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Temporal variation S-W species diversity of oriental garden lizards in Madhepura district of Bihar, India

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Abstract : The status of biodiversity in general & species diversity in particular is always under anthropogenic threat throughout the world in varieties of habitats where human beings have started building their shelter. Nevertheless, the natural profile of species diversity at habitat level & biodiversity at biospheric level always displays temporal & spatial variation in time and space. The present article deals with the temporal variation of garden lizard sampled in different seasons from Madhepura during 2013. Lizards being important member of lacertilian reptiles are also exposed to different degree of endangerment and threatening pressure over their species members due to such interference. The present paper is an attempt to bring on record different species of garden lizards present in various terrestrial habitats of Madhepura district. Eight different species of garden lizards have been sampled and identified from these habitats & their cumulative species diversity index through Shannon-Weiner equation (S-W) has also been statistically computed on the basis of their individual population per unit area during the sampling period. The result reflects their survival status only.

Key words: Temporal variation, S-W species diversity, garden lizard, lacertilian reptiles.

INTRODUCTION

The word "Biodiversity" is most commonly used to for the term, species diversity and species richness.¹ Species richness and genetic diversity are the two important aspect of biodiversity that influences the overall ecosystem processes and functions.² Biodiversity is not distributed evenly on Earth, and is richer in the tropics.³ These tropical forest ecosystems cover less than 10 percent of earth's surface and contain about 90 percent of the world's species. And biodiversity is significant for sustaining of the ecosystem and also for providing benefits the human society in multiple ways like food security,

health, medicine, livelihood, regulating and controlling spread of diseases, disaster risk reduction, nutrient cycling, air purification, micro climate variability, etc.⁴ Biodiversity is considered as economically valuable since it provides essential goods and services for the survival of human beings.⁵ Reptiles are among one those species which somehow plays a very crucial role in conservation of the ecosystem. India is a country with only 2.4% of the world's land area that harbours 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals. According to the first global assessment 19% of the reptiles which includes crocodiles, lizards, snakes and turtles are struggling for the survival, 12% of it are critically endangered situation, 41% are endangered and 47% are vulnerable going to extinct, over

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3800 species of lizards all across the world. Skinks which are also called lizards of the order Squamata (or scaly reptiles) are the largest and the most diverse family of lizards living today. They are also widespread, occurring throughout most of the world, wherever lizards are found in general.⁶ Almost one in five of the reptiles are going to face extinction.⁷ The loss of biodiversity and habitat due to rapid development is considered to be an alarming call for an urgent redressal of the issue, the Conference of the Parties of the Convention on Biological Diversity (CBD) adopted a Strategic Plan in 2002.

MATERIALAND METHODS

Study area

The study was conducted in four different season:- Winter (October to January), Spring (February to March), Summer (April to June) & Monsoon (July to September) in Madhepura district of Bihar which is situated between

25°31 and 26°20 latitude and in the middle of 86°36 to 87°07 longitudes. The maximum temperature of this district ranges from 35 to 40°C and the minimum temperature varies from 7°-9°C & average rain fall in this district is 1300 mm. Since much fluctuation is seen in temperature in this area, it function as best place for the study of variations in biotic community. To access the research based on study of temporal diversity of lizards nearby areas were selected and field trip was made during different hours depending upon the season. Since majority of lizard species are active during the day though some are active at night therefore field trip was done during the second half when the temperature was used to be little warm favourable for these species. After each encounter with these species, photo as well as video footage was taken to study their habitat, identification & species diversity.

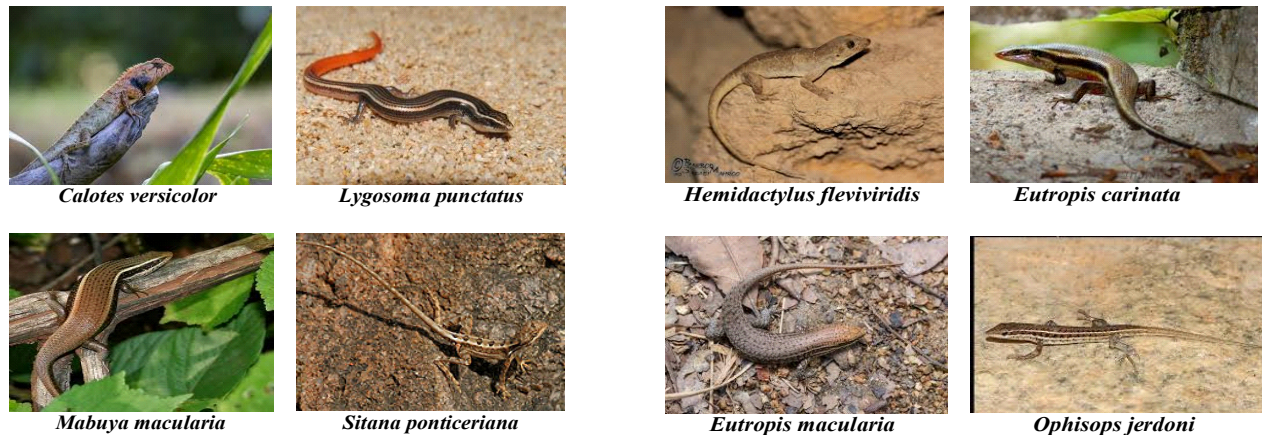


Fig. 1: Different species of lizard sampled from Madhepura

Table 1- Time specific distribution of different species of lizard

Sl no.	Name of the species	Family	Winter (Oct-Jan)	pi (n/N)	log pi	pi x log pi	H	Spring (Feb-Mar)	pi (n/N)	log pi	pi x log pi	H	Summer (Apr-Jun)	pi (n/N)	log pi	pi x log pi	H	Monsoon (July- Sept)	pi (n/N)	log pi	pi x log pi	H
1	<i>Calotes versicolor</i>	Agamidae	6	0.166	-0.779	-0.1293		10	0.175	-0.756	-0.1323		15	0.2	-0.698	-0.1396		2	0.166	-0.779	-0.1293	
2	<i>Lygosoma punctatus</i>	Scincidae	5	0.138	-0.860	-0.1186		7	0.122	-0.913	-0.1113		9	0.12	-0.920	-0.1104		3	0.25	-0.602	-0.352	
3	<i>Mabuya macularia</i>	Scincidae	4	0.111	-0.954	-0.1058		8	0.140	-0.853	-0.1194		12	0.16	-0.795	-0.1272		1	0.083	-1.080	-0.0896	
4	<i>Sitana ponticeriana</i>	Agamidae	4	0.111	-0.954	-0.1058		9	0.157	-0.804	-0.1262		11	0.146	-0.835	-0.1219		2	0.166	-0.779	-0.1293	
5	<i>Hemidactylus fleviviridis</i>	Gekkonidae	8	0.222	-0.653	-0.1449	0.869	7	0.122	-0.913	-0.1113	0.8847	8	0.106	-0.974	-0.1032	0.8791	1	0.083	-1.080	-0.0896	1.0087
6	<i>Eutropis carinata</i>	Scincidae	4	0.111	-0.954	-0.1058		7	0.122	-0.913	-0.1113		8	0.106	-0.974	-0.1032		0	00	0	0	
7	<i>Eutropis macularia</i>	Scincidae	3	0.083	-1.080	-0.0896		4	0.070	-1.154	-0.0807		5	0.066	-1.180	-0.0778		2	0.166	-0.779	-0.1293	
8	<i>Ophisops jerdoni</i>	Lacertidae	2	0.055	-1.259	-0.0692		5	0.087	-1.060	-0.0922		7	0.093	-1.031	-0.0958		1	0.083	-1.080	-0.0896	
	Total		36					57					75					12				

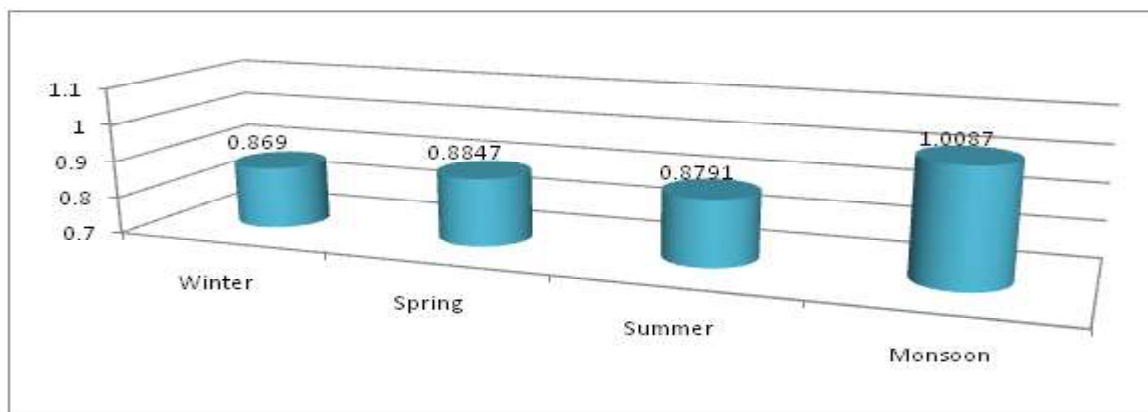


Fig. 2: Season specific temporal variation in S-W diversity of garden lizard in Madhepura District

RESULT AND DISCUSSION

On the basis of investigation done 8 various species of oriental garden lizard have been recorded in different seasons of Madhepura as denoted in table 1 & figure 1. These species includes *Calotes versicolor*, *Lygosoma punctatus*, *Mabuya macularia*, *Sitana ponticeriana*, *Hemidactylus fleviviridis*, *Eutropis carinata*, *Eutropis macularia* & *Ophisops jerdoni*. Data obtained from sampling of these species show that different seasons of a year, play an important role in breeding & population building of these species. As mentioned in table number 1 it is clear that garden lizards are seasonal breeders & their occurrence is directly related to the temperature, humidity & rainfall etc. During winter season i.e. from October to January, the S-W diversity was 0.869, in spring (February to March) it was 0.8847, in summer (April to June) 0.8791 & in monsoon (July to September) 1.0087 which has also been displayed in fig.2. Thus the above findings reflect that low temperature in winter is ecologically unfavourable for the survival & preparation of these reptiles while monsoon months proved to be highly congenial when the S-W diversity value climbed upto 1.0087.

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