

Vol 6 Issue 3 Dec 2016

ISSN No : 2249-894X

*Monthly Multidisciplinary
Research Journal*

*Review Of
Research Journal*

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STUDIES ON SOIL INSECT FAUNA OF WASHIM REGION MAHARASHTRA, INDIA

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ABSTRACT :

Soil is alive with biological organisms which respond directly to variations in the environment and modify environment physically and chemically. Insects, related arthropods, and other invertebrates are commonly seen on the ground in gardens, fields, lawns, and yards. Many of these are very active on the soil surface in agricultural fields and often found there. Some of these insects are pests of plants and some help with biocontrol by feeding on pests. Many of these are important for decomposition and nutrient recycling. The present research work is intended to introduce common invertebrates that are typically found on the soil surface around Washim region. The study is carried out for period of 7 months that is July 2016 to January 2017 and reported 12 soil insects belonging to 11 families and 7 order.



KEY WORDS: Washim region, Soil, insects, biodiversity.

INTRODUCTION:

Soil is probably one of the most species-rich habitats of terrestrial ecosystems, considering the habitats like vertebrate faeces, decaying wood, epiphytic soils and forest/agricultural or domestic litter. The diversity of soil thus comprises of large number of soil insects including many ground dwelling insects those are functionally important to the biodiversity **Imam et.al, (2016)** With over 1 million different species in the world soil insects have successfully colonized a great

diversity of habitats. The soil is a particularly ideal niche for insect because the soil provides protection from heat and cold, drying and heavy rains, and natural enemies such as birds. The roots, stems of tubers, corn, bulb and various plants provide an abundance of food to the insects .soil insect are extremely successful animals and they are affects of our lives despite their small size. All kind of natural and modified, terrestrial and aquatic, ecosystem support communities of insect that presents a bewildering variety of life style form and function **Gullan and Cranston (2010)**. Soil Insect come on this earth about 250 million

years ago **Gupta et al.,(2000)**. Insect are mostly solitary, but some such as certain bees, ants and termites are social and live in large well organised colonies manner some insect such as earwing, Centipede, Millipede earthworm, shows maternal care guarding their eggs and Young insect can communicate with each other in a variety of ways. Some soil insect are beneficial to the farmer because they are the natural enemies of other soul insect predatory insect feed on other insect and in this way they help control pest insect **Metcalf et.al., (1962)**. There remains a considerable lack of knowledge on the abundance and distribution of soil insect at an individual and a community level. Grass land soil support a diverse range of insect, many of which are direct pest of grass or nearby crops (eg.wireworms) when present in

sufficient number conversely, the stable habitat that grassland can provide a reservoir of generalist natural enemies **Johnson et al., (2013)**.

There are several possible mechanisms through which soil community diversity could contribute to soil insect diversity. First, soil insects could simply increase the diversity of plant species available to herbivores. Second, soil insects could contribute to phenotypic variation within species by modifying plant size or quality **Alison et al., (2010)** soil insects are responsible for performing vital functions in the soil ecosystem which have direct interactions with the biological, atmospheric and hydrological systems. Soil insects are the primary agents of nutrient cycling, regulating the dynamics of soil organic matter, soil carbon sequestration and greenhouse gas emissions, modifying soil physical structure **Bijlmakers, (1995)**. Soil Insect diversity is also drive of plant diversity **Houston, (1979)** suggested that plant diversity is a product of variation in the rate at which different plant species. Soil Oribatid Mite Fauna of Western Vidarbha, Maharashtra India was investigated by **Acharya and Basu (2015)** in which 15 species under 12 genera belonging to 10 families of soil oribatid mites were found. The study of biodiversity of some insect fauna in different coastal habitat of Tamil Nadu, Southeast coast of India was carried out by **Srinivasan et al., (2014)** and recorded a total of 929 insects belong to 23 families and 6 orders. **Madhumitha et al., (2013)** Observed Patterns of Insect Abundance and Distribution in Urban Domestic Gardens in Bangalore, India they recorded a large number of insects, 2,185 insects from 10 orders, of which ants, bugs, beetles and flies were the most common. **Uniyal and Mathur, (1998)** investigated on the Species Diversity among selected insects group of Great Himalayan National Park and observed 6 orders belonging to 37 families and 108 genera with 125 species.

The soil is a complex of many factors which separately and conjugated are of vital importance to soil insects life **Jennings, (1906)**. Soil inhabiting insects such as ants improve soil texture and aeration. Habitats types include polar, temperature, subtropical the terrestrial vegetation type may be forest, steppe, and grassland semi-arid or desert. There is a need to study of biodiversity of soil insects in Washim region and their diversity from this region as the study of soil insects play a important ecological role in forest, garden and farmland ecosystem. It is important to study biodiversity of soil insects for management of soil area in Washim region. The present research aim to study different species of soil insects in Washim region, their habit and habitats, morphological or life cycle and the relationship between soil insects and human at ecological level.

MATERIAL AND METHODS:

The present study of soil insects diversity of Washim district was investigated over a period of 7 month that is July 2016 to January 2017. Washim located in the eastern region of Vidarbha and is one of the four municipal council of Washim district of Maharashtra. The specimen are collected by this method hand collection method and net collection method **Schauff, (1992)** and the preservation of soil insects are very important for record in the laboratory for preservation of soil insects three method namely dry preservation and liquid preservation and refrigerator and freezing method. The soil insects were collected from various sites that like R.A.college garden Washim, Ekburji Dam Washim, Agriculture area of (PDKV), Punjab Rao Deshmukh Krishi Vidyapith. Washim, Farm land of Kekatumra district Washim, Farm land of civilline in Washim, Chaupal sagar garden at Malegaon road, Forest land in Medshi Taluka. District Washim.

RESULT AND DISCUSSION :

The present study is first effort to investigate the soil insects diversity in Washim district of Maharashtra in general in present investigation a total number of 12 species of soil insects belonging to 11 families were recorded over a period of 7 month from July 2016 to January 2017 the total soil insects species observed and collected are tabulated in table no I that is five worm ,two bug ,and four beetles, one weevil and the total soil insects are belonging to some other way different families that like two different species belongs to same family Carabidae, and one each belonging to Staphylinidae, Dinidoridae, Oniscidea, Lygaeidae, Labiduridae, Scolopendridae, Xystodesmidae, Syrphidae, Veronicellidae, Curculionidae.

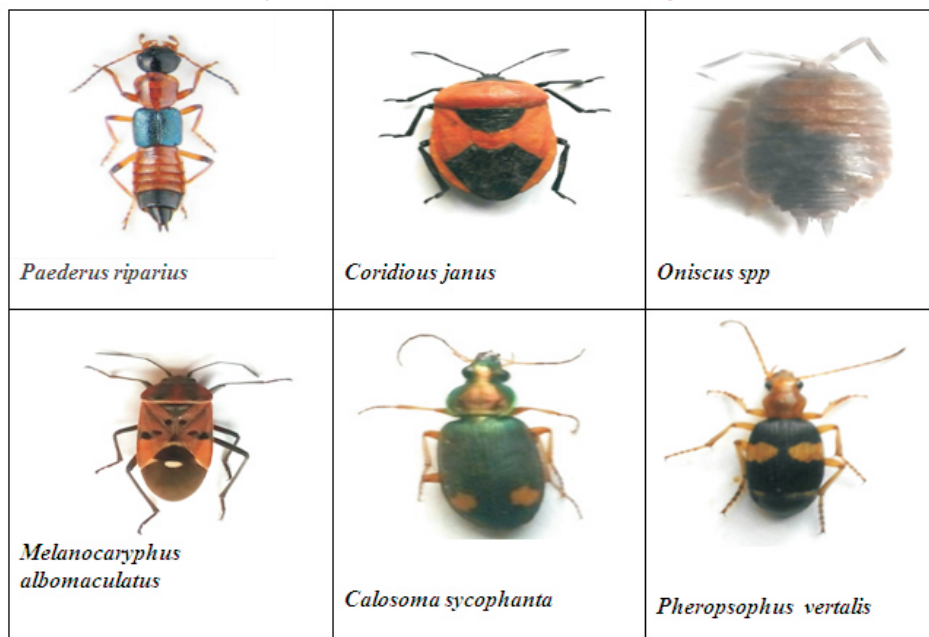
Conservation of such fauna is important since we do not know the interaction of such soil insects with the animal and plant species. Less than 1% of soil insects are regarded as pests. Such soil insects are important in

nature to help keep pest population (insects or weed) at tolerable level. The soil insects of 11 families its seasonal and habitats wise variations in the occurrence has been observed. Relatively low soil insects diversity is found in the given study area it does not means that the habitat studied are of no conservation importance. The presence of these species suggested that the study area might have abundant soil insects diversity. However it is suggested that the diversity of soil insects in these area should be studied exclusively a long term study is needed to observe the species occurred in all season and their interaction with the environment changes different habitat types in Washim should also be studied for better results. It may result in the collection of more soil insect species from varied habitat which would indicate considerable soil insect diversity in the region.

Table No.I: Soil Insects of Washim Region

Sr. No	Common name	Class	Order	Family	Genus	Species	Seasonal occurrence
1	Nairobi fly	Insecta	Coleoptera	Staphylinidae	Paederus	riparius	Sept -Oct
2	Cucurbit	Insecta	Hemiptera	Dinidoridae	Coridius	janus	Nov-Dec
3	Sow bug	Malacostraca	Isopoda	Oniscidea	Oniscus	spp	Oct – Nov
4	Seed bug	Insecta	Hemiptera	Lygaeidae	Melanocaryphus	albomaculatus	Dec-Jan
5	Forests hunter	Insecta	Coleoptera	Carabidae	Calosoma	sycophanta	Sep-Nov
6	Bombardier insect	Insecta	Coleoptera	Carabidae	Pheropsophus	verticalis	Oct –Dec
7	Earwigs	Insecta	Dermaptera	Labiduridae	Labidura	riparia	Sep -Oct
8	Centipede	Chilopoda	Scolopendromorpha	Scolopendridae	Scolopendra	subspinipes	Dec- jan
9	Millipede	Diplopoda	Polydesmidae	Xystodesmidae	Harpaphe	haydeniana	Sep –Jan
10	Black beetle	Insecta	Coleoptera	Dynastidae	Heteronyctus	arator	July - Aug
11	Slug	Gastropoda	Systellommatophora	Veronicellidae	Laevicaulis	alte	Sept -Oct
12	Weevil	Insecta	Coleoptera	Curculionidae	Sitophilus	granarius	Jan -Des

Photoplate I: Soil Insects of Washim Region.





ACKNOWLEDGEMENT

The authors are grateful to the Principal Dr. M. M. Sancheti R. A. College Washim and Dr. D. S. Dabhade Professor & Head P. G. and Research Department of Zoology, R. A. College Washim for providing necessary facilities and Guide line for this Research Project.

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