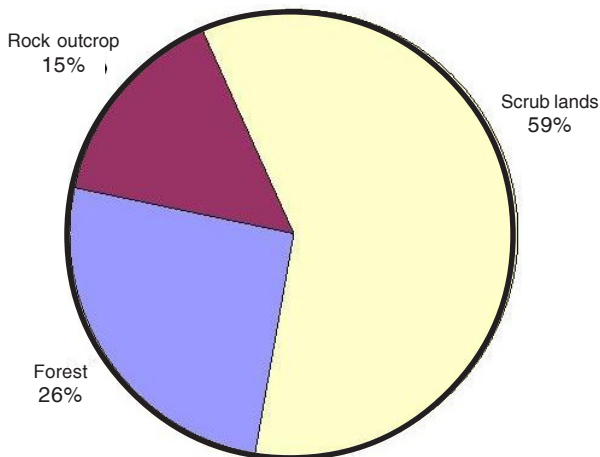


Figure 1. Species composition of Butterflies with habitats in Tanthirimale Archaeological Forest Area



Image 1. Common Sailor *Neptis hylas*



Image 2. Common Cerulean *Jamides celeno*



Image 3. Common Tiger *Danaus genutia*



Image 4. Mottled Emigrant *Catopsilia pyranthe*



Image 5. Common Pierrot *Castalius rosimon*

Table 2. Number of species of butterflies in different habitat types in TAF area.

Habitat Type	No. of Species	No. of Families
Forest	12 (32.43%)	3 (75 %)
Rock outcrop	7 (18.91%)	3 (75 %)
Scrub lands	28 (75.67%)	4 (100 %)

rich with a variety of flowers and larval food plants while the lowest diversity was recorded in Rock Outcrop. The family with the largest number of species was Nymphalidae (18 species), followed by Pieridae (8 species), Papilionidae (6 species) and Lycaenidae (5 species).

Common Sailer *Neptis hylas* (Image 1), Dark Blue Tiger *Tirumala septentrionis*, Plain Tiger *Danaus chrysippus*, Common Tiger *Danaus genutia* (Image 3), Tawny Coster *Acraea violae*, Common Pierrot *Castalius rosimon* (Image 5), Lesser Grass Blue *Zizina otis*, Common Cerulean *Jamides celeno* (Image 2) were dominant in scrublands. Lesser Albatross *Appias paulina* and Common Indian Crow *Euploea core* were mostly observed in forest areas. Common Grass Yellow *Eurema hecabe* and White Four-Ring *Ypthima ceylonica* were observed in both forest and scrublands (Table 1).

Among the butterflies, Lesser Albatross *Appias paulina* and Quaker *Neopithicops zalmora* are nationally threatened taxa as notified by IUCN Sri Lanka (IUCN SL 2000).

Isolation is the main threat to the Tantirimale forest, close to Vilpattu National Park is surrounded by paddy fields, villages and roads. During May and June (Vesak and Poson) anthropogenic environmental disturbance occurs more due to pilgrims in addition to other factors like fire, logging, gem mining, pesticide application and road kills. Alien invasive species *Gandapana Lantana camara* grows in the scrubland area. Enhanced conservation efforts are required for TAF.

References

Ashton, M., C.V.S. Gunatileke, N. De Zoysa, M.D. Dassanayake, N. Gunatileke & S. Wijesundara (1997). *A field guide to the Common*

Trees and Shrubs of Sri Lanka. Wildlife Heritage Trust of Sri Lanka, Colombo.

- Bambaradeniya, C.N.B., M.S.J.Perera, W.P.N. Perera, L.J.M. Wickramasinghe, L.D.C.B. Kekulandala, V.A.P. Samarawickrema, R.H.S.S. Fernando & V.A.M.P.K. Samarawickrema (2003). Composition of faunal species in the Sinharaja World Heritage Site in Sri Lanka. *Sri Lanka Forester* 26: 21-40.
- Banks, J. & J. Banks (1985). *A selection of the butterflies of Sri Lanka*. Lake House Investments Ltd., Sri Lanka.
- Bossuyt, F., M. Meegaskumbura, N. Beenaerts, D.J. Gower, R. Pethiyagoda, K. Roelants, A. Mannaert, M. Wilkinson, M.M. Bahir, K. Manamendra-arachchi, P.K.L. Ng, C.J. Schneider, O.V. Oommen & M.C. Milinkovitch (2004). Local endemism within the Western Ghats - Sri Lanka Biodiversity Hotspot. *Science* 306: 479-481.
- Chandarathana, T.T. (2004). *Tanthirimale*. Tanthirimale Raja Maha Viharaya, Sri Lanka.
- D'Abbrera, B. (1998). *The Butterflies of Ceylon*, Wildlife Heritage Trust of Sri Lanka, Sri Lanka.
- Gunatilake, I.A.U.N. & C.V.S. Gunatilake (1990). Distribution of Floristic Richness and its Conservation in Sri Lanka. *Conservation Biology* 4(1): 21-31.
- IUCN SL (2000). *The 1999 List of threatened fauna flora of Sri Lanka*. Colombo. IUCN, Sri Lanka.
- Meegaskumbura, M., F. Bossuyt, R. Pethiyagoda, K. Manamendra-Arachchi, M.M. Bahir, M.C. Milinkovitch & C.J. Schneider (2002). Sri Lanka: an Amphibian hotspot. *Science* 298: 379.
- Perera, W.P.N. & C.N.B. Bambaradeniya (2006). Species richness, Distribution and Conservation Status of Butterflies in Sri Lanka, pp. 53-64. In: Bambaradeniya, C.N.B. (eds.) *Fauna of Sri Lanka: Status of Taxonomy, Research and Conservation*, IUCN Sri Lanka.
- Senanayake, F.R., M. Soule & J.W. Senner (1977). Habitat values and endemism in the vanishing rainforest of Sri Lanka. *Nature* 265: 351-354.
- Senaratna, L.M. (2001). *A Check List of the Flowering Plants of Sri Lanka*, National Science Foundation, Sri Lanka.
- Tan, B.C. (2005). New species records of Sri Lanka Mosses. *The Raffles Bulletin of Zoology*, Supplement No. 12: 5-8.
- van der Poorten, G. (2005). Butterflies and other Insects of Sri Lanka. <http://www.srilankaninsects.net/index.htm>
- Woodhouse, L.G.O. (1952). *The Butterfly Fauna of Ceylon*. Ceylon Government Press, Colombo.

