Analysis of Correlation Coefficient between Physico Chemical Parameters and Population of Fishes of Kishan Pura Lake of Indore Madhya Pradesh

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Abstract: **Kishanpura Lake Indore (M.P.) is a shallow tropical lake whose shoreline has dense population of bottom fish fauna. Very little work is reported on the benthic biodiversity of shoreline of tropical shallow lake of Malwa region in Madhya Pradesh. This was the first attemperaturet to carry out the biodiversity.**

Keywords: **Kishanpura Lake, Fish Population, Physico Chemical Parameters**

1. INTRODUCTION

Abiotic part of freshwater ecosystem consists of physico-chemical nature of water. The aquatic animals particularly the fishes perform all biological phenomena in aquatic medium. The physico-chemical factors govern the entire ecology of the aquaculture of the water body.

The environmental factors affecting the fish-food in fresh water fisheries were reported by Bhowmik (1968). Co-relation of physico-chemical factors with planktons ecology recorded by George (1969). India ranks next to China and Russia in inland fish production in the world.

Fish production in Reservoir is directly or indirectly dependent on the abundance of plankton and bottom fauna. The physico-chemical properties of water determine the quality and quantity of the fauna.

Different scientists have studied about fish populations. Boinley et.al. (1944), Eills (1946), Singh and Shiromani (1962), Dubey and Chatterjee (1976), Singh and Desai (1980), Rao et.al. (1988), Choubey (1990), Singh and Singh (1993), Shukla (1995) and Saxena (1997).

The bottom fauna of this lake is qualitatively diversified and rich. The fish fauna of Kishanpura Lake includes 29 species (2006-07) and 30 species (2007-08) belonging to different families were observed. The Kishanpura Lake have rich biodiversity due to benthic fauna, organic pollution and shoreline vegetation.

Correlation analysis helps us in determining the degree of relationship between two variables it doesn't tell us anything about cause and effect relationship. When correlation coeffient is applied mathematically it is known as statistical analysis

2. MATERIALS AND METHODS

Statistical analysis:

Establishment of co-relation coeffient between physico-chemical and biological parameters by

 > APHA (1998), Welch (2002).

In order to derive the correlationship between physico-chemcial and biological variables, coefficient of correlation values with degree of significance were computed as per Karl Pearson formula.

Biostatistical Analysis:

Following statistical methods were applied in the biostatistical analysis of collected data during present investigation.

$$r = \frac{n \, \Sigma \, dx \, .dy \; - \; \Sigma \, dx. \, \Sigma \, dy}{\sqrt{(n \, \Sigma \, dx^2 - (\Sigma \, dx)^2} \, . \, \sqrt{(n \, \Sigma \, dy^2 - (\Sigma \, dy)^2}}$$

Where ,   x and y stand for two variables

3. RESULTS AND DISCUSSION

The quality of water is subjected to wide variations due to the meterological conditions, geochemistry and discharge of sewage, other garbage and municipal refuge in the water body.

During the present study of Kishanpura Lake 30 species of fishes were recorded which belong to different families and genera. Dubey and Mehra (1959) reported 54 species from the Chambal river during pre-impoundment of Gandhi Sagar Reservoir. Dubey and Chatterjee (1976).

The change in the composition of a fish assemblage often indicate a variation in the water quality parameters, such as pH, temperature, dissolved oxygen and nutrient (Jhingran,(1982 Sharma et.al, 2007. Devi and Raghunathan (1999) studied on Ichthyo fauna of Dharmpuri.

Table 28 : Analysis of correlation coefficient between physico-chemical parameters and population of fishes of Kishanpura Lake 2006-07

	Cyprinidae	Notopteridae	Bagridae	Ophiocephalidae	Mastacambalidae	Siluridae	Belonidae	Heterophensti	Clupeidae	Claridae
Water Temperature	-0.736620005	-0.928252999	-0.723898794	0.286142848	0	0.540670406	0.888851565	0.371949418	-0.841234517	0.371949418
pH	-0.018620973	-0.371153744	1.52882E-15	0.891042111	0	0.981980506	0.944911183	0.928571429	-0.188982237	0.928571429
Transparency	0.854049281	0.614767621	0.863587684	0.841262541	0	0.65831601	0.19374755	0.788708294	0.752741677	0.788708294
Total Solids	-0.999752461	-0.942961799	-0.999164821	-0.417132237	0	-0.148699217	0.365663936	-0.332900953	-0.988882472	-0.332900953
Free CO2	0.960598395	0.996803299	0.955256325	0.170058822	0	-0.109922961	-0.592166132	0.07989482	0.99394011	0.07989482
Dissolved Oxygen	0.208862327	0.541348943	0.190615825	-0.788180139	0	-0.927952606	-0.989979639	-0.840798027	0.372698217	-0.84079802
Alkalinity	0.948405135	0.999239591	0.942336711	0.129544337	0	-0.15055087	-0.62468201	0.038990247	0.988602264	0.038990247
Total Hardness	-0.813769639	-0.966759658	-0.802806265	0.166864579	0	0.433779902	0.826173848	0.255686848	-0.901018866	0.255686848
Chloride	-0.99413514	-0.96809765	-0.991949008	-0.337426408	0	-0.063104762	0.444353127	-0.250573224	-0.998006908	-0.250573224
Calcium	-0.950386412	-0.998973742	-0.94442917	-0.135797005	0	0.144311374	0.61974348	-0.045293076	-0.989532328	-0.045293076
B.O.D.	-0.173910126	-0.51106905	-0.155542754	0.809593313	0	0.940634162	0.984324138	0.85953966	-0.339422117	0.85953966
Sulphate	-0.56903584	-0.823164551	-0.553624914	0.490727924	0	0.713134847	0.968106335	0.56780289	-0.701026882	0.56780289
Total Nitrate	-0.635959128	-0.321792017	-0.650219091	-0.972114226	0	-0.868936362	-0.505059049	-0.946810381	-0.494923831	-0.946810381
Total Phosphate	-0.948797427	-0.775671099	-0.954515009	-0.698949748	0	-0.473176509	0.030700945	-0.631137344	-0.880967645	-0.631137344

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