MATERIAL AND METHODS

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The present work has been carried out during the period September 1981 to April 1982. This work is more of an ecological nature and involves hydrobiological study of a sub-tropical fresh water body ' Matitalav ' at Sawantwadi, Maharashtra.

The investigations on physical, chemical and biological limnology were carried out during the above mentioned period. Major part of the experimental work was done in field, mainly on the site of the tank. The different methods applied were selected considering the field conditions, requirements and availability of the material. Whenever necessary, the methods applied were modified to suit the field conditions and attempts were made to get the best possible results with the help of available instruments and chemicals.

Due to unavialability of a boat, the water and plankton samples for analysis could not be collected from the centre of the tank. However, the samples were drawn from the marginal area from the water as deep as the mean depth.

The readings were taken and samples collected during the morning hours between 7.30 am to 11.00 am, when the surface water was calm. Weekly readings were taken for all experiments throughout the period of investigation, and their monthly averages were used for comparism and conclusions.

Two stations were established, one in each part of the Motitalav in order to study the difference in the influence

of the biotic and abiotic factors on the specific physical conditions of the large and small part of the tank. Also consideration was given to the water depth, distance from tank margin, Vegetation and the position of inlets and outlets. The stations in the large and small part of the Motitalav were named as stn.1 and stn.2 respectively and have been mentioned so throughout the investigations.

The morphometry and physical limnology was studied according to the methods given by Welch (1948) & Lind (1974). Transparency of water was estimated with the help of 30 cm diameter Secchi disc. The extinction coefficient was calculated using the formula given in the FAO manual (FAO, 1958). Temperature readings of the air and surface water of the tank were recorded in ^{o}C by using a standard thermometer. The range of the thermometer was from $0^{o}c$ to $100^{o}c$ with $0.5^{o}c$ graduations. The readings were taken at both the stations 1 & 2 during 10 am and 11 am. in the morning hours every time.

During the present hydrological investigations six major chemical parameters, namely dissolved oxygen, free carbon dioxide, pH, hardness of water, phosphates and nitrate from the surface waters of the 'Motitalav ' were studied. After collecting the water samples at fixed spots i.e. Stn.1 and Stn.2., the analysis of the same was carried out immediately in the field.

The dissolved oxygen was estimated by Winklers method as discribed by Welch (1948). The amount of free carbondioxide was also estimated by the titration method given by the same

author. Hydrogen ion concentration (pH) of water was estimated by using an universal indicator having range from 4 pH-11 pH made by BDH-India, in the field with .5 graduation.

The hardness of water was estimated by using standard E.D.T.A. reagent ethylene diaminetetra acitic acid as given by Lind (1974).

In the study of nutrients important ones like phosphate and nitrate were studied. The amount of phosphate phosphorus (PO4) was estimated by the help of Daniges method (1920) as modified by Robinson and Thmpson (1948) by using Nessler's tubes and expressed in mg/lit of phosphate phosphorus in water. The estimation of nitrate was done by using Brucine method, and the amount was expressed in mg/lit of nitrates in water sample.

Attempts were made to study the hydrobiology qualitatively by conducting the survey of aquatic flora and fauna of the water body. Water samples were collected from different locations to record the existing micro and macro organisms. These investigations were carried out for the entire duration of research.

In biological limnology the main emphesis was on phyto and Zooplankton as it forms the primary level in the food chain of any aquatic ecosystem.

Plankton organisms were collected by a hand operated standard plankton net, with mesh size 98 /inch and made of nylon . The diameter of the ring was 27 cms and the height of the net was 86 cms. The collected microorganisms were preserved in formation (4 %) and later identified in the university laboratory using standard manuals by Ward and Whipple (1959) Kimor and Polling-her (1965) ,Need-ham and Needhaum (1964) etc.

The plankton samples were originally collected from the central region of the tank using both vertical and horizonetal hauls. Since there was no significant difference in the plankton samples drawn from both the methods, perhaps due to shallowness of the water mass, after wards the samples were collected by vertical hauls only.

The quantity of water filtered was calculated by using the following formula meter for want of flow meters

Water filtered $= \pi r^2 X h$

were r = radius of the plankton ring

h = height of the water column filtered.

For quantitative studies in plankton the preserved plankton samples were hand centrifuged for about 10 to 15 minutes at a moderate constant speed of about 1500 rotations per minute.

The morphometric and historic information about the 'Motitalv ' was obtained after the detail research of literature from collector's and municipal old records. The information about fisheries in the tank was geathered from the district fisheries office and local reliable sources, from 1955 onwards.