Abstract of Ph.D. Thesis

“STUDIES ON HYDROBIOLOGY MONITORING AVIFAUNA AND ICTHYOFAUNA OF SENDURSENA DAM TAL. BASMATH DIST HINGOLI”

INTRODUCTION:

Water is very important abiotic natural resource. It is said as liquid of life which is essential of all living process. Water is an universal solvent as it is dissolved more substances than any other liquid without undergoing any change. Thus it is an unique component of nature. It has played an important role in the life from molecules to man, since the time unmemorable the great human civilization has originated, evolved and flourished around water resources. Water covers 70% of earth surface but only 2.7% of total water in the river, lakes, and atmosphere is as biological water. It has estimated that only 0.00192% of the total water on earth is available for human consumption Trivedi, (1998).

The study of fresh water in all their aspects physical, chemical and biological is termed as Limnology Odum, (1977) or it is the study of freshwater or saline water which are contained within continental boundaries Goldman and Horn, (1983). Limnology is also described as, ‘Hydrobiology or aquatic biology’. According to Edgar does Baldi a prominent Italian Ecologist limnology is the Science dealing with internal action of processes and methods where by matter and energy all transformed within the pond. Welch (1952) is of the view that it is science dealing with biological productivity of water together with all causal influences on the qualitative and quantitative features along with its actual potential aspects. Wetzel (1975) defined limnology as “Study of the functional relationship and productivity of freshwater biotic environmental factors”.
A hydrobiological study generally involves analysis of physico-chemical and biological parameters and reflects on the status of the environment in connection with both the biotic and abiotic factors. This is helps in utilizing the resources in right manner in order to curb the pollution, to boost the productivity and to conserve the prosperity of the biodiversity. Hence there is a constant interaction and exchange of mass and energy in an ecosystem, the quality of water becomes an important dynamic entity. That is exactly why the hydrobiological studies have to be done on regular basis. It is essential for variety of objectives like increasing productivity and conservation of the potentials along with checking pollution if any. This will also help in proper development of agricultural activities, industrial activities, recreational programs, domestic usage pattern and aquatic bird sanctuaries. It will play an important role in planning activation that strengthening biodiversity.

Present Lake is extremely productive in terms of food, plants and animals, because the temperature of water was often lower than that of the surrounding air, it act as valuable feeding habitats during the cold. In addition it provides water for drinking, bathing and offers protection from land predators. It is not surprising therefore that this freshwater habitat is home of many bird species and visited by many other bird species not primarily adapted to aquatic life. Most of these are equally familiar in standing and flowing water because their size and the tendency of some types of flock together. Population of aquatic birds is more likely to be found on lake, due to the amount of food needed to support them.

Birds occupy an important position in the animal kingdom, especially in relation to man. Economically, they are both useful and harmful to man's interest. Some of the important
uses to men are as biological control, as Scavenger, as pollinators, as Seed Disperser and as Fertilizer.

Water birds are commonly grouped into several categories based on behaviors, Diving birds, water fowl, wading birds, Gulls and Terns Eleanor C. Foerste, (2000) one of the most common diving birds seen locally coot. These birds are dark grey to black with white bill. Large migratory flocks grouped on local lakes during the winter. They appear to walk on water before they get up enough lift to fly. Coot eats aquatic plants, including hydrilla and insects.

Conventional models of freshwater food webs assume that fish occupy the top trophic level. These are the most important biotic determinant of trophic abundance lower down in the food web Vannote et al. (1980), Fry (1991), Well Born et.al. (1996). However many terrestrial predators, including many bird species, feed on aquatic system and therefore are components of trophic level in aquatic food webs Steinmetz, (2003).

Fishes are the most popular group of animals, about 40,000 species of fishes are known that live in different aquatic habitat.

Fishes occupy very important position in the animal kingdom, especially in relation to man. Economically fishes are useful to man. The infection of helminth parasite becomes a major global public health problem because of their very high prevalence and will effect on both nutritional and immunological status of human population, their prevalence and impact are particularly intense in countries with tropical climate standard of living, poor sanitation and poor health education.

Ever since the spread of environment awareness all over world, monitoring of water resources through regular analysis has becomes crucially important feature. It is essential
for exploration, exploitation and conservation of the potential of the water bodies keeping this view; we have made an attempt to evaluate the important physico-chemical parameters along with diversity of avifauna and ichthyofauna with there helminth parasites of Sendursena dam.

**Sailent feature of Sendursena Dam:**

1. **Name of River Basin**: Godavari
2. **Shape of the Dam**: Flask Shaped
3. **Original catchments area**: 14.37 Sq. Km.
4. **Average Annual rain fall**: 830 mm.
5. **Top width of dam**: 3 meters.
6. **Submergence area in Hector**: 79 Hector
7. **Gross storage in M. Cum.**: 1.884. M. Cum
8. **Command area for irrigation**: 695 Hector
9. **Nature of dam**: Deep

**The Principal objectives of the present study are:**

1. Determination of Physical, Chemical and Biological characteristics of water.
2. Determination of changes in Physical and Chemical aspects.
3. Evaluation of Sendursena dam during different seasons of the year.
4. Identification of birds, fishes and their helminth parasites.
5. Determination of population ecology of birds, fishes and helminth parasites.
Methodology:

Water sample of four selected sites of Sendursena Dam worked out during the study period. The fish material was collected with help of local fisherman from dam. The fish specimens collected were instantly fixed in 4- 5% formalin solution and subsequently after 3- 4 hour fixation and washing with water, transfer to rectified spirit. The large sized specimen was injected with 10% formalin and given incision on its belly. While identifying the fish specimens, stress was mainly given on stable character both meristic and morphometric. The latest authentic books on fish systematic and fauna volume such as Day (1978, 1889), Jayaram (1981, 1991), Menon (1964, 1987) and Talwar and Jhingran (1991) were referred for fish identification.

Bird's counts were carried out around the study period from all four sites of Sendursena dam. Bird counts were done by two different methods. An actual head count were done by bird species which were small number for fast moving birds or for birds present in flock. A bird viewer was observing their movements and habitat. The identification of birds was done by the book of “Indian Bird” Salim Ali (2001) and a pectoral guide to the birds of the Indian subcontinent Salim Ali and Riplay.

Helminth Parasites:

Cestode and trematode parasites collected from fishes and birds preserved in 4% formalin (hot), stained in Harris Haematoxylin or Borax Carmine mount in DPX. Identification and drawing made with the help of Camera Lucida, while Nematodes wear preserved in glycerol and mounted in glycerin jelly. All the helminth parasites were identified with the help of volume of S. Yamaguti (1959).
The Thesis comprises of four chapters.

Chapter I - Hydrobiology
Chapter II - Avifauna and Ichthyofauna.
Chapter III - Taxonomic study of helminthes parasites.
Chapter IV - Bibliography.

Chapter I

The chapter contains the introduction of ecological parameters categorized as Physical, Chemical and Biological parameter.

A) Physical parameters: -
   Colour, Temperature, pH, Transparency, Turbidity, Total dissolved solids and Conductivity.

B) Chemical Parameters: -
   Dissolved oxygen, Carbon dioxide, Alkalinity, Chlorides, Sulphates, Hardness, Biochemical oxygen Demand.

C) Biological Parameters:
   Phytoplankton, Zooplankton, Bacteriological analysis, Analysis of Macrophytes.

Chapter II:

Avifauna and Ichthyofauna:

This chapter deals with the diversity of birds and fishes. Avifauna—total 24 species are recorded.
   Ichthyofauna—there are 13 species of fishes with different order and families are reported.

Chapter III:

Taxonomic Study of helminth parasites:

This part of the thesis deals with the taxonomy of helminth parasites from birds and fishes from Sendursena dam from genera of class Cestoda, Trematoda and Nematode.
Chapter IV:
Bibliography:

Note
- List of paper publication.
- Conference attended

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