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A Study on nectar host plants of Butterflies of Pachamalai Hills of Eastern Ghats in Tamilnadu, India.

V. Anand Gideon*¹, K. Cyril Rufus² and P. Vivekraj¹

¹Department of Botany, Bishop Heber College, Tiruchirappalli - 620017, India

²Fieldwork Environs, 12, Kongurar Layout, Udumalpet – 642126, India

ABSTRACT

The present investigation has been carried out to enumerate the butterfly diversity greatly depends on the availability of host plants. The study has been carried from August 2014 – July 2015 in Pachamalai hills of Eastern Ghats in Tamilnadu. In the ecological site that has been observed in the native plant species of the Eastern Ghats especially in *Vitex negundo*, *Ehretia pubescens*, *Premna serratifolia* and *Pavetta indica* as well as observed in *Prosopis juliflora*, an invasive plant species. This study reveals that some of the native nectar host plants play a vital role in attracting butterflies and increasing the diversity of butterflies. *Vitex negundo*, which acts as a primary nectar host plant for a variety of species is studied in detail.

Keywords: Pachamalai hills, Butterfly, Host plants, *Prosopis juliflora*, *Vitex negundo*.

INTRODUCTION

The butterfly fauna of the southern part of the Indian peninsula is very rich and diverse compared to other parts of the peninsula due to the availability of diverse habitats, a wide range of altitudinal gradients and associated microclimatic regimes. Butterflies are one of the most interesting and fascinating insect groups. Butterflies widely appreciated for their aesthetic value are important as ecological indicators [1]. One fifth of the world's total butterflies are available in India [2]. The butterflies are selective in their choice of flowers and plants they visit. There is an intimate association between butterflies and plants [3]. The rate of visit of butterflies to a flower depends on color, odor and the shape of the flower. Butterflies and their caterpillars are dependent on specific host plants for foliage, nectar and pollen as their food. Thus, butterfly diversity indirectly reflects overall plant diversity, especially that of herbs and shrubs, in the given area. Change in land use pattern leads to landscape changes that can reflect change in butterfly diversity and distribution [4]. Adult butterflies are considered opportunistic foragers that visit a wide variety of available flowers [5]. In studies conducted to date, observed species have shown distinct flower preferences that can differ between them [6]. Under any circumstances nectar resources for adults are likely important limiting factors [7] and may shape community patterns [8]. Furthermore, it was hypothesized that butterflies are randomly distributed on native nectar host plant species.

STUDY AREA:

The present study was undertaken in the Pachamalai Hills, located between the districts of Tiruchirappalli and Salem, Tamil Nadu, India. The hill is situated 1500 to 3000 feet above mean sea level and lies between 11° 28' N latitude and 78° 31' E longitude with an area covered with 14,122 sq. km. The mean annual rainfall ranges between

110 -150 cm's and maximum amount of rainfall was received during northeast monsoon. Pachamalai hill is a part of Eastern Ghats in Tamil Nadu and it contain 59.5 percent forest area and 40.5 percent cultivation land with human settlement.

MATERIALS AND METHODS

A random sampling was carried out with special reference to the nectar host plants. The butterflies were observed during sunny day hours (08:00-16:00 hr.). In additional several field trips were carried out from August 2014 – July 2015 in the study area. The species of butterflies were identified by referring with the help of the book of Indian Butterflies, Butterflies of Peninsular India and checklists [9, 10, 11]. Nine common species were continuously monitored for the feeding behavior on *Vitex negundo*. Numbers of visits of each species at various timings was recorded and mean values were taken.

OBSERVATIONS:

The butterfly diversity of the area is populated with 71 species. Out of the 71 species, 31 species (Table 1) were sighted sipping out nectar from the flowers of *Vitex negundo*, *Ehretia pubescens*, *Premna serratifolia* and *Pavetta indica*. Although plant species like the *Ehretia pubescens* and *Premna serratifolia* share the stage of being the primary nectar host plants, *Vitex negundo* topped the nectar host plant list with 28 butterfly species (Figure 1). The site was surveyed and found to have 1121 *Vitex negundo*, 705 *Ehretia pubescens* and 409 *Premna serratifolia* plants. Whereas *Tridax procumbens*, *Heliotropium indicum* and *Turnera subulata* acted as primary nectar host plants before the ecological interactions was started.

RESULTS AND DISCUSSION

Table.1: List of butterfly diversity which dependent upon the nectar host plants

S.No.	Species	<i>Vitex negundo</i>	<i>Ehretia pubescens</i>	<i>Premna serratifolia</i>
Family: Papilionidae				
1	Common Jay <i>Graphium doson</i> C. & R. Felder, 1864	X	X	X
2	Tailed Jay <i>Graphium Agamemnon</i> Linnaeus, 1758	X	-	-
3	Common Mormon <i>Papilio polytes</i> Linnaeus, 1758	X	-	-
4	Lime Butterfly <i>Papilio demoleus</i> Linnaeus, 1758	X	X	X
5	Common Rose <i>Pachliopta aristolochiae</i> Fabricius, 1775	X	X	-
6	Crimson Rose <i>Pachliopta hector</i> Linnaeus, 1758	X	X	-
7	Spot Swordtail <i>Pathysa nomius</i> Esper, 1798	X	-	-
Family : Pieridae				
8	Pioneer <i>Anaphaeis aurota</i> Fabricius, 1793	-	-	X
9	Common Gull <i>Cepora nerissa</i> Fabricius, 1775	X	X	X
10	Common Jezebel <i>Delias eucharis</i> Drury, 1773	X	-	-
11	Small Salmon Arab <i>Colotis amata</i> Fabricius, 1775	-	-	X
12	Common Wanderer <i>Pareronia valeria</i> Cramer, 1776	X	X	-
13	Common Emigrant <i>Catopsilia Pomona</i> Fabricius, 1775	X	X	X
14	Mottled Emigrant <i>Catopsilia pyranthe</i> Latreille, 1758	X	X	X
Family : Nymphalidae				
15	Blue Tiger <i>Tirumala limniace</i> Cramer, 1775	X	X	
16	Plain Tiger <i>Danaus chrysippus</i> Linnaeus, 1758	X	X	X
17	Striped Tiger <i>Danaus genutia</i> Cramer, 1779	X	X	X
18	Common Indian Crow <i>Euploea core</i> Cramer, 1780	X	X	
19	Common Leopard <i>Phalanta phalantha</i> Drury, 1773	X	-	X
20	Tawny Coster <i>Acraea terpsicore</i> Linnaeus, 1758	X	-	X
21	Angled Castor <i>Ariadne ariadne</i> Linnaeus, 1763	X	-	X
22	Common Castor <i>Ariadne merione</i> Cramer, 1777	X	-	X
23	Peacock Pansy <i>Junonia almana</i> Linnaeus, 1758	X	-	X
24	Yellow Pansy <i>Junonia hierta</i> Fabricius, 1798	X	-	X
25	Lemon Pansy <i>Junonia lemonias</i> Linnaeus, 1758	X	-	X
26	Blue Pansy <i>Junonia orithya</i> Linnaeus, 1758	X	-	X
27	Great Eggfly <i>Hypolimnas bolina</i> Linnaeus, 1758	-	X	X
28	Danaid Eggfly <i>Hypolimnas misippus</i> Linnaeus, 1764	X	X	X
Family : Lycaenidae				
29	Pale Grass Blue <i>Pseudozizeeria maha</i> Kollar, 1848	X	-	X
30	Plains Cupid <i>Chilades pandava</i> Horsfield, 1829	X	-	X
Family : Hesperidae				
31	Rice Swift <i>Borbo cinnara</i> Wallace, 1866	X	X	X

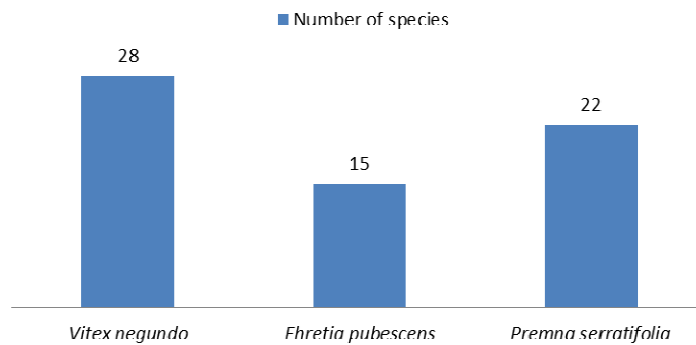
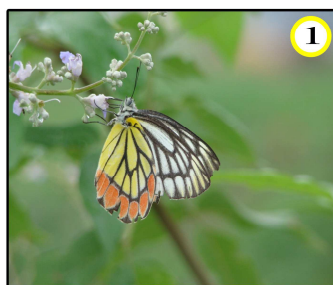
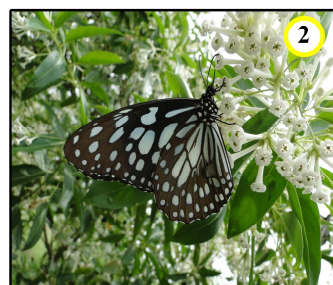


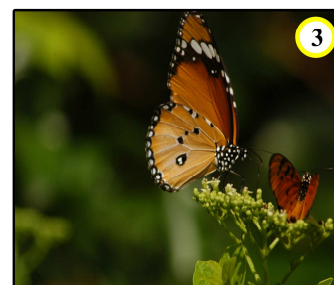
Figure 1: Number of species visiting different plant species



(1) *Delias eucharis* feeding on *Vitex negundo*

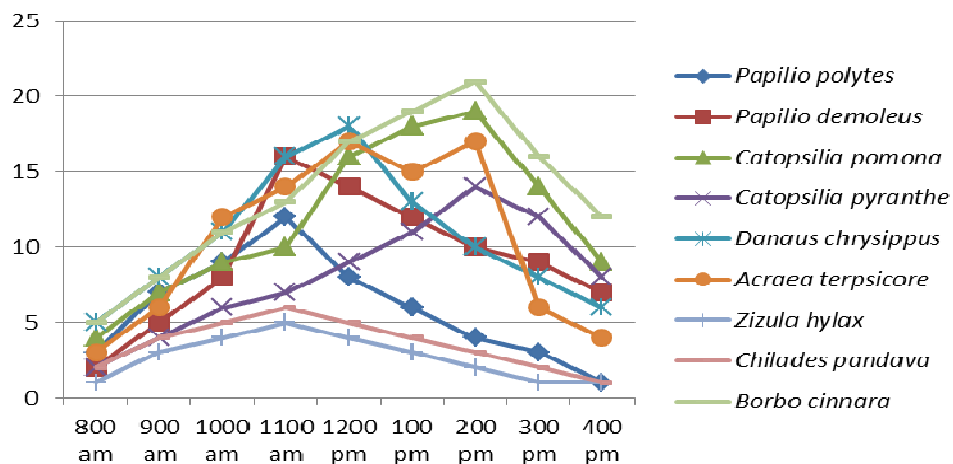


(2) *Tirumala limniace* feeding on *Ehretia pubescens*



(3) *Danaus chrysippus* and *Acraea terpsicore* feeding on *Premna serratifolia*

Figure 2: Species showing different visitation timings



As cited earlier, the study area has undergone a great change in the land use and plant diversity, hence it will surely reflect on the butterfly diversity and abundance too. The overview of native vegetation and suitable host plants has shown a tremendous change in the species diversity of the study area. Before the start of the ecological interactions, only 47 species of butterflies were observed in the study area. It is evident that the introduction of plants like *Vitex negundo*, *Ehretia pubescens*, *Premna serratifolia* and *Pavetta indica* has shown a tremendous change in the nectar host plant preference of butterflies and has played a major role in attracting butterflies that directly reflects in the increase in the diversity of butterflies to 71 species. Nine species namely: *Papilio polytes*, *Papilio demoleus*, *Catopsilia pomona*, *Catopsilia pyranthe*, *Danaus chrysippus*, *Acraea violae*, *Zizula hylax*, *Chilades pandava* and *Borbo cinnara* were continuously monitored for visitations. It was noted that for this particular plant, species of

same family showed peak visits during a particular timing which is related to the temperature. The sequence was found to be early noon - Papilionidae and Lycaenidae; mid noon - Nymphalidae; late noon – Pieridae and Hesperidae (Figure 2). Although, only 9 species were closely watched even the rest showed the same visiting patterns for their respective families. From, this study it is evident that all species that are dependent on this plant as the nectar host plant show the same visiting patterns.

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