



Statistical Analysis of Soil of Kararia Lake, Near Motihari

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Abstract: Soil constitutes have direct relationship with growth of aquatic animals and plants. They are responsible for the germination and efficient growth of plants. Soil plays an important role in determining the fertility of fish in water bodies. So it is an important factor for the productivity of water bodies. Various parameters such as pH, Conductivity, Alkalinity, Organic carbon, etc. were analyzed. The clay loam soil of this lake were found to be alkaline (i.e. basic). The pH varying from 7.1 to 7.6. During the soil analysis, Elements were not found in elemental state, but they found in compound states such as Nitrogen as Nitrate, Phosphorus as Phosphate, etc. Soil analysis of this oxbow lake were analyzed at the interval of three months for one year from January 2011 to December 2011.

Keywords: Kararia, Germination, Fertility, Loam, oxbow.

INTRODUCTION:

Treshow (1970) defined the soil as a complex physical and biological system providing support, water nutrient and oxygen for the plant. In general terms soil is the shallow upper layer of land surface of the earth. It is the bridge between organic, inorganic and living world. Soil contains 40% mineral matters, 10% organic matters, 25% soil water and 25% soil air besides biological system. Soil constituents have direct relationship with the growth of aquatic animals and plants. They are responsible for germination and luxuriant growth of plants as well as the productivity of water bodies. Soil plays an important role in determining the fertility of fishes in ponds and rivers. The study of soil of water body is one of the essential prerequisite to successful fish culture. Soil of any water body is an under water soil which is very complex in nature due to its high content of organic

colloids with high absorption capacity and low redox potential. It governs the process of absorption and release of nutrient. Thus the fish production is largely depends upon the soil type on which the water is flowing. Kararia (Motihari) falls under young alluvium, calcareous and non-saline soil. The soil of North Bihar covering the districts Muzaffarpur, Champaran, Saran, Darbhanga, Saharsha and Purnea are almost the same nature.

TOPOGRAPHY:

This lake is somewhat "U" shaped, situated about 2.5 km to the North-East of Motihari town, the district head quarter East-Champaran, Bihar. It covers an area of about 400 acres of water including that of rainy season. The exact location of this lake is $26^{\circ}39'49''\text{N}$ and $85^{\circ}35'3''\text{E}$.

EXPERIMENTAL:

Organic carbon was estimated by Walkely and Black's method (1934). For the estimation of organic carbon following reagents were prepared---

- Potassium dichromate solution (1N)
- Ferroussulphatesolution (1N)
- Diphenylamine solution
- Phosphoric acid(85%)

pH weredetermined by electrometric method for accuracy.

Available nitrogen was estimated by rapid procedure of Sibbiah and Asija (1956). Reagents used in this estimation are---

- 0.32% KMnO₄.
- 2.5% NaOH.
- 0.02N NaOH
- Liquid paraffin.
- 0.02N H₂SO₄.
- Methyl red indicators.

Available phosphorous (as P₂O₅) were estimated by Jackson (1973) using 0.002N H₂SO₄ as extract.

Estimation of Ca and Mg were done by EDTA method.

Carbonate and Bicarbonate were estimated by standard methods.

Conductivity were measured by Conductometre.

RESULT AND DISCUSSION:

For the biological productivity and maintenance of aquaculture , chemical components and nature of soil

are important factors. It's physico-chemical parameters are responsible for the growth of the vegetation and determine the kind of organism that can live. It can determine the fertility of fish in any water body.

pH of this water body was varied from 7.10 to 7.60. Maximum pH was 7.60 in the month of January to April while minimum was 7.10 in the month of May to August. Organic carbon was ranging from 0.57 to 2.60. From May to August it was maximum 2.60 while minimum 0.57 was in the month of January to April. Phosphate content of the soil vary from 10.10 to 88.60. It was maximum 88.60 in the month of September to December while minimum 10.10 in the month of January to April. Very little quantity of Ca and Mg in the soil were recorded. It was ranging from 0.35 to 1.01. It was maximum 1.01 in the month of September to December while minimum 0.35 in the month of January to April. Carbonates was absolutely absent in the soil of this lake throughout the research year 2011. Bicarbonates ranges from 3.20 to 4.60. It was maximum 4.60 in the month of May to August while minimum 3.20 in the month of September to December. Conductivity of this soil varied from 0.36 to 0.45. Maximum in the month of May to August was 0.45 while lowest 0.36 was in the month of September to December.

CONCLUSION:

All the soil parameters of this lake were recorded within the permissible level. So the soil quality is good for pisciculture and aquatic life.

Table:

S.No.	Constituents	Jan to Apr	May to Aug	Sep to Dec
01	pH	7.60	7.10	7.30
02	Organic Carbon (in %)	0.57	2.60	1.70
03	Phosphate (P ₂ O ₅) in ppm	10.10	29.3	88.60
04	Ca and Mg (in m.e./100gm of soil)	0.35	0.91	1.01
05	Carbonates	Nil	Nil	Nil
06	Bicarbonates	3.70	4.60	3.20
07	Conductivity ml/mhos/cm at 25°C	0.38	0.45	0.36

Soil Analysis data of Kararia Lake in 2011.

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