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A Study of Physico-Chemical Parameters and Fish Diversity of Nizam Sagar Dam, Nizamabad, Telangana

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Abstract

The Nizam Sagar Dam constructed across the Manjira River, a tributary of the Godavari River, between Achampet (Nizamabad) and Banjapalle villages of the Nizamabad district in Telangana, India. The dam was constructed in 1923 by the rulers of the erstwhile Hyderabad State, Mir Osman Ali Khan. In this present investigation we have made an attempt to estimate the total sixteen number of physico-chemical parameters along with Pearson correlation and total nineteen number of different species of fishes. Based on the results all the selected physico-chemical parameters are within the permissible limits of standard methods of APHA, AWWA.

Keywords: Nizam Sagar, physico-chemical, Zooplankton and fish

Introduction

Water is one of the most abundant substances on the earth. It is essential for survival of any plant and animal, but this valued resource is increasingly being threatened as human populations grow and demand more water of high quality for domestic purposes and economic activities. Protecting the lake ecosystems is crucial not only to protecting this country's public and economic health, but also to preserving and restoring the natural environment for all aquatic and terrestrial living things.

Ecosystem is defined as "*the complex of a community of organisms and its environmental functioning as an ecological unit*". It is a dynamic system where the biotic and abiotic components are constantly acting and reacting upon each other bringing forth structural and functional changes. An aquatic ecosystem is a group of interacting organisms dependent on one another and their water environment for nutrients (e.g., nitrogen and phosphorus) and shelter. An aquatic ecosystem is an ecosystem that is based in water, whether it is a pond, lake, river or an ocean. It involves living aquatic organisms (e.g. fish, planktons, annelids, etc.), which constitute as the biotic factors and their relationship with their environment, which collectively can be referred to as the abiotic factor. Composing more than 70% of the earth's surface, aquatic ecosystems are not only the dominant features of earth but are also very diverse in species and complexity of interaction among their physical, chemical and biological components.

The inland water bodies in India such as lakes, tanks and ponds are exhibit distinct seasonal fluctuations in their physico-chemical and biological features. Physico-chemical and biological parameters play very important role in the assessment of water quality. The study of different water bodies is very important in understanding of the metabolic events in aquatic ecosystem. The parameters influence each other and also the sediment parameter, as well as they governs the abundance and distribution of flora and fauna. The history of fish introduction dates back several hundred years, relatively little is known about the reasons for success or failure of an introduced species and ecological consequences have been poorly documented (Mahesh., 2014) ^[1].

Now days with the exploitation of human population and with the problems of malnutrition the fish fauna gained much importance. Because they have high protein contents in their flesh and at the same time fish byproducts are also have economic importance throughout the world.

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2. Material and methods

Study Area

The Nizam Sagar dam is a manmade reservoir and was constructed in the year of 1923 by Mir Osman Ali Khan, Nizam dynasty king. The dam is located in the villages of Achampet and Banjapally of Nizamabad district. It is situated at 18°19' (N) latitude and 76°56' (E) longitude. The catchment area of the dam is 21.633 sq. kms, 8376 sq miles and total length of the dam is 5273 meters and depth is 21 feet. This Project was originally contemplated for utilization of 58.00 TMC of water to irrigate 2, 31, 339 acres in Banswada, Bodhan, Nizamabad and Armoor Taluks of Nizamabad District.

For estimation of physico-chemical parameters, water samples were collected on monthly basis. Collections were made on specific dates of every month with two different permanent stations. Surface samples were collected using a clean plastic container for the study of various physico-chemical and biological parameters. All the sample collection and observation were made in the morning time (i.e. 6:00am to 8:00 am) and some of the parameters were calculated at the collection point and other parameters were estimated in the lab throughout the study period. Water samples collected for the purpose of estimation of various parameters were brought to the laboratory and subjected to analysis immediately as far as possible. Standard Methods for Estimation of (Water and Waste Water 20th Edition, 1998 (APHA, AWWA)) [2] were referred for estimation of parameters.

Ichthyofauna (fishes)

Fishes were collected by using the gill net, drag net, hand net, cast net and purely help of local fishermen society of Achampet and Banjapally villages. Collected fish photographed immediately and the specimen were preserved in 10% formalin after giving an abdominal cut then brought to laboratory for identification. The fish specimens were identified with standard identification keys (Days volume 1878, Jayaram, 1981 and Jhingran, 1991) [3-5].

Statistical analysis

Standard statistical analysis was applied to determine the co-relation co-efficient between physico-chemical parameters as per the (Bliss, 1970 and Campbell 1978) [6, 7] and also the co-relation were computed using Pearson's co-relation co-efficient package.

Results and Discussion

In the present investigation variation of physico-chemical parameters results of two different stations were depicted in table no. 1 and 2.

Atmospheric temperature

In this study Atmospheric temperature values were ranged between 19.8 °C to 32.2 °C in station A and B respectively. Atmospheric and Water temperature values were positively correlated with WT, TRANS, EC, DO, CO₂, TA, S, P and BOD at both the stations.

Water temperature

In this study water temperature values were ranged between 19.8 °C to 32.2 °C in station A and B respectively. In the present investigation highest values of both atmospheric and water temperature values were recorded in the month of June and lowest values were recorded in the month of December at

both the stations. The results clearly showed that water temperature remained lesser than air temperature throughout the study period. (Hutchinson, 1957 and Garnier 1958) [8, 9] also suggested that meteorological conditions are responsible for seasonal changes of temperature.

Transparency

During the study period values of transparency, ranged between 32.3 cms to 70.6 cms at station A and 32.6 cms to 72.8 cms at station B. In this study highest values were observed in March 2014 and lowest values were recorded in the month of October 2014. Transparency is nothing but clarity of water. Water clarity is primarily affected by algae and suspended sediments. Similar results were observed by (Mahesh *et al.*, 2014) [1]

Transparency positively values were correlated with AT, WT, EC, pH, DO, TA, CL, S, P and BOD at both the stations.

Turbidity

During the study period, values of turbidity ranged between 9 to 21 NTU at station A and 10 to 22 NTU at station B. In this study highest values were observed in May 2014 at station A and March 2014 at Station B and lowest values were recorded in the month of October 2014 at both the stations. Turbidity is another measure of clarity of water, which is a qualitative measure of how much light is scattered by the particles in a water sample. (George, 1976) [10] reported high turbidity due to degradation of blue green algae which reduced the light penetration.

Turbidity positively values were correlated with AT, WT, EC, pH, DO, TA, CL, S, P and BOD at station A and TDS, CO₂, TH and COD at station B.

Total Dissolved Solids

In the present investigation total dissolved salts values ranged between 110 to 380 mg/lit at station A and 112 to 386 mg/lit at station B. In this study highest values were observed in May 2014 at station A and B and lowest values were recorded in the month of August 2014 at both the stations. Turbidity and Total Dissolved Solids having common effects in reducing light penetration thereby suppressing primary producers in the form of algae and macrophytes. Bhagath and Sagar (2013) [11] reported the range of dissolved solids from minimum 136 mg/liter to maximum 480 mg/liter in Punjab.

Total Dissolved Solids values were positively correlated with AT, WT, EC, pH, DO, TA, CL, S, P and BOD at station A and TURB, CO₂, TH and COD at station B.

Electrical Conductivity

In the present investigation electrical conductivity values ranged between 740 to 910 µmho/cm at station A and 742 to 920 µmho/cm at station B. In this study highest values were observed in April 2014 at station A and B and lowest values were recorded in the month of December 2014 at both the stations. (Patil, *et al.*, 1986 and Balakrishna *et al.*, 2013a) [12, 13] Stated that any rise in the electrical conductivity of water indicates pollution.

Electrical Conductivity values were positively correlated with AT, WT, TRANS, pH, DO, TA, CL, S, P and BOD at station A and AT, WT, TRANS, pH, DO, CO₂, TA, CL, S, P and COD at station B.

Table 1: Monthly Variation of Physico-Chemical Parameters of Nizam Sagar Dam during the Year 2014-15 at Station A

Month/parameter	AT	WT	TRANS	TURB	TDS	EC	PH	DO	CO2	TA	TH	CL	S	P	BOD	COD
FEB-14	23.4	22.2	60.2	10	170	869	8.2	6.6	32.7	226	68	86	9.8	0.68	4.6	12.8
MAR-14	28.8	27.2	70.6	10	168	886	8.0	6.9	28.6	238	72	92	11.2	0.76	4.8	10.2
APR-14	30.0	28.6	69.2	10	126	910	7.9	7.8	46.3	246	86	98	10.6	0.78	5.2	9.6
MAY-14	32.2	31.2	66.6	9	110	868	7.6	7.4	52.6	258	92	90	8.2	0.60	5.8	8.2
JUN-14	30.1	28.2	48.6	12	224	836	7.7	5.2	62.3	196	138	62	8.4	0.41	3.8	11.6
JUL-14	26.9	24.2	40.4	14	308	810	7.2	4.2	68.8	110	142	58	7.3	0.36	4.0	13.6
AUG-14	28.2	26.8	42.6	15	380	798	7.4	4.0	70.2	85	146	68	7.7	0.28	3.0	13.2
SEP-14	26.2	25.1	38.2	17	360	800	7.4	4.8	56.6	75	130	64	8.0	0.22	3.2	12.6
OCT-14	24.2	22.3	32.3	21	310	776	7.8	5.1	48.8	148	122	78	7.1	0.32	3.4	9.6
NOV-14	21.3	20.0	46.8	13	294	760	7.7	5.6	33.6	160	128	90	6.4	0.39	4.2	10.6
DEC-14	19.8	18.2	50.6	11	268	740	7.9	5.0	30.2	172	136	84	6.9	0.46	3.6	9.8
JAN-15	20.2	18.9	52.2	11	220	748	8.0	5.4	30.8	210	112	80	6.8	0.48	3.2	10.0

Table 2: Monthly Variation of Physico-Chemical Parameters of Nizam Sagar Dam during the Year 2014-15 at Station B

Month/parameter	AT	WT	TRANS	TURB	TDS	EC	PH	DO	CO2	TA	TH	CL	S	P	BOD	COD
FEB-14	23.5	22.1	61.4	11	172	862	8.0	6.8	34.2	236	72	80	8.2	0.62	3.3	13.2
MAR-14	28.9	27.8	72.8	10	170	892	8.1	7.2	30.2	246	78	88	10.2	0.78	3.8	11.2
APR-14	30.1	28.2	70.4	11	122	920	8.0	8.1	48.6	248	90	90	9.2	0.78	4.2	10.2
MAY-14	32.2	31.2	68.8	10	112	870	7.5	7.8	54.2	260	96	82	7.6	0.62	4.4	9.6
JUN-14	30.3	28.4	52.2	11	218	832	7.6	5.8	63.2	202	142	56	7.0	0.42	3.2	12.8
JUL-14	27.0	25.3	41.4	15	310	830	7.4	7.8	69.3	112	148	52	7.0	0.38	3.0	13.2
AUG-14	28.4	27.4	43.6	14	386	810	7.5	5.1	72.4	88	150	60	7.1	0.30	3.2	13.6
SEP-14	26.4	25.2	40.0	15	366	802	7.4	5.4	63.2	76	138	60	7.4	0.24	3.8	13.2
OCT-14	24.6	22.6	32.6	22	306	780	7.9	5.3	52.2	152	136	72	6.2	0.34	3.4	10.1
NOV-14	21.6	19.2	47.0	14	298	768	7.7	6.2	33.8	168	132	84	6.0	0.38	4.6	10.8
DEC-14	19.8	18.1	50.8	11	272	742	7.8	6.1	32.6	180	142	80	6.2	0.48	4.0	10.0
JAN-15	20.3	18.9	54.2	10	226	752	8.1	6.8	33.2	218	118	72	6.4	0.46	4.4	11.0

Table 3: Correlation analysis of physico-chemical parameters of Nizam Sagar Dam during the year 2014-15at station A

	AT	WT	TRANS	TURB	TDS	EC	PH	DO	CO2	TA	TH	CL	S	P	BOD	COD
AT																
WT	0.993															
TRANS	0.362	0.405														
TURB	-0.161	-0.195	-0.876													
TDS	-0.341	-0.371	-0.898	0.778												
EC	0.770	0.781	0.719	-0.462	-0.683											
PH	-0.342	-0.300	0.549	-0.440	-0.603	0.187										
DO	0.360	0.411	0.881	-0.635	-0.917	0.735	0.582									
CO2	0.581	0.536	-0.459	0.414	0.432	0.087	-0.841	-0.469								
TA	0.205	0.237	0.865	-0.751	-0.972	0.558	0.721	0.883	-0.558							
TH	-0.200	-0.246	-0.812	0.549	0.810	-0.708	-0.700	-0.878	0.566	-0.788						
CL	-0.066	-0.007	0.736	-0.520	-0.684	0.343	0.692	0.828	-0.735	0.745	-0.734					
S	0.555	0.571	0.739	-0.453	-0.618	0.908	0.408	0.690	-0.163	0.540	-0.769	0.412				
P	0.253	0.277	0.942	-0.768	-0.909	0.726	0.681	0.892	-0.537	0.892	-0.883	0.770	0.779			
BOD	0.518	0.540	0.812	-0.652	-0.849	0.761	0.258	0.880	-0.212	0.767	-0.718	0.652	0.585	0.791		
COD	-0.029	-0.067	-0.453	0.274	0.584	-0.063	-0.440	-0.616	0.495	-0.664	0.366	-0.709	-0.044	-0.436	-0.468	

Table 4 Correlation analysis of physico-chemical parameters of Nizam Sagar Dam during the year 2014-15at station B

	AT	WT	TRANS	TURB	TDS	EC	PH	DO	CO2	TA	TH	CL	S	P	BOD	COD
AT																
WT	0.995															
TRANS	0.380	0.396														
TURB	-0.1340	-0.164	-0.809													
TDS	-0.341	-0.334	-0.892	0.628												
EC	0.782	0.779	0.708	-0.345	-0.650											
PH	-0.342	-0.341	0.470	-0.243	-0.511	0.123										
DO	0.298	0.292	0.704	-0.513	-0.746	0.617	0.227									
CO2	0.574	0.569	-0.456	0.379	0.448	0.117	-0.794	-0.226								
TA	0.159	0.153	0.860	-0.626	-0.962	0.486	0.654	0.629	-0.620							
TH	-0.210	-0.230	-0.843	0.503	0.822	-0.687	-0.630	-0.600	0.561	-0.803						
CL	-0.107	-0.112	0.682	-0.350	-0.650	0.303	0.673	0.422	-0.782	0.727	-0.733					
S	0.566	0.586	0.756	-0.435	-0.574	0.883	0.353	0.516	-0.144	0.473	-0.758	0.420				
P	0.304	0.307	0.935	-0.616	-0.899	0.727	0.625	0.746	-0.523	0.875	-0.872	0.755	0.780			
BOD	-0.232	-0.235	0.397	-0.363	-0.364	-0.122	0.287	0.292	-0.574	0.435	-0.287	0.676	-0.039	0.298		
COD	0.115	0.137	-0.330	0.059	0.486	0.050	-0.419	-0.315	0.521	-0.559	0.259	-0.714	0.044	-0.427	-0.711	

Table 5: List of different types of identified fishes at Nizam Sagar Dam during the year 2014-15

S. No	Order	Family	Scientific Name	Common Name	Vernacular Name	Population status	IUCN status
1	Cypriniformes	Cyprinidae	<i>Catla catla</i>	Catla	Botchea	A	LC
2			<i>Labeo rohita</i>	Rohu	Erramosu	A	LC
3			<i>Cyprinus carpio</i>	Common carp	Bangarutheega	A	LC
4			<i>Cirrhinus mrigala</i>	Mrigal	Mrigala	A	LC
5			<i>Puntius sarana</i>	Olive barb	Gandaparaka	R	LC
6			<i>Puntius sophore</i>	spot fin swampy barb	Buddaparaka	A	LC
7			<i>Salmostoma bacaila</i>	Large minnow	Chandamama	R	LC
8		Cobitidae	<i>Lepidocephalus guntea</i>	Guntea loach	Vuliche	C	LC
9	Siluriformes	Bagridae	<i>Mystus aor</i>	Mystis	Jella	A	LC
10		Siluridae	<i>Wallago attu</i>	Boal	Valuga	C	NT
11		Claridae	<i>Clarius batrachus</i>	Batchwa vache	Marupu	C	LC
12		Heteropneustidae	<i>Heteropneustes fossilis</i>	Stinging cat fish	Ingulikam	R	LC
13	Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Grey feather back	Cheppu thatta	R	LC
14	Channiformes	Channidae	<i>Channa marulias</i>	spotted snake head	Korramatta	A	LC
15			<i>Channa punctatus</i>	Giant Snake head	Pubomme	R	LC
16			<i>Channa striatus</i>	Banded snakehead	Bomme	R	LC
17	Perciformes	Mastacembelidae	<i>Mastacembelus armatus</i>	Zig zag spiny eel	Papera	A	LC
18		Anabantidae	<i>Trichogaster fasciatus</i>	Banded gourami	pamplet	R	LC
19		Cichilidae	<i>Oreochromis mossambicus</i>	Mozambique tilapia	Chinna guraka	R	NT

A= Abundant (76%- 100%); C= Common (51 – 75%); R= Rare (1 – 25%) and LC= Least concern; NT= Near threaten

pH

In the present investigation pH values ranged between 7.2 to 8.2 at station A and 7.4 to 8.1 at station B. In this study highest values were observed in February at station A, March 2014 at station B and lowest values were recorded in the month of July 2014 at station A and September 2014 at station B. It is affected by environmental factors such as temperature, salinity and pressure. Similar results were observed by (Surrender Reddy *et al.*, 2015) ^[14].

pH values were positively correlated with TRANS, EC, DO, TA, CL, S, P and BOD at both the stations respectively.

Dissolved Oxygen

In the present investigation dissolved oxygen values ranged between 4.0 to 7.8 mg/lit at station A and 5.1 to 8.1 mg/lit at station B. In this study highest values were observed in April 2014 at station A and B and lowest values were recorded in the month of August 2014 at both the stations. Oxygen availability throughout the year is influenced by other chemicals present in the water, biological processes, and temperature (Balakrishna *et al.*, 2013b) ^[15].

Dissolved Oxygen values were positively correlated with AT, WT, TRANS, EC, pH, TA, CL, S, P and BOD at station both the stations respectively.

Free Carbon Dioxide

In the present investigation Carbon dioxide values ranged between 28.6 to 68.8 mg/lit at station A and 30.2 to 72.4 mg/lit at station B. In this study highest values were observed in July 2014 at station A, August 2014 at station B and lowest values were recorded in the month of March 2014 at both the stations. Carbon dioxide values were positively correlated with AT, WT, TURB, TDS, EC, TH and COD at station both the stations respectively.

Total Alkalinity

Alkalinity is the buffering capacity of a water body. During the present investigation total alkalinity values was ranged between 75 to 258 mg/lit at station A and 76 to 260 mg/lit at station B. In this study highest values were observed in May 2014 at station A and B and lowest values were recorded in the month of September 2014 at both the stations.

Total Alkalinity values are positively correlated with AT, WT, TRANS, EC, pH, DO, CL, S, P and BOD at station both the stations respectively.

Total Hardness

During the present investigation total hardness values ranged between 68 to 146 mg/lit at station A and 72 to 150 mg/lit at station B. In this study highest values were observed in the month of August 2014 at station A and B and lowest values were recorded in the month of February 2014 at both the stations. It is caused by dissolved polyvalent metallic ions dissolved in water. The present results were showed similar to the (Vijaykumar *et al.*, 2009) ^[16].

Total Hardness values are positively correlated with TRUB, TDS, CO₂, and COD at station both the stations respectively.

Chloride

Chloride plays very important role in determining the water quality in a water body. During the present investigation chloride values was ranged between 58 to 98 mg/lit at station A and 52 to 90 mg/lit at station B. In this study highest values were observed in the month of April 2014 at station A and B

and lowest values were recorded in the month of July 2014 at both the stations. Chlorides are maximum in summer season due to evaporation of water. Similar results were observed by (Reddy *et al.*, 2009) ^[17] from Pakhal Lake, Warangal, Telangana.

Chloride values are positively correlated with TRANS, EC, pH, DO, TA, S, P and BOD at station both the stations respectively

Sulphate

In the present investigation sulphate values was ranged between 6.4 to 11.2 mg/lit at station A and 6.0 to 10.2 mg/lit at station B. In this study highest values were observed in the month of March 2014 at station A and B and lowest values were recorded in the month of November 2014 at both the stations. Sulfate is a common compound found in water as a result of the dissolution of minerals from soil and rocks. The present observations are agreement with (Balakrishna *et al.*, 2013c) ^[18].

Sulphate values are positively correlated with AT, WT, TRANS, EC, pH, DO, TA, CL, P and COD at station both the stations respectively

Phosphate

In the present investigation phosphate values ranged between 0.22 to 0.78 mg/lit at station A and 0.24 to 10.2 mg/lit at station B. In this study highest values were observed in the month of April 2014 at station A and B and lowest values were recorded in the month of September 2014 at both the stations. The presence of phosphate in large quantities in fresh water indicates pollution through sewage and industrial waters. (Pejaver and Gurav 2008) ^[19] recorded phosphate value range of 0.01 mg/liter to 0.79 mg/liter in lakes of Thane city.

Phosphate values are positively correlated with AT, WT, TRANS, EC, pH, DO, TA, CL, S and BOD at station both the stations respectively

Biological Oxygen Demand

Biochemical oxygen demand is nothing but the amount of oxygen utilized by microorganisms to stabilize the organic matter. During the present investigation Biological Oxygen Demand values was ranged between 3.0 to 5.8 mg/lit at station A and 3.0 to 4.6 mg/lit at station B. In this study highest values were observed in the month of May 2014 at station A, November 2014 at station B and lowest values were recorded in the month of May 2014 at station A and July 2014 at station B.

Biochemical oxygen demand values are positively correlated with AT, WT, TRANS, EC, pH, DO, TA, CL, S and P at station A and TRANS, pH, DO, TA, CL and P at station B respectively

Chemical Oxygen Demand

During the present investigation chemical oxygen demand values was ranged between 8.2 to 13.6 mg/lit at station A and 9.6 to 13.6 mg/lit at station B. In this study highest values were observed in the month of July 2014 at station A, August 2014 at station B and lowest values were recorded in the month of May 2014 at station A and station B. The chemical oxygen demand test is commonly useful to indirectly measure the amount of organic compounds in water. Similar results were observed by Balakrishna Dhatrika., 2012 ^[20].

Chemical oxygen demand values are positively correlated with TURB, TDS, CO₂ and TH at station A and with AT, WT,

TURB, TDS, EC, CO₂, TH and S at station B respectively. In this present study correlation values, atmospheric temperature values showed perfect positive correlation with water temperature at both the stations, phosphates are showed perfect positive correlation with transparency and sulphates also showed perfect positive correlation with electrical conductivity, while total dissolved solids were showed perfect negative correlation with dissolved oxygen, total alkalinity and phosphates at station A. At station B water transparency showed perfect positive correlation with phosphates, where as total dissolved solids were showed perfect negative correlation with total alkalinity.

Ichthyofaunal diversity

In the present investigation ichthyofaunal diversity showed in Table No. 05 and Graph no. 1 &2 respectively.

In India more than 1600 species of fishes have been found, (Mishra 2003) [21] has recorded 402 species. In the selected dam supports high diversity of ichthyofauna. (Rama Rao, 2014) [22] Has recorded a total of sixty seven species at manair dam, Karim Nagar district, Telangana. During the study period total nineteen number of different species were identified belonging to different orders.

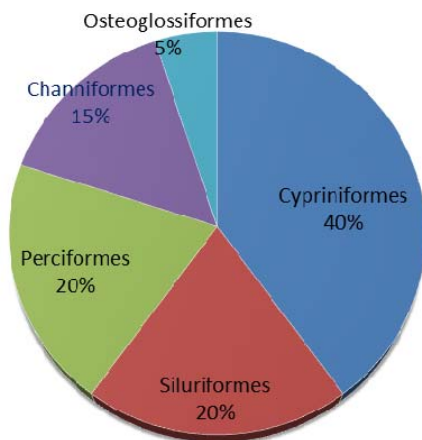
In all the species, the order Cypriniformes is represented by 8 numbers of species belongs to two families, they are Cyprinidae- *Catla catla*, *Labeo rohita*, *Cyprinus carpio*, *Cirrihinus mrigala*, *Punctius sarana*, *Punctius sophore*, *Salmostoma bacaila* and Cobitidae -*Lepidocephalus guntea*.

The order Siluriformes is represented by four number of species, belongs to the families Bagridae-, *Mystis aor*, Siluridae- *Wallago attu*, Claridae- *Clarius batrachus*, and Heteropneustidae -. *Heteropneustes fossilus*. The order Osteoglossiformes is represented with by one species belongs to the family Notopteridae - *Notopterus notopterus*. The order Channiformes is represented by 3 species belongs to the family Channidae- *Channa marulias*, *Channa straitus*, *Channa punctatus*.The order Perciformes is represented by four number of species belongs to the families Mastacembalidae-*Mastacembalus armatus*, Anabantidae- *Trichogaster faciatius*, and Cichilidae - *oreochromis mossambicus*.

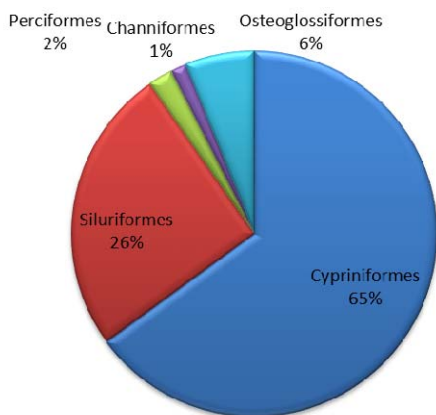
In this study the total 19 number of different species were identified, among the nineteen species *Catla catla* and *Labeo rohita* was dominated species followed by *Cyprinus carpio*, *Mystis aor*, *Channa punctatus*, *Punctius sophore*, *Mastacembalus armatus*, *Clarius batrachus*, *Lepidocephalus guntea*, *Salmostoma bacaila*, *Notopterus notopterus*, *Cirrihinus mrigala* and *Wallago attu*. The low abundant species are *Punctius sarana*, *Oreochromis mossambicus*, *Channa marulias*, *Channa straitus*, *Trichogaster faciatius* and *Heteropneustes fossilus*.

Conclusion

In the present investigation values of various physico-chemical were within the permissible limits of APHA and WHO. On the basis of these results, this dam water was not much polluted and supports high diversity of aquatic animals.



Graph 1: Showing order wise diversity of Nizam Sagar Dam during the year 2014-15



Graph 2: Showing Abundance of different order species of Nizam Sagar Dam during the year 2014-15

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