INTRODUCTION
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Fish farming and fish industry are one of the biggest and fastest growing industries in India. It is associated with a major group of people depending on for their livelihood. There are large number of fishes which are economically important and useful for millions of human beings who depend on their rich proteineous food and oil. Fishes are also the source of different vitamins (as A & D) and minerals. They are important for providing nourishment to poultry and cattle, and also useful for producing a high quality of manure especially for citrus plant, as a source of nitrogen and phosphate. Fish oil is of a great medicinal value.

Fish industry is also important economically as some of fishes take less than two gms food to add one gm fish protein a kind of the boom to the patients of high blood pressure and cardiac diseases as the fish protein has low cholesterol in comparison to egg and red meat. Different body parts of fishes are used to produce various products as Isinglass, the product of their air bladder used to filter vine, making adhesive materials while then dried skin is used for making bags. Larvivorous fishes help in reducing mosquito larva. Fish aquarium is commonly use for ornament.

However these fishes which are of great importance also suffer from different parasitic infections including those of helminth parasites. These parasites which affect the economical value of fish as well as fish industry inspire us to carry out an extensive taxonomical and pathological work on the parasites which are the major group of these helminth parasites.

A large number of digenetic trematodes which infect fishes externally (gills, fins and cloacal region) and internally (all internal organs and body cavity) causing heavy loss leading to mortality and
morbidity. According to Chauhan, (1963) trematode parasites constitute one of the largest groups of parasites which cause a great damage to quality of the fish protein. The larval stages of trematode parasites also result in causing losses Klass, (1963). The metacercarian cause great damage to their host according Klass (1963) specially the larval stage metacercarian causing great loss to economically important fishes. Trematode can also be dangerous if they reach human intestine. These adult parasites other wise are responsible for a affecting the size, weight and quality of fish food to a great extent (Cross, 1933).

Adult trematodes can cause great pathological effects on the body of fish. Haematological values of the fishes infected with trematode parasites greatly change in comparison to normal fishes, leading to a great reduction in their growth rate and protein content.

Presence of monogeneans and their larval stages parasites in the sensitive areas of these fishes, including their eyes, brain and gills will disturb their metabolic activity (Evans 1974, Davis et al). All extra intestinal trematode infections are potentially pathogenic.

The monogeneans cause considerable damage to the gills and can impair respiration where as adult worms and trapped eggs including larval forms can physically obstruct the passage of food in the intestine can cause obstruction and subsequently necrosis (Hoffinan et al., 1985) escape of larval stage can lead of anaemia (Evans 1974, Davis et al 1961). Loss of blood from host is evident from the pale coloration of gills of host there by decline in the packed cell volume and oxygen level (Evans 1974). Heavy infection of trematode may lead to stressful condition of the host. It was stressful during transportation of the fish (Lucky 1964, Smith 1972) in chronic infection of trematode adult from dispersed eggs become in capsulated and may become surrounded with a
fecal granuloma. Nodular coeci have been demonstrated in heart, kidney, brain and spleen of fishes (Lucky 1964). Tissue of the host response to heavy production of eggs of trematodes spread throughout versa and in filtering the kidney (Anderson and Sharon 1986). Trematodes are host specific but sometime transmission may spread to very close genera of the host in Bundelkhand region due to excess loss of water and rapid drying of water reservoir. The parasites have developed the habit to escape them selves and to choose the new host for their existence.

Pathological effect of monogeneans and their larval stages on some important fishes have been reported (Davis et al., 1961, Evans 1974, Luky 1964, Simth 1972, Hottmeta et all 1985) damaging the gills leading to obstruction in respiration, blocking the passage of food with intestine even causing necrosis, loss of blood and anaemia as well as the condition of stress in fishes. As reported by (Lucky 1964), the nodular coeci of trematodes reach to the heart, brain and spleen of the fishes. It is evident that it would result in causing damage to all the vital organs of the fishes which may lead to the death of the fishes (Anderson and Sharon, 1986).

The second part of the thesis including pathological data based upon the experimental observation, collected during the experiment the adult worms and their developmental stages of trematodes such as presence of metacercaria and eggs in the sensitive organs such as body cavity, reproductive organs, brains, spinal chord, liver, gills etc, causing considerable damage to these organs and its impact on the pathology of the fish due to structural damage of the tissue. Sometimes high infection can be proved fatal. During the encystment of metacercaria, large part of gills filaments get damaged which impairs respiration hence providing poor oxygen supply for the growth of fish body. The adult worms and trapped eggs obstruct the passage of food and blood vessels causing
thrombosis and subsequent necrosis (Hoffman, 1985). It is also observed during the experiment that miracidia larva escape through infected gill epithelium, their by causing a great loss of blood supply which may also lead to anaemia.

These metacercaria generally remain encysted in a variety of organs including inside the eye ball, in the intestinal mucosa, in the skin, forming black spot or in the liver even in the uterus forming nodules of considerable size. When ever they were present in the gills they caused considerable damage, leading to impair respiration. Dispersed eggs become encapsulated, and may become surrounded forming cyst causing with focal granuloma. Nodular foci were seen and collected from heart, head, kidney, and spleen of carp (Lucky, 1964). Generally these eggs are found in and around alimentary canal through out the viscera and collected from *Channa punctatus* in laboratory.

These cysts were ruptured and trematodes were collected. Some of the cysts were made to develop in laboratory with in the host and outside the host in the aquarium. The fishes were daily fed with the food pellets and proper water oxygenation care was taken by changing the water at intervals and safety of oxygenation was maintained. By the time infection was dissected on the body, skin, and gills of the fish. Few fishes were taken out and dissected at intervals for the collection of parasites and cysts. Massive mortality in the fishes during the infection in the gill region was observed in *Xenentodon cancila*.

The additional work also carried out on population diversity of helminth parasites, seasonal variation of trematode parasites of fresh water fishes of Bundelkhand region, Jhansi and Correlation between the size and sex of fishes and intensity of infection.
Population diversity of helminth parasites in fresh water fishes was determined to investigate different factors and morphological changes depending on change in season, temperature and humidity of the habitat of fishes.

In present investigation application of statistical methods to understand the distribution of helminth parasites in different seasons is studied. The statistical methods were applied for distribution of helminth parasite population according to the prevalence, mean intensity and relative density.

The seasonal variation of helminth infection showed the maximum infection in summer season and lower infection in rainy season. The existence and survival of parasite is also influenced by pollution and the high temperature of the environment during in summer in the Bundelkhand region.

Bio-statistically it was also explained the Correlation between the size and sex of fishes and intensity of infection. It was also observed that degree of infection higher in female in comparison to male fishes. Heavy burden of parasitic infection the size, weight and intensity of infection increase and fishes show high degree of mortality and morbidity during transportation, causing great loss to the fish industry and these fishes are when consumed by the human population causing different infection and disease and loss to human health.

During the course of this investigation the work carried out has already being published in leading Journals and conferences of India, the photocopy of the published paper after the concluding paragraph. The list of the papers and abstracts already published is given below.

(2) Record of *Phyllodistomum vachius* Dayal, 1949 from fresh water fish *Eutropiichthys vacha* (Ham.) at Jhansi. *Indian Journal of Helminthology* Volume 24, 2006 pp. 11-12.

(3) A new digenetic trematode *Dactylostomum cuchia* from fresh water fish *Amphipnous cuchia* of Matatila Dam, Jhansi (U.P) India. *17th Annual Conferences of Purvanchal Academy of Sciences* (PAS) Ayodhya Faizabad (U.P) India February, 19-20, 2008 pp.50.

