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

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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; Agrawal 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 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 Blhlerao, 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.

KEY WORDS
Clinostomum gideoni
Camallanus sp.
Endoparasitic
Genarchopsis goppo

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 Blhlerao, 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.
preservation, 70% ethanol or loos 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 redescriptions. The other four species of freshwater fishes, Cirrhinus rafaga, 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 anthelmintic 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 are G. lobata Srivastava, 1933; G. piscicola Srivastava, 1933; G. singularis Srivastava, 1933; G. ovovacudata Srivastava, 1933; G. dasus Gupta, 1951; G. indicus Gupta, 1951; G. faruquis Gupta, 1951; G. melamosticus Dwiwedi, 1963; 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 Kurtz, 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

<table>
<thead>
<tr>
<th>S. No</th>
<th>Fish species</th>
<th>No. of fishes examined (a)</th>
<th>No. of infected fishes (b)</th>
<th>No. of parasites (c)</th>
<th>Prevalence (%)</th>
<th>Intensity of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Channa punctatus</td>
<td>51</td>
<td>2</td>
<td>5</td>
<td>3.92</td>
<td>2.5</td>
</tr>
<tr>
<td>2</td>
<td>Catla catla Hamilton</td>
<td>26</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Labeo rohita Hamilton</td>
<td>34</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Cirrhus Mirgala</td>
<td>46</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Anabas oligolepis</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>9.09</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Mastacembelus armatus</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>174</td>
<td>3</td>
<td>8</td>
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</tbody>
</table>

Table 2: Helminth parasites of the fish species

<table>
<thead>
<tr>
<th>S. No</th>
<th>Fish species</th>
<th>Helminth parasites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Channa punctatus</td>
<td>Genarchopsis goppo Oski, (1925) (Trematode)</td>
</tr>
<tr>
<td>2.</td>
<td>Anabas testudineus</td>
<td>Camallanus species (Nematode)</td>
</tr>
</tbody>
</table>

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