JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

DIVERSITY OF MILLIPEDES AT AND AROUND MEHKAR CITY OF BULDANA DISTRICT, MAHARASHTRA, INDIA.

[a]Thakare Pavan R, [b]KakdeVandana R
[a&b] Department of Zoology, JijamataMahavidylaya, Buldana (M.S.)

Corresponding g-mail: **pavanthakare70@gmail.com, vrkakde@gmail.com**

INTRODUCTION

Millipedes are small invertebrates which placed under the Phylum Arthropoda. These are small invertebrate's species which is having two pairs of jointed legs on entire most body segments. This all are placed in class Diplopoda, Subphylum Myriapoda of Phylum Arthropoda, which is the largest and highly diverse group of invertebrate animals. Few species of millipedes are having elongated cylindrical or flattened bodies with more than 20 segments, while pill millipedes are showing shorter and can roll into a ball. There are about 1000 legs observed in millipedes in the universe. Majority of the species are slow moving detritivores which eating decayed leaves and other dead plant matter. The name "millipede" derives from the Latin root which means "thousand feet". They are soil loving animals living on the ground, in shallow habitats, among the leaf-litters or in the soil. Millipede ranges from 2 to 280 mm in length, and can have about 11 to over 100 segments. Generally they are black or brown in colour, but few are brightly coloured species. Millipedes move slowly due to presence of short legs, which are helping them push their way through the soil and vegetative litter. They are seasonal animals, generally seen is monsoon season and rarely in summer and winter season, as they are commonly affected by environmental conditions specially change in temperature **(Ashwini and Sridhar, 2006),** and so are predominantly abundant in the tropical and sub-tropical regions of the world.

The characteristics features of the group is the presence of diplosomites, double trunk segments formed from the fusion of two segments. They have as many as 200 pairs of legs-two pairs on each diplosomite except for the first (head) segment, which is legless, and the next three segments, which each contain one pair of legs. They are good biological indicators of environment change in ecosystem and improve the structure content organic matter and nutrient elements of soil. Most millipedes are detritivorous animals; feed on decaying plant matter, functioning as decomposers in the ecosystem. A few species of millipedes are omnivorous or occasionally carnivorous, feeding on small invertebrates like earthworms, insects, snails etc.**(LorangerMerciris et al., 2007, Seeber et al., 2008).**Millipedes are functionally important in facilitating nutrient cycling through decomposition of plant debris, and also play a vital role in soil formation process useful to the plant or crops. Globally there are 12,642 species of millipedes belonging to 2,001 genera of 163 families in 16 orders. There are over 270 species occur in India belonging to 90 genera, 25 families and 11 orders **(Golovatch and Wesener, 2016).**Study on Indian millipedes begins with Linnaeus (1758). Major studies on Indian millipedes made by Pocock (1899a, 1899b) and Carl (1932) works on South Indian millipedes and published his results on the Indian species of Ploydesmoidea in which he described 41 new species and 23 new genera from India.

The research work on millipede diversity is so much limited in the Maharashtra state. Its need to do research on different perspectives of millipedes species. **Choudhari et al., (2014)** reported 04 species of millipede belongs to 04 families from Northern Western Ghat of Maharashtra. Patil et al., (2018) also reported 05 species belongs to 03 families from tropical or agricultural landscape of Rajgurunagar, Northern

Western Ghat of Maharashtra. Recently Mane et al., (2020) added one more species Anoplodesmussaussurii to the millipede's fauna of Maharashtra.**Dash and Priyadarsini (2013)** recorded three species of millipedes from Gujarat. Similar work was done by **Alagesab and Ramanathan, (2013)** and **Chezhian and Prabakaran,(2016)** in Tamil Nadu. History of this study was not exploring the ideas about diversity of millipede species and importance of millipedes' decomposers in the natural environment from this study area. Hence, main objective of this study is to provide the information regarding with the distribution and diversity ofmillipedes species in Mehkar city of Buldana district, Maharashtra, India.

MATERIALS AND METHODS

The present study area of Mehkar is taluka place and municipal council located in Buldana district of Maharashtra state, India.Mehkar is situated near to PaingangaRiver and falls in Vidarbha region. It was previously known as "MeghankarNagari". Its latitude is $20^0$9'0''North and longitude is $76^0$34'30''East. It has pleasant climate atmosphere with temperature ranges between 22^0C to 45^0in winter and summer season.

The study was carried out during the monsoon season in year 2021 for six months. There were five different sites selected for the study purpose. In the biodiversity area, millipedes species selected by used hand-picking method. Samples can be taken from rotten woods, under stone, uppermost soil strata and all other kinds of plant debris. The photographs were taken to collected millipedes and then released them in their natural habitat. Species of collected millipedes were identified with the help of field guider and standard literature. They all helped me to identify the millipede species.

RESULT AND DISCUSSION

In the present study total 05 different species of millipedes belongs to 05 genera of 04 families were recorded from Mehkar tehsil of Buldana district, Maharashtra.The following species of millipedes were identified from the study area.

Harpaphehaydeniana: It is commonly known as yellow-spotted millipede. It belongs to order Polydesmida and family Xystodesmidae. The body is black in colour and both the sides with patches of yellow spots. It consists of approximately 15-20 segments, bearing a total of 30 (in case of males) or 31 (in case of females) pairs of legs. It reaches a length of 4-5 cm, width of 0.1 to 0.3 cm, and weight of 0.8 to 1.5 g.

Orthomorphacoarctata: It belongs to order Polydesmida and family Paradoxosomatidae. The male are 14.5 to 20.5mm in length and female are 16.5 to 2.5 mm. The middle body portion is segmented, with longer gonopods. Narceusamericanus (Palisot de Beauvois, 1817): It is commonly known as American giant millipede. It belongs to order Spirobolida and family Spirobolidae. It was found in Painganga river shore near the Mehkar city. It was about 3 inches long, cylindrical and blackish brown in colour.

Trigoniuluscorallines: It is commonly known as rusty millipede. It belongs to order Spirobolida and family Trigoniulidae. It is medium to large-sized millipede with brick red colour body. It grows up to 5cm in length and can often be found in bunch. During this survey it is noted that *Harpaphehaydeniana* and *Orthomorphacoarctata*were found to be most abundant species at all, seen on dry leaf, around the crop roots, wet landscape and on other plant debris. On the other hand *Narceusamericanus* was single time recorded in farm area near the city. It is due to the geographical location and habitat differences. *Trigoniuluscorallinus* was found to be on dry landscape in bunch. *Harpaphehaydeniana* is generally found in agricultural area, breaking down leaf litter and freeing its nutrients for other organisms. *Orthomorphacoarctata* and *Trigoniuluscorallinus* are capable of composting waste. Recently in Brazil, studies with the species *Trigoniuluscorallinus* have shown that mill compost obtained from agricultural residues has physico-chemical characteristics similar to vermicomposting (Antunes*et al*., 2016). The present study on millipedes was the first report of the distribution of millipede fauna in the Mehkar city, Amravati district, Maharashtra, India.

Table1. Photographs of Millipedes species recorded from study area.

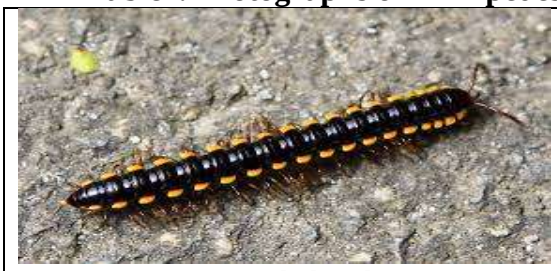

Fig.1.*Harpaphehaydeniana*

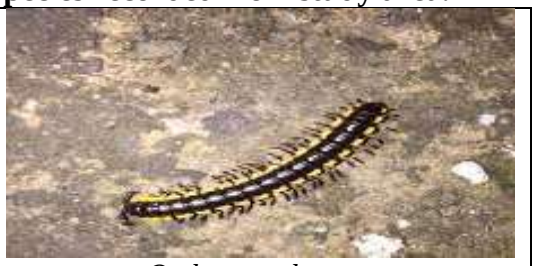

Fig.2. *Orthomorphacoarctata*

Fig.3. *Oxidusgracilis*

Fig.4. *Trigoniulus corallines*

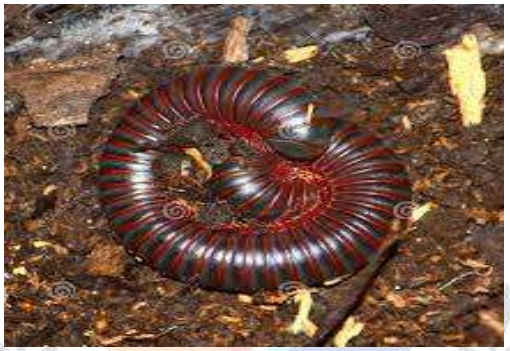

Fig.4. *Narceusamericanus*

Table 2. List of Millipedes species recorded from at and around Mehkar tehsil

Sr. No.	Species Name	Order	Family	Genus
1.	*Harpaphehaydeniana*	Polydesmida	Xystodesmidae	*Harpaphe*
2.	*Orthomorphacoarctata*	Polydesmida	Paradoxosomatidae	*Orthomorpha*
3.	*Oxidusgracilis*	Polydesmida	Paradoxosomatidae	*Oxidus*
4.	*Trigoniulus corallines*	Spirobolida	Trigoniulidae	*Trigoniulus*
5.	*Narceusamericanus*	Spirobolida	Spirobolidae	*Narceus*

CONCLUSION

India has great and rich biodiversity. Western Ghats is one of the major bio-geographic zones in India and Western Ghats of Maharashtra state occupied about 12.5% of total bio diversified area of it.. It has great rich source of major faunas and small invertebrates including millipedes, centipedes and small creatures, molluscs, annelids, echinoderms etc. Due to less available of literature about these small millipedes' invertebrates, this group is most likely to be neglected such as soil fauna, deforestation, soil erosion, lack of rains and other artificial practices pose risk to the survival of millipedes. There is need to have study over this millipedes species every day. This current study reveals the study of biodiversity and distribution of millipede's species.

ACKNOWLEDGEMENT

The author expresses sincere thanks to Head of Department of Zoology, Jijamata Mahavidylaya, Buldana M.S. and also to field guide, farmer, forest conserver with each and every components who direct and indirect supported and helped during this research work.

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