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PREVALENCE AND INCIDENCE OF CERCARIAL INFECTION IN FRESHWATER SNAILS IN KANNUR DISTRICT (KERALA)

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An attempt to survey trematode infection in snails was carried out during the period January - October 2008 in Kannur district. During the explorative study a total of 671 snails were collected which included three pulmonate snails - a lymnaeid *Lymnca luteola*, two planorbids *Gyraulus convexiusculus* and *Indoplanorbis exustus* - and four prosobranch snail, *Bellamya bengalensis*, *Thiara tuberculata*, *Paludomous transchauricus* and *Pila virens*. The infection rate and the larval forms released were monitored. The cercariae released belonged to the groups the Amphistome, Echinostome, Furcocercous and Xiphidiocercous. Most of the cercarial infections were recorded from *Indoplanorbis exustus* (14.3%), which harboured all the four morphologically different cercariae. No infections were recovered from *Paludomous transchauricus* and *Pila virens*.

Key words : Cercarial infection, snail, Trematode, Kannur.

INTRODUCTION

Molluscs play a crucial role in the life-cycles of trematodes of the subclass Digenea, because they serve as the first and often also as the second intermediate hosts, and thus directly influence the distribution of the parasites (Esch *et al.*, 2001).

Parasites are ubiquitous, though often invisible components of most ecosystems. They influence the survival and reproduction of individual hosts, the dynamics of host populations, and the structure of entire communities. Infection with larval trematodes sometimes alters the phenotypes of their snail hosts, while some trematode species have distinct effects on host phenotypes (Levri *et al.*, 2005). Digenetic trematodes are parasites, which have heteroxenous life cycle (Dias *et al.*, 2002)

Kannur district with ample freshwater resources is ideal for hostage of different species of freshwater snails. The total snails (671) belonging to six different genus collected from several sources, yielded a wide variety of cercarial groups (4). Mollusc directly influences the distribution of the parasites. Therefore, their examination is a keystone for the elucidation of the trematode fauna in regions of interest. An attempt to identify the incidence of infection in different snail species and the cercarial diversity in a particular species of snail was carried out.

MATERIALS AND METHODS

Snails were collected from freshwater bodies (ponds, ditches, paddy fields, streams, irrigation canals, rivulets) of Kannur district. The snails were brought alive to the laboratory and screened for cercarial infection, and the infected snails were isolated and kept in separate containers. The infected snails were counted and the live cercariae were subjected to detailed studies with respect to their morphology and behaviour. The specimens were stained with diluted neutral red and observed.

RESULTS AND DISCUSSION

In the present study, the prevalence of infection was found to be highest in *Indoplanorbis* when compared to the other snails. Of the 671 snails, comprising of seven species collected from different regions of Kannur district, 75 snails were positive for cercarial infection. *Indoplanorbis exustus* - 385 (14.3%), *Lymnea luteola* - 117 (11.2%), *Bellamya bengalensis* - 86 (3.5%), *Gyraulus convexiusculus* - 31 (9.67 %), *Thiara tuberculata* – 12 (8.3%), *Paludomous transchauricus* - 25 (0%), and *Pila virens* – 15 (0%). Among the infected snails, the Furcocercous and Echinostome group were the commonest type of cercariae while Xiphidiocercariae was recovered only from *Indoplanorbis*. *Indoplanorbis exustus* was found to be infected with four different types of cercariae and the occurrence of infection in different snails is given in Table I.

Double infection was observed in one of the *Indoplanorbis exustus* which was infected with Furcocercous as well Echinostome cercariae.

Table I . Cercarial infection in different snails during the study period January - October 2008.

Snail Type	Furcocercous	Xiphidiocercous	Amphistome	Echinostome
Indoplanorbis exustus	+	+	+	+
Lymnea luteola	+	-	-	+
Bellamya bengalensis	+	-	-	
Gyraulus convexiusculus	-	-	-	+
Paludomous transchauricus	-	-	-	-
Thiara tuberculata	+	-	+	+
Pila virens	-	-	-	-

There is a need to identify the larval stages of all the digenetic trematodes even those, which are not so important, because of the possibility of competition for the same intermediate hosts (Dias *et al.*, .2002). In the present study, *Indoplanorbis exustus* was found to be the most infective followed by *Lymnea luteola, Gyraulus convexiusculus*, *Thiara tuberculata* and *Bellamya bengalensis*. *Indoplanorbis exustus* was the most common species by occurrence in all the selected localities. A study of European waters showed that the Planorbid snails were the most common snail and this is due to the fact that they can survive in water with low oxygen pressure as they have hemoglobin in their haemolymph (Alyakrinskaya, 2002). The prevalence of infection in the present study was highest in *Indoplanorbis exustus* (14.3%) with four different cercarial groups. Planorbid snails are reported to harbour cercariae of a rather broad spectrum of trematode families (Faltynkova *et al.*, 2008). A survey carried out in district Ratnagiri, Maharashtra showed that *I. exustus* was the most common species by occurrence in all the selected localities and next to it was *L. luteola* followed by *T. tuberculata*, *B. bengalensis* and *B. dissimilis*, in succession. Infection with liverfluke and amphistome cercariae was found in most of the collected snail species except *P. globosa* (Devi & Jauhari, 2008).

Cases of double infection of snails with cercariae of different species have been found to be very uncommon and this accords with the findings of other workers. Once an

infection has been established the chemoattraction power of the snail is destroyed, or that the chemical changes which take place in the infected digestive gland of the snail, produce an unfavourable condition for the successful development of another miracidium.

In the study of larval trematode infections in freshwater gastropods from Albufera Natural Park in Spain (Toledo *et al.*, 1998), *Physa acuta* was the most frequently occurring snail and the Lymnaeid, *Lymnea peregra* had the highest frequency of larval digenean. The infection rate was 1.04% and the seven species of snails examined were found to harbour nine distinguishable types of cercariae. Dias *et al* (2002) studied the prevalence of cercarial infection in mollusc the Flood plain of the high Parana River, Brazil and found that the infection of *Biomphalaria peregrina* was 0.75% and seven species of cercariae were released.

Sewell (1922) while studying the cercarial fanna of India noted variability in the prevalence of infection from place to place. Exclusive studies on cercariae of Kerala been carried out by Mohandas (1974) and reported that 10.23% of the snails in Kerala exhibited infection by 37 species of cercanae.

The prevalence and incidence of infection by cercariae was not very high in the Malabar region. It was found to be 6.6% (Vasandakumar, 2002) and twenty-two species of cercariae were recorded.

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