



CHANGE IN DIVERSITY OF MILLIPEDES FROM 2014 TO 2017 ALONG THE
NORTHERN AND WESTERN GHATS OF RAJGURUNAGAR, (M.S.) INDIA,
(ARTHROPOD: DIPLOPOD)

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Abstract

The Diplopods are commonly known as millipedes which mean “Thousand legers”, though it is a gross exaggeration. The millipedes are sluggish, timid and secretive creatures avoiding enemies and hiding in dark and damp places such as under stones, logs and barks, among decaying leaves or in moss or rotten wood. Current knowledge on the effects of climate, food quality and land cover on millipedes is reviewed. The different period was used to study of diversity of millipedes species. In present research concludes the diversity of millipede rich in part of Northern Western Ghats of Rajgurunagar (M.S.) India. A total 8 species of millipedes belonging to order polydesmida and spirobolida, were recorded from tropical or agricultural landscape of Rajgurunagar. At the time of diversity study, Trigonulus corallines and Orthomorpha were observed more than other millipede species, which supports the environmental determinism condition.

Keywords:- Diplopod, Northern Western Ghats, Millipede diversity from year 2014 to 2017

Introduction

The Diplopods are generally known as millipede. The millipedes are widely distributed in all over world. The environmental changes commonly affect on the millipedes mainly high temperature. It also biological indicator, it shows variation in environment and climatic condition (Brunner H 2001). The millipedes are seasonal arthropods, it commonly found in rainy season and rarely found in summer season, because fluctuation in temperature are affect on millipede. (Ashwini KM, Shridhar KR, 2006).

The millipedes are belongs to phylum Arthropoda, and class Diplopods. Millipedes are classified into 16 orders and 145 families (Shelley R.M. 2007, Sierwald p. 2001). The eighty thousands species are estimated in that twenty thousand species are distributed in world. The millipedes are directly or indirectly economically important to human being.

In India there are about seven zone of biodiversity are recommended as hot spot. The Northern Western Ghats is one of the regions in this hot spot zone of biodiversity. (Myers N., Mittermeier A, 2000). In the Northern Western Ghat, many exotic species are need to research for its conservation. The Northern Western Ghats are deciduous and tropical moist forest, which environment is suitable to millipede, that's the reason to study the millipede in given environment.

The millipedes mean thousand legers. The millipedes are sluggish limed and secretive creature. It move slowly because of its short legs, these help to push soil. The millipede body is divided in to three parts head, thorax and abdomen. In which there are first three at thoracic region and one pair at abdomen. The

protection from enemies millipedes mostly leave at dark and damp places. Such as under the stone logs and bark of tree also rotting leaves mosses and rotten wood.

Material and Methods

The study was carried out during the all seasons in the year 2013 to 2017. In monsoon seasons green forest and grassland regeneration is very low. We are selected three locations from given area of different altitude. Done the survey of Northern Western Ghats and observe occurrence of different species of millipedes. Then millipedes are collected for photography by hand picking method and identify the species using field guider and standard literature and Wikipedia site. At every sampling time noted the air, soil temperature at 10 cm above depth of land using thermometer. Standard methods were used for the richness and evenness of millipede species at different altitude.

Results and Discussion

In present study total 5 numbers of species belongs 5 genera were recorded from Rajgurunagar. At the Northern western Ghats of Rajgurunagar in which order polydesmida belongs to four species and order spirobolida belongs to one species were recorded.

At Northern Western Ghats of Rajgurunagar millipede fauna was not well known. The following species under two orders of millipede were identified from the study area.

1] Order – Polydesmida.

It is the largest order of millipede. The order polydesmida are the flat backed millipedes, with fused sclerites. These millipedes generally have 20 segments as about 2700 species recorded in there order.

Under these order we are recorded 4 species.

a) *Apheloria virginiesis* – It is common millipede species. It is also called the black and gold flat millipede. There millipede is identified by its flattened look and black body with orange and yellow spots or highlights, with medium sized antenna. It is commonly found at leaf litter.

b) *Orthomorpha coarctata* (Saussure,1860)- It is also called *Asiomorpha coarctata*. The male are 14.5 to 20.5mm in length and female are 16.5 to 27.5 mm in size . Middle body is segmented, with longer gonopods.

c) *Harpaphe haydeniana* (Wood,1964) –There species also in order polydesmida and family xystodesmidae. There millipede is black colored, with yellow spots at both sides of the body.The length of the millipede is 5 cm, with 15-20 body segments.

d) *Oxidus gracilis* (Koch,1847) –It is in order polydesmida belongs to family paradoxosomatidae. There millipede is brown in color with faint yellow patches on body, the length of these animal is 4-5 cm in long with 15-20 segments.

2] Order-Spirobolida.

It is also included in class Diplopoda (millipede). The spirobolids are generally tropical species. Both pairs of legs on the seventh

segment of the male are modified into gonopods. The spirobolids are generally tropical species, some of which are very brightly coloured (Lewis, 1984). From given order we are recorded only one species.

a) *Trigoniulus corallines* (gervais,1847)-It is also called rusty millipede. These millipede are medium to large in size, brick red in color, mostly it is found in botanical gardens found in bunch.

From the given study area the *Harpaphe haydeniana* and *Orthomorpha coarctata* these two species are abundance in given ecosystem .The millipede species reported from the Northern Western Ghats, total 5 species which were present in selected area . In that the 4 species are already introduced in 2013 (C.R.Choudhri and S.V.Theurkar, 2013) and one species is not introduced.

The millipede species are active at morning in rainy season. It is mostly present at wet landscape. The millipedes are good decomposers especially in forest ecosystem in montane areas. (Aldgasam and Ramanathan, 2013). There is an urgent need for intensive inventorying and monitoring of millipede in different habitats especially in the Northern Ghats (M.S.) India in order to promote the conservation of diversity of millipede .

Millipede species	Order	Family	Genus
Trigoniulus Corallines	Spirobolida	Trigoniulidae	Trigoniulus
Apheloria virginiesis	Polydesmida	Xystodesmidae	Apheloria
Orthomorpha coarctata	Polydesmida	Paradoxosomatidae	Orthomorpha
Harpaphe haydeniana	Polydesmida	Xystodesmidae	Harpaphe
Oxidus gracilis	Polydesmida	Paradoxosomatidae	Oxidus



Figure 1- Apheloria virginiesis



Figure 2-Harpaphe haydeniana



Figure 3- Trigoniulus corallines



Figure 4- *Orthomorpha coarctata*



Figure 5- *Oxidus gracilis*

Conclusions

Most of the species are abundant at rainy season than summer and winter season, it is depends on arability of food. These investigated that the effect of seasonal fluctuation on diversity of millipede. Millipede need to conserve from the given area of hot spot and increase their species richness.

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