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BIODIVERSITY AND BIOGEOGRAPHY OF (DICTYOPTERA: MANTODEA: PRAYING MANTIDS) FROM BALOCHISTAN, PAKISTAN

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ABSTRACT

Biodiversity means life variety of a particular place, habitation and when joint with biogeography becomes the study of biological diversity of environment isolated by barriers and both pronounce how and why distribution of plants and animals occurs. In support of this, biodiversity of praying mantids undertaken to identify and evaluate the species richness and evenness was measured through Shannan Index and three Simpson's Indexes. The mantids were collected from cultivated and non-cultivated fields and organize an inclusive and updated record of biodiversity of mantodea occurring in 08 districts of Blaochistan Province of Pakistan. Throughout survey 110 mantids were collected and arranged into 13 species. Pictures were captured by digital camera.

1. INTRODUCTION

Biodiversity refers to all the kinds of living things, occupying, living on this globe counting from kingdom Monera to kingdom animalia, undomesticated plants fauna and animals fauna, micro-organisms, reclaimed or tame animals and plants fauna. The learning of different entities, kinds of insect's fauna is of immense significance for the reason that supplementary number of the globally reported animals are include insects. Biogeography is the learning of ways and means by which all the living beings disperse, their process of allocation [1-3] Praying mantids belongs (Order Dictyoptera) relatively small suborder Mantodea containing only around 2300 species according [4-5]. Suborder mantodea is divided into eight families namely: Chaeteissidae, Metallyticidae, Mantoididae, Eremiaphilidae, Amorphoscelididae, Hymenopodidae, Empusidae and Mantidae are reported in the world. While out these Eremiaphilidae, Empusidae and Mantidae, Hymenopodidae and Amorphoscelididae occur in Pakistan.

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They are all predators and consume a very large range of small animals includes insects, and other arthropods, small reptiles, and rarely on small birds and tree frogs, and their mouthparts are carnivorous type [6-10]. They are active during the day hence called diurnal live alone in warmer parts of this globe (tropical and subtropical regions) but a very small number is reported from cold areas. Praying mantids live lonely on the tress and stem of trees, on and in the shrubs, grounds, agriculture crops, grasses and wear a cryptic color which resembles leaves, flowers, dry stick of grasses, leaves or stem of trees to hide or camouflage the surrounding for avoiding enemies [11-14].The camouflage facilitates them easy approach to their prey. Being predators they are very important for the studies concerning the bio-control and pest management because many of the insects consumed by them are crop pests [15-19].

2. MATERIALS AND METHODS

Collection of 110 specimens was made during 2016-2017, in May to October from various districts and localities of Balaochistan, Pakistan as shown in

figure1. Mantids were collected, preserved through standard entomological methods and kept in boxes along with information tag mentioning date of collection, locality, and name of collector figure 2. To prevent the attack of animals Naphthalene bolls were used in boxes. Specimen's Identification prepared by keys given [20-23]. To measure the biodiversity upcoming equations were used Simpson's Index (D), $D = \sum (n / N)^2$ where D= Simpson's Index, ∑= some of, n=sum of individuals of particular species, N= sum of individuals of all species. Here measures of D vary stuck between 0 and 1. Where 0 is infinite diversity and 1 means no diversity. Second Simpson's Index of Diversity is equal to 1 – D, The significance of this equation will fall into 0 and 1, it shows, the better the value, the superior the sample diversity. In additional the Simpson's Reciprocal Index 1 / D, was measured. The assessment of this index begins from 1 as the lowest possible figure and onward. This numeral would characterize a community enclose merely solitary species. This shows the privileged the value and the superior the variety of life. Finally Species Richness and Shannan Index were measured.

3. RESULTS AND DISCUSIONS

From this province work on the praying mantids is partial this study was carried out for the first time to see the latest status of praying mantids occurring in Baluchistan fig 1. The objective of this study is to contribute knowledge of biodiversity and biogeography of praying mantid in Baluchistan. Presently, a comparative account on biodiversity and biogeography of nine species including seven new records are known and discussed table.1and 2, fig.2.

Biodiversity is a look to represents the life diversity (Members of all five kingdoms) of a given place while, habitations collective forms the biogeography which becomes the study of biological diversity of organisms habitat. This study was formulated to see biodiversity and biogeography of the praying mantids occurring in various habitations of Balochistan province. It was observed that the geographical features of Balaochistan are most suitable for the fauna of insects including praying mantids. In addition the role of praying mantids as a bio - control agent is highlighted after conducting some experiments on live praying mantids and it is concluded. Praying mantids, diversity, biodiversity index, Simpson index of diversity and species richness is measured as shown in results. This research provides the firm basis of praying mantids biodiversity with the special references of biogeography including occurrence, feeding, mating, egg laying or oviposition, male and female longevity and female fecundity. The simplified taxonomic keys based on the easily recognizable characters (pronotum, forelegs, hind wings, body length, coxa, femur, tibia, tarsus) were organized.

4. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interests regarding the publication of this article.

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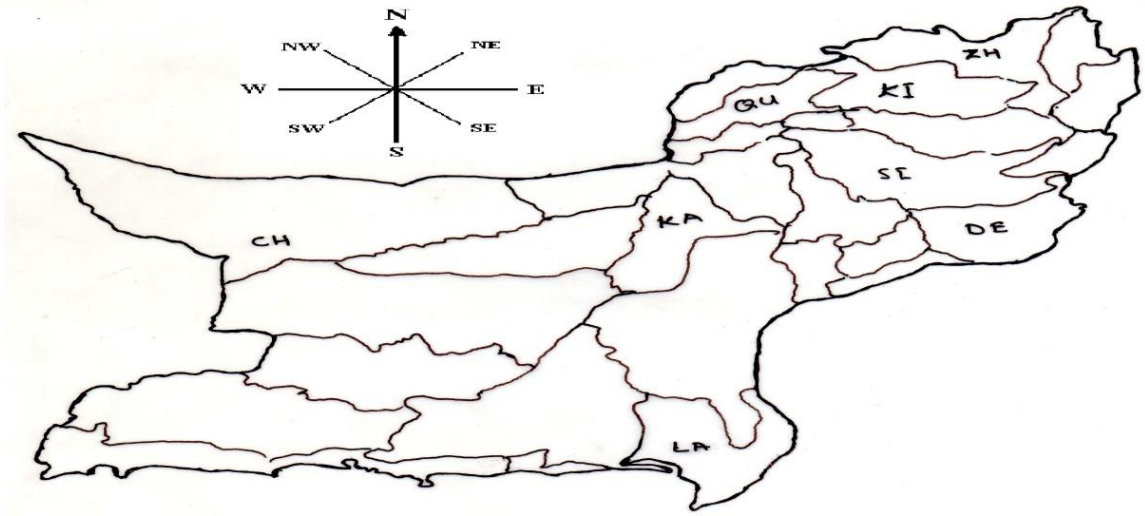

Fig.1 The map of Baluchistan showing the districts, visited for the collection of praying Mantids

Table.1 Distribution of praying mantids in eight 08 Districts of Baluchistan province.

Families / Name of Species	CH	DE	KI	QU	LA	KA	SI	ZH	#sp
Amorphoscelidae									
Amorphoscelis annulicornis	-	-	+	-	-	-	-	-	01
Empusidae									
Empusa uricornis	-	-	+	-	-	-	-	+	06
Mantidae									
Mantis religiosa	+	+	+	+	+	+	+	+	38
Sphrodromantis transcaucasica	+	+	+	+	+	+	+	+	48
Aethalochroa affinis	+	-	-	+	-	-	-	+	17
									110

Note: (+) sign indicates the presence of species while (-) sign indicates absence of the species.

CH	Chagai	DE	Dera Bugti	KI	Killa Saifullah	QU	Quetta
LA	Lasbella	KA	Kalat	SI	Sibi	ZH	Zhob

Table. 2 Name & number of species, their biodiversity index and Simpson's index of diversity from Baluchistan province.

S#	Name of species	Total # collected	Biodiversity Index	S. I. D
1	*Amorphoscelis annulicornis*	01	0.00008	0.999
2	*Empusa unicornis*	06	0.00291	0.997
3	*Mantis religiosa.*	38	0.11902	0.880
4	*Sphodromantis transcaucasica*	48	0.19080	0.809
5	*Aethalochroa affinis*	17	0.02371	0.976

Note: In the Baluchistan the species richness was calculated 0.476

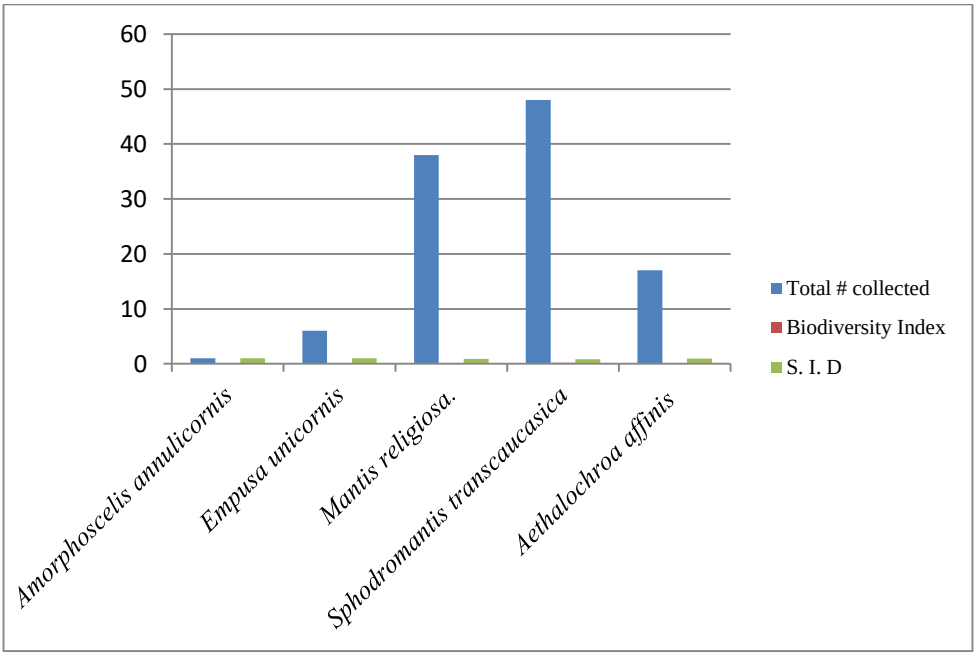

Fig.1 Name & number of species, their biodiversity index and Simpson's index of diversity from Baluchistan province.

Figure 3. A sample Insect box, showing the collection of praying Mantids