

A Study on some aspects of Hydrographical Parameters of Water in Vasishta Godavari River at Narsapur; West Godavari District of Andhra Pradesh

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ABSTRACT

India has a long coast line of 5650 km with a total continental shelf area of 2,59,000sqkms. History reveals that some form of Aqua culture existed around 300 B C in Bengal, Bihar and Orissa and credited with age old practices in this trade. Today Aquaculture has spread to most of the states and is flourishing as a trade on modern lines. Water is said to be the essential medium for aquaculture practices in which various aquatic organisms will be raised. For this purpose quality water is the primary requisite. To maintain the water quality the aqua culturists suppose to maintain various parameters of the water like Physical, Chemical, Nutrients and Gases at their limitations. Water contains various physical and chemical parameters like temperature, turbidity, salinity, dissolved oxygen, carbon dioxide, nitrates, phosphates etc., the poor and lack of proper water quality maintenance effects the growth and yield of the culturing organisms.

1. Introduction

Water has attracted the attention of man largely in recent years because of their multiple uses. It is a dynamic and highly productive environment, which can conveniently be utilize in a number of ways for increasing the yield of nutritive fish in close proximity to the human habitations. Man's intimate contact with the aquatic environment occurs in the areas and harvests the largest part of living and non-living resources. The creeks and salt marshes of estuaries are rich in nutrients and considered as an excellent natural nursery grounds for a variety of fish and shrimp.

Water areas are often rich in flora and fauna and act as recreational zones for tourism. They provide natural sites for harbours and play an important role in strategic areas for defense because of their easy access to open sea. They often used as source of water supply for industrial and domestic purposes. Because of their multiple uses, it is not surprising that seven of the ten largest cities in the world are located close to the estuaries.

The water sources in modern times used as outfall sites for disposal of sewage and industrial effluents without imparting much damage. With increasing industrial activity and population, many of the water bodies feared to reach a state of rapidly deteriorating water quality due to accumulation of pollutants. Hence, it is becoming apparent to protect the water quality and ecosystems. This can be possible, if we thoroughly understand their physico – chemical and biological parameters.

2. Materials and Methods

For the purpose of present study a single station was fixed at Narsapur and only the physical and some chemical parameters were studied. The physical parameters such as Transparency, Atmospheric and Surface water temperatures and the chemical factors like Salinity, Dissolved oxygen and P^H

measured. To know the parameters it was followed the methods, which were universally accepted standard methods.

The atmospheric temperature recorded with the help of a Celsius mercury thermometer of 0.1° sensitivity.

The surface water collected with a polythene bucket at all the stations and the temperatures recorded with the help of a Celsius mercury thermometer of 0.1° sensitivity.

The water samples for the estimation of Salinity and Dissolved oxygen collected in polythene and glass bottles respectively. Polythene bottles of 100 ml capacity used for the collection of water samples intended for the estimation of Salinity. Few drops of chloroform added to the water samples to store for further analysis. Glass bottles of 250 ml capacity used for collection of water samples intended for the estimation of dissolved oxygen content. Dissolved oxygen content fixed by the addition of Winkler 'A' and Winkler 'B' immediately after collection.

The transparency measured in the field using a Sacchi Disc. For this purpose, a metallic disc of 20 cm diameter with four quadrants on upper surface painted alternate black and white is used. The Sacchi Disc lowered into the water with the help of a rope tied to the hook at the center of the disc. The reading of depth at a point where the disc just disappears recorded in cm.

Salinity was estimated by following Harvey's method of titration using standard silver nitrate ($Ag NO_3$) 27.25 gm/l (i.e. 1.604 N) and 0.5% potassium chromate as indicator. After applying the appropriate correction, the salinity expressed as parts per thousand (‰).

The dissolved oxygen content of the water estimated, by following the classical Winkler's method. After fixing the dissolved oxygen content of the sample in the field after the

addition of Winkler 'A' (Manganous Sulphate) and Winkler 'B' (Alkaline Iodide) the samples were stored in a dark chamber to avoid possible photochemical changes and allow the precipitate of manganese hydroxide to settle. As soon as the samples brought to the laboratory acidified with the addition of Winkler 'C' (Conc. Sulphuric Acid). When, the oxidized manganese again reverts to the divalent state, the liberated Iodine equivalent to the original quantity of the dissolved oxygen present in the water. The Iodine liberated was titrated against standard Sodium thiosulphate (0.01 N) using starch as indicator. The oxygen content expressed as mg/l by employing the following formula.

$$V \times N \times 56$$

Where

V = the volume of sodium thiosulphate (Hypo) required for titration

N = the normality of sodium thiosulphate (Hypo).

And

56 = isa constant factor.

3. P^H (Hydrogen Ion Concentration)

p^H was recorded with the help of a portable p^H meter (Model No. UC 23, digital P^H/ORP meter manufactured by Central Kagaku Company Ltd., Japan). The instrument was calibrated with standard buffer solution (P^H 7.0) before use. The p^H was recorded immediately after collection.

4. Results

The transparency ranged from 50 cm to 75 cm. and the average mean is 62.5 cm.

The temperature ranged from 26.5°C to 34.0°C and the average mean is 30.25°C

The surface water temperature ranged from 24.5°C to 31.5°C and the average mean is 28.0°C

The surface water temperatures closely followed atmospheric temperatures variations. The low temperatures of the surface water corresponding to the winter and high temperatures to the summer seasons respectively.

The salinity ranged from 09.96‰ to 32.77‰ and the average mean is 21.36‰

The dissolved oxygen ranged from 2.968 mg/l to 4.256 mg/l and the average mea is 3.612 mg/l

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The total results obtained in the present study were very much correlated with results obtained by the earlier workers who studied the area.

5. Discussion

India has a long coast line of 5650 km with a total continental shelf area of 2,59,000sqkms. History reveals that some form of Aqua culture existed around 300 B C in Bengal, Bihar and Orissa and credited with age old practices in this trade. Today Aquaculture has spread to most of the states and is flourishing as a trade on modern lines. Water is said to be the essential medium for aquaculture practices in which various aquatic organisms will be raised. For this purpose quality water is the primary requisite. To maintain the water quality the aqua culturists suppose to maintain various parameters of the water like Physical, Chemical, Nutrients and Gases at their limitations. Water contains various physical and chemical parameters like temperature, turbidity, salinity, dissolved oxygen, carbon dioxide, nitrates, phosphates etc., the poor and lack of proper water quality maintenance effects the growth and yield of the culturing organisms.

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