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Spatial variation in the S.W species diversity of oriental garden lizard of mangroves & home garden in Madhepura district of Bihar, India

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Abstract : The natural profile of species diversity at habitat level & biodiversity at biospheric level always displays temporal & spatial variation in time and space, hence is a dynamic function. Therefore it is mandatory for researcher to undertake spatial (geographical) and temporal (time specific) mapping of the species diversity to investigate the degree of variation. The present article being the part of continuous mapping of lizard faunal diversity of Madhepura urban conglomerates done during the years 2014-2016 targets to unravel the spatial variation of garden lizards found in two different habitats - home garden and mangrove. Oriental garden lizards being an important member of lacertilian reptiles are subjected to population wise threat & endangerment due to multidimensional unmindful anthropogenic interference. The article brings on record different species of garden lizards present in specific terrestrial habitats such as home garden & mangroves of Madhepura. Six different species have been identified from these habitats & their cumulative species diversity index through Shannon-Weiner equation (S-W) have been statistically computed on the basis of species abundance & richness recorded numerically during the sampling without sacrificing any live individual (IBML) so that none of the species get harm during the research.

Keywords : Spatial variation, S-W diversity, oriental garden lizard, mangroves

INTRODUCTION

Immense diversity in our biosphere exists not only at the species level but also the biological level that ranges from macromolecules within cells to biomes. As we know that the word biodiversity is the most common word reflecting species diversity and species richness, the rapid change undergoing is due to climatic variations and other human influences.¹ Spatial variation in pattern of biodiversity result in change of their distribution, leaving of the local communities, extinction etc.^{2,3} Changes occurring in the community composition of any organism are however not necessarily associated with the changes in species richness if any gain or loss of the species are

balanced.⁴⁻⁷ However it can be adverse in the places where the intensity of land use is seen higher, it could result in decrease of species richness.⁸ Significant geological events, such as the formation of mountain ranges, are often treated as a source of long-term biogeographical barriers.⁹ In some cases, however, distinct geographical patterns can arise without obvious geographical barriers (e.g ecological divergence, geographical distance, competition) among populations.¹⁰ Ecological interactions of organisms with their environment play an important role in population divergence and speciation.¹¹ The use of such data in ecological niche modeling has provided insights into speciation and diversification in relation to environmental factors. Therefore it is very important to incorporate ecological data into studies of mechanisms

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driving diversification and demography.¹² Hence disturbance of the habitat is considered as one of the important anthropogenic factor influencing the ecosystem at high speed caused by human activities in natural habitats.¹³

MATERIAL & METHODS

Spatial variation which is considered as one of the best key to study about the ecological status of any organism, here in this paper study on diversity with reference to spatial variation of oriental garden lizard was done so that the result which may be obtained from the analysis would be anyhow useful to know the current status of the species and could bear in taking of special conservative measures for the protection of the fauna of that particular area.

For this, study was conducted in two different sites mangroves and home garden of Madhepura district during 2014-2016 as also mentioned in the previous paper. The study was carried out between 11 am to 2 pm when the temperature was favorable for the reptiles. Since lizards are model organisms for ecological studies and easily handled not too many precautions were required. The photographic image and few videos were also taken so that it could become easy to examine and identify the species without interfering the IBML that says none of the species should be harmed during research activities.

RESULT & DISCUSSION

As observed in table no. 1 six different species were encountered during the field study namely- *Eutropis carinata*, *Ophisops jerdoni*, *Mabuya macularia*, *Eutropis macularia*, *Calotes versicolor* & *Sitana ponticeriana* from two different sites of the Madhepura district, which includes mangroves & home garden. Among these species sampled *Calotes versicolor* were among the highest species found but only from the site 1 while in site 2 i.e. home garden *Sitana ponticeriana* were among the highest of all the other species. When diversity of both the sites were compared species from different mangroves were statistically highest having S-W diversity index (&) as 0.7594 which shows that population of the lizard species is not rich but their abundance is high as it should be. While the numerical data of the home garden showed lower abundance & higher richness of the species with respect to the former having diversity index 1.1049. As per species diversity interpretation index if, the obtained diversity value of the species is less than 1, all the species of the lizards will diversified with less survival risk whereas the value being more than 1 denotes the less diversified species present in the habitat with greater survival risk. Thus specific measures are compulsory for the protection of these species in urban areas of Madhepura so that ecosystem get balanced.

Table 1-Site specific species diversity of different species of garden lizards sampled from Madhepura district sampling sites-different mangroves

Sl no.	Name of the species	Family	Average no. of sampled individuals per unit area	pi(n/N)	log pi	pi*log pi	H
1	<i>Eutropis carinata</i>	Scincidae	5	0.151	-0.821	-0.1239	0.7594
2	<i>Ophisops jerdoni</i>	Lacertidae	6	0.181	-0.742	-0.1343	
3	<i>Mabuya macularia</i>	Scincidae	3	0.090	-1.045	-0.0940	
4	<i>Eutropis macularia</i>	Scincidae	6	0.181	-0.742	-0.1343	
5	<i>Calotes versicolor</i>	Agamidae	8	0.242	-0.616	-0.1490	
6	<i>Sitana ponticeriana</i>	Agamidae	5	0.151	-0.821	-0.1239	
	Total		N = 33				

Table 2- Site specific species diversity of different species of garden lizards sampled from Madhepura district sampling sites-different home garden

Sl no.	Name of the species	Family	Average no. of sampled individuals per unit area	pi(n/N)	log pi	pi*log pi	H
1	<i>Eutropis carinata</i>	Scincidae	3	0.12	-0.920	-0.1104	1.1049
2	<i>Ophisops jerdoni</i>	Lacertidae	2	0.08	-1.096	-0.0876	
3	<i>Mabuya macularia</i>	Scincidae	4	0.16	-0.795	-0.1272	
4	<i>Eutropis macularia</i>	Scincidae	4	0.16	-0.795	-0.1272	
5	<i>Calotes versicolor</i>	Agamidae	5	0.2	-0.698	-0.498	
6	<i>Sitana ponticeriana</i>	Agamidae	7	0.28	-0.552	-0.1545	
	Total		N = 25				

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