



## Effect of water pH on growth and production of fish in the Coka Dam Papara Distt. Satna (M.P.)

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### Abstract

Coka Dam Papara is big water body rich in flora and Fauna also used for fish culture under the control of Department of Fishries Govt. of M.P. Composite fish cultures were conducted in Coka Dam Papara Satna in 2.3 hectare water area. *Amblypharyngodon mola* (Ham.) *Puntius chola* (Ham.) *Cirrhinus mrigala* (Ham.) and *Labeo calbasu* (Ham.) were cultured under experimental and control Coka Dam in the pH of water of the experimental area was within 5.5-8.5 the limestone containing 55-66% Cao and dolomite containing 30-32% Cao at were used for raising the water pH level. Application of dolomite helps to increase the water retention capacity of the Coka Dam. Niger was observed higher in experimental Coka Dam than the control one.

Key-Words: Coka Dam, Fish, Growth, Production, Satna

### Introduction

The fresh water bodies are spread over diverse Geo climatic regions. They are exposed to various climatic conditions and received drainage from different of catchments areas. The hydrogen-ion concentration (pH) of natural waters is an important environmental factor for the growth of fishes. Increases in the concentration of H<sub>2</sub> – ions results lower pH value and low H<sup>+</sup> ions concentration brings about higher pH value. The pH of water is the logarithm of the reciprocal of hydrogen ion concentration. The objective of this study was to find out the effects of pH of water on the production of fish in composite fish culture. Demand of fishes is increasing day by day. Production of fish depends on the application of required amount of organic and inorganic fertilizer which are helpful to increase the natural fish food. Optimim level of water quality such as dissolved oxygen, alkalinity, hardness and pH are also the prerequisite for fish production. Among which pH of water has an important role for enhancement of fish yield. Lime fertilizers such as lime stone containing 55-66% Cao, dolomite lime stone containing 42-55% Cao, and dolomite containing 30-32% Cao are generally used for raising the water pH level to required doses. Natural water of Satna district in Madhya Pradesh is mostly acidic, having pH ranging from 4.0 to 5.5.

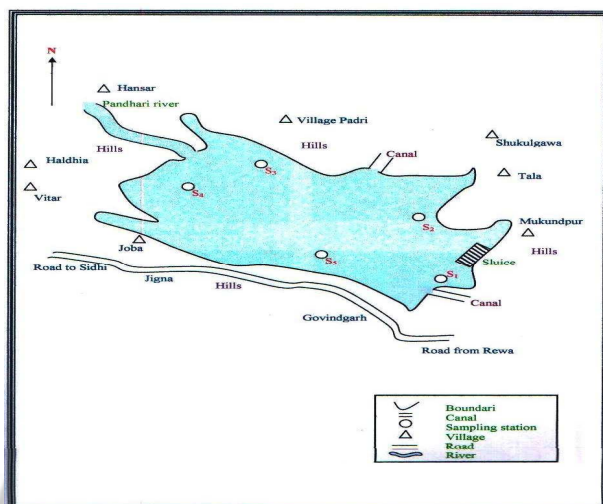
To find out the effects of pH on fish growth and production the fresh water Coka Dam were selected for composite fish culture of four species. Expected yield was observed for grass carp *Cirrhinus Mrigala* and *Labeocanbsu* in the Coka Dam. The growth rate and production of Indian major carps, *Amblypharyngodon mola* (Ham.), *Puntius chola* (Ham.), *Cirrhinus mrigala* and *Labeo calbasu* (Ham.) per unit area were evaluated. The various works have been made as per method suggested by Dutt, et al (2001), and George (1969).

### Geography of Coka Dam

Coka Dam is situated in municipal area of Satna town, located on south west part of Madhya Pradesh. It is an important district of Ex- Vindhya Madhya Pradesh State and part of Baghelkhand rele of Second century A.D. Satna district is a pilgrim and an industrial place, area rich in Limestone, Bauxite, White clay, Geru, Ramraj and Flagstones. It is also famous for its religious places of Chitrakoot. The district Satna is the central part of Vindhya region which is surrounded by the boundaries of Rewa and Satna on the North, Bilaspur district on the South and Jabalpur on the West side.

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Map of Coka Dam Fish Farm 2.3 Hectare



### Material and Methods

Fish sampling were collected from the Coka dam district Satna in three distinct season viz. summer monsoon and winter. Summer extends from March to June Water samples were collocated at 1<sup>st</sup> of each monthly for all the five sites. The of water samples directly measured by digital. pH meter. Collected fish during Sampling were preserved in 10% formation and were identified with the help of as per eminent workers (APHA, 1995; Mishra, 1968).

### Results and Discussion

The fish production of fresh water was selected at Coka Dam Dist. Satna Madhya Pradesh having 2.3 hectare water area of composite fish culture. One of which was used as experimental Coka Dam and the other as control Coka Dam Dolomite 5470 kg./ ha containing 30-32% Cao and lime stone 2500 kg./ha containing 55-56% Cao were applied to the experimental Coka Dam pH OF water was maintained within 5.5-8.5 The pH of water of control Coka Dam carried within 3.5-5.5 as lime fertilizers were not applloed. Manuring was done by applying cow dung at 340 kg./ ha per month in the Coka Dam Fries of Amblypharyngodon mola (Ham.), Puntius chola (Ham.), Cirrhinus mrigala (Ham.) and Labeo calbasu (Ham.) were intruduced in experimental and control Coka Dam. Fries were stocked at the rate of 12000/ hectare and in the ratio 3:1 5: 2: 1of Amblypharyngodon mola (Ham.), Puntius chola (Ham.), Cirrhinus mrigala (Ham.) and Labeo calbasu (Ham.) respectively. Netting was performed twice in a month. Rice bran as supplementary feed was applied at 2 kg/ ha per day for first 90 days, 4 kg/ ha per day for second 90 days, 6 kg/ ha per day for 90days and 8 kg/ ha per day for first 90 days in the Coka Dam. weeds

lemna, the occum of in prods viz,Hydrilla one basket/day were applied in each cases. Dissolved oxygen, alkalinity and hardness of water were almost same in the Coka Dam. Observations were made as per method outlined by APHA *et al.* (1995), Harvesting in the Coka Dam were performed in June 2010. Tables 1 and Table 2 show the yield of fish in a year. Fish yield was 3400 kg./ ha in the experimental Coka Dam and 250 kg/ ha in-the control and production of the Amblypharyngodon mola (Ham.), Puntius chola (Ham.), Cirrhinus mrigala (Ham.) and Labeo calbasu (Ham.) in the experimental Coka Dam was oserved higher than the control one during 2009-2010. Dolomite has played an important role to minimize the water seepage. It has been recorded that the pH of water of Coka Dam varies during March to June. It is established that water having pH ranges between 5.5-8.0 have been most suitable for in land Coka Dam fish culture and pH value more than 8.5 was found to be unsuitable as CO<sub>2</sub> in not available. Mortality of fishes occurs at about pH. In Acid waters lose their appetite, growth capacity and tolerance to toxic substances. Toxic effects of H<sub>2</sub> S<sub>2</sub> copper and other heavy metals to fish increased by lowering the pH of water. Indian major carps prefer to feed the aquatic organisms as their food. In control Coka Dam low yield of the Indians major carps maybe due to 10 pH of water than the experimental one. The acid in water may indirectly harmful effect on aquatic organisms which was used as natural food by fishes. On the contrary the yield of grass carp and silver carp were almost same inthe both experimental areas there form low pH of water may not have low productive effects on the growth and production of these two exotic carps. The similar observations have been made by Bhatt (1968), Singh (2007), Welch, (1948), Das (1957), David (1963) Dattamunshi & Shrivastava (1988), Faiace (1978), amd Fulton (1904).

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**Table 1: The yield of fish (kg/ha) in the Coka Dam**

Fish	Family	pH	Amount (kg.)
<u>Amblypharyngodon mola (Ham.)</u>	Cyprinidae	3.5-5.5	285
<u>Puntius chola (Ham.)</u>	Cyprinidae	3.5-5.5	223
<u>Cirrhinus mrigala (Ham.)</u>	Cyprinidae	3.5-5.5	232
<u>Labeo calbasu (Ham.)</u>	Cyprinidae	3.5-5.5	582

**Table 2: The yield of fish (kg/hectare) in the experimental Coka Dam**

Fish	Family	pH	Amount (kg.)
<u>Amblypharyngodon mola (Ham.)</u>	Cyprinidae	5.5-8.5	562
<u>Puntius chola (Ham.)</u>	Cyprinidae	5.5-8.5	498
<u>Cirrhinus mrigala (Ham.)</u>	Cyprinidae	5.5-8.5	455
<u>Labeo calbasu (Ham.)</u>	Cyprinidae	5.5-8.5	635