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1	Morphometric study of copepods (zooplankton) in Upper Morna reservoir, Medshi, Dist-Washim, Maharashtra	Dr. M. R. Solanke	Zoology	Journal of Emerging Technologies and Innovative Research (JETIR)	2021	7.95

Morphometric study of copepods (zooplankton) in Upper Morna reservoir, Medshi, Dist-Washim, Maharashtra.

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Abstract: In the Upper Morna Reservoir in Medshi, Dist- Washim, during study of morphometric relationship of zooplankton, the zooplankton community is comprised of Rotifer, Cladocera, Copepoda and Ostracoda. Total 53 species and 29 genera of zooplankton were recorded; Number of Copepods recorded 21 species in 15 genera and 6 families. It shows the fluctuation all over the year but maximum number of copepods was found in January and less number found in April and May in both years of 2015 and 2016. In Copepods all the three suborder Cyclopoida, calanoida, herpacticoida including species shows dominancy. In Copepods all the three suborder Cyclopoida, calanoida, herpacticoida including species shows dominancy. In *Cyclopoida, Cyclopes, Eucyclopes sp.* are found most dominant, in Calanoida *Diaptomus* were observed dominant and in hercapticoida sub order *Bryocamptus and Mararia species* found in abundances.

Keywords: Zooplankton, Copepods, Medshi, Upper Morna Reservoir, Washim

Introduction

The Upper Morna Reservoir is located in a village Medshi, until now the study on that reservoir is not done, which is used mainly for irrigation purpose, fishery purposes and some people use that reservoir for drinking and domestic use, therefore zooplankton are use as pollution indicator and indicating food chain therefore it is necessary to study them. In Upper Morna Reservoir Copepods are the metazoans represent 80% of Zooplankton. They are natural food sources of fish fry. They adapted to fluctuating environment. They produce resting eggs hat can survive for decades in the sediment before hatching of returning to the water column. The free-living Copepods, together with parasitic copepods, constitute the order Copepoda and class crustacean in the phylum Arthropoda. Free-living copepods in fresh water bodies are Calanoida, Harcapticoida and Cyclopoida.

Morphology

The segmented body of the copepods of suborders Calanoida, Hercapticoida and Cyclopoida. It has two important divisions separated by a major articulation. The point of this articulation is easily determined in the Calanoida and Cyclopoida and in some Harpacticoida because of a noticeable difference in the widths of the two parts. In the Calanoida, the articulation occurs between the somite of the fifth leg and the genital segment; in the Cyclopoida and the Harpacticoida, it occurs between the somites of the fourth and fifth legs.

Anterior and posterior divisions:

Anterior and posterior divisions of the copepods body are metasome and urosome. The metasome can be divided into two regions which are the head with five pairs of appendages (first antennae or antennules second antennae, mandibles, maxillules, and maxillae); and the thorax with six pairs of appendages (maxillipeds, four pairs of well-developed swimming legs referred to as legs 1 to 4, and one pair, leg 5, which may be modified or vestigial). Cephalic segment is referred as first body segment, is composed of the head and a thoracic somite (bearing the maxillipeds) ; sometimes a second thoracic somite bearing leg is also fused with the head. The last two segments of the metasome may be partially or entirely fused. The metasome may thus have six, five, four segments, depending on the genus or species.

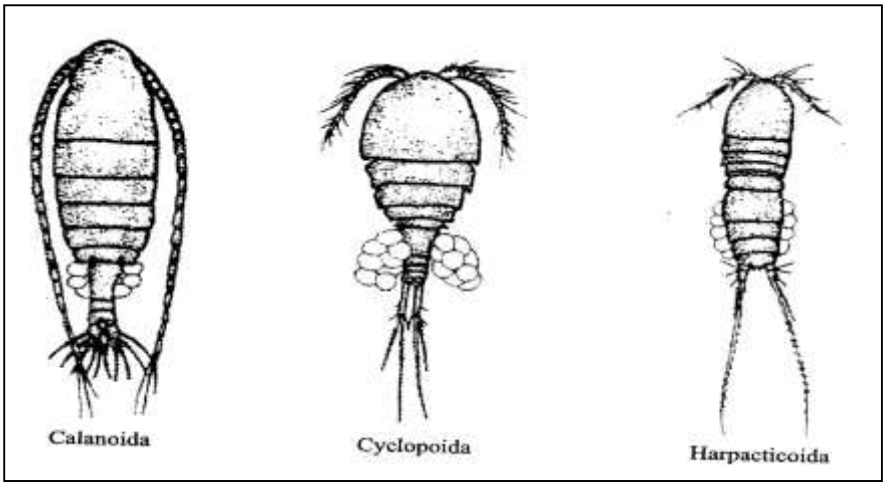


Fig 1: Diagrammatic representative of the major groups of Copepods (modified from Smith and Fernando, 1978)

The term urosome as used herein includes the genital segment and the succeeding abdominal segments. In the female, the first abdominal somite is fused with the genital somite and the whole is referred to as the genital segment; other fusions of somites may reduce the number of segments in the urosome to three or two. In development, the copepods pass by molting through five or six Nauplius stages, and six copepodid stages, of which the last is the adult. The body form of the copepodid is similar to that of the adult. Immature copepods are not identified easily, the early copepodid stages (I -III) can be recognized because all pairs of legs are not developed, or are very rudimentary. Stages IV and V in which four or five pairs of legs are present may be confused with the adult stage.

Review of literature: Gadekar *et al*., (2014) investigated 25 genera belonging to five major groups Protozoa (6 genera), Rotifera (5 genera), Copepoda (6 genera) and Cladocera (5 genera) and Ostracoda (3 genera) in Pangdi lake, Gondia, District Gondia, Maharashtra. Chavan and Dhamani (2011) Studied Biodiversity of zooplankton community in Wainganga River Bramhapuri, District Chandrapur (MS), India, they recorded 41 species, consisting of Rotifera (15), Cladocera (21), Copepoda (4) and Ostracoda (1). Pradhan (2014) reported Zooplankton populations which are Rotifera, Cladocera and Copepoda in Wunna Lake. Padate *et al*., (2014) studied seasonal variations in density of total microcrustacean for two years of investigation and reported 15 species of microcrustaceans belonging 30 genera which include Cladocera (9 species) and Copepoda (6 species) in high altitude, Lotus lake, Toranmal (M.S.) India. Patil *et al.*, (2013) studied microfaunal biodiversity of two aquatic habitat, that is Sarsi-Both Lake and Sawargaon (Kanhoba) Lake Dist. Washim (M.S.) and they recorded that from total zooplankton species i.e. Protozoa, Rotifera, Ostracoda, Cladocera and Copepoda. Lahane and Jayabhaye (2013) reported zooplankton community in the pimpaldari tank, Hingoli, Maharashstra, in the period march 2010 to Feb 2011 in this they investigate total 15 species of zooplankton out of which six species of rotifer, 4 species of copepods and 3 species of cladocera are found. Dabhade and Chhaba (2019), also studied zooplankton diversity around Washim region of Maharashtra and recorded different 27 zooplankton species from the different sampling sites of Washim region comprising of 11 species of Rotifera, 06 Copepods, 09 Cladocera and 1 Ostracoda. The community structure of zooplankton showed a mixed composition of mesotrophic to eutrophic species.

MATERIALS AND METHOD:

Site description: The Upper Morna reservoir is located ($18^0$36”44’N and $76^0$56”33.61’E) at Medshi, Malegaon Taluka in Washim district of Maharashtra. It is constructed on the Upper stretch of the Morna River, one of the minor river of Vidarbha region of Maharashtra and one of the tributary of the Purna River.

Copepods or Cyclopoida specimen were fixed in dilute formalin and placed in slide with drop of water in a drop of glycerin. Water get evaporates and leave only glycerine on specimen which can examined and dissected under dissecting microscope. By using needle, first body was separated between the fourth and fifth thoracic

somite's to expose the important fifth on the underside of the fifth thoracic somite's, as first antennae, caudal rami, on swimming legs. Last two legs must be dissected out as they are too closely. Permanent mount of specimen and dissecting part were made by placing it into a drop of melted glycerine jelly on a slide.

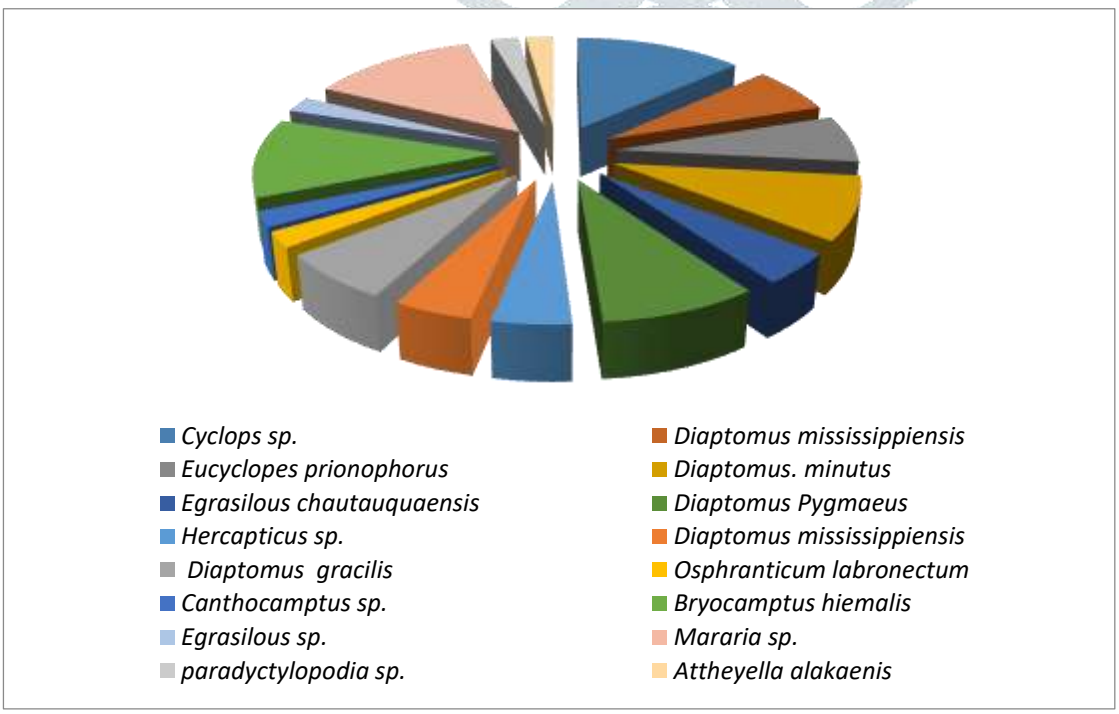
For the collection of zooplankton (copepods) Samples collected monthly from four different sites of reservoir during two yeas study 2015 1nd 2016 by towing Nylon plankton Net of mesh size 25u. This net used repeatedly operated to get concentrated samples. Large common organisms like aquatic insects, crustacean larva and tadpole larva were removed by forceps. Concentration of samples was done by using a bore cut wide syringe with fine mesh size netting fitted on mouth. The water sieved inside the tube of syringe without piston is dipped in the inserting the piston in the tube of syringe is poured away so as to prepare a data searching was done for identification of new species. .

Identification of zooplankton species is carried out by standard literature of **Edmonson (1959), Dhanpati (2000)**

Result:

Total 53 species and 29 genera of zooplankton were recorded, out of which number of Copepods recorded 21 species in 15 genera and 6 families. It shows the fluctuation all over the year but maximum number of copepods was found in January and less number found in April and May in both study years. In Copepods all the three suborder Cyclopoida, calanoida, herpacticoida including species shows dominancy. In *Cyclopoida, Cyclopes Eucyclopes sp.* are found most dominant, in Calanoida *Diaptomus* were observed dominant and in hercapticoida suborder *Bryocamptus and Mararia species* found in abundances. Pawar and Pulle (2005) also some similar results that *Calanoida (Diatomus sp.)* and *Cyclopes* dominant in copepods in Pethwadaj dam Nanded. Controversial result obtained by Pradhan (2014) that they found dominancy of Copepods in summer month during study period. Pawan Panpatil and Deshmukh S. V.in (2021) studied on zooplankton diversity at Rajura Dam , Jalgaon Jamod dist- Buldana , they show controversy in their result that they found minimum number of copepods in overall zooplankton community. Their study indicates total 09 species of zooplankton were recorded. among these 06 species belonging to Rotifera, 01 species belonging to Copepoda, 02 species belonging Cladocera were found.

Seasonal fluctuation and abundance in number of species of Copepoda shown in **Graphplate I.**



Graphplate I: Pie diagram shows dominancy and abundance of Copepoda Species.

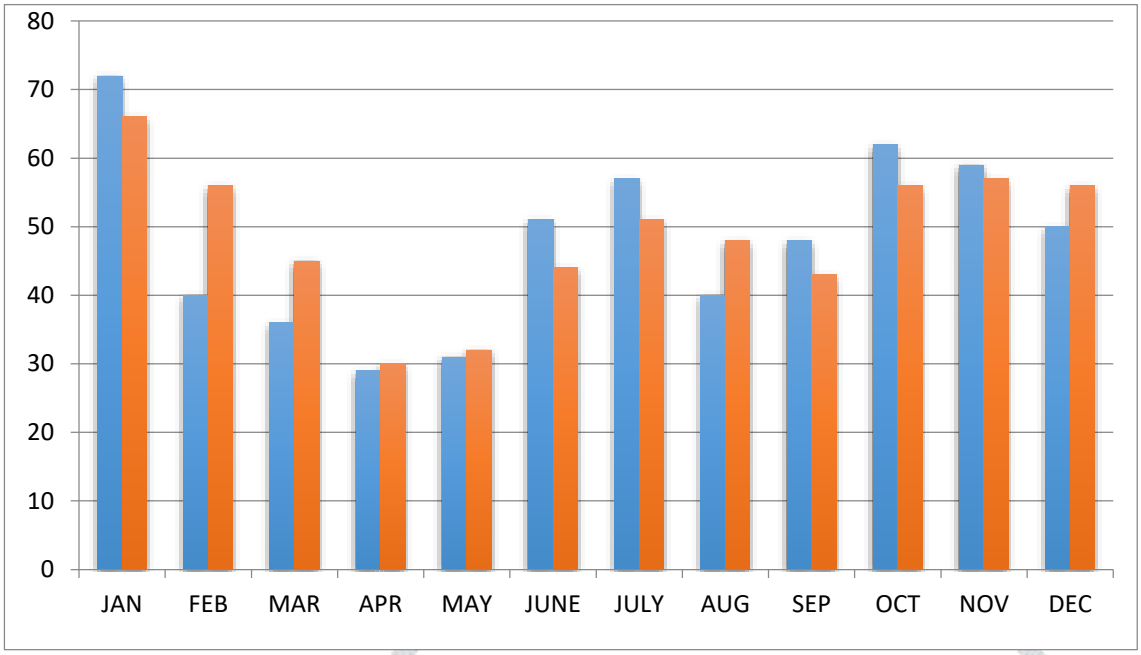


Fig 2: Seasonal variation in number of species of Copepoda in 2015-16

(Blue colour- 2015, Orange colour- 2016)

Aknowlegment:

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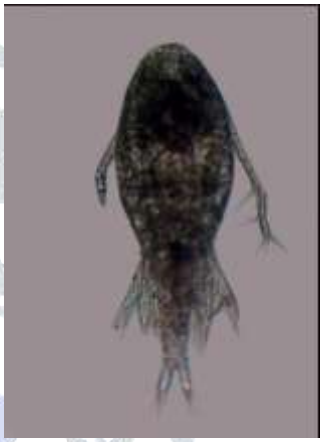
PHOTOPLATE – I (Copepoda-Calanoid)

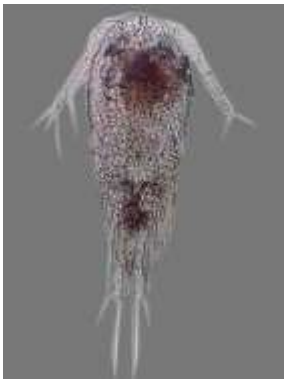
		
Diaptomus minutes	*Diaptomus nauplius stage*	*Diaptomus pygmaeus*
		
Diaptomus mississippiensis	*Diaptomus gracilis (female)*	*Diaptomus theeli*
		
Diaptomus sp.	*Diaptomus sp.*	*Osphranticum labronectum*

PHOTOPLATE – II (Copepoda-Harpacticoid)

		
Bryocamptus hiemalis.	*Bryocamptus pygmaeus*	*Bryocampus sp.*
		
Paradactylopodia brexncornis	*Mararia duthieri*	*Mararia sp.*
		
Canthocamptus robertcokeri	*Attheyella alakaensis*	*Harpacticus chelifer*

PHOTOPLATE – III

(Copepoda-Cyclopids)

		
Eucyclopes prionophorus	*Eucyclopes agilis*	*Cyclopes scutifer*
		
Nauplius of cyclopes	*Nauplius of cyclopes*	*Cyclopes crassicaudis brachycercus*

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