



Isolation of different trematodes cercariae spp. of medical and veterinary importance from Shatt-Al-Arab water south of Iraq

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Abstract

The current study was designed to determine larval trematodes (cercaria stage) that infect "*Melanopsis* and *Lymnae*" snails in Shatt- Al-Arab water south of Iraq. Some of those trematode species are of medical and veterinary importance.

Snail samples were brought from different observation sites of the river, two species were recognised corresponding to the morphological features of the shell, then crushed directly to obtain cercariae. The most abundant species was *Melanopsis* with a percentage of 60.9% followed by 39.1% for the *Lymnaea*. The *Melanopsis* species were the most highly infected with 327 infections record (77.4%), followed by 179 (66.2%) of *Lymnaea* snails (66.2%). Nine morphologically different Cercariae species were recorded in both *Melanopsis* and *lymnea* species except *Furcosircus* cercaria were absent in the *Melanopsis* snails.

Keywords: trematodes, cercaria, Shatt-Al-Arab water

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INTRODUCTION

It has been reported that parasitic infections with Trematodes remain a major medical problem worldwide (Andrews et al., 2008).

Millions of people have been infected with trematode parasitic diseases such as Fascioliasis and Schistosomiasis (Elsheikha and Elshazly, 2008) in which snails act as intermediate hosts (Subba Rad and Mitra, 1989), means of transport, food source and reproduction site for many of the Trematodes cercariae where they proliferate in snail, migrate, enter the intermediate and the definitive hosts (Rao, 1989 and Lockyer et al., 2004; Fentahun, 2020)

In spite of the low spread of snails in some areas, there still exists the possibility that vast numbers of cercaria could be released into the river making an epidemiological study of infected cercariae extremely important (Piratae and Bithynia., 2015). Snail numbers could be increased especially in the water streams, causing snail-born diseases (Bass and Weis, 2008). Documentation of the cercaria species is also important for providing information about the ecological settings in which snail borne diseases take place (Locker et al. 1981). AL-Mayah (1998) reported in a study of Shatt al-Arab water 'the infection of *Melanopsis* with one cercaria species and the *Lymnaea* with six'. In another study of Shatt al-Arab (AL-Hussein, 2000) has documented the infection of *Lymnaea* snail

with nine cercaria species and *Melanopsis* with seven. There were limited investigations about the trematode infection in Shatt- Al-Arab river. This study's goal is to diagnose the larval trematode species that infect "*Melanopsis* and *Lymnae*" snails in Shatt- Al-Arab water in southern Iraq.

MATERIAL AND METHODS

Random samples of snails scooped from the river bank saved in plastic containers, filled with fresh water then carried directly to the laboratory. Two species of snail were identified according to the morphological characteristics of their shells (Gupta, et al., 1987 and Rao, 1989), sediment was removed, washed then crushed in Petri dish using forceps and dissection pins, (Mahbuba and AbdulGofur khan, 2016).

The shells were removed and the samples were examined under a dissecting microscope. A camera lucida was used to record the morphological characteristics, cercariae were identified at family level 'according to the taxonomic keys proposed by (Cable, 1963) and (Frandsen & Christensen, 1984)'.

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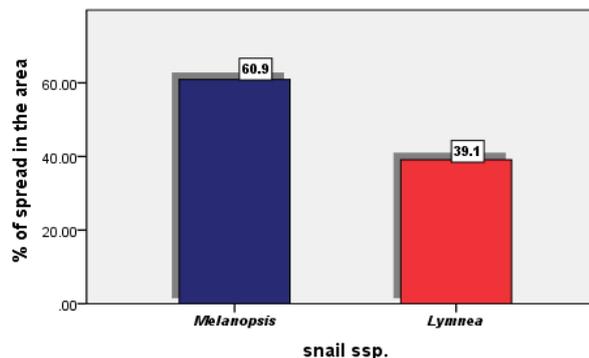


Fig. 1. The percentage of *Melanopsis* and *lymnea* snail in the study

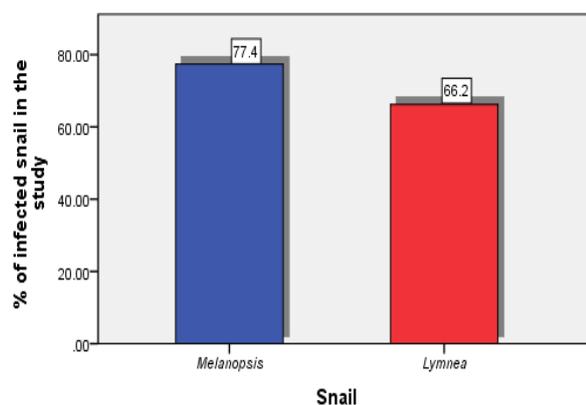


Fig. 2. The percentage of *Melanopsis* and *lymnea* spread in the area

Statistical analysis

The data collected were subjected to percentage of viable and dead cercariae.

RESULTS

692 snails related to two species were brought from Shatt-Al-Arab river water. The most abundant species was *Melanopsis* followed by *Lymnea*. They represent 60.9% and 39.1% of the total snail collected, respectively (Fig.1).

The *Melanopsis* snails were found the most susceptible species for infections with a prevalence of 327 (77.4%) followed by 179 (66.2%) of *Lymnea* snails, as shown in Fig.2.

This study recorded nine different species of cercariae, each with the ability to cause human and animal diseases (Image 1).

This study found that the *lymnea* snails were containing all the cercariae species, while furcosircus cercaria was absent in the *Melanopsis* snails.

DISCUSSION

In this study the classification of cercariae to family or genus was done according to the morphological characteristics using a non-stained cercariae method. It

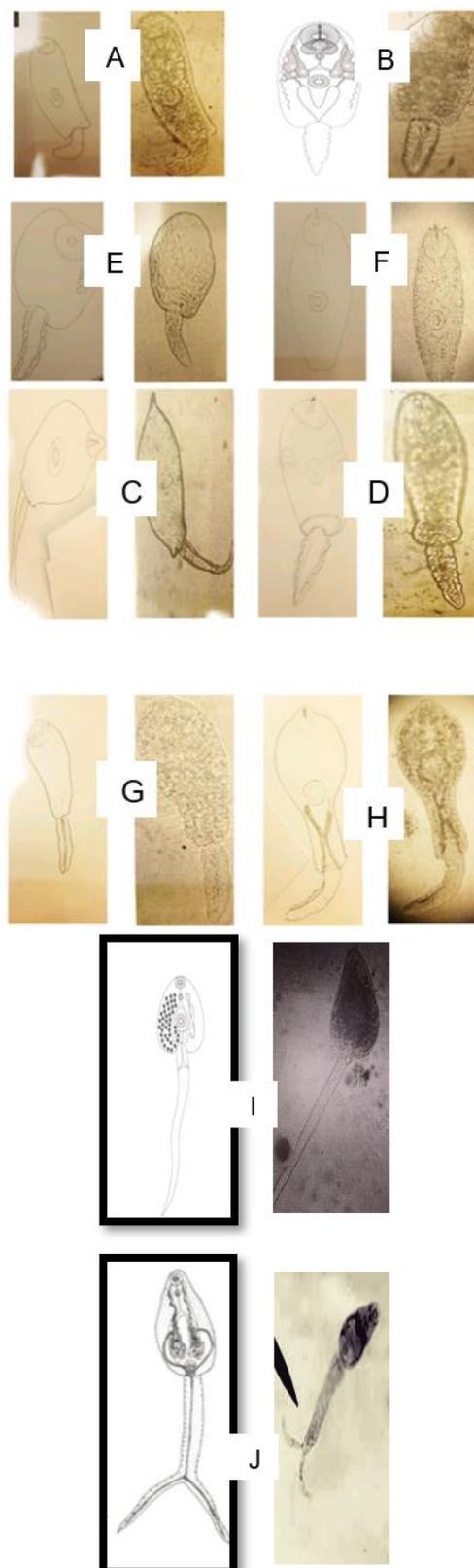


Image 1. Nine species of cercariae were found as follows: (A) Ornate cercariae (B) Virgulate cercariae (C) Distome cercariae (D) Echinostome cercariae. (E) Monostome cercariae (F) cercarium Cercariae (G) Echinostome cercaria (H) Xiphidiocercariae (I) gymnocephalous cercaria (J) Furcocercous cercariae

was decided that this method was the most suitable as important structures such as fin folds and spines can only be obvious in live cercariae.

As scientific data of the larval trematode in Iraq is limited, this study aimed to focus on the characteristic features of nine cercariae species, isolated from *Lymnaea* and *Melanopsis* snails.

It was found that the infection rate of the snail *Melanopsis* was (77.4%), which is significantly higher than the *Lymnaea* snail (36.2.%) in the area.

Trematodes abundance in the river was due to the availability of snails in the slow moving river branches where they are suitable for their living and because snails were highly susceptible to trematodes infection.

Melanopsis are the intermediate hosts for the cercaria species of *Fasciola hepatica*, *Schistosoma* and *Echinostoma* (Soldanova, *et al.*,2010) and (Liu *et al.*, 2010).

Lymnaea snail shows that it is highly susceptible to the infection of *Fasciola hepatica* (which cause fascioliasis) and *Fasciola gigantica*.

Furcosircus cercariae of *Schistosoma* infection in mammals were recovered in this study only from *lymnea* snails because it doesn't resist to this cercaria species.

In addition, echinostome cercaria, the major cause of echinostomiasis (Jayawardena *et al.*,2010) was also found in *Lymnaea* snails in this study.

The Xiphidiocercariae which infects all vertebrate intestine (Tehrani *et al.*, 2015) was found in both *Melanopsis* and *lymnea* snails

The Echinostome cercariae 'the reason of oral, duodenal and respiratory echinostomiasis in humans and livestock' were also isolated from both *Melanopsis* and *lymnea* snail and human infections may be due to the drinking of untreated water. Xiao *et al.*, (1995).

In this study, *lymnea* snails were containing all cercaria except furcocircus cercaria because of the competition between different types of cercariae within the snail, leading to the establishment of some species. Arahnak *et al.*, (2006).

CONCLUSION

This research and its subsequent results have provided new information on the great diversity of cercaria species present in Shatt-Al-Arab river with a high prevalence of parasitic infection of many species of mammals.

Nine cercariae species with different characteristic were isolated from *lymnea* and *Melanopsis* snails.

The trematodes spread were affected by many important factors: Human urination, farming, grazing and Also swimming which was the most important factor in causing trematode disease in this area.

All classes of vertebrates can become hosts to parasitic trematodes and the adult or juvenile trematodes can infect all organs of the vertebrate body.

To eliminate snail-borne disease It is important to prevent human from swimming in the river water and water treatment facilities should be provided.

Also this study conclude that Further studies must be taken for the accessibility of snail types to specific species of cercaria.

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