

CHAPTER 4:-BIOLOGICAL PARAMETERS OF WATER

PLANKTON ANALYSIS:

The physical and chemical characteristics of water affect the abundance, species composition, stability and productivity of the indigenous populations of aquatic organisms. The biological methods used for assessing water quality includes collection, counting and identification of aquatic organisms; biomass measurements; measurements of metabolic activity rates; toxicity tests; bioaccumulation; biomagnification of pollutants; and processing and interpretation of biological data. The work involving plankton analysis would help in:

1. Explaining the cause of colour and turbidity and the presence of objectionable odour, tastes and visible particles in waters.
2. The interpretation of chemical analyses.
3. Identifying the nature, extent and biological effects of pollution.
4. Providing data on the status of an aquatic system on a regular basis.

Plankton: A microscopic community of plants (phytoplankton) and animals (zooplankton), found usually free floating, swimming with little or no resistance to water currents, suspended in water, non-motile or insufficiently motile to overcome transport by currents, are called "Plankton".

Phytoplankton (microscopic algae) usually occurs as unicellular, colonial or filamentous forms and is mostly photosynthetic and is grazed upon by the zooplankton and other organisms occurring in the same environment.

Zooplankton principally comprise of microscopic protozoans, rotifers, cladocerans and copepods. The species assemblage of zooplankton also may be useful in assessing water quality.

The structure of photosynthetic populations in the aquatic ecosystems is dynamic and constantly changing in species composition and biomass distribution. An understanding of the community structure is dependent on the ability to understand the temporal distribution of the different species. Changes in species composition and biomass may affect photosynthetic rates, assimilation efficiencies, rates of nutrient utilization, grazing, etc.

Plankton, particularly phytoplankton, has long been used as indicators of water quality. Because of their short life spans, planktons respond quickly to environmental changes. They flourish both in highly eutrophic waters while a few others are very sensitive to organic and/or chemical wastes. Some species have also been associated with noxious blooms causing toxic conditions apart from the tastes and odour problems.

Plankton net: The plankton net is a field-equipment used to trap plankton. It has a polyethylene filter of a defined mesh size and a graduated measuring jar attached to the other end. A handle holds the net. The mesh size of the net determines the size range of the plankton trapped. The mesh number 30 of size 60 mm was used for collecting samples.

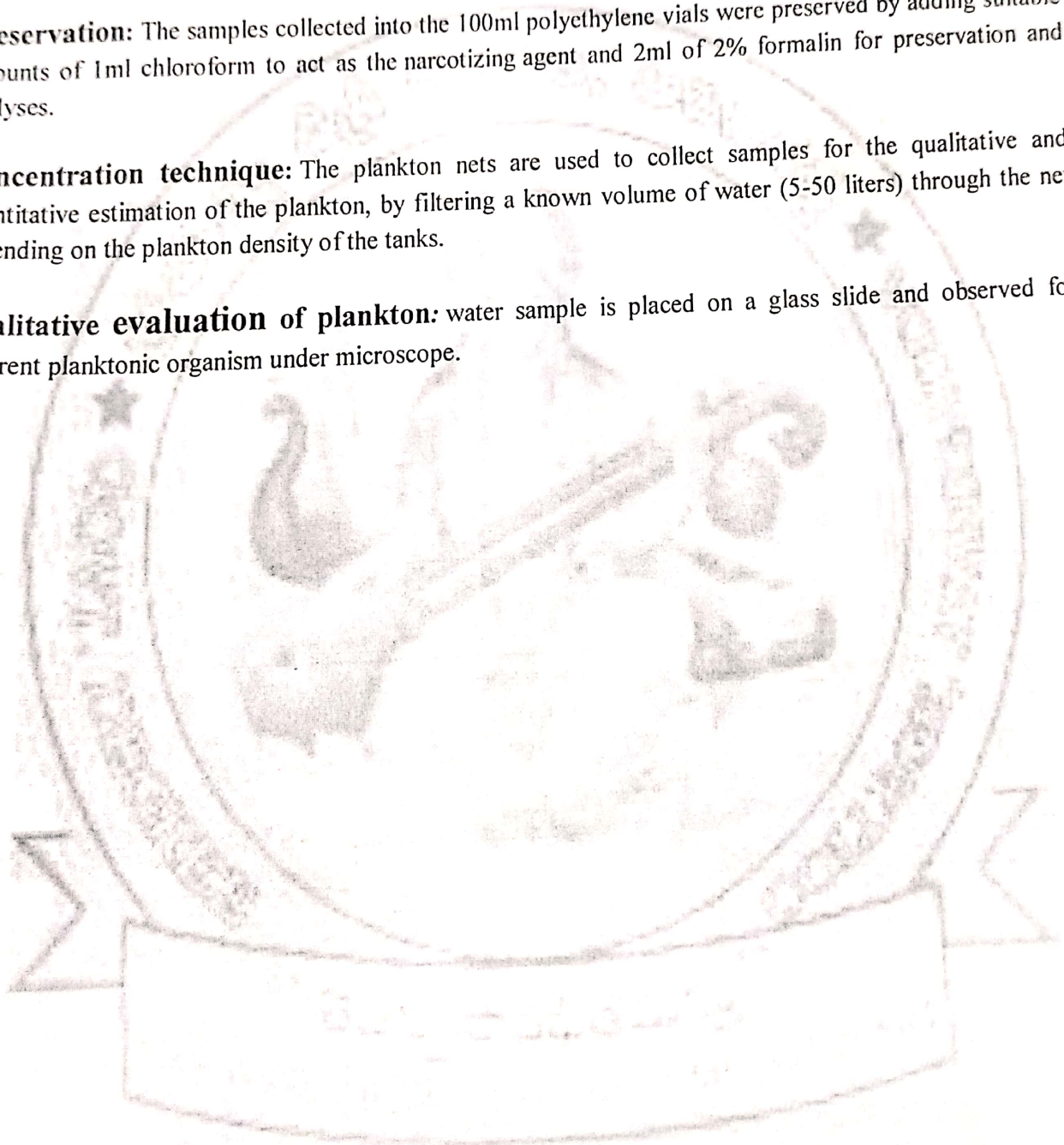
Sampling Procedure: The manner in which sampling is done should conform to the objectives of the study. The "surface samples" (samples collected from the surface) are collected as close to the water surface as possible, mostly towards the center of the pond at regular intervals. A known volume of the sample, 5L, is filtered and planktons are filtered and preserved for further analysis

Labels: The sample label has the date, time of sampling, study area-lake name and the volume measured and pasted on the containers of 50ml capacity.

Preservation: The samples collected into the 100ml polyethylene vials were preserved by adding suitable amounts of 1ml chloroform to act as the narcotizing agent and 2ml of 2% formalin for preservation and analyses.

Concentration technique: The plankton nets are used to collect samples for the qualitative and quantitative estimation of the plankton, by filtering a known volume of water (5-50 liters) through the net depending on the plankton density of the tanks.

Qualitative evaluation of plankton: water sample is placed on a glass slide and observed for different planktonic organism under microscope.



CHAPTER 5:- RESULTS

AQUA ONE CENTRE (AOC)
 U/s. P. Venkateswara, 1st ward, Salipeta village & Mandal, Krishna District, Pin- 521128, AP.

WATER ANALYSIS REPORT

DATE: 13-07-2022

Name: S. SATYANARAYANA
 Address: KODURU
 Contact Mobile NO: 8322036346

TEST PARTICULARS	Optimum Range	sample B1	sample B2	sample B3	sample B4	sample A	sample A	sample A	sample A4	sample A5	sample A6
pH	7.5-8.5	7.7	7.7	8.4	8.1	8.4	8.4	8.1	8.1	8.7	8.7
Salinity(ppt)	10 to 25	8	9	9	8	9	9	9	10	10	10
DO(ppm)	>4.0	7.8	8.1	8.1	8.1	8.1	8.1	8.1	8.7	8.1	8.4
Total(ppm) carbonates	100-200	110	110	80	80	110	70	90	90	90	70
ALKALINITY (PPM)											
Carbonates (Co3)		10	20	10	10	20	10	10	10	10	10
Bicarbonates (HCO3)	80-200	100	80	70	70	90	60	80	80	80	60
Total	Based on salinity	1700	1760	2800	2950	1800	1100	1250	1600	1100	1600
Hardness (ppm)											
Ca++	Based on salinity	1120	1100	1170	1180	950	950	880	1100	1050	1250
Mg++	Based on salinity	2080	1660	1680	1770	2150	2150	2270	2500	2100	2250
Ca+	Based on salinity	448	448	448	470	180	180	372	440	490	580
Mg+	Based on salinity	892	108	401	475	516	516	544	660	564	580
Ammonia (ppm)											
T Ammonia	<0.5	NHL	NHL	NHL	NHL	NHL	NHL	NHL	NHL	NHL	NHL
U Ammonia	<0.1	-	-	-	-	-	-	-	-	-	-
Nitrite (ppm)	<0.25	-	-	-	-	-	-	-	-	-	-
Nitrate (ppm)	Based on salinity	-	-	-	-	-	-	-	-	-	-
Iron (ppm)	<0.1	-	-	-	-	-	-	-	-	-	-
H2S(PPM)	<0.02	-	-	-	-	-	-	-	-	-	-
Phyto plankton	As Applicable	-	-	-	-	-	-	-	-	-	-

Scanned by TapScanner

AQUA ONE CENTRE (AOC)
 U/s. Anle Venkata Kutumbharao, 89-91, Salipeta, Nagayalanka Village & Mandal, Krishna District, AP, Pin: 521128

WATER ANALYSIS REPORT

date: 12-07-2022

Name Of the Farmer : PRASAD
 Address: KODURU
 Contact Mobile NO: 8322036346

TEST PARTICULARS	Optimum Range	sample B1								
pH	7.5-8.5	8.21								
Salinity(ppt)	10 to 25	20								
DO(ppm)	>4.0	7.8								
Total(ppm) carbonates	100-200	190								
ALKALINITY (PPM)										
Carbonates (Co3)	10 TO 40	20								
Bicarbonates (HCO3)	80-200	170								
Total	Based on salinity	4250								
Hardness (ppm)										
Ca++	Based on salinity	750								
Mg++	Based on salinity	1500								
Ca+		300								
Mg+	30;01	840								
Ammonia (ppm)										
T Ammonia	<0.5	0.59								
U Ammonia	<0.1	-								
Nitrite (ppm)	<0.25	0.01								
Nitrate (ppm)	Based on salinity	-								
Iron (ppm)	<0.1	1								
H2S(PPM)	<0.02	-								
Phyto plankton										

Scanned by TapScanner

COLOR AND ODOR

The color of the investigated pond water was observed visually. The color of study pond 1 and 2 were found to vary from light to deep green. The deep green color represents higher planktons and light green color represents lower planktons. According to Das (1997), a well and phytoplankton enriched water body appears to be dark greenish blue, red or brown. The odor of the investigated pond water was smelt by nose. The odor of pond 1 was not fishy and odor of pond 2 fishy. The odor of an ideal pond water is not fishy or odorless (Das, 1997)

TRANSPARENCY

Transparency of the studied ponds is determined by using secchi disc and the results were observed as 22cm and 20 cm for pond 1 and pond 2 respectively. A slight variations in the transparency were observed during study period due to cloudy weather in those months but in remaining months the variation quite negligible.

BIOLOGICAL PARAMETERS:

The sample water is tested for the presence of various phytoplankton and zooplankton to learn about the planktonic growth with in the pond and also to form an idea about the amount of feed to be given to the culture organisms or amount of fertilizers to be added to the pond. The observations of the present study are as follows.

Zooplankton:

1. In the sample 1 the following zooplankton has been observed.

- Rotifers: *Brachionus species*, *Filinia species* etc.
- Cladocerans: *Daphnia sp.*, *Moina sp.*, *Diaphanosoma sp.* Etc.
- Copepods: Cyclopoids and Calanoids were found.

2. In the sample 2 the following zooplankton have been observed.

- Rotifers: *Brachionus species*, *Filinia species* etc.
- Cladocerans: *Daphnia sp.*, *Moina sp.* Etc.
- Copepods: Cyclopoids and Calanoids were found.

Community Seminar project
 x work done statement (by book)

S.No	Date	Day	Activity done	Signature of Candidate
1.	25/5/22	1	Went to Chandrashekhar Home located at Atmakur	<u>Sonu</u>
2.	26/5/22	2	Went to Satya Home located at Amarchinta	<u>Satya</u>
3.	27/5/22	3	Went to Venu Home located at Amarchinta	<u>Venuj</u>
4.	28/5/22	4	Went to Nagaraju Home located at Atmakur	<u>Naru</u>
5.	29/5/22	5	Went to Pavan Home located at Atmakur	<u>Pavan</u>
6.	30/5/22	6	Went to Madhuh Home located at Atmakur	<u>Madhu</u>

Week - 3

S.No	Date	Day	Activity	Signature of Candidate
1.	9/6/22	1	Went to Somesh Home located at Uppena	<u>S</u>
2.	10/6/22	2	Went to Nagesh Home located at Uppena.	<u>Nagesh</u>
3.	11/6/22	3	Went to Upenchra Home located at Uppena.	<u>U</u>
4.	12/6/22	4	Went to Eswar Home located at dewarakadra	<u>Eswar</u>
5.	13/6/22	5	Went to Mallesh Home located at dewarakadra	<u>M</u>
6.	14/6/22	6	Went to Vijay Home located at dewarakadra.	<u>Vijay</u>
7.	18/6/22	7	Went to Suresh Harish Home located at dewarakadra	<u>Harish</u>
8.	18/6/22	8	Went to Vasista Home located at klanaparthi.	<u>Vasista</u>
9.	19/6/22	9	Went to Tharun Home located at klanaparthi	<u>Tharun</u>