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Documentation of varieties of butterflies in Tiptur taluk, Karnataka

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Abstract
The diversity of butterflies of Tiptur taluk of Karnataka was studied from June to December 2021. During this study, a total of 47 species under 34 genera of 05 families were recorded. Of these family Nymphalidae accounted for 22 species of the total species count followed by Pieriidae (11 species), Papilionidae (8 species), Lycaenidae and Hesperidae with 8 species each. Different types of diversity indices were calculated. In this study, land use pattern of butterflies is discussed in detail.

Keywords: Butterflies, diversity indices, variety, Tiptur taluk, hand net

Introduction

Butterflies are a susceptible that is strongly affected by environmental fluctuations and forest structure (Pollard, 1991) [27]. Butterflies are the beautiful and colorful creatures in the world and have high aesthetic value. They play a role in the food chain (Aneesh *et al.*, 2013) [2]. They are important morphologically and therefore, sociologically, and have different cultural meanings for some groups of people (Alma *et al.*, 2015) [1]. Butterflies contribute to ecosystems by recycling nutrients, which are important for crops (Schmidt and Roland, 2006) [32]. Their larvae feed on Agrestares while, excreting feces, providing the plants with the nutrients they need (Marchiori and Romanowski, 2006) [21]. Most of them are strictly seasonal and prefer only certain habitats (Kunte, 1997; Sayeswara, 2018) [16, 31]. Adult butterflies pollinate many local plants.

Because butterflies and their caterpillars depend on specific host plants for food, butterfly diversity indirectly reflects the overall plant diversity of a region, especially the diversity of shrubs and herbs (Padye *et al.*, 2006). To determine the impact of natural habitat changes on butterfly diversity and distribution, there is a need to study the community structure and dynamic grouping of butterflies in different parts of our region. Therefore, the present study was conducted to investigate the butterfly diversity of Tiptur taluk, Karnataka and prepare baseline data for future butterfly research.

Materials and Methods

Study area

Tiptur is a town in Southern Karnataka, India. It is the branch headquarters in Tumkur district of Karnataka. The capital Bangalore is 140 km away. The town of Tiptur is known for its coconut plantations. Tiptur is said to have been taken from the local language Kannada, 'Tipatala', which means 'copra'. The name probably derives from the desiccated coconut industry around the town. Tiptur was surrounded on the west by Arsikere and Channarayapatna. From the East: Chikanayakana Hari, Gubbi, and Tuluvekere. Tiptur is located on National Highway 206 (now renamed National Highway 48) about 73 km (45 miles) west of Tumkur. It is located 140 km (87 miles) northwest of the state capital, Bangalore. It is located on the Bangalore-Mirage railway line. Tiptur's average elevation is 861 meters (2,825 Feet). Average temperatures was peak in summer and minimum in Winter.

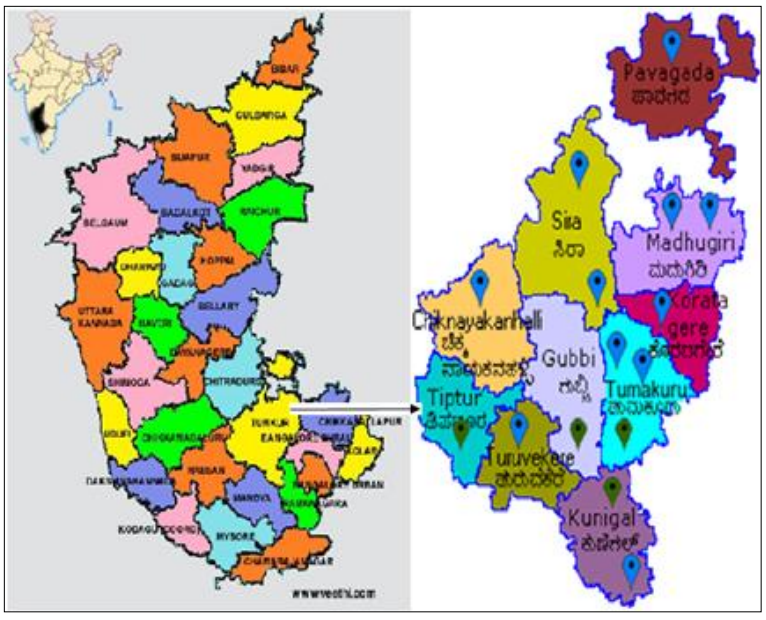

Fig 1: Study area map showing location of Tiptur taluk

Collection

Butterflies were collected since June to December 2021. Field observations were conducted every 7 days. The survey was conduct every Sunday from 10 am to 2 pm in the vicinity of agricultural lands, parks, houses, temples, gardens, markets and universities in Tiptur town. Observations were made using the pollard walk method and butterflies were counted. In addition, observation and illustration counting methods were also used when the weather was favourable (Kunte, 1997; Gupta *et al*., 2012; Kunte *et al*., 2012) [16, 8, 20]. Butterflies were identified, and immediately released at the capture site. They were difficult to identify in the field were collected using hand nets.

Identifications of butterflies

The characters used for recognition of butterflies are color and other factors. Identification was carried out according to Evans (1932) [6], Talbot (1947) [34], Remadevi *et al*., (2022) [28], Smith (2006) [33], Van dr Poel & Wangchuk (2007) [35] and internet references (www.ifoundbutterflies.org). After identification, the species were photographed. The whole survey includes keen observation and search for the butterflies in the study area such as the trees, bushes, herbs, flowering plants, and playing ground. Usual trees and plants with a high nectar-feeding were also documented in the study period.

Results and Discussion

The results is depicted in Table 1 to 2 and Figures 2 to 4. In this study, a sum of 47 species, 34 genera of 05 families were recorded. Of these Nymphalidae with 22 species of the total species count followed by Pieriidae (11 species), Papilionoidea (8 species), Lycaenidae and Hesperidae with 8 species each respectively.

Table 1: Family wise record of butterfly species in Tiptur taluk, Karnataka

Sl. No	**Family**	**Species**
1.	Papilionidae	*Graphium agamemnon*
		*Graphium doson**
		Pachliopta aristolochiae
		*Pachliopta hector**
		Papilio crino
		Papilio demoleus
		Papilio polytes
2.	Pieridae	*Belenois aurota*
		*Catopsilia pomona**
		*Catopsilia pyranthe**
		Cepora nerissa
		Delias eucharis
		*Eurema andersonii**
		*Eurema brigitta**
		Eurema blanda
		*Eurema hecabe**
		Ixias pyrene
		Leptosia nina
3.	Nymphalidae	*Acraeaterpsi core*
		Ariadne merione
		Danaus chrysippus
		Danaus genutia
		Elymniashy permnestra
		*Euploea core**
		Hypolimnas bolina
		Hypolimnas misippus
		Junonia almana
		Junonia hierta
		Junonia iphita
		Junonia lemonias
		*Letheeuropa**
		Libytheamyrrha
		*Melanitis leda**
		Melanitis zitenius
		Mycalesis anaxias
		Mycalesis subdita
		Neptis hylas
		Parantica aglea
		Symphaedranais
		Tirumala limniace
4.	Lycaenidae	*Chilades parrhasius*
		Jamedes celeno
		Pseudozizzeeria maha
	Hesperidae	*Gangara thyrsis*
5		*Matapa aria*
		Notocrypta curvifascia

Table 2: Diversity indices for Butterflies in Tiptur taluk

	Site 1	Site 2	Site 3	Site 4	Site 5
Shannon-Weiner index	1.45	1.3	1.5	1.62	1.38
Evenness index	0.97	0.95	0.98	0.81	0.89
Simpsons diversity index	0.85	0.82	0.78	0.87	0.84

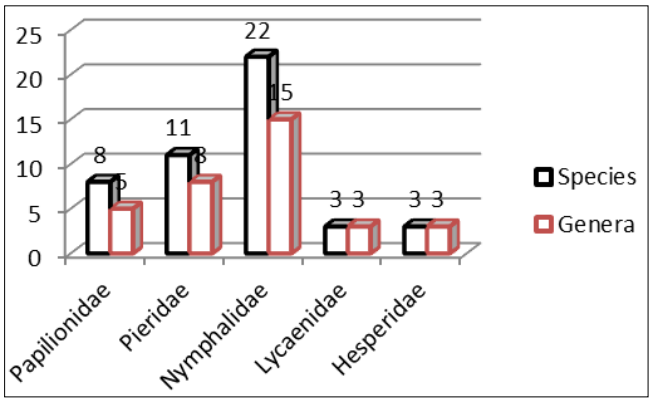

Fig 2: Total species and genera of Butterflies in each families

Chalapathi *et al* (2021) [4] recorded diversity of butterflies with 40 species belonging to 26 genera in Tumkur University Campus of which 13 species listed in Wildlife (Protection) Act 1972. The campus, harbours diverse vegetation that provide enough nectar plant species and as larval host plants. The butterflies in Karnataka has been studied by many researchers (Kathikeyan, 1999; Sayeswara, 2014; Dayananda, 2014; Nijavali, 2015; Naik and Mustak 2016; Remadevi *et al.*, 2018a,b; Mohandas and Ramadevi, 2019; Kumar *et al.*, 2004. 2007; Kunte 2006, 2017) [11, 30, 5, 23, 22, 13-12, 18-19].

Jeevan *et al.* (2013) [10] also recorded 52 species of butterflies at Mandagadde, Sivamogga, Karnataka. In their opinion, Nymphalidae were the most common species. Ankargi *et al.* (2014) studied butterflies varieties (31 species) at Ankarga village, Gulbarga district, Karnataka.

A total of 137 species belonging to 05 families have been recorded in the butterfly checklist in and around Mysore (www.mysorenature.org). Umapati *et al.* (2016) and Ugale *et al.* (2019) have recorded 36 and 48 butterflies from the Karnataka University campus, Dharwad.

from Karnataka University, Dharwad. Ugale *et al.* (2019) recognized butterflies at the Karnataka University campus and were able to demonstrate the presence of 48 species.

Harisha and Hosetti (2021) [9] recorded 115 species of butterflies at Kuvempu University, Karnataka. The Western Ghats are a biodiversity hotspot and habitat to many species of butterflies in diverse landscapes and era as worked out by many researchers (Gaonkar, 1996; Kunte, 2000b, 2008, 2011; Padhye *et al.*, 2012) [7, 17-14-15, 26].

Land use pattern

Of the total species, 47 species were recorded from Tiptur taluk, 20 species from the parks/garden, 10 species from agricultural land, 06 species were recorded from Colleges/Universities, 05 species in houses, 04 species from temples and 02 of which were found only in markets (Figure 3).

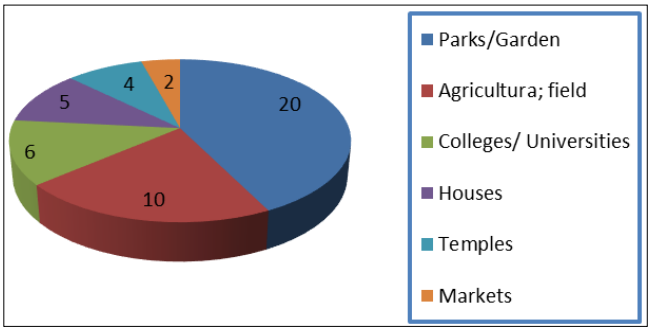

Fig 3: Species richness in different land use patterns

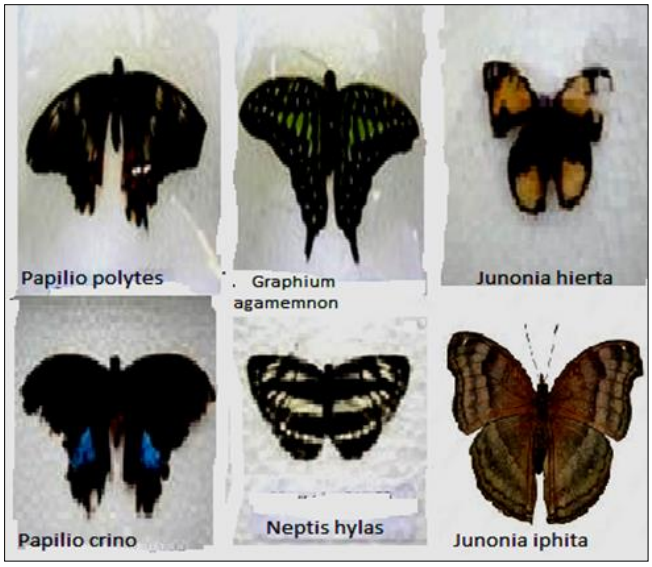

Fig 4: Butterflies of Tiptur taluk

Conclusion

In nut shell, 47 butterflies have been recorded in Tiptur taluk of Karnataka. The diversity of butterflies in the region is very high. Botanical gardens and natural vegetation are unique ecosystems are the main cause of butterfly richness and diversity. Butterfly populations vary significantly from one habitat to another. Protecting the habitats should be a top priority in any conservation program. Trials to be made to initiate butterfly conservation in the protected areas.

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