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A Preliminary Study On Seasonal Diversity Of Weevils (Curculionidae) Nearby Karanja Sohol Wildlife Sanctuary, Maharashtra.

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Abstract:
The current investigation reveals the preliminary information about seasonal diversity of weevils (Curculionidae) nearby Karanja Sohol Wildlife Sanctuary during year 2019-2022. The entry sits were selected to study the diversity of weevils nearby Karanja Sohol Wildlife sanctuary. Over all 22 species of 13 genera belonging to four subfamilies of family Curculionidae were identified during the present investigation. The calculated data showed that the diversity index, Margalef's richness and evenness of weevils in the study area were 1.281, 3.863 and 0.711 respectively. It was found that the diversity of weevils was found high in monsoon followed by winter while least diversity was observed in summer.
Keywords: weevils, Curculionidae, Karanja, diversity, Sohol.

Introduction

Life on this earth has constantly evolved for last four billion years to form the present spectacular richness of living world. The fossil records indicate that, on average life has steadily increased in diversity and complexity over time to produce the present richness. The current popular term for this richness and diversity of life is biological diversity**.** Insects are the major component of the world's biodiversity. By virtue of their vast numbers of both species and individuals, they are vital determinants of terrestrial ecological processes (Uniyal and Mathur, 1998). Biodiversity is a crucial part of nature's precious assets that provide many human needs and insures against environmental disasters **(**Hydari *et al*., 2020).

The order Coleoptera includes 3,50,000 species, amongst which about 1, 5088 species of coleopteran insects are known from Indian region (Kazmi and Ramamurthy, 2004; Thakkar and Parikh, 2016). Beetle species can be used as environmental and pollution of aquatic and terrestrial environments bioindicators. as a bioindicator species of the impact caused by intensive agriculture, deforestation, reforestation.(da Rocha *et al*., 2010). Beetles are exceedingly variable both ecologically and biologically (Thakkar and Parikh, 2016). Beetles are a group of mostly predatory insects, abundant in the field; their coloration, shape, and activity attract human beings (Shirbhate and Shirbhate, 2020). Each species rarely occurs in more than one or a very few habitat

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types and habitat associations tend to be highly specific (Morgan *et al*., 2000; Rafi *et al.*, 2010; Borges *et al.* 2007; Scudder *et al*. 2005; Shirbhate and Shirbhate, 2020).
As long as intermittent work is reported, a few notable work in Vidarbha region are by Khamnakar *et al.*, (2021) in Wani region, Thakare and Zade (2012), for Melghat Tiger reserve, Shirbhate and Shirbhate (2020) for forest in Akola district. The main aim of present study was to explore the diversity of weevils nearby Karanja Sohol Wildlife Sanctuary. The data generated form present survey will aid in assessing the state's diversity and facilitating future research.

Materials and Methods

The study area is the localities nearby Karanja Sohol Wildlife Sanctuary, inhabiting variety of insect species like butterflies, moths and beetles. Beetle sampling and collection was done by standard collection methods like pitfall trap, light trap, pheromone trap, insect net, etc during year 2019-2022. Traps were set up in all the sites and were monitored as per the schedule. After collection each specimen was preserved in absolute alcohol and stored in small vials with proper labeling. Identification was done using standard identification manuals of Marshall (1916) and Arnett *et al.*, (2002). The raw data collected is stored in the form of Microsoft Excel sheet and the diversity indices were calculated by using following formulae.

a) Shannon-Weiner diversity index (H) = – H Pi In Pi
Where, Pi = S / N
S = number of individuals of one species
N = total number of all individuals in the sample
In = logarithm to base e

b) Margalef's richness index = (S-1) / In N
Where,
S = total number of species
N = total number of individuals in the sample
In = logarithm to base e

c) Pielou's evenness index (e) = H / In S
Where,
H = Shannon-Wiener diversity index
S = total number of species in the sample
In = logarithm to base e

Results and Discussion

In the present study, 229 individuals from 22 species belonging to 13 genera of family Curculionidae were identified which are represented in table 1. In current investigation, subfamily Dryophthorinae (119 individuals) was found to be dominant followed by Lixinae (61 individuals), Entiminae (27 individuals) and least individuals

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were recorded from Subfamily Molitinae (Fig. 1). Out of 22 species, *Sitophilus oryzae* was reported dominant followed by *Sitophilus zeamais*, *Sitophilus linearis*, *Cneorhinus viridimetallicus* and *Sitophilus granaries* while least number was reported by *Larinus latus* and *Larinus planus* (table 1). The overall number of individuals was found highest in monsoon at all the sites nearby Karanja Sohol wildlife sanctuary and least number was found in summer season at all the study sites (table 1). The calculated data showed that the diversity index, Margalef's richness and evenness of weevils in the study area were 1.281, 3.863 and 0.711 respectively (table 2).

The individuals from family Curculionidae are usually considered to be the harmful one and at no time or place they were reported to be in aggregation that can lead to the serious problem (Thakkar and Parikh, 2016). The diversity was observed increase due to the increased appearance of weevil species during the monsoon. Weevil diversity appears to vary according on seasonal climate circumstances, it was recorded more in monsoon, which could be related to increasing vegetation during the wet season. Similar observations were reported by Thakare and Zade (2012), Shirbhate and Shirbhate (2020) and Khamnakar *et al.*, (2021).

Conclusion

In present survey, 22 species belonging to 13 genera of family Curculionidae were identified from nearby sites of Karanja Sohol wildlife Sanctuary in which the species *Sitophilus oryzae* was found to be dominant. The present study shows the first time report of weevil species from this area. The seasonal observations represented relatively more number of weevils in monsoon as that observed in winter and summer.

References

1. Arnett, R. H., Thomas, M. C., Skelley, P. E., & Frank, J. H. (Eds.). (2002). *American Beetles, Volume II: Polyphaga: Scarabaeoidea through Curculionoidea* (Vol. 2). CRC press.
2. Borges A.V, Oromi P, Serrano RM, Amorim IR and Pereiara F, (2007). Biodiversity patterns of carvernicolous ground beetles and their conservation status in the Azores with the description of a new species : Trechus isabelae n.s.p. (Coleoptera : Carabidae : Trechinae). *Zootaxa*, 1478: 21-31.
3. da Rocha, J. R. M., De Almeida, J. R., Lins, G. A., & Durval, A. (2010). Insects as indicators of environmental changing and pollution: a review of appropriate species and their monitoring. *Holos environment*, *10*(2), 250-262.
4. Heydari, M., Omidipour, R., & Greenlee, J. (2020). Biodiversity, a review of the concept, measurement, opportunities, and challenges. *Journal of Wildlife and Biodiversity*, *4*(4), 26-39.
5. Kazmi, S. I., & Ramamurthy, V. V. (2004). Coleoptera (Insecta) fauna from the Indian Thar Desert, Rajasthan. *Zoos' print journal*, *19*(4), 1447-1448.
6. Khamankar D. B., Deshmukh C. K. and Patel P. R. (2021). Record of Fungus beetle *Cis pickeri* (Coleoptera: Ciidae) from Wani region, District- Yavatmal,

ISSN PRINT 2319 1775 Online 2320 7876

 UGC CARE Listed (Group -I) Journal Volume 11,Iss 12 , 2022

Maharashtra, India, *International Journal of Emerging Technologies and Innovative Research*, 8(12), 81-384.

7. Margalef R.. (1958). Temporal succession and spatial heterogeneity in phytoplankton. In: *Perspectives in Marine biology*, Buzzati-Traverso (ed.), Univ. Calif. Press, Berkeley, 323-347.
8. Marshall, G. A. K. (1916). The Fauna of British India. Curculionidae. Pt. 1. *The Fauna of British India. Curculionidae. Pt. 1.*
9. Morgan M, Knisley C. B and Vogler A. P., (2000). New Taxonomic Status of the Endangered Tiger Beetle Cicindela limbata albissima (Coleoptera: Cicindelidae): Evidence from mtDNA. *Annals of the Entomological Society of America*, 93(5): 1108- 1115.
10. Pielou, E. C. (1966). The measurement of diversity in different types of biological collections. *Journal of theoretical biology*, *13*, 131-144.
11. Rafi, M. A., Jürgen, W., Matin, M. A., Zia, A., Sultan, A., & Naz, F. (2010). Faunistics of tiger beetles (Coleoptera: Cicindelidae) from Pakistan. *Journal of Insect Science*, *10*(1), 116.
12. Scudder, G. G., & Cannings, R. A. (2005). Project Report; Beetle Families of British Columbia, Project Number: Y051001. *Forest Investment Account (FIA)-Forest Science Program*.
13. Shannon, C. E. (1997). The mathematical theory of communication. *MD computing*, *14*(4), 306-317.
14. Shirbhate, M., & Shirbhate, A. (2020). Diversity and checklist of beetles (Arthropoda: Coleoptera) from forest areas and agricultural areas of District Akola,(Maharashtra), India. *Environment Conservation Journal*, *21*(1&2), 89-94.
15. Thakare, V. G., & Zade, V. S. (2012). Diversity of beetles (Insecta: Coleoptera) from the vicinity of Semadoh-Makhala road, Sipnarange, Melghat Tiger Reserve,(MS) India. *Bioscience discovery*, *3*(1), 112-115.
16. Thakkar, B., & Parikh, P. H. (2016). A Study on diversity and abundance of coleopterans in Gujarat, India. *Journal of Entomology and Zoology Studies*, *4*(5), 1082-1089.
17. Uniyal, V.P. and Mathur, P.K. (1998). A Study on the Species Diversity among Selected Insect Groups. *FREEP-GHNP* Research Project.

Table 1: Seasonal diversity of Weevils in study area during year 2019-2022.

Sub-family	Species	Monsoon	Winter	Summer
Entiminae	*Cneorhinus viridimetallicus* Motschulsky,1860	14	3	0
	Tanymecus indicus Faust, 1895	3	2	0
	Tanymecus versicolor Marshall, 1916	4	1	0
Dryophthorinae	*Cosmopolites sordidus Germar*,	8	3	1

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	1824			
	Scyphophorus acupunctatus Gyllenhaal, 1838	6	2	0
	Sitophilus granarius Linnaeus, 1875	2	12	2
	Sitophilus linearis Herbst, 1795	8	9	1
	Sitophilus oryzae Linnaeus, 1875	13	12	1
	Sitophilus zeamais Motschulsky, 1855	8	11	0
	Sipalus hypocrita Boheman, 1845	7	4	0
	Rhynchophorus ferrugineus (Olivier, 1790)	9	0	0
Lixinae	*Hypolixus nubilosus* Boheman, 1836	0	6	0
	Hypolixus pica Fabricius, 1798	7	1	0
	Hypolixus truncatulus Fabricius, 1798	5	4	0
	Larinus latus Herbst, 1784	3	0	0
	Larinus planus Fabricius, 1792	2	1	0
	Larinus turbinatus Gyllenhal, 1835	2	4	0
	Larinus vulpes Olivier, 1807	7	1	0
	Xanthochelus faunus Olivier, 1807	7	4	0
	Lixus sp. Fabricius, 1801	4	3	0
Molitinae	*Alcidodes karelinii* Boheman, 1844	7	6	1
	Peribleptus scalptus Boheman, 1843	5	3	0
Total		**131**	**92**	**6**

Table 2: Species diversity indices of Weevils observed in sites nearby Karanja Sohol Wildlife sanctuary during year 2019-2022.

Shannon-Weiner species Diversity	1.281
Margalef's Richness	3.863
Evenness	0.711

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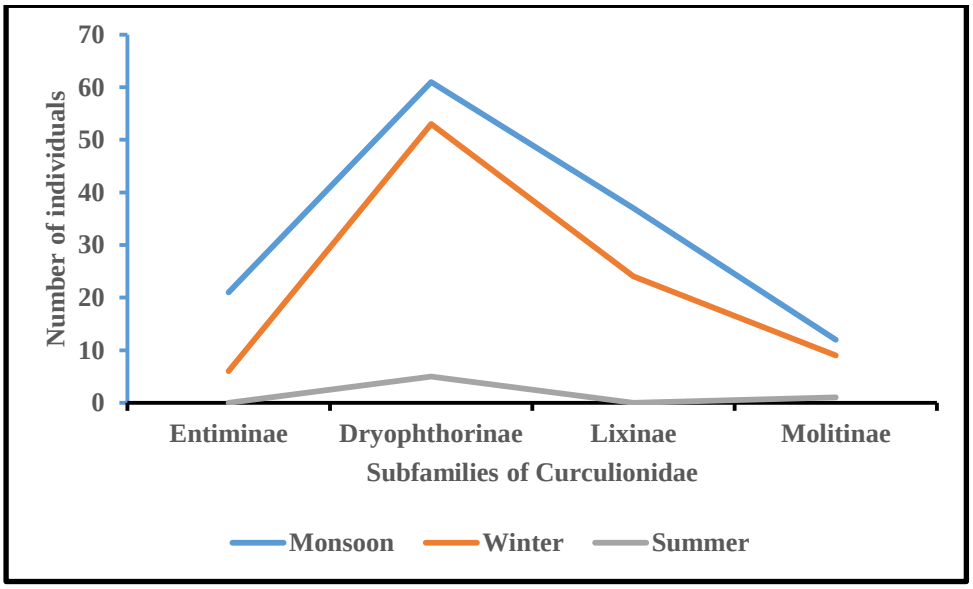

Figure 1: Seasonal variation in Weevil Species observed during year 2019-2022 nearby Karanja Sohol Wildlife Sanctuary.