



Research paper

On some Zooplanktons recorded from Ooty, Nilgiri District of Tamil Nadu

J. Thilak*, R. Sakthivel and Neethu, K. P.

Southern Regional Centre, Zoological Survey of India, 130-Santhome High Road, Chennai, Tamil Nadu, India

*Corresponding author email: jayasreethilak@yahoo.com

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Abstract: The paper deals with the diversity zooplankton such as Rhizopoda, Rotifera, Cladocera and Ostracoda from the different localities of Ooty, Nilgiri district of Tamil Nadu. The present study comprises of a total of 37 species of Zooplankton which include 3 species of Rhizopoda, 19 species of Rotifers, 12 species of Cladocera and 2 species of Ostracoda from Ooty, Nilgiri district of Tamil Nadu. The study was conducted during the year 2013- 2014. Rotifers were the dominant group representing 19 species. The polymorphic forms of the Rotifer genera *Brachionus* such as *Brachionus calyciflorus f. amphiceros* (Gosse, 1851) and *Brachionus quadridentatus brevispinous* (Ehrenberg, 1832) are also recorded during the present study. The diversity of Rotifers are more when compared to the other groups. The study reports several alkaline and eutrophic species.

Keywords: Rhizopoda, Rotifera, Cladocera, Ostracoda, Diversity, Distribution, Species, Nilgiri, Tamil Nadu.

Introduction:

Zooplanktons are of primary importance of aquatic food chain and are also good bio-indicators of aquatic environment. They are very sensitive aquatic organisms so, any change in the environment may lead to change in the zooplanktonic communities in terms of tolerance, abundance, diversity and dominance in the habitat (Barnes, 1968); Ferdous and Muktedir (2009). The planktonic life is an essential part of aquatic eco system to maintain a healthy and productive environment (Khangarotand Das, 2009). Freshwater zooplankton consists of the animal groups such as Rhizopoda, Rotifera, Cladocera, Copepoda, Ostracoda, insect larvae, fish eggs, fish larvae etc.

The Protozoa are microscopic unicellular eukaryotes that have a complex internal structure. Free-living forms constitute flagellates, amoebae and ciliates. Protozoans are very important as bioindicators for pollution and environmental biomonitoring (Kolkwitz and Marsson, 1908). The free-living protozoan community plays a functional role in aquatic biotopes (Finlay and Esteban, 1998). The present study reports

3 species of Rhizopoda belonging to 3 genera under 3 families.

Rotifers are small microscopic organisms with size variation ranging from 40 microns to 2.5mm in size. They are commonly known as “Wheel animalcules”. They form an integral part in aquatic food chain; plays an important role in biological productivity and also serves as bio indicators to assess the water quality and in toxicological bioassay experiments (Berzins & Pejler, 1983). The present study reports 19 species of Rotifers belonging to 7 genera under 5 families.

The Cladocera, commonly known as the ‘Water fleas’ forms an important constituent of freshwater organisms. The members of the 3 genera viz. *Penilia*, *Evadne* and *Podon* are known to be truly marine. The size of Cladocera varies from 0.2 to 3.0 mm. The trunk is invariably covered with a bivalve carapace which is usually ornamented. They are filter feeders and feed on microscopic algae and microbes which are the major components of water bodies. Cladocerans constitute an important link in aquatic food webs. They are used as environmental tools for toxicology studies and are used in bioassay studies. As they play an integral role in fresh water ecosystems and, they are recognized as ecological indicators (Stemberger et.al., 2001; Jeppesen et. al., 2001). They inhabit every type of freshwater habitats and are intolerant to high salt concentrations in the medium, even though there are some species which frequently occur in brackish water (Michael and Sharma, 1988). The present study reports 12 species of Cladocerans belonging to 2 orders, 9 genera under 6 families.

Freshwater Ostracods commonly known as ‘seed shrimps’ are the neglected little crustaceans. Most species are benthic. Some occur among aquatic vegetation and algal mats and a few are planktonic. Ostracoda plays an important role in the

aquatic food chain (Forbes, 1888), acts as ecological indicators (Puri, 1964) and act as secondary hosts for a number of fish parasites (Hoff, 1942; Hoffman, 1967). They are also used as Stratigraphic markers in Geology (Moore, 1961). Ostracods come as a separate class under the Subphylum Crustacea and divided into the subclasses Myodocopa and Podocopa (Martin and Davis 2001; Horne et al., 2002). The three orders viz. Platycopeida, Podocopeida and Paleocopeida come under the Subclass Podocopa. The marine and a very few brackish water forms come under the order Platycopeida, Podocopeida includes both freshwater & marine species and Palaeocopeida represents fossil records (Karanovic, 2012). The present study reports 2 species of Ostracods belonging to 2 genera under 1 family.

Historical Review:

The studies on Indian free-living Protozoa were initiated by Cantor (1842). Later Penard (1907), Ghosh (1918-1921), Choudhary (1989), Mukherjee (1990), Das et. al., (1995), Naidu (1966), Sharma & Sharma (2008), Thilak & Bindu (2012), Bindu (2013, 2019) paid contributions to the Rhizopoda in India. Rotifers were first described by Leeuwenhoek (1703). Systematic studies on Indian Rotifera were initiated by Anderson (1889). A number of workers viz. Arora (1966), Chandra Mohan and Rao (1976), Das and Akhtar (1976), Dhanapathi (2000), Sharma and Michael (1980), Sharma (1978, 1983, 1987, 1991, 1996, 1998, 1998a, 2005), Sharma & Sharma (1997, 1999, 2000, 2001, 2005a, 2005b, 2008, 2009, 2014, 2017, 2018), Patil (2001), paid much attention to the Rotifer fauna of India. The studies on Indian Cladocera were initiated by Baird (1860). Later various workers viz., Michael (1962), Navaneethakrishnan and Michael (1971), Murugan and Sivaramakrishnan (1973 & 1976), Sharma

1978; Battish, (1981), Sharma and Sharma, 1985; Sharma and Michael, (1983); Michael and Sharma, (1988); Battish, (1992); Venkataraman, (1983, 1991, 1992, 1993, 1994, 1995, 1998, 1999, 2000); Venkataraman and Das (2000); Raghunathan, (1990, 1995) Raghunathan and Ranae (2001); Raghunathan and Kumar (2003); Sharma, (2008); Sharma and Sharma (1985, 1999, 2001, 2008, 2009, 2010, 2013, 2014, 2017), Chandrasekhar and Chatterjee (2003, 2008); Subbamma (1992, 1993); Chandrasekhar (2004) paid much attention to various aspects of Cladoceran studies in India including taxonomic studies. Taxonomic studies on Indian Ostracoda were initiated by Baird (1959), Klie (1927), Arora (1931), Hartmann (1964), Deb (1972, 1973 and 1978), Victor and Michael (1975) and Battish (1978, 1981). Later Victor and Fernando (1979), Thilak (1992), Thilak et.al., (1994), Venkatramanand Krishnamoorthy (1998), Venkataraman (1999), PatilandTalmalae (2005), Harsheyand Thilak (2011), Karuthapandi et.al., (2014), Karuthapandi and Rao (2017) provided information on freshwater Ostracods from Indian waters.

Materials and Methods:

The Nilgiri district of Tamil Nadu which is a part of the Western Ghats of India is one of the famous hill stations and is popularly known as the “Queen of hills”. It is situated at an altitude of 2240m elevation. The climate is subtropical highland climate. The co-ordinates of Ooty isN-

11°28601' E-76°43839'. There are so many lakes and dams such as Ooty lake, Pykara falls, Parson valley Reservoir, Kamarajasagar dam, Emerald Lake, Avalanche Lake, Porthmund lake etc. In addition to these there are so many small streams, pools and ditches.

Zooplankton sample collections were made from the different localities of Nilgiri, district of Tamil Nadu during 2013 to 2014. Nearly 46 samples were collected and examined. The general map of Tamil Nadu showing the selected districts and the co-ordinates of the collection localities were given as (Fig.1), (Table.1). Sample collections were done by sweeping the plankton net of bolting silk of mesh size 67µ among the water and also by disturbing the bottom. Samples were immediately fixed in 10% formalin. Taxonomic identification was carried out by detailed examination under higher magnification of stereo zoom microscope. Standard references viz. Edmondson (1959); Needham & Needham (1962); Pennak (1978); Victor & Fernando (1979); Karanovic (2012); Sharma & Sharma (2008); Michael & Sharma (1988); Chattopadhyay and Das (2003); Deflandre (1959); Adl et. al., (2012); Das et. al., (1993, 1995, 2000);Chatterjee et.al., (2013) were followed for identification and classification. The samples collected were deposited in the National Zoological Collections of SRC/ ZSI/ Chennai. Some of the photographs of the recorded species of zooplankton were also provided (Plates- 1- 3).

GLOBAL & INDIAN STATUS OF THE RECORDED ZOOPLANKTON GROUPS.

No	Group	World	India
1	Protozoa (Freeliving)	2390	1600
2	Rotifera	2030	419
3	Cladocera	700	137
4	Ostracoda	2330	154

Source: Chandra et. al., 2017

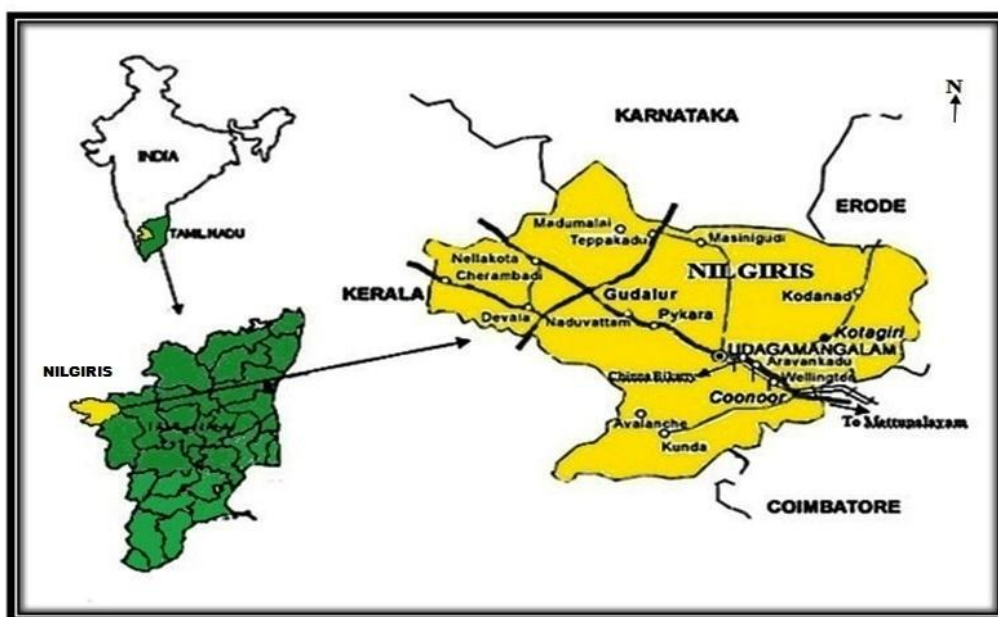


Fig-1. A general map of Tamil Nadu showing the selected district and study areas.

Table-1. Showing the coordinates of the sample collection localities of the Nilgiri district of Tamil Nadu.

No	Collection date	Locality Name	Latitude	Longitude	Altitude	Collected by
1	04.03.2013	Toda colony pond, Ooty, Nilgiri	N-11°22590'	E-76°40618'	6678 Ft	J. Thilak & Pty
2	06.03.2013	Pykara Lake, Ooty, Nilgiri	N-11°28272'	E-76°36270'	6671 Ft	J. Thilak & Pty
3	06.03.2013	Kamarajasagardam, Ooty, Nilgiri	N-11°26332'	E-76°39630'	7010 Ft	J. Thilak & Pty
4	06.03.2013	Ooty lake, Near boat house, Ooty, Nilgiri	N-11°24399'	E-76°41337'	6900 Ft	J. Thilak & Pty
5	07.03.2013	Mukurthi Lake Ooty, Nilgiri,	N-18°386'	E-76°30322'	6552 Ft	J. Thilak & Pty
6	07.03.2013	Emerald dam, Ooty, Nilgiri	N-11°19708'	E-76°37319'	6579 Ft	J. Thilak & Pty
7	08.03.2013	Irumbupalam (Devala River), Ooty, Nilgiri	N-11°29663'	E-76°26977'	2827 Ft	J. Thilak & Pty
8	09.3.2013	Massanallaodai, Near Masinagudi, Nilgiri	N-11°32809'	E-76°40847'	2926 Ft	J. Thilak & Pty
9	10.03.2013	Parson valley, Ooty, Nilgiri	N-11°23667'	E-76°35567'	7282 Ft	J. Thilak & Pty
10	10.3.2013	Power House II, Near Porthmund	N-11°21663'	E-76°43230'	6498 Ft	J. Thilak & Pty
11	11.3.2013	Avalanchi, Chinnai Coonoor, Nilgiri	N-11°28601'	E-76°43839'	5525 Ft	J. Thilak & Pty
12	11.03.2013	Marlimuderi, Ooty, Nilgiri	N-11°25971'	E-76°41905'	7507 Ft	J. Thilak & Pty

13	11.03.2013	Indra Nagar tank Ooty, Nilgiri	N-11°27261'	E-76°42469'	7058 Ft	J. Thilak & Pty
14	11.03.2013	Kedharai bridge, Thoraitty village, Ooty, Nilgiri,	N-11°29089'	E-76°45748'	5587 Ft	J. Thilak & Pty
15	12.03.2013	Bettu village pond, Ooty, Nilgiri	N-11°24033'	E-76°42882'	7152 Ft	J. Thilak & Pty
16	12-3-2013	Ralliah dam, Nilgiri	N-11°23810'	E-76°45644'	6993 Ft	J. Thilak & Pty
17	13.03.2013	Milethaimalai, Ooty, Nilgiri	N-11°16131'	E-76°43835'	5610 Ft	J. Thilak & Pty
18	14.03.2013	Katteystream, Ooty, Nilgiri	N-11°20309'	E-76°44212'	6255 Ft	J. Thilak & Pty
19	14.03.2013	Kathey upper dam, Ooty, Nilgiri	N-11°20402'	E-76°43996'	6358 Ft	J. Thilak & Pty
20	20.09.2014	Avalanche power house, Ooty, Nilgiri	N-11°18314'	E-76°34587'	6517 Ft	J. Thilak & Pty
21	20.09.2014	Emerald dam, Ooty, Nilgiri	N-11°19661'	E-76°37272'	6561 Ft	J. Thilak & Pty
22	20.09.2014	Emerald village bridge, Ooty, Nilgiri	N-11°19158'	E-76°37409'	6351 Ft	J. Thilak & Pty
23	22.03.2014	Kamarajasagar dam, Ooty, Nilgiri	N-11°26580'	E-76°39116'	7089 Ft	J. Thilak & Pty
24	22.03.2014	Emerald dam, Ooty, Nilgiri	N-11°24335'	E-76°40822'	6553 Ft	J. Thilak & Pty
25	22.03.2014	Ooty lake, Ooty, Nilgiri	N-11°24335'	E-76°40822'	7273 Ft	J. Thilak & Pty
26	22.03.2014	Marlimuddam, Ooty, Nilgiri	N-11°25935'	E-76°41945'	7623 Ft	J. Thilak & Pty
27	22.03.2014	Ramaiyah bridge, Ooty, Nilgiri	N-11°16948'	E-76°39345'	543 Ft	J. Thilak & Pty
28	22.03.2014	Pykara dam, Ooty, Nilgiri	N-11°28033'	E-76°36227'	6773 Ft	J. Thilak & Pty
29	22.03.2014	Kamarajasagar dam, Ooty, Nilgiri	N-11°26580'	E-76°39116'	7089 Ft	J. Thilak & Pty
30	22.03.2014	Pykara boat house, Ooty, Nilgiri	N-11°29301'	E-76°35844'	6852 Ft	J. Thilak & Pty
31	22.03.2014	Glenmorgan dam, Ooty, Nilgiri	N-11°30423'	E-76°36167'	6518 Ft	J. Thilak & Pty
32	22.03.2014	6 th mile dam, Ooty, Nilgiri	N-11°26139'	E-76°40006'	6210 Ft	J. Thilak & Pty
33	22.03.2014	T.R. Dam, Ooty, Nilgiri	N-11°27971'	E-76°33698'	6549 Ft	J. Thilak & Pty
34	23.03.2014	Ooty lake, Ooty, Nilgiri	N-11°24335'	E-76°40822'	7273 Ft	J. Thilak & Pty
35	23.03.2014	Ramaiyah bridge, Ooty, Nilgiri	N-11°16948'	E-76°39345'	5239 Ft	J. Thilak & Pty
36	23.03.2014	Emerald village bridge, Ooty, Nilgiri	N-11°19161'	E-76°37413'	6345 Ft	J. Thilak & Pty

37	23.03.2014	Emerald dam, Ooty, Nilgiri	N-11°19694'	E-76°37347'	6553 Ft	J. Thilak & Pty
38	23.03.2014	Kundha dam, Ooty, Nilgiri	N-11°16883'	E-76°38768'	5375 Ft	J. Thilak & Pty
39	19.11.2014	Karamei R.F., Coonor, Nilgiri	N-11°21785'	E-76°50135'	5899 Ft	J. Thilak & Pty
40	20.11.2014	Elladakotagiri, Nilgiri	N-11°28563'	E-76°54633'	6394 Ft	J. Thilak & Pty
41	21.09.2014	Andis canal, Ooty, Nilgiri	N-11°24036'	E-76°38313'	7369 Ft	J. Thilak & Pty
42	21.09.2014	Parson valley dam, Nilgiri	N-11°23664'	E76°35557'	7282 Ft	J. Thilak & Pty
43	21.09.2014	Kollikodemorth, Ooty, Nilgiri	N-11°24368'	E-76°37210'	7620 Ft	J. Thilak & Pty
44	22.09.2014	Ooty lake, Nilgiri	N-11°24406'	E-76°41335'	7282 Ft	J. Thilak & Pty
45	22.09.2014	Kamarajasagar dam, Nilgiri	N-11°26575'	E-76°39161'	7116 Ft	J. Thilak & Pty
46	22.09.2014	Glenmorgan dam, Ooty, Nilgiri	N-11°30429'	E-76°36112'	6537 Ft	J. Thilak & Pty

SYSTEMATIC LIST OF ZOOPLANKTON RECORDED FROM NILGIRI DISTRICT OF TAMIL NADU.

PROTOZOA

Phylum SARCOMASTIGOPHORA

Class RHIZOPODA

Subclass LOBOSEA

Order ARCELLINIDA

Family ARCELLIDAE

Genus *Arcella* Ehrenberg, 1832

1. *Arcelladiscoides* Ehrenberg, 1843

Family CENTROPYXIDAE

Genus *Centropyxis* Stein, 1857

2. *Centropyxis* *secornis* (Ehrenberg, 1843)

Family NEBELIDAE

Genus *Lesquereusia* Schlumberger, 1845

3. *Lesquereusia spiralis* (Ehrenberg, 1830)

ROTIFERA

Phylum ROTIFERA

Class EUROTATORIA De Ridder, 1957

Subclass MONOGONONTA Wesenberg-

Lund, 1889

Order PLOIMA Hudson and Gosse, 1886

Family BRACHIONIDAE Wesenberg-

Lund, 1889

Brachionus Pallas, 1776

4. *Brachionus angularis* Gosse, 1851

5. *Brachionus calyciflorus* Pallas, 1766

6.

Brachionus calyciflorus *amphiceros* (Gosse, 1851)

7. *Brachionus caudatus* Barrois and Daday, 1894

8. *Brachionus caudatus personatus* (Ahlstrom, 1940)

9. *Brachionus falcatus* Zacharias, 1898

10. *Brachionus quadridentatus* Hermann, 1783

11.

Brachionus quadridentatus brevispinous (Ehrenberg, 1832)

Genus *Keratella* Bory de St. Vincent, 1822

12. *Keratella quadrata* (O.F. Muller, 1786)

13. *Keratella tropica* (Apstein, 1907)

14. *Keratella cochlearis* (Gosse, 1851)

15. *Keratella lenzi* Hauer, 1953

Genus *Platyias* Haring, 1913

16. *Platyias quadricornis* (Ehrenberg, 1832)

Family LECANIDAE Bartos, 1959

Genus *Lecane* Nitzsch, 1827

17. *Lecane luna* (O.F. Muller, 1776)

18. *Lecane unguolata* (Gosse, 1887)

19. *Lecaneleontina*(Turner,1892)
 Family ASPLANCHNIDAE Harring&
 Mayers, 1926
 Genus *Asplanchna*Gosse, 1850
 20. *Asplanchnabrightwelli*Gosse, 1850
 Family CONOCHILIDAE Remane, 1933
 Genus *Conochilus*Ehrenberg,1834
 21. *Conochilusunicornis*Rousselet, 1892
 Family FILINIDAE Bartos, 1959
 Genus *Filinia*Bory de St. Vincent
 22. *Filinialongiseta*(Ehrenberg, 1834)
 23. *Filiniaopoliensis*(Zacharias, 1898)

CLADOCERA

- Class BRANCHIOPODA
 Superorder CLADOCERA
 Order CTENOPODA Sars, 1865
 Family SIDIDAE Baird, 1850
 Genus *Diaphanosoma*Fischer, 1850
 24. *Diaphanosomasarsi*Richard, 1894
 Order ANOMOPODA Sars, 1865
 Family DAPHNIIDAE Straus, 1820
 Genus *Ceriodaphnia*Dana, 1853
 25. *Ceriodaphniacornuta*Sars, 1885
 26. *Ceriodaphniaquadrangula*(O.F.
 Muller, 1776)
 Genus *Daphnia* O.F. Muller, 1785
 27. *Daphnia*
*(Ctenodaphnia)carinata*King, 1853 s. lat.
 Genus *Simocephalus*Schoedler, 1858
 28. *Simocephalus (Ehinocaudus)*
acutirostratus King, 1853
 29. *Simocephalus (Coronocephalus)*
serrulatus(Koch, 1841)
 30. *Simocephalus (Simocephalus)*
vetulus(O.F. Muller, 1776)
 Family MOINIDAE Goulden, 1968

- Genus *Moina*Baird, 1850
 31. *Moinamicrura*Kurz, 1874
 Family BOSMINIDAE Baird, 1845 sensu
 Sars, 1865
 Genus *Bosmina* Richard, 1895
 32. *Bosminopsis (Bosmina)*
longirostris(O.F. Muller, 1776) s. lat
 Family MACRITHRICIDAE Norman and
 Brady, 1867
 Genus *Macrothrix*Baird, 1843
 33. *Macrothrix spinosa* King, 1853
 Family
 CHYDORIDAEDybowsk&Grochowski,
 1894
 Subfamily
 ALONINAEDybowsk&Grochowski,
 1894
 Genus
*Coronatella*Dybowsk&Grochowski, 1894
 34. *Coronatellarectangula*Sars, 1862 s.lat
 Genus *Chydorus*Leach, 1816
 35. *Chydorussphaericus*(O.F. Muller,
 1776) s. lat
OSTRACODA
 Phylum ARTHROPODA
 Class OSTRACODA Latrielle, 1806
 Order PODOCOPIDA Sars, 1866
 Family CYPRIDIDAE Baird, 1845
 Subfamily CYPRICERCINAE McKenzie,
 1971
 Genus *Strandesia*, Stuhlmann, 1888
 36. *Strandesiaelongata* Hartmann, 1964
 Genus *Potamocypridopsis*Brady, 1867
 37. *Potamocypridopsisdubia*Sars, 1903

Results and Discussion:

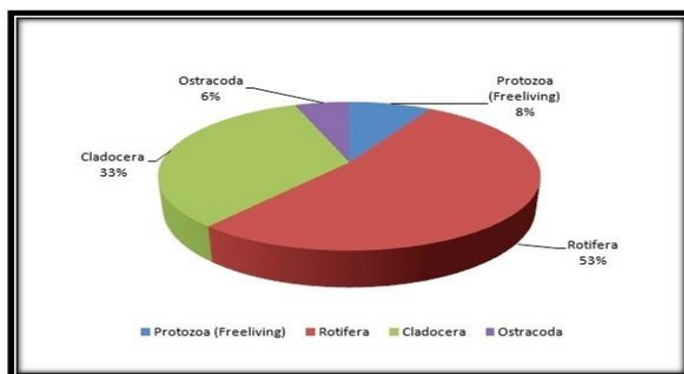


Fig-2. Pie diagram showing the percentage composition of zooplankton groups from Nilgiri district of Tamil Nadu.

The present study reports only 37 species of zooplanktons of different groups viz. Rhizopoda, Rotifera, Cladocera & Ostracoda. Rhizopoda represents 3 species(8%)belonging to 3genera under 3 families. More studies will reveal more species from this area. The Rotifers represents the most dominant group showing the presence of 19 species (53%)belonging to7 genera under 5 families. **Warm steno-thermal species:** *Brachionusfalcatus* Zacharias, 1898,*Filiniaopoliensis*Zacharis, 1898. **Eurythermal species:** *Brachionus angularis* Gosse, 1851, *Brachionuscalyciflorus* Pallas, 1766, **Species preferring temperate waters:** *Brachionusquadridentatus* Hermann, 1783, *Keratellacochlearis* (Gosse, 1851). **Alkaline species:** *Brachionuscaudatus* Barrois & Daday, 1894,*Brachionuscalyciflorus* Pallas, 1766, *Brachionusfalcatus* Zacharias, 1898, *Keratellatropica* (Apstein, 1907) *Asplanchnabrightwelli* Gosse, 1850, *Filinalongiseta* (Ehrenberg, 1834), *Filiniaopoliensis* Zacharis, 1898, **Eutrophic species:** *Brachionus angularis* Gosse, 1851, *Brachionuscalyciflorus* Pallas, 1766, *Brachionusfalcatus* Zacharias, 1898, *Keratellatropica* (Apstein, 1907), *Lecaneleontina* (Turner, 1892), *Filinalongiseta* (Ehrenberg, 1834), *Filiniaopoliensis* Zacharis, 1898, *Conochilus* (*Conochilus*) *unicornis* Rousselet, 1892 are reported during present study. The Cladoceransrepresents the second dominant group with arepresentation of 12 species (33%) belonging to2 orders, 9 genera under 6 families. The high-altitude species such as *Diaphanosomasarsi* Richard, 1895; *Simocephalus* (*Simocephalus*) *vetulus*(O.F. Muller, 1776); *Ceriodaphniacornuta*Sars, 1885 were also recorded during the present study.The present study reports only 2 species (6%)of Ostracods belonging to 2 genera under 1 family.

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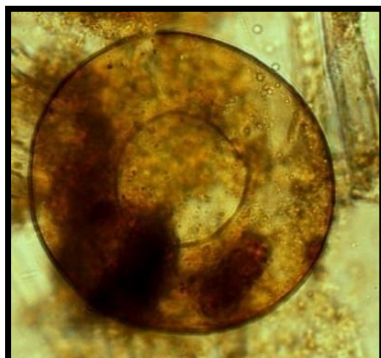
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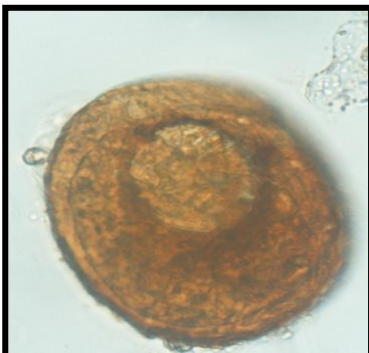
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PLATE-1



Arcella discoidea Ehrenberg



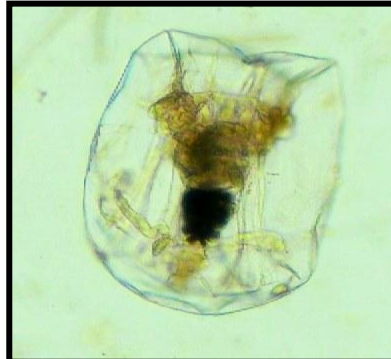
Centropyxis ecornis (Ehrenberg)



Lesquerusia spiralis (Ehrenberg)



Platiyas quadrichornis Ehrenberg



Aplanchna brightwelli Gosse



Brachionus caudatus personatus (Ahlstrom)



Brachionus quadridentatus brevispinus (Ehrenberg)



Brachionus calyciflorus Pallas



Brachionus angularis Gosse



Brachionus falcatus Zacharias



Keratella quadrata (O.F. Muller)

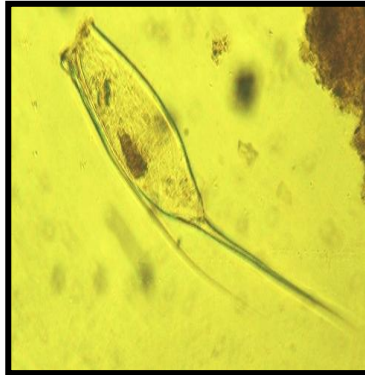


Lecane luna (O.F. Muller)

PLATE- II



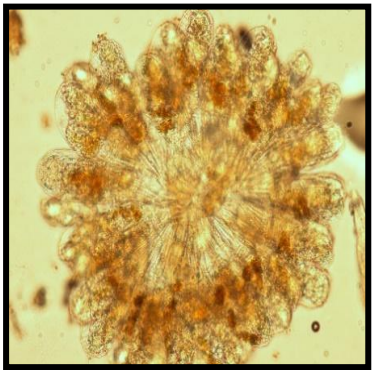
Filinia longiseta (Ehrenberg)



Filinia opolensis (Zacharias)



Colurella adriatica Ehrenberg



Conochilus unicornis Rousset
 (Colony of 29 individuals)



Conochilus unicornis Rousset



Keratella cochlearis Gosse



Keratellalenzi Hauer



Keratellatropica Apstein



Lecaneungulata (O.F. Muller)



Lecane leontina (Turner)



Ceriodaphnia quadrangula (O.F. Muller)



Bosmina longirostris
 (O.F. Muller)

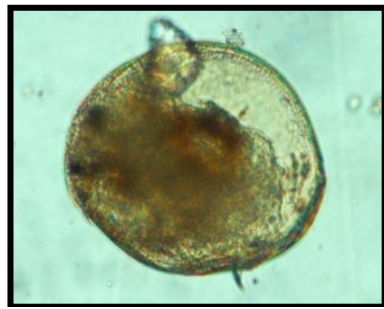
PLATE-III



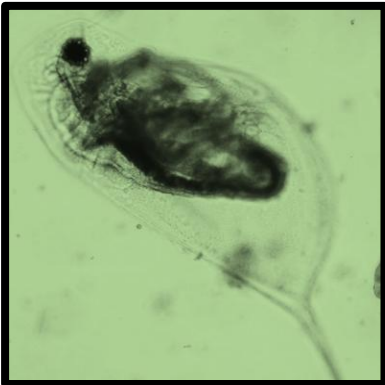
Coronatella rectangula rectangula (Sars) s.lat.



Ceriodaphnia cornuta Sars



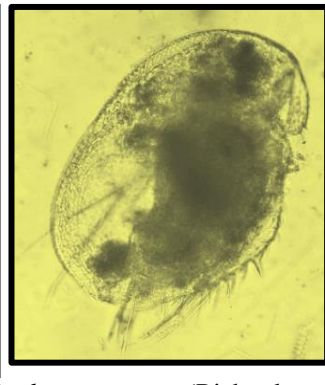
Chydorus sphaericus (O.F Muller)



Macrothrix spinosa King
Carinata King, s. lat



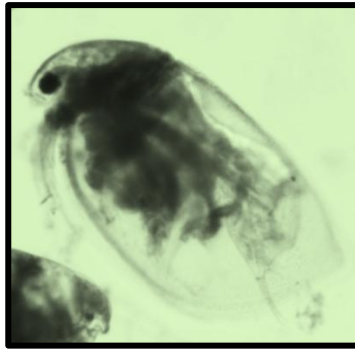
Daphnia (Ctenodaphnia)



Diaphanosoma sarsi Richard



Moinamicrura Kurz



Simocephalus (Ehinocaudus) acutirostratus King



Simocephalus serrulatus (Koch)



Simocephalus (Simocephalus) vetulus (O.F. Muller)



Cypridopsis dubia Sars



Strandesia elongata Hartmann