

**Executive summary report of minor research project**

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**Title of the project: - “TAXONOMICAL STUDY OF CESTODE FAUNA OF FISHES  
IN AND AROUND THE KRISHNA RIVER BASIN IN WESTERN MAHARASHTRA”**

**Introduction: -** Krishna River is one of the largest rivers in India and flows through Maharashtra, Karnataka, Telangana, and Andhra Pradesh and finally meets the sea in Bay of Bengal. It originates at Mahabaleshwar, Satara district and flows further through Sangli and Kolhapur district of Maharashtra. Maharashtra is blessed with an abundant supply of water so that the life is enriched by farming as well as fish farming and fishery. Fishery provides a major source of food, employment, and economic wellbeing for the present and future human generations. . Millions of human beings suffer due to hunger and malnutrition. Fish is an excellent source of protein and vitamin like A, D, E, K and B<sub>12</sub> besides being rich in calcium, iron, phosphorous and iodine for human diet. Traditionally the fish is considered as the “protein for poor” (Mishra and Sharma, 2004). The present study will contribute some extent to better understanding of the systematics and biodiversity of cestodes of freshwater fishes. Cestoda is a class of parasitic flatworms, commonly called as tapeworms, which live in digestive tract of the vertebrates.

The archeological study has been revealed that, parasites and parasitic diseases are potentially associated with human being. Human have acquired about 300 species of helminth worms, some derived from our primate ancestors and some acquired from pet and wild animals. The term ‘parasite’ may use to describe many kinds of organisms from viruses to vertebrates. We have largely restricted our review to the study of macro parasites affecting the vertebrates. The macro parasites (May and Anderson, 1979) are the metazoan parasites belong to phylum Platyhelminthes and nematoda. The roundworms belong to nematoda while flatworms and flukes belong to class cestoda and trematoda respectively. Yamaguti, in 1959 divided the class cestoda into two subclasses which further divided into 21 orders 120 families and 640-650 genera. Under natural conditions 50 – 90 % of the fresh water fishes harbor at least one species of parasites. (Sieszko 1975, Daniel 1978) Crompton (1973) reported that worms prefer alimentary canal of fish, and high concentration occur in intestine. Heavy infection may block the lumen of alimentary canal which affects the growth, health, and the productivity of fishes. These edible fishes are known to harbour a number of cestode parasites which cause deterioration in their health include emaciation

(significant loss of body mass), nodules or masses present in skin or muscle, growth inhibition, abnormal swimming, and weakness or death, hence their market, and nutritive value is affected. (Sharma, 2016) Parasites also cause some diseases which finally lead into death of host fishes. Now a days aquaculture contributes for human nutrition. (Chakraborty et.al 2013) Aquaculture supplies almost 50 percent of fish for human consumption globally and it is a source of income for more than 20 million people. (FAO) Hence in order to meet increasing demand of growing population it is necessary to increase productivity and to deserve special attention on aquaculture. The present work has contributed for the Taxonomic study of cestode parasites of fresh water fishes in and around the Krishna river basin in Maharashtra. It is essential to study the taxonomy and life cycle of parasites which helps to control the parasitic infection and to increase the productivity of fishes.

#### **Material and Method:-**

The freshwater host fishes were collected at different collection sites from local fishermen. After collection fishes were brought to the laboratory for further study. The host fishes were dissected out and intestines were cut open for parasitological examination. Dissected intestines were examined under stereomicroscope to observe the degree of infection. The cestode parasites were collected, placed in saline solution and freed from the mucus by shaking well. Further the parasites were flattened, and preserved in 4% formalin. These preserved parasites were dehydrated by passing through alcohol grades and finally stained with Harry's haematoxylin cleared in xylene and mounted in DPX for taxonomical study. Sketches were drawn with the aid of camera Lucida. Identification of parasites was carried out by using "Systema Helminthum" Vol. II by Yamaguti.

#### **Objectives:-**

- 1) General survey of fish markets, for obtaining the alimentary canals and study of fishing sites to obtain the fishes from fisherman.
- 2) To study the prevalence of cestode parasite.
- 3) To study the biodiversity of cestode parasites
- 4) Taxonomic study of cestode parasites.
- 5) To study the density of infection.

## **Findings:-**

The study was conducted in Maharashtra in and around the Krishna river basin. Krishna river basin is about 257369 sq. km. and in Maharashtra it is about 69425 sq. km. spreading through Satara Sangli and Kolhapur districts and total 21 Tehsil. Fishes were collected from different collection sites of Satara, Sangli, and Kolhapur district from August 2017 to August 2018. Cestode parasites were collected from the intestine of fresh water fishes namely *Mastacembelus armatus*, *Labeo rohita*, *Labeo fimbriatus*, *Clarius batrachus*, *cirrina mrigala*, *Wallago attu*, *Tilapia mossambica* and *Catla catla*. Total 307 fishes were dissected and examined, 109 were found infected. Total 144 parasites were collected throughout the year, preserved in 4% formalin for further taxonomic study.

**Conclusion:** In the present study it has been observed that incidence of cestode parasites was highest in summer followed by winter, and low in rainy season. This seasonal variation may be due to environmental factors like temperature, rainfall, humidity, breeding period, feeding habitat, etc. The study also revealed the high incidence of cestode parasites i. e. **35.50%**. It decreases the growth and protein content and increases the mortality of fishes. By 2050 to feed the estimated population there is requirement of increase in food production. (Singh et.al 2014) so to meet the increasing demand of growing population it is essential to enhance the production of good quality and sufficient quantity of fishes as an affordable source of protein. The present investigation deals with the taxonomy of cestode parasites of following two orders.

- 1) Order- Pseudophyllidea Carus 1863
- 2) Order- Caryophyllidea Van beneden in Carus 1863
- 3) Order- Proteocephalidea  
and three families
  - 1) Family-Ptychobothridae
  - 2) Family- Caryophyllidae
  - 3) Family-Proteocephalidae

Total four genera of cestode parasites were reported which are as follows.

- 1) Genus *Senga*, Dollfus 1934 (Order-Pseudophyllidea, Family Ptychobothridae)
- 2) Genus *Lytocystus*, Cohn 1908 (Order- Caryophyllidea, Family- Caryophyllidae)
- 3) Genus *circumonchobothrium* Shinde 1968. (Order-Pseudophyllidea, Family Ptychobothridae)

4) Genus *Gangesia* Woodland 1924 (Order- Proteocephalidea, Family- Proteocephalidae).