International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 6 Issue 7, November-December 2022 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

The Diversity and Distribution of Rotifers in Two Selected Biotopes of Kanyakumari District, Tamil Nadu, India

A. Sivaselva Rajan.; Renu, A.; Rinaldin Aroma, S.

S R Center for Scientific Research and Social Resource, Ramavarmapuram, Nagercoil, Tamil Nadu, India

ABSTRACT

Rotifers are the free-floating and microscopic animals found in all aquatic ecosystems. It is important for many of the fishes as they are used as the source of food. They are filter feeders that will eat dead materials, algae, and other microscopic living organisms, and are therefore very important components of aquatic food webs. Zooplankton are playing important role in biomonitoring of water pollution and rotifers exhibit complex patterns of diversity and distribution in freshwater because many species are cosmopolitan. The zooplankton community fluctuates according to the physicochemical parameters of the environment, especially rotifer species change with biotic factors. Zooplankton is heterotrophic and plays an important role in the food web by linking primary producers to higher trophic level. Kumaracoil temple tank and Suchindrum temple tanks are selected for present study and they were highly fertile freshwaters of Kanyakumari District. Zooplankton samples were collected by filtering 100 liter of water through a zooplankton net made up of bolting silk 35 µm mesh size. *Brachionus falcatus, Brachionus caudatus, Brachionus angularis, Brachionus calyciflorus, Brachionus patulus, Brachionus quadridentatus, Brachionus forficula, Keratella tropica, Keratella procurva, Platias quadricornis, Brachionus donneri, Brachionus durgae, Keratella edmondsoni, Keratella lenzi, Platyias eloupi, Pseudoeuchlanis longipedes, Mytilina acanthophora, Macrochaetus longipes, Lepadella biloba, Lepadella dactyliseta, Lepadella eurysterna, Lecane braumi, Lecane eswari, Lecane lateralis, Lecane simonneae, Lecane sola, Lecane (Monostyla)anthinula, Lecane (Monostyla) bulla diabolica, Ascomorpha ecaudis, Trichocerca bicristata, Trichocerca iernis, Asplanchnopus bhimavaramensis* species were identified. Most of the species identified are new to Kanyakumari District and some are new to Tamil Nadu.

How to cite this paper: A. Sivaselva Rajan. | Renu, A. | Rinaldin Aroma, S. "The Diversity and Distribution of Rotifers in Two Selected Biotopes of Kanyakumari District, Tamil Nadu, India" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-7, December 2022, pp.745-750, URL: www.ijtsrd.com/papers/ijtsrd52383.pdf

IJTSRD52383

KEYWORDS: *Hydrocarbon, Biodegradation, Pollution, Cyanobacteria, Soil*

INTRODUCTION

Rotifers are the great consumers of protozoans and bacteria (Arndt, 1993). The influence of rotifers in environmental factors had been focused in several research papers (Hoffman 1977; Coulon 1983; Kirk and Gilbert, 1990; Pollard *et al.,* 1998; Bledzki and Ellison, 2003, Casanova, 2000; Fathibi, *et al*., 2020). Genetic differentiation and phylogeography of rotifer *Polyarthra dolichoptera* and *P. vulgaris* populations between outheastern China and eastern North America: High intercontinental differences was carried out by Liang *et al*., 2022. Distribution and species composition of zooplankton (rotifers and crustaceans) in the Basin of the Middle Volga River, Russia was published by Mukhortova *et al*., 2021. Structure and spatial distribution of the rotifer assemblages along a tropical reservoir was studied by Santos *et al*., 2021. Primary production nutrients, temperature, sexual dimorphism, potential food resources toxicology has been indicated as important factors influencing the rotifer commonly (Devetter, 1998; Grosell *et al*., 2006; Segers, 2007; Govoni et al., 1986; Casanova, 2009).

In view of the significance of zooplankton especially the rotifers in the aquatic ecosystem, an understanding of their pattern of distribution, intensities and seasonal fluctuation are important. Further, cladocerans are noted for their appearance

quite abruptly in the plankton, when the environmental conditions are favourable. Specific studies have been carried out by Raghunathan (1983) in Ennore estuary, Raghunathan (1990) in Chingleput tank, in the eastern Arabian sea and the Bay of Bengal, Goswami and Devassy (1991) in Mandovi estuaries of Goa. Rani (1995) from Vizhinjam and Veli backwaters in Thiruvananthapuram. Murugan *et al*., (1998) and Altaf (1999) in Madurai region. Diversity of freshwater rotifer in veinthankulam pond, Tirunelveli, Tamilnadu was done by Santha Kumari, 2022. In this Chapter an attempt is made to discuss the Rotifers in two selected temple tanks of Kanyakumari district, Tamil Nadu.

MATERIALS AND METHODS

Rotifers and other zooplankton samples were collected from Suchindrum and Kumaracoil temple tanks twice every month from June 2020 to May 2022. Sampling was done in the early morning during 6.00 – 6.30hr. About 100 litre of water was taken in a clean plastic bucket of 10 litre of capacity and was filtered through a zooplankton net made up of fine bolting silk cloth (No.12, 135µ) with 30cm mouth diameter and the residue was concentrated to 150ml to 250ml and was immediately fixed and preserved in 4% formaldehyde solution.

Plankton samples were brought to the laboratory without causing any damage to the organisms. Full samples were analysed carefully for qualitative estimation of cladoceran and other zooplankton. The final numerical estimates were expressed as No/100ml. Atmospheric and water temperature were also recorded by using a thermometer. An electrometric pH meter was used to measure the hydrogen ion concentration of the water samples. Light penetration was measured with the help of a secchi disk.

The sorting and identification of rotifers and other zooplankters were done with the help of a binocular microscope. The specimens were thoroughly washed with the help of a fine brush without damaging the specimens. Care was taken not to damage the organisms. The specimens were mounted on microslides by adding a few drops of glycerin to hold the specimen. For detailed study of the particular part of the animal, the specimens were dissected out carefully by a fine dissecting needle. For the sake of a realistic assessment, the data were analysed season - wise by giving importance to rainfall as the area is influenced by the south-west and northeast monsoons. The period from June to September was treated as 'southwest monsoon', from October to December as 'northeast monsoon', January to February as 'postmonsoon' and March to May as 'premonsoon' seasons.

RESULTS

Rotifers:

As given in Tables 1 and 2, a total of 32 species of rotifers were observed in Kumaracoil temple tank and 13 species were observed in Suchindrum temple tank. *Brachionus falcatus* occurred throughout the year in both the temple tanks. The highest concentration in Kumaracoil temple tank was 4676 and it was recorded during the southwest monsoon season and the lowest (410) was observed during the premonsoon season. In Suchindrum temple tank maximum (1672) was observed during southwest monsoon and minimum (511) was observed during the premonsoon period.

Brachionus caudatus was recorded during the monsoon season and was completely absent during the post-monsoon and pre-monsoon in Kumaracoil temple tank. High concentration (1140) was observed during the southwest monsoon and low concentration (48) was recorded during the northeast monsoon season. *Brachionus caudatus* was recorded during all the months of the four seasons in Suchindrum temple tank. But high concentration was observed during the southwest and northeast monsoon and low concentration was recorded during the post-monsoon and pre-monsoon seasons.

The concentration of *Brachionus calyciflorus* increased slowly from the southwest monsoon to the premonsoon season. In Kumaracoil temple tank, highest concentration (3027) was observed during the southwest monsoon and lowest (309) was found during the premonsoon season. *Brachionus patulus* was present in all the samples during all the seasons but was dominant in the months of June and July, August and September. High concentration (2924) and low concentration (303) in Suchindrum temple tank was observed during the months of September (southwest monsoon) and May (premonsoon) respectively. *Brachionus angularis* was first appeared in June with good concentration in both the stations. In Kumaracoil temple tank complete absence of this species was observed during February, April and May. Very low concentration (2) was observed during the pre and postmonsoon seasons. High abundance (904) was observed during the southwest monsoon season. In Suchindrum temple tank it first appeared during June with the concentration of 120 followed by a steady decrease during the post- monsoon season and complete absence during the premonsoon season.

Brachionus quadridentatus, a representative of rotifer was found to occur with good concentration during southwest monsoon in Kumaracoil and

Suchindrum temple tanks. In both the stations this species decreased from the southwest monsoon to the premonsoon season. In both the stations high concentration (2808 and 1003) of this species was observed during the southwest monsoon and the low concentration (351, 19) was during the premonsoon period. *Brachionus forficula* was completely absent during the pre and post monsoon season in Kumaracoil temple tank and higher abundance of 309 during the northeast monsoon. In Suchindrum temple tank this species was found to occur during all the seasons. Highest (357) and lowest (39) values were observed during the southwest and pre-monsoon seasons respectively. *Keratella tropica* first appeared in June with the concentrations of 307 and it slowly decreased to attain 9 during the month of May in Kumaracoil temple tank. During the northeast monsoon, postmonsoon and premonsoon periods they were altogether absent. *Keratella procurva* observed during the southwest monsoon period from Suchindrum temple tank with low concentration. The concentrations of this species during June, July, August and September were 49, 29, 39 and 19 respectively. Moderate concentration of this species was observed in Kumaracoil temple tank throughout the study period, but it was absent during April and May. Higher concentration (1528) was recorded during southwest monsoon and lower concentration (340) in March (premonsoon season).

Platias quadricornis was found on both the stations. This species first appeared in Suchindrum temple tank in June with the concentration of 19 and it was increased slowly and reached a maximum of 31 during August, it was completely absent during October and then reappeared during November with a concentration of 1. From December to May this species was not found. This species was found in all the months of southwest monsoon period and was completely absent during the postmonsoon and premonsoon seasons.

From Kumaracoil temple tank highest concentration of *Brachionus donneri, Brachionus durgae, Keratella edmondsoni, Keratella lenzi, Platyias eloupi, Pseudoeuchlanis longipedes, Mytilina acanthophora, Macrochaetus longipes, Lepadella biloba, Lepadella dactyliseta, Lepadella eurysterna, Lecane braumi, Lecane eswari, Lecane lateralis, Lecane simonneae, Lecane sola, Lecane (Monostyla)anthinula, Lecane (Monostyla) bulla diabolica, Ascomorpha ecaudis, Trichocerca bicristata, Trichocerca iernis, Asplanchnopus bhimavaramensis* were 2110, 1653, 1564, 2053, 1641, 1653, 1563, 1462, 1463, 1545, 1566, 1852, 1683, 1662, 1640, 1985, 482, 1633, 1682 respectively. In Suchindrum temple tank, highest concentration were 3, 1744, 1098, 103, 2387, 1421, 1098, 1586, 1426, 985, 783, 585, 2265, 2356, 684, 1525, 915, 1687, 892 respectively.

From Kumaracoil temple tank lowest concentration of *Brachionus donneri, Brachionus durgae, Keratella edmondsoni, Keratella lenzi, Platyias eloupi, Pseudoeuchlanis longipedes, Mytilina acanthophora, Macrochaetus longipes, Lepadella biloba, Lepadella dactyliseta, Lepadella eurysterna, Lecane braumi, Lecane eswari, Lecane lateralis, Lecane simonneae, Lecane sola, Lecane (Monostyla)anthinula, Lecane (Monostyla) bulla diabolica, Ascomorpha ecaudis, Trichocerca bicristata, Trichocerca iernis, Asplanchnopus bhimavaramensis* were 401, 204, 154, 254, 125, 361, 174, 285, 388, 603, 624, 852, 508, 915, 154, 702, 354, 321, 10 respectively. In Suchindrum temple tank, lowest concentration were 1, 112, 210, 19, 481, 186, 29, 599, 152, 24, 26, 114, 25, 99, 65, 1, 75, 56, 54 respectively. *Lecane arcula* was found only in Suchindrum temple tank with poor concentration during the southwest monsoon. It was not found during northeast monsoon, postmonsoon and premonsoon seasons.

DISCUSSION

Considering the data of the present investigation and analysing the data of the present study from two sampling stations. Out of which 10 species of Rotifers have been recorded from Kumaracoil temple tank and Suchindrum temple tank from June 2020 to March 2022.

Among these frequently occurred genera was Brachionus. The species recorded in the present study were found to be commonly encountered in freshwater ecosystems of India (Sharma, 1978a; Sharma, 1978b). Total species identified are *Brachionus falcatus, Brachionus caudatus, Brachionus angularis, Brachionus calyciflorus, Brachionus patulus, Brachionus quadridentatus, Brachionus forficula, Keratella tropica, Keratella procurva, Platias quadricornis Brachionus donneri, Brachionus durgae, Keratella edmondsoni, Keratella lenzi, Platyias eloupi, Pseudoeuchlanis longipedes, Mytilina acanthophora, Macrochaetus longipes, Lepadella biloba, Lepadella dactyliseta, Lepadella eurysterna, Lecane braumi, Lecane eswari, Lecane lateralis, Lecane simonneae, Lecane sola, Lecane (Monostyla)anthinula, Lecane (Monostyla) bulla diabolica, Ascomorpha ecaudis, Trichocerca bicristata, Trichocerca iernis, Asplanchnopus bhimavaramensis.* From that, Brachionus and Keratella together accounted for the highest richness of species. Keratella with Brachionus is indicative of the nutrient-rich status of the water body (Berzins and Pejler, 1987).

REFERENCE

[1] Altaf K. 1999. Biology of Cladocerans. J. Mar. Biol. Ass. India, 15: 410-414.

[2] Arndt, H. (1993). Rotifers as predators on components of the microbial web (bacteria, heterotrophic flagellates, ciliates) a review. Paper presented at the Rotifer Symposium VI.

[3] Berzins, B., and Pejler B. 1987. Rotifer occurrence in relation to pH. Hydrobiologia, 147: 107-116.

[4] Bledzki, L. A., Ellison, A. M. 2003. Diversity of rotifers from northeastern USA bogs with new species records for North America and New England. Hydrobiologia, 497:53-62.

[5] Casanova, S. M. C., Panarelli, E. A., Henry, R. 2009. Rotifer abundance, biomass, and secondary production after the recovery of hydrologic connectivity between a river and two marginal lakes (São Paulo, Brazil). Limnologica, 39: 292-301.

[6] Casanova, S.M.C. 2000. Distribuicao longitudinal da comunidade zooplanctonica na regiao de transicao rio-reservatorio (Rio Paranapanema- Represa de Jurumirim). Master Sciences, Universidade Estadual Paulista Botucatu, SP.

[7] Coulon, P. Y., Charras, J. P., Chasse, J. L., Clement, P., Cornillac, A., Luciani, A. and Wurdak, E. 1983. An experimental system for the automatic tracking and analysis of rotifer swimming behaviour. In Biology of Rotifers, Springer, 197-202.

[8] Devetter, M. 1998. Influence of environmental factors on the rotifer assemblage in an artificial lake. Hydrobiologia, 387/388 (1998), pp. 171-178.

[9] Fathibi, K., Ambalaparambil, V.S., Aneesh, E.M. 2020. Species composition and abundance of rotifers (Rotifera: Eurotatoria) in Thrissur Kole wetland, Kerala, India. Egyptian Journal of Aquatic Biology and Fisheries 24(6): 439-451.

[10] Goswami S.C., Devassy V.P. 1991. Seasonal fluctuations in the occurrence of cladoceran in the Mandovi-Zuari estuarine waters of Goa. Indian J. Mar. Sci., 20(2): 138-142.

[11] Govoni, J. J.; Boehlert, G. W. and Watanabe, Y. 1986. The physiology of digestion in fish larvae Contemporary studies on fish feeding: the proceedings of GUTSHOP'84 Springer, pp. 59-78.

[12] Grosell, M., Gerdes, R.M., Brix, K.V. 2006. Chronic toxicity of lead to three freshwater invertebrates-Brachionus calyciflorus, Chironomus tentans, and Lymnaea stagnalis. Environmental Toxicology and Chemistry: An International Journal, 25: 97-104.

[13] Hoffman, W. 1977. The influence of abiotic environmental factors on population dynamics in planktonic rotifers. Arch. Hydrobiol. Beih. Limnol, 8 (1977), pp. 77-83.

[14] Kirk, K.L. and Gilbert, J.J. 1990. Suspended clay and the population dynamics of planktonic rotifers and Cladocerans. Ecology, 71 (1990), pp. 1741-1755.

[15] Liang D., MC Manus G.B., Wang Q., Sun X., Liu Z., Lin S., Yang Y. 2022. Genetic differentiation and phylogeography of rotifer *Polyarthra dolichoptera* and *P. vulgaris* populations between outheastern China and eastern North America: High intercontinental differences. *Ecol Evol*. 12(5):e8912. doi: 10.1002/ece3.8912. PMID: 35592069

[16] Mukhortova O., Senator S., Unkovskaya E. 2021. Distribution and species composition of zooplankton (rotifers and crustaceans) in the Basin of the Middle Volga River, Russia. *Biodivers Data J.* 9:e76455. doi: 10.3897/BDJ.9. PMID: 34795551.

[17] Murugan N.P., Murugavel S., and Kodarkar M.S. 1998. Cladocera (The biology, classification, identification and ecology) IAAB, 5: 1-55.

[18] Pollard, A.I., Ganzalez, M.J., Vanni, M.J., Headworth, J.L. 1998. Effects of turbidity and biotic factors on the rotifer community in an Ohio reservoir. Hydrobiologia, 387/388 (1998), pp. 215-223.

[19] Raghunathan M.B. 1983. Studies on some planktonic Cladocerans (Crustacea) of Tamil Nadu, India. Ph.D. Thesis, University of Madras (unpublished).

[20] Raghunathan M.B. 1990. Seasonal studies on freshwater cladocera of Chingleput tank, Tamil Nadu, Rec. Zool. Surv. India, 86(2): 253-259.

[21] Rani M.J. 1995. Studies on Cladocerans of Southern Kerala, Ph.D. Thesis submitted to Department of Aquatic Biology and Fisheries, University of Kerala. Thiruvananthapuram, pp.69.

[22] Santha Kumari R. 2022. Diversity of freshwater rotifer in veinthankulam pond, Tirunelveli,

Tamilnadu. International Journal of creative research thoughts., Vol. 10. 6: 2320-2882.

[23] Santos T. A. S., Lansac-Toha F. A., Mantovano T., Conceicao E.O., Schwind L.T.F., Arrieira R.L., Lima J.C., Serafim-junior B. 2021. Structure and spatial distribution of the rotifer assemblages along a tropical reservoir. *Braz. J. Biol.*, 81(2): 361-369.

[24] Segers, H. 2007. Annotated checklist of the rotifers (Phylum Rotifera), with notes on nomenclature, taxonomy and distribution. Zootaxa, 1564: 1-104.

[25] Sharma, B.K. 1978a. Contributions to the rotifer fauna of West Bengal Part I. Family Lecanidae. Hydrobiologia, 57(2): 143-153.

[26] Sharma, B.K. 1978b. Contributions to the rotifer fauna of West Bengal Part II. Genus Lepadella Bory de St. Vincent, 1826. Hydrobiologia, 58(1): 83-88.

TABLE 1. MONTHLY ABUNDANCE (No/100l) OF ZOOPLANKTON IN KUMARACOIL TEMPLE TANK DURING JUNE 2020 TO MAY 2022

SI. No	SPECIES	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	*Brachionus falcatus*	2438	2348	3555	4676	2005	1872	1910	2027	794	423	410	422
2	*Brachionus caudatus*	1108	982	1140	779	430	203	48	0	0	0	0	0
3	*Brachionus angularis*	607	904	406	258	199	107	121	2	0	2	0	0
4	*Brachionus calyciflorus*	2058	3027	2010	2529	2676	2809	2672	1408	1417	1272	715	309
5	*Brachionus quadridentatus*	2048	2554	2248	2808	2227	1999	1525	1428	1510	799	417	351
6	*Brachionus forficula*	58	230	46	171	309	200	179	0	0	0	0	0
7	*Keratella tropica*	307	100	108	238	119	199	99	139	709	739	159	9
8	*Keratella procurva*	1528	808	700	1122	541	536	450	432	527	340	0	0
9	*Brachionus donneri*	2106	1995	2110	2005	1503	1434	1245	1402	802	684	650	401
10	*Brachionus durgae*	1240	1458	1653	904	785	552	634	521	355	304	351	204
11	*Keratella edmondsoni*	1541	1534	1564	1326	226	355	154	256	0	0	0	0
12	*Keratella lenzi*	2053	1246	1544	544	521	251	654	523	351	325	302	254
13	*Pseudoeuchlanis longipedes*	1256	1311	1641	1212	1254	414	345	356	245	240	155	125
14	*Mytilina acanthophora*	1563	1651	1453	1435	1594	1653	835	765	452	412	401	361
15	*Macrochaetus longipes*	1554	1145	1543	1563	1322	1521	1536	235	219	214	195	174
16	*Lepadella biloba*	1462	1453	1235	1265	724	642	524	482	421	312	304	285
17	*Lepadella eurysterna*	1254	1287	1273	1283	1463	653	628	619	594	522	411	388
18	*Lecane braumi*	1545	1536	1524	1432	1544	752	726	714	706	627	614	603
19	*Lecane eswari*	1566	1546	1536	1562	1538	846	832	824	820	786	638	624
20	*Lecane lateralis*	1852	1823	1835	1643	1563	1415	942	935	922	911	901	852
21	*Lecane simonneae*	1436	1532	1683	1622	1366	1639	1336	542	534	508	519	523
22	*Lecane sola*	1654	1662	1623	1656	1642	985	978	957	945	937	924	915
23	*Lecane (Monostyla) bulla diabolica*	1050	954	943	1640	845	265	200	154	0	0	0	0
24	*Ascomorpha ecaudis*	1465	1985	1852	1496	1834	742	738	730	702	719	711	726
25	*Trichocerca bicristata*	452	482	456	435	416	375	371	356	354	3	0	0
26	*Trichocerca iernis*	1633	1282	1289	1586	1578	1255	758	639	456	321	344	359
27	*Asplanchnopus bhimavaramensis*	1562	1682	1618	415	410	358	374	321	10	28	19	35

TABLE 2. MONTHLY ABUNDANCE (No/100l) OF ZOOPLANKTON IN SUCHINDRUM TEMPLE TANK DURING JUNE 2020 TO MAY 2022

SI. No	SPECIES	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1	*Brachionus falcatus*	1547	1494	1672	1313	1207	1193	1215	905	906	672	663	511
2	*Brachionus caudatus*	1642	1627	1815	1007	1246	1455	1260	799	719	612	200	132
3	*Brachionus angularis*	2406	2337	2002	2408	2411	2587	2493	1192	120	1204	982	883
4	*Brachionus patulus*	2199	2314	2924	2613	1206	1310	1332	1081	809	799	322	303
5	*Brachionus quadridentatus*	1003	982	819	611	519	417	399	320	207	199	799	19
6	*Brachionus forficula*	357	200	320	300	199	107	110	89	49	39	0	0
7	*Keratella procurva*	49	29	39	19	0	0	0	0	0	0	0	0
8	*Platias quadricornis*	29	20	31	19	0	0	0	0	0	0	0	0
9	*Brachionus donneri*	1	3	1	2	0	0	0	0	0	0	0	0
10	*Keratella edmondsoni*	1598	1744	1013	925	802	805	736	646	112	223	210	340
11	*Keratella lenzi*	1098	1073	1034	943	893	879	713	248	242	210	228	234
12	*Platyias eloupi*	25	19	103	100	0	0	0	0	0	0	0	0
13	*Mytilina acanthophora*	2387	2264	2019	2000	1211	1377	1060	981	962	481	720	745
14	*Macrochaetus longipes*	1372	1421	1222	1206	1072	913	954	807	544	186	213	220
15	*Lepadella biloba*	1098	1073	1034	943	893	879	713	698	654	48	37	29
16	*Lepadella eurysterna*	1452	1354	1586	1256	1383	865	765	724	701	599	607	645
17	*Lecane braumi*	1250	1246	1426	1254	656	533	530	529	246	152	174	239
18	*Lecane eswari*	985	952	949	944	925	914	901	879	722	24	58	77
19	*Lecane lateralis*	748	783	715	682	667	642	524	367	73	48	26	39
20	*Lecane simonneae*	516	355	585	561	455	241	387	245	165	137	125	114
21	*Lecane sola*	2188	2116	2264	2265	1656	463	568	65	59	25	65	89
22	*Lecane (Monostyla)anthinula*	2356	2315	2154	2146	548	447	595	484	156	99	113	122
23	*Lecane (Monostyla) bulla diabolica*	268	351	684	256	662	65	0	0	0	0	0	0
24	*Ascomorpha ecaudis*	1241	1525	312	282	256	325	54	32	23	2	0	1
25	*Trichocerca bicristata*	764	911	915	835	466	245	543	356	145	128	86	75
26	*Trichocerca iernis*	1534	1432	1354	1623	1687	565	487	359	289	56	210	225
27	*Asplanchnopus bhimavaramensis*	892	745	487	156	58	54	77	0	0	0	0	0