

# A REPORT ON THE OCCURRENCE OF SOME ENDOPARASITIC HELMINTHS IN SELECTED FISH SPECIES OF TENALI, GUNTUR DISTRICT, ANDHRA PRADESH, INDIA

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## KEY WORDS

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## ABSTRACT

The study was conducted to investigate the occurrence of parasites in selected fish species of Tenali region, Guntur District, Andhra Pradesh. A total of 174 fish specimens including *Anabas oligolepis* Bleeker, *Catla catla* Hamilton, *Channa punctatus* Bloch, *Cirrhinus mrigala* Linnaeus, *Labeo rohita* Hamilton and *Mastacembelus armatus* Lacepede were examined for the parasites from 2009-2010. Only three species, *Genarchopsis goppo* Ozaki, 1925; *Camallanus* sp. from *Channa punctatus* and a metacercaria of *Clinostomum gideoni* Bhalerao, 1942 from *Anabas oligolepis* were obtained. The other four fish species showed no infection with the helminths. The present study reveals that parasite diversity of freshwater fishes in this area is very poor and might be due to the nutritive habitat and healthy nature.

## INTRODUCTION

The fish culture in India has transformed into a main commercial activity in the past two decades. But the intensification and expansion of fish culture is facing a severe threats from pathogens as they are the prime cause for chronic mortalities and poor growth thus, affecting the yield and marketability of fishes. Application of therapeutic measures to get rid of these pathogens requires a sound base of taxonomy. Fishes like any other vertebrate harbours a wide variety of metazoan pathogens which include viruses, bacteria, algae, protozoans, helminths, annelids, arthropods and molluscs. Metazoan parasitic diseases are most common in fishes inhabiting Indian waters and encounter more frequently than microbial infections in natural as well as culture systems (Madhavi, 2003). Many of the Indian fish hosts have not been screened properly and studies are still going on in this arena. A considerable amount of work on the metazoan parasites in these selected fishes has been contributed by the scientists all over the world (Agarwal, 1964, 1966; Chakrabarti and Baugh, 1970; Bashirullah and Rahman, 1972; Fernando *et al.*, 1972; Bashirullah, 1974; Chakrabarti, 1974; Agrawal, 1980; Agrawal and Singh, 1980; Agarwal and Kumar, 1981; Agrawal and Khan, 1982; Britz *et al.*, 1985; Bauer, 1987; Banu *et al.*, 1993; Appleby and Sterud, 1996; Madhavi, 2003; Arafa *et al.*, 2005; Jalali and Barzegar, 2006; Pazooki and Masoumian, 2007; Barzegar *et al.*, 2008; Raissy *et al.*, 2010). In the present study, an attempt was made to study the helminth parasitic

fauna of the freshwater fishes of Tenali, Guntur District.

## MATERIALS AND METHODS

Fishes were caught by gillnets and bagnets by local fisherman during 2009-2010 and were brought alive to the laboratory, dissected and examined for the parasites. In total of 174 fishes, specimens belonging to six species were examined, including *Anabas oligolepis* Bleeker, *Catla catla* Hamilton, *Channa punctatus* Bloch, *Cirrhinus mrigala* Linnaeus, *Labeo rohita* Hamilton and *Mastacembelus armatus* Lacepede (Table 1). Only a very few parasites were collected from these fishes in the present study. It may be due to the healthy nature of the host as the habitat is richly nutritive. The rate of infection was also low, except for a few. After examining the hosts for ectoparasites, various organs of the host were separated, washed in physiological saline to remove excess of mucus and were cut open with a longitudinal incision. The parasites obtained were carefully collected in cavity blocks filled with saline solution. Trematodes were flattened between two slides or under the slight pressure of coverslip over the slide, post-fixed in AFA (Alcohol, Formalin and acetic acid in 85:10:5) and stained with alum carmine. Conventional techniques were employed for permanent whole mount preparations (Hiware *et al.*, 2003; Madhavi *et al.*, 2007). Nematodes collected from different locations such as liver, intestine and coelom were kept apart in shallow glass vessels containing saline solution. The worms were freed of debris either by shaking or with a fine brush. For

preservation, 70% ethanol or looss fluid (9 parts 70% ethanol and 1 part glycerol) was heated in a test tube and was poured over the nematodes in a petridish devoid of water. Parasites uncoil and killed instantaneously and were finally transferred into bottles containing a mixture of 70% ethanol and glycerol (3:1). Genus and species identification of these parasites was done with the aid of standard books of Yamaguti (1958, 1961, 1971 and 1975), Fernando *et al.*, (1972) and Bray and Gibson (1992). Also, identification of fishes was done according to Jayaram (1981), Munro (1982) and Day (1994). Figures were drawn with the aid of camera lucida. Measurements are given in millimeters. The parasites were preserved and stored in Museum of Zoology Department, J. M. J. College for Women, Tenali.

## RESULTS AND DISCUSSION

A total of 6 species of freshwater fishes were examined, of which only two species *Anabas oligolepis* and *Channa punctatus* were found to be infected with parasites (Table 1). In the present survey, out of 51 *C. punctatus* only two fishes and out of 11 *A. oligolepis* only one fish was found to be infected. Two parasitic species, *Genarchopsis goppo* and a nematode, *Camallanus* sp. from *C. punctatus* and one larval form of digenean, *Clinostomum gideoni* from *A. oligolepis* was obtained (Table 2). The fluke, *Clinostomum gideoni* is an avian digenetic trematode and requires freshwater fishes which serve as intermediate host to complete their life-cycle. All the three species of parasites are redescrptions. The other four species of freshwater fishes, *Catla catla*, *Cirrhinus mrigala*, *Labeo rohita* and *Mastacembelus armatus* were not found to be infected. Ectoparasitic infection in these fishes was nil. The metazoan parasite diversity is very poor in these freshwater fishes. This might be due to the therapeutic use of antihelminthic drugs in the culture ponds and also due to the healthy nature of the fish and its nutritive habitat.

### *Genarchopsis goppo* (Ozaki, 1925) (Fig. 1)

Habitat: Stomach

Name of the host: *Channa punctatus* Bloch

No. of hosts examined: 51

No. of hosts infected: 02

No. of parasites: 02

**Measurements:** Body 1.54-2.37 x 0.43-0.70. Oral sucker 0.14-0.27 x 0.18-0.32. Forebody 0.70-1.24, hindbody 0.50-0.76. Acetabulum 0.37-0.54 x 0.34-0.51. Oral sucker to ventral sucker ratio is 1: 2. Pre-pharynx absent. Pharynx 0.03-0.06 x 0.08-0.10. Oesophagus short. Right testis 0.11-0.30 x 0.11-0.22, left 0.15-0.33 x 0.11-0.21. Seminal vesicle 0.07-0.17 x 0.03-0.07. Cirrus sac 0.15-0.22 x 0.11-0.14. Ovary 0.12-0.22 x 0.09-0.20. Right vitellaria 0.10-0.18 x 0.07-0.10, left vitellaria 0.10-0.18 x 0.07-0.10. Eggs 0.028-0.034 x 0.008-0.015.

The genus *Genarchopsis* was erected by Ozaki (1925) with *Genarchopsis goppo* as a type species from the intestine of *Morgunda obscura* from Japan and named the species after the common name of the host 'Goppo' in Japan. Later, the parasite has been reported from various parts of the world from various freshwater fishes and freshwater snakes. Several species of this genus have been reported from India. These

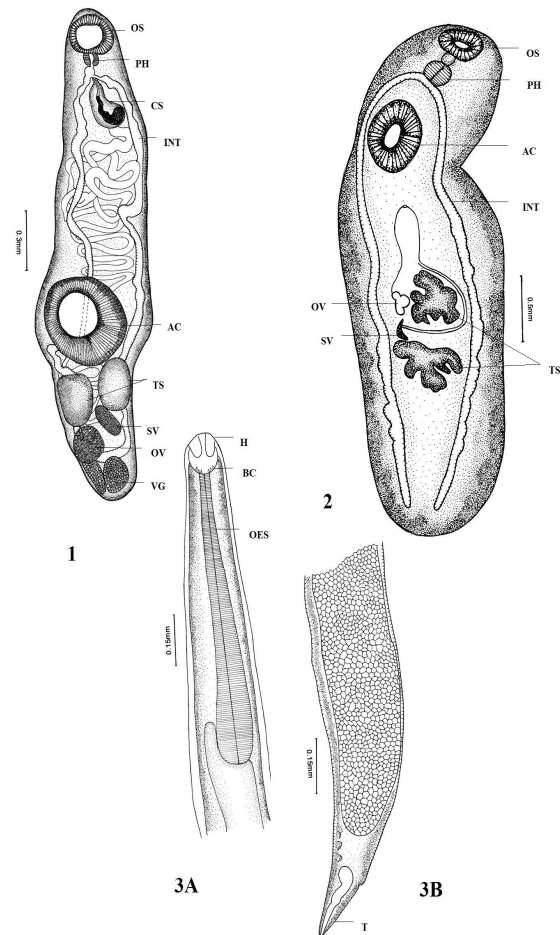


Figure 1 to 3: (1). *Genarchopsis goppo* Ozaki, 1925. 5 X 10- Camera lucida; (2). Metacercaria- *Clinostomum gideoni* Bhalerao, 1942. 5 X 10 Camera lucida; (3A). Anterior region of *Camallanus* sp. 15 X 10- Camera lucida; (3B). Posterior region of *Camallanus* sp. Female 15 X 10- Camera lucida; OS- Oral sucker; PH- Pharynx; CS- Cirrus sac; INT- Intestine; AC- Acetabulum; TS- Testes; OV- Ovary; SV- Seminal vesicle; VG- Vitelline gland; H-Head; BC-Buccal capsule; OES-Oesophagus; T-Tail.

are *G. lobata* Srivastava, 1933; *G. piscicola* Srivastava, 1933; *G. singularis* Srivastava, 1933; *G. ovocaudata* Srivastava, 1933; *G. dasus* Gupta, 1951; *G. indicus* Gupta, 1951; *G. faruquis* Gupta, 1951; *G. melanosticus* Dwiwedi, 1965; *G. thapari* Dwiwedi, 1965; *G. punctati* Agarwal, 1966; *G. cuchiai* Kakaji, 1969; *G. ozaki* Bashirullah and Elahi, 1972 and *G. bangladesensis* Bashirullah and Elahi, 1972. However, Rai (1971) revised the genus *Genarchopsis* and synonymized eight Indian species of the genus with *G. goppo*. The remaining Indian species of the genus, as well as *G. ozaki* Bashirullah and Elahi, 1972 and *G. bangladesensis* Bashirullah and Elahi, 1972 were further synonymized with *G. goppo* by Pandey (1973). At present in addition to *G. goppo* the genus *Genarchopsis* includes 4 more species namely, *G. anguillae* Yamaguti, 1938; *G. gigi* Yamaguti, 1939; *G. mulleri* Levinsen, 1881 and *G. macrocotyle* Coil and Kuntz, 1960. Anjaneyulu (1968) and Madhavi and Hanumantha Rao (1974) described the female reproductive system of this species to show juel's organ which is a pouch into which laurer's canal terminates. This organ was named by Gibson and Bray (1979). However,

**Table 1: Fish species examined from the study site**

S. No	Fish species	No. of fishes examined (a)	No. of infected fishes (b)	No. of parasites (c)	Prevalence (%)	Intensity of infection
1	<i>Channa punctatus</i> Bloch	51	2	5	3.92	2.5
2	<i>Catla catla</i> Hamilton	26	-	-	-	-
3	<i>Labeo rohita</i> Hamilton	34	-	-	-	-
4	<i>Cirrhinus Mrigala</i> Linnaeus	46	-	-	-	-
5	<i>Anabas oligolepis</i> Bleeker	11	1	3	9.09	3
6	<i>Mastacembelus armatus</i> Lacepede	6	-	-	-	-
	Total	174	3	8		

**Table 2: Helminth parasites of the fish species**

S. No	Fish species	Helminth parasites
1.	<i>Channa punctatus</i>	<i>Genarchopsis goppo</i> Ozaki, (1925) (Trematode) <i>Camallanus</i> species (Nematode)
2.	<i>Anabas testudineus</i>	Metacercariae <i>Clinostomum gideoni</i> , Bhalerao, (1942) (Trematode)

the life cycle of *G.goppo* has also been depicted by Madhavi (1978). Hence the present parasites are redescribed as *Genarchopsis goppo* Ozaki (1925).

#### **Metacercaria *Clinostomum gideoni* (Bhalerao, 1942) (Fig. 2)**

Habitat: Intestine

Name of the host: *Anabas oligolepis* Bleeker

No. of hosts examined: 11

No. of hosts infected: 01

No. of parasites: 03

**Measurements:** Worms 2.57-3.20 x 0.85-0.87; Oral sucker 0.17-0.26 x 0.23-0.26; Pharynx 0.13-0.14 x 0.13-0.18; Acetabulum 0.40-0.53 x 0.33-0.50. Testis 0.25-0.26 x 0.16-0.28; posterior testis 0.17-0.22 x 0.18-0.33; Ovary 0.10-0.12 x 0.07-0.08; Uterine sac 0.40-0.45.

*Clinostomum gideoni* was first proposed by Bhalerao (1942) from the gills of the *Barbus sephere*. The parasite is characterized in having a ventrally bent anterior end, genital pore at the level of middle of anterior testis and characteristically lobed testes. In the present study the parasites are collected from the intestine of *Anabas testudineus* and resemble *C. gideoni* in all respects. Hence they are considered as *Clinostomum gideoni* Bhalerao, 1942.

#### ***Camallanus* sp. (Fig. 3A and 3B)**

Habitat: Intestine

Name of the host: *Channa punctatus* Bloch

No. of hosts examined: 51

No. of hosts infected: 02

No. of parasites: 03

**Measurements:** Body 4.28-13.15 x 0.29-0.39; Dorso-ventral diameter of head 0.39 x 0.32; Buccal capsule 0.13 x 0.10; Oesophagus 0.70-1.31; Tail 0.10 x 0.052.

Raillet and Henry (1915) erected the genus *Camallanus* with *C. lacustris* Zoega, 1776 as its type. Subsequently, a large number of species have been reported since then from various parts of the world. There are reports of other species from India by Moorthy (1937) and Khera (1956). Khera (1956) reported *Camallanus unispiculus* from *Mastacembelus armatus* and the present parasites are also collected from the same hosts. They resemble *C. unispiculus* Khera, 1956 in all

characters and hence they are considered as *Camallanus unispiculus* Khera, 1956. In the present study, these parasites were obtained from *Channa punctatus*.

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