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Tropic Niche Specialization of *Butea monosperma* from Chandigarh

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Abstract
The tropic niche specialization entails how an organism responds to the sharing of available habit and habitat stuffs and possible competitors. The form and number of variables comprising the dimensions of an environmental niche vary from one species to another. The relative importance of particular environmental variables for a species may vary according to the geographical and biotic perspectives. The tropic niche was studied with respect to *Butea monosperma* (Lam.) commonly called as `Flame of forest` or `Parrot tree` or `Palas`. It belongs to the family Fabaceae and distributed throughout India. The comprehensive and extensive study was made to work out the tropic niche specialization of this plant in different location of the city beautiful-Chandigarh which is also the State flower of Chandigarh. The observations were made with respect to sixteen species belonging to insects and birds; reptile and mammal which are attracted to *Butea monosperma* on account of its rich source of nectar.

Keywords: *Butea monosperma*, Niche, Chandigarh, Hymenoptera, Avian diversity, Nectar

1. Introduction
Butea monosperma is inherent to the Indian subcontinent. It is a slow growing tree that reaches a height of 35 to 60 feet [1]. It has a crooked trunk and irregular branches. The leaves are 3-foliate and flowers are bright ochracious in colour. It is an exceptional flowering tree with blooms start appearing usually in the month of February and continues up to the third week of April and is rich source of nectar for nectar feeding birds and insects. When the tree is in full bloom, the flowers grow in number of clusters on branches devoid of leaf and the appearance of the tree is then such that it looks as it has been set a flame, hence, the name.
B. monosperma provides wood, fodder, gum, dye and medicine [2] which are widely applicable in Ayurveda, Unani and Homeopathic [3] and used as astringent, aphrodisiac, tonic and diuretics [4]. It is also a host to the lac insect, which produces natural lac [5]. Extensive studies were carried out [6] on *Butea* which reveal the occurrence of *viz*; scale insects *Aulacaspis sp*., (Hemiptera: Diaspididae), *Pseudaulacaspis cockerelli* (Cooley) (Hemiptera: Diaspididae), sweet potato bug, *Physomerus grossipes* Fabricius (Hemiptera: Coreidae) as well as Curculionids *viz*., *Myllocerus discolor* Boheman (Coleoptera: Curculionidae); *Amblyrrhinus poricollis* Marshall (Coleoptera: Curculionidae) and *Peltotrachelus* sp. (Coleoptera: Curculionidae) were recorded for the first time from India on *Butea monosperma*. Avian biodiversity with respect to thirty one species was studied in Nagpur area on *B. monosperma* [7]. The main objective of the present study was to understand specific co-relation with respect to tropic niche and faunistic profile on *Butea monosperma.*

1.1 Study Areas
The extensive field surveys were made during February to April, 2015 in different parts of the city Chandigarh. As many as seven sites (Figure 1) were identified for in length study of tropic niche specialization of *B. monosperma*.

2. Material and Methods
Seven observation sites were selected across the city. Detailed in-depth studies were made thrice a week between 6:30 a.m. to 6:30 p.m. The observation site 1 (outside to Suhkna lake Sanctuary), site2 (Sector-3), site 3 (Kisangarh Golf Range ground), site 4 (Panchkula Railway over Bridge,) site 5 (Industrial Area, Phase II), site 6 (Sector-31) and site 7 (Sector-47). Direct observations were made with the help of Nikon Camera with configuration of DX AF-S

NIKKOR 18-55mm. occasionally, observations were also recorded with the help of Sony Xperia mobile Z1 and Sony camera 14.1 Mega Pixels. Extensive observations were recorded with respect to types of relevant species visited and feeding on *B. monosperma* and specific co-relation with respect to tropic niche.

Fig 1: Location map

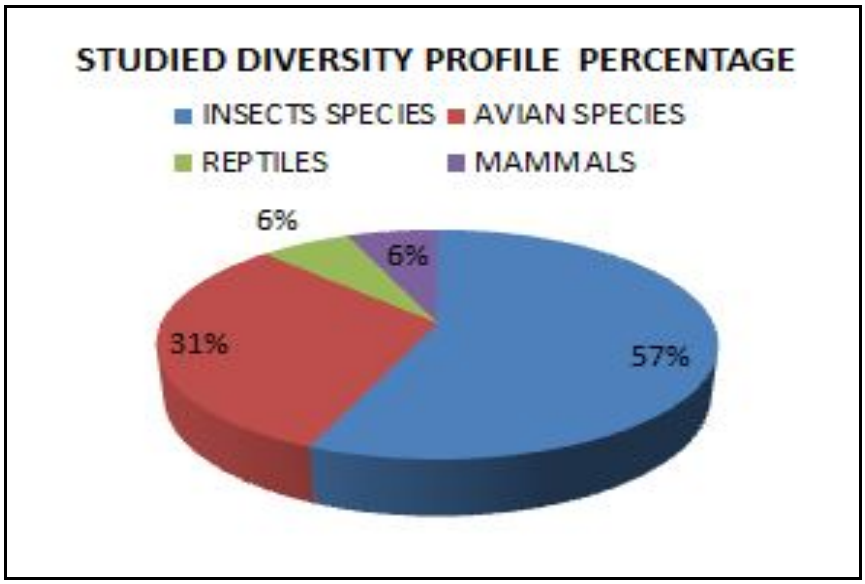

Fig 2: Diversity profile percentage

3. Results and Discussion

During present study diversity profile was carried out (Fig 2) and it was observed that nine insects exhibited tropic niche on *B. monosperma*. Out of which six belonged to Order Hymenoptera, two fell to Lepidoptera while one belonged to Coleoptera. Out of which four species of honeybees *viz*; *Apis dorsata* (the rock bee), *A. cerana*, (the indian bee), *A. florea* (the little bee), *A. mellifera (*the european bee*)* (Photo5); two butterflies viz; *Catopsilia pomona* (the lemon emigrant) and *Jamides celeno* (Photo2) (the common cerulean) fed on nectar of *Butea* flowers and one species of ant, *Camponotus sp.* (Photo1), fed on nectar. The lablab bug *Megacopta cribraria* (Photo 3) fed on leaves and plant sap and also completed its life cycle on the leaves of *Butea*. It was also observed that common parthenium beetle (*Zygogramma bicolorata)* (Photo 4) also damaged the leaves of this plant.

A. dorsata fed for 30-40 seconds during single visit while others bees fed on nectar for 20 -30 seconds while butterflies fed only for 15-20 seconds during single visit while ant species stayed and sucked for 10-15 seconds on a particular flower.

Calotes (Photo 6*)*, common garden lizard, studded with mid-dorsal crest, adaptive for arboreal behaviour and gripping the twigs and bark and catching ants, bees and butterflies on *B. monosperma*.

Avian diversity was studied with respect to five species *viz*; Rose –ringed parrot (*Psittacula krameri* (Photo 10*)*, Sunbird (*Nectarinia asiatica*) (Photo 9), Myna (*Acridotheres tristis*) (Photo 12), Red vented Bulbul (*Pycnonotus cafer*) (Photo 11) and Common Kingfisher (*Alcedo atthis*) (Photo 7). It was observed that parrot feeding primarily on flower buds and later on fed on young pods for 5-8 minutes. It was studied in case of sunbird that it exclusively fed on nectar. It used slender and long decurved bills to probe into *Butea* flowers for nectar and also acted as vital plant pollinators and fed for 45-90 seconds during single visit.

Funambulus palmarum -the striped squirrel (Photo 8) was studied which fed on flowers and young buds of *B. monosperma* for 5-7 minutes roaming on different portion of *Butea* plant.

Table 1: Faunistic profile on *Butea monosperma*

Sr No	Species	Family	Order	Class
1	*Apis dorsata* F.	Apidae	Hymenoptera	Insecta
2	*Apis cerana* F.	Apidae	Hymenoptera	Insecta
3	*Apis florea* F.	Apidae	Hymenoptera	Insecta
4	*Apis mellifera* L.	Apidae	Hymenoptera	Insecta
5	*Camponotus sp.*	Formicidae	Hymenoptera	Insecta
6	*Jamides celeno(Cramer)*	Lycaenidae	Lepidoptera	Insecta
7	*Catopsilia pomona* F.	Pieridae	Lepidoptera	Insecta
8	Megacopta cribraria (F)	Plataspidae	Hemiptera	Insecta
9	*Zygogramma bicolorata* Pallister	Chrysomelidae	Coleoptera	Insecta
10	Calotes versicolor (Daudin)	Agamidae	Squamata	Reptilia
11	*Psittacula krameri(*Scopoli*)*	Psttaculidae	Psittaciformes	Avian
12	*Nectarinia asiatica* (Latham)	Nectariniidae	Passeriformes	Avian
13	*Acridotheres tristis (*L.)	Sturnidae	Passeriformes	Avian
14	*Pycnonotus cafer (*L*)*	Pycnonotidae	Passeriformes	Avian
15	*Alcedo atthis* (L.)	Alcedinidae	Coraciiformes	Avian
16	*Funambulus palmarum (*L.)	Sciuridae	Rodentia	Mammalia

4. Conclusion

B. monosperma plant was found to be indispensable for number of insects and birds species for survival. It is important to initiate immediate efforts to plant more and more of these trees in and around Chandigarh. Strategies for the conservation of existing trees should also be taken due care of keeping in view the fact that flower of *B. monosperma* has already been declared as ` State flower of Chandigarh.

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