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ALNASIR TOWN, IRAQ FOR DETECTION SOME ZOONOTIC PARASITES CONTAMINATED TO FECES OF *MONACHA CARTUSIANA* GASTROPODS AS INTERMEDIATE HOSTS

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Abstract

An agricultural area of Alnasir town, Iraq characterized by abundance of palms and fruit trees and the existence of streams of rivers through which water, especially during the winter season, spring and autumn. In this study collected seventy- four from snails throw four highest rains months in Iraq (March, April, Jun, July) when the snails (*Monacha cartusiana*) increased and appear over the grass, initially takes its feces to prepare many samples slides detection of *Brachylaima spp*. Eggs in (78.7%) from examination samples, *Taenia spp*. Oocysts in (36.1%), lung worm spp. Eggs in (10.6%) and *F. hepatica* metacercaria in (4.2%). With total percentage (95.7%) of examination *Monacha cartusiana* snails.

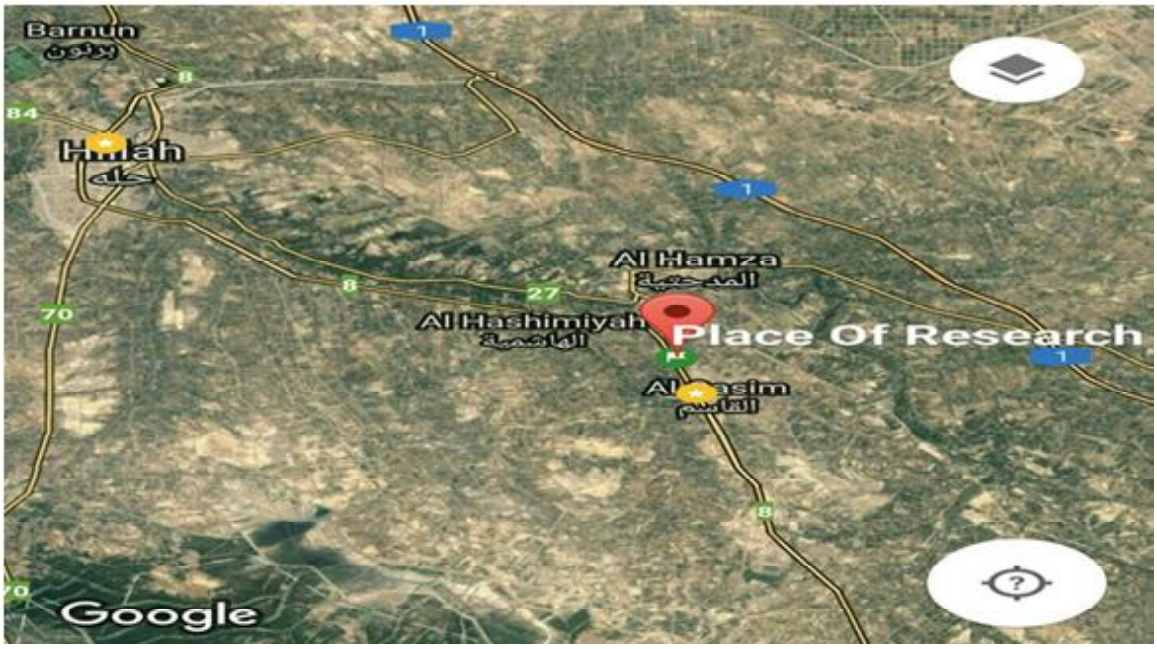
Key words : Alnasir town, zoonotic parasites, *Monacha cartusiana*, intermediate hosts.

Introduction

Monacha cartusiana is a species of small air-breathing mud snail, a terrestrial pulmonate gastropod mollusk in the family Hygromiidae, the hairy snails and their allies (Hlaváć and Peltanová, 2011). A digenean life cycle, several species of snails can act as intermediate hosts of the parasite life cycle, the aptitude of the different species of snails maintain during natural or experimental infections varies according to snail species and more particularly to the age of the snails when exposed to miracidia (Torgerson and Claxton, 1999). The Michigan State University Snail Laboratory provides information on the Carthusian *(Monacha cartusiana*) snail and other pest mollusk, *Monacha cartusiana* can serve as an intermediate host for Brachylaima sp., *Dicrocoelium dendriticum* (lancet liver fluke), *Mullerius capillaris* (sheep and cattle lungworm), *Prostrongylus rufescens* (sheep lungworm) and *Taenia bothrioplitis* (a cestode) (Atkinson, 2004). Taeniasis is the infection of humans with the adult tapeworm of *Taenia* spp. Humans are the only definitive hosts for *T. saginata* and *T. solium*. Eggs or gravid proglottids are passed with feces (CDC, 2013).

A life cycle of *Brachylaima* sp. (Trematoda: Brachylaimidae) is elucidated. Operculated, assymetric, embryonated eggs are passed with feces of the natural (*Rattus norvegicus* and *R. rattus*) definitive hosts and ingested by the gastropodin branched sporocysts in the digestive gland emerge from this snail (González-Moreno, 2002).

F. hepatica life cycle involves the mud snail *Monacha cartusiana* as the first intermediate host and depends on the development and survival of larval stages both in the snail intermediate host and in the environment conditions of summer rainfall. Humans are infected mainly by ingesting raw aquatic vegetables such as watercress like lettuce that are contaminated with the metacercaria of snail feces. Infections are also induced by drinking water containing viable metacercaria of *F. hepatica* (Moghaddam *et al*., 2004). *F. hepatica* is distributed mainly in Europe, Asia, Africa and America (Mas-Coma *et al*., 2005) WHO added fascioliasis to the list of important helminthiases significantly impacting human development and detecting the infection status of *F. hepatica* in the natural environment is important (Novobilský *et al*., 2014).



Map 1 : Map of study area.

Lung worms are parasitic nematode worms of the order Strongylida that infest the lungs of vertebrates. they migrate to their hosts' lungs or respiratory tracts, and cause bronchitis or pneumonia. The lungworm will gradually damage the airways or lung tissue by inciting an inflammatory reaction inside the tissue (Sripa, 2012). In Alnasir region, Iraq a study targeted to detect of some zoonotic parasitic infection from *Monacha cartusiana* snails feces by microscopically examination.

Materials and Methods

Snails and collecting samples

The population of *Monacha cartusiana* (Fig. 1) was collection between March and July 2017, seventy-four snails were collected from Alnasir regions in Iraq.

The Carthusian snail (*Monacha cartusiana*) (Müller, 1774) is an air-breathing land snail living in a muddy situation of environment.

A total of 47 a live snail (height, 3.5 ± 1 mm) were collected with a rain condition. They were living in petri dishes (15-mm in length, 10 in width) with 2-3 ml of water with a piece of malva parviflora with changing water every three days for fourth months and transported to the laboratory in isothermal conditions in standard aquaria, for microscopic examination prepare of snail feces (adhered in cover petri dish) to detected the parasites.

Detection of parasites

Scanned as follow

Simple smear: a drop of the distal water with loopfull feces was applied on the center of a clean grease-free slide. A clean cover slip was placed gently to avoid air bubbles and over flooding. The preparation was examined under a light microscope using 10 and 4x objectives (Garcia, 2007).

The statistical analysis

Statistical analyses were carried out using chi-square tests of the SPSS software version 9.0 for windows (Levesque, 2007) to compare the rate of infection of snails among different months. The differences were considered significant at $p< 0.05$.

Results

Results are summarized in tables 1 and 2 and figs. 2, 3, 4 and 5. Types parasites were detected in 95.7% of the examined samples. The parasites detected in snails feces samples were *Brachylaima* spp. Eggs (fig. 2), *Taenia* spp. oocysts (fig. 3), lung worm spp. Eggs (fig. 4), *F. hepatica* metacercaria (fig. 5) (table 1). The *Brachylaima* spp. Eggs, measuring 26-32 µm in long and 16-17.5 µm in width are highest number of infected samples was detected in snails (78.7%) while the *F. hepatica* metacercaria 0.2 mm in diameter are least number of snails infected samples (4.2%) (table 1).

Monacha cartusiana was the most infected with Brachylaima spp. in this study (78.7%). Brachylaima spp. were the most prevalent parasite in snails' samples of lung worm spp. eggs (36.1%) followed that (10.6%). *Taenia* spp. oocysts contamination, and finally *F. hepatica* metacercaria (4.2%) (fig. 2 and table 1). The

Fig. 1 : *Monacha cartusiana* and their feces.

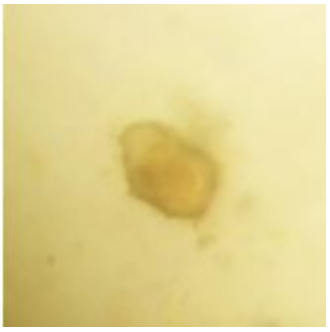


Fig. 2 : Egg of *Brachylaima* spp.

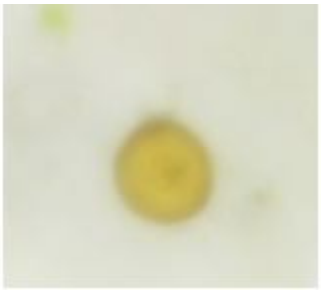


Fig. 3 : Oocyst of *Taenia* spp. with scolex.

mean of parasite score density in the contaminated samples ranged between (2.22) and (0). The highest score of parasite density was that of *Brachylaima* spp. eggs (3.33). It was detected in infected snails' feces samples. However, the least score of parasite density was that of *F. hepatica* metacercaria (0.33). The highest rate of parasitic contamination samples in different months was found in march (38.2%), followed by April (36.1%). There was no significant difference between the number of contaminated samples in these two months. Lesser contamination rates were found in Jun (14.8%) and in July (6.3%). There was also no significant difference between these two months. Comparing the rate of parasitic contamination in the four months, it was found that the number of contaminated samples in April was significantly higher than the number of contaminated samples in Jun and July.

Fig. 4 : Egg of *Lung worm* spp., dark brown.

Fig. 5 : Membrane- bound metacercaria of *F. hepatica*.

Table 1 : The number and percentage of contaminated samples and the mean of parasite score density in *Monacha cartusiana* snails' feces.

Name of parasites	No. (%) (95.7%) n1	Total no. infected snails = 45 D
***Brachylaima* spp. eggs**	37 (78.7)	3.33
Taenia* spp. *oocysts	5 (10.6)	0.79
Lung worm spp. eggs	17 (36.1)	1.66
***F. hepatica* metacercaria**	2 (4.2)	0.33

No.: Number of infected snails' feces by each parasite.n1 = Number of examined snails = 47D: mean score density for each parasite in snails.

Table 2 : The number and percentage of infected snails with parasites in different months.

Months	No. (%) n1 = 47
March	18 (38.2)
April	17 (36.1)
Jun	7 (14.8)
July	5 (6.3)

No.: Number of infected snails feces/season.n1=Total number of examined snails/season= 47.Total No./season: Total number of infected snails/seasonp value considered significant at $p<0.05$.

Discussion

This study is the first in Iraq, that showed a considerably high level of infection of *Monacha cartusiana* snail feces with some parasite in Alnasir,

Iraq (97.7%) like Brachylaima spp. And lung worm eggs or metacercaria of *F. hepatica* while the (Haifa and Hasna'a, 2015) revealed that the species *Melanopsis nodosa*, *Melanoides tuberculata* and *Lymnaea*. Auricularia snails were infected with Digenean larval stages throw association of Aquatic worms, and the first species recorded the highest infection percentage of 60.04% and the lowest percentage of 5.70% was recorded in *L. auriculari*, while *M. tuberculata* recorded a percentage of 38.98%. In the present work, *Brachylaima* spp. was the most prevalent parasite (29.3%). These agree with another study in Costa Rica which reports the occurrence of some pathogenic micro-organisms in vegetables consumed on a daily basis. Lung worm eggs are the second prevalent parasites in this study (25.3%). Unspecified spore species have been found in samples from strawberries, lettuce and parsley in the study carried out by Calvo (2004).

In the case of *F. hepatica* metacercaria, they were detected in 2.6% of the examined samples (Dreyfuss *et al*., 2005) live larval forms of *F. hepatica* can be easily observed among the fragments of the shell and snail's viscera. This is an easy and fast way to evaluate the prevalence of infection in snails collected from the field. Indeed, the sporocysts of *F. hepatica*, the immature or degenerated rediae (Rondelaud and Barthe, 1980) and a few free cercariae, often located within the snail's foot and mantle, cannot be observed. In the same way, the encystment of released cercariae into metacercariae on the dish walls is scarce making.

In seasonal study indicated that the rate of parasitic infection snails' samples was the highest in march (49.3%) and the lowest in July (9.3%). However, there was no significant difference between April and march and between June and July. On the other hand, statistical analysis revealed that the rate of infection was significantly higher ($p < 0.001$) in march and April than in Jun and July. Eman and Emaduldeen (2015) showed that the highest relative abundance density and relationship with some physico-chemical properties of the soil; temperature, moisture and pH. of *Monacha cantiana* was 60.8% in April 2014 at Al-Al-Hussainia, Karbala and the lowest was 12.6% in January 2014 at Zafaraniya, Baghdad. The highest value of relative abundance of *Candidula gigaxii* was 51.9 % in January 2014 at the Zafaraniya, Baghdad and the lowest value was 7.3% in March 2014 at Hindiya dam, Babylon.

Other studies in histopathological effect of metacercariae of the genus *Brachylaima* on the land snail, *Monacha obstructa* (Rashed *et al*., 1995) and (Yannick *et al*., 2008) shows the snail when crushing and dissection allow quick establishing of prevalence in natural or experimental infections, whereas histology is considered as the most accurate approach to assess the intensity of infection and used polymerase chain reaction (PCR) technique gives high sensitivity and specificity levels for cercarial shedding only gave an idea on cercarial production. So the present study, it is firstly in type of snail and there feces examination instead of the detection of parasites.

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