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Falcaustra heosemydis (Nematoda: Kathlaniidae) From *Glemmys caspica* Turtles at Basrah City/ Southern Iraq

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Abstract
Many different animals and amphibians play an important role in the life cycle of different species of nematode parasites as a paratenic or intermediate or final hosts. This study was design to identification the intestinal nematode that found in fresh water turtles *Glemmys caspica* in Basrah city. A total of ten fresh water turtles *G caspica* were captured from Shatt Alarab river at Basrah city/ southern Iraq and a total number of isolated nematodes 26 divided into 16 male and 10 female and after make a full description it is found to be *Falcaustra heosemydis* (Kathlanidae). This study revealed as a few studies on fresh water turtles in Basrah city and this nematoda found to be as a first record, some worms samples put in British Natural History Museum as a voucher specimens. In r conclusion the result of this research showed that the turtles have different parasites and one of them the nematode *Falcaustra heosemydis* with percentage infection 90% and intensity of infection 2.8 and the best way is lactophenol to clarification the nematode.

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1. Introduction

Adult amphibians play an important role in the life cycle of different species of nematode parasites (Gonzalez and Hamann, 2010). Nematodes are found to be the most common parasites that infect different mammalian species and one of them is turtles may be as paratenic , intermediate or final host (Foster and Smith, 2010).

Falcaustra was established by Lane (1915) when he re describe *Oxysoma falcatum* Linstow, 1906 a nematode from the intestine of the turtles, There are 67 nominal species of *Falcaustra* that occur in the digestive tracts of hosts: fishes, amphibians and reptiles (Charles et al. 2000).

Bursey et al. (2009) record *F. batrachiensis* from large intestine of *Nyctimystes cheesmani* (Anura, Hylidae) from Papua new Guinea, while, Bursey et al. (2004) isolated *F. costaricae* n. sp. and *F. heosemydis* . sp. from the intestine of the Lizard *Norops tropidolepis* and large intestine of the turtles *Heosemys depressa* respectively in Costa Rica. Furthermore, Bursey and Kinsella (2003) recorded *F. greineri* n. sp. from the large intestine of the turtle *Orlitia borneensis* and *F. kutcheri* found in feaces of turtle *Geoemyda yuwonoi* in Indonesia by (Bursey et al. 2000). *F. tannaensis* isolated from the large intestine of *Nactus pelagicus* and represents as the first species from Oceanica. By the other hand, Bursey and Freemen, (2005) described and illustrated *F. kinsellai* from the turtle *Heosemys grandis.*

In Iraq there are fewer studies on parasitofauna which isolated from Iraqi reptiles, for example, Al-Barwari and Saeed (2007) found eight different helminth species from seven species of Iraqi reptiles and one of them is *F. japonensis*, while, in Basrah governorate a study by Mustafa (2014) found a nematode *Chabaudinema americana* isolated from the intestine of fresh water turtles *Glemmys caspica*.

1.1 Objective of Research

The objective of this research was to identification the intestinal nematode as an internal parasites that found in fresh water turtles *Glemmys caspica* in Basrah city and focus a full taxonomy for this parasite, this parasite could be make a good rule for distribution to the aquatic environment and may be another aquatic organism infect with the same parasite, like, fishes.

2. Materials and Methods

1.1 Samples Collection

A total of (10) fresh water turtles are collected randomly from Shatt Alarab river at Basrah city southern Iraq by hand captured.

The full taxonomy of each turtle is recorded by specialist from Marine Science Center at Basrah University and it's found to be as *Glemmys caspica*, each captured turtle is bring a live to the laboratory of Veterinary Parasitology at Department of Microbiology and Veterinary Parasitology in College of Veterinary Medicine at Basrah University.

Each turtle is euthanized by 10% formaldehyde and then necropsy, the alimentary tract is removed in clean petri dish with normal saline 0.9% and examined for parasites that be found according to the method by (Gonzalez and Hamann, 2010). All isolated parasites are collected in clean petri dish with washing many times with normal saline.

1.2 Labrotary Study

The nematodes that found are removed by fine needle, washed many time in distilled water , then some preserved in 70% ethyl alcohol with glycerin according to (Garcia and Ash, 1979), other are cleared in lactophenol. A temporary slides are mounted, and under light microscope drawing by camera Lucida, while, measurements are given in micrometers. Each worms were confirm a taxonomy by Prof. Dr. Nasr Elbahy, College of Veterinary Medicine, University of Almunoffya, Egypt, and some of isolated worms are sent to the British Natural History Museum to make a full confirmation and put as a voucher specimens.

3. Results

Description based on 26 recovered specimen; 16 male and 10 female from nine infected of total ten examined turtles.

Site of infection: large Intestine

Localities: Basrah city/ southern Iraq

Prevalence: 90%

Intensity of Infection: 2.8

The isolated nematodes related to the:

Order: Ascaridida

Suborder: Kathlanidae (Lane, 1914 subfam.) Travassos, 1918

Genus: *Falcaustra* Lane 1915, Spironoura Leidy, 1856, Velariocephalus Singh 1958

Species: *Falcaustra heosemydis*

The general characteristic: Anterior end extremity of esophagus differentiated into pharyngeal portion with 3-6 lips, spherical esophagus isthmus and well differentiated esophageal bulb and well developed valves.

This nematode could be parasitic on different hosts, like, fish, amphibian and reptiles. In Fig. (1)it found a male of *F. heosemydis* posterior end with ventral view and anterior end with dorsal view under scale bar 500 and 100 µm respectively, while, in Fig. (2) female *F. heosemydis* with lateral view a posterior end and vulvar region lateral view with scale bar 500 µm. The anterior end lateral view of female *F. heosemydis* with scale bar 500 µm with clear lips found in (Fig. 3).

The photomicrographs with isolated nematodes which mounted with lactophenol clear the anterior end with lips (1) and Pharynxes and esophagus (2), a female vulvar region (3), posterior end of male with spicules (4) and pointed posterior end of female (5).

Figure 1: *F. heosemydis* male, A: posterior end ventral view, B: anterior end dorsal view. Par = 500, 100 µm

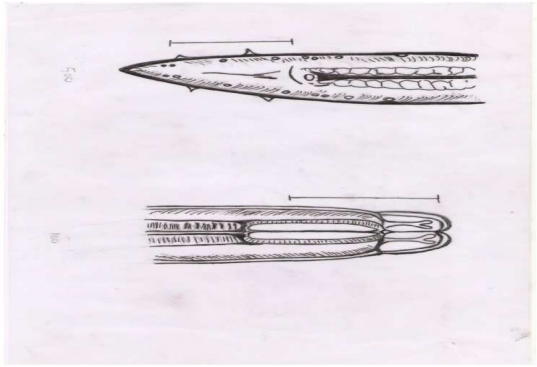


Figure 2: *F. heosemydis* female, A: posterior end lateral view and B: vulvar region lateral view. Par = 500 µm

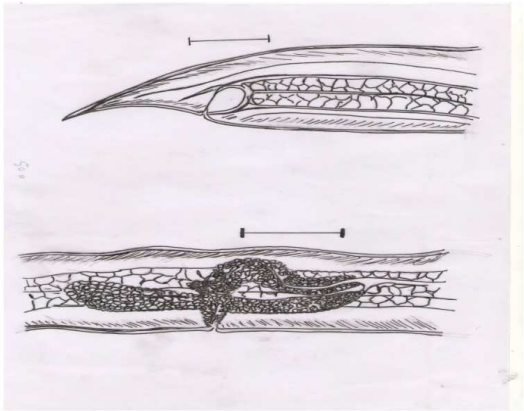
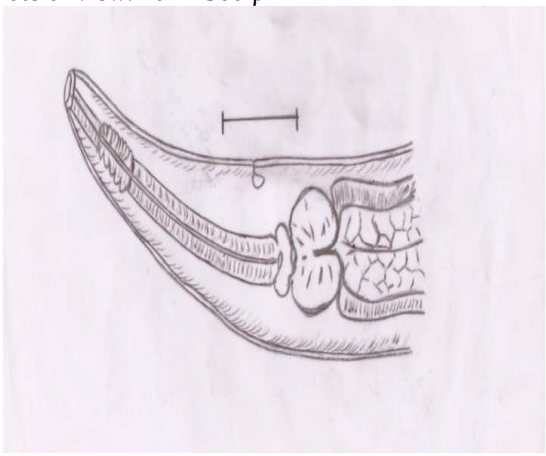
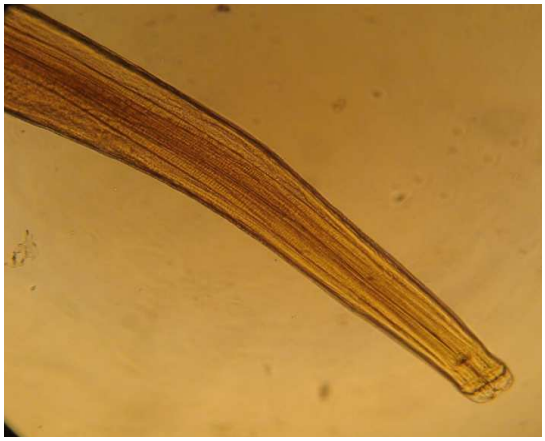


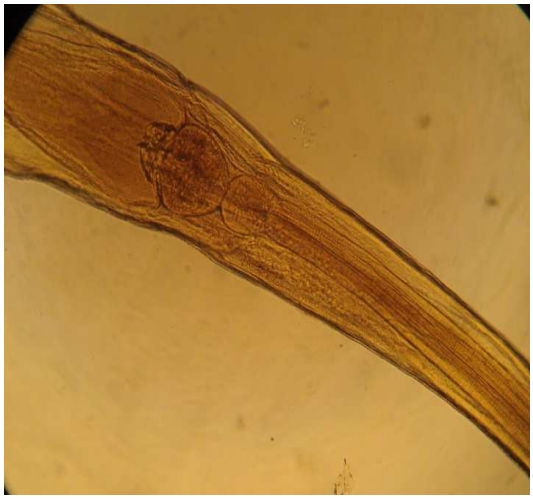
Figure 3: *F. heosemydis* female anterior end lateral view. Par = 500 µm



Photomicrograph (1): *F. heosemydis* female anterior end lateral view with clear lips. 10 X



Photomicrograph (2): *F. heosemydis* female with pharynxes and esophagus lateral view with pharynx. 10 X



Few reports are available on the helminth parasites of turtles in Iraq and Basrah city, to my knowledge nothing has been reported on the endoparasites of fresh water turtles except Mustafa (2014) when

Photomicrograph (3): *F. heosemydis* female lateral view with vulvar region. 10 X

Photomicrograph (4): *F. heosemydis* male with spicules. 10 X

Photomicrograph (5): *F. heosemydis* female posterior end. 10 X

Recognize and isolated the nematode *Chabaudinema americana* from intestine of fresh water turtles. *F. heosemydis* are intestinal nematode found in many reptiles and amphibian and fishes

in the world, it is a nematode with a cylindrical body tapering anteriorly and posteriorly with thin cuticle and fine regular striations, the mouth opening triangular surrounded with three large lips, amphidial pore at lateral edge of each sub ventral lip and the lip support is lightly sclerotized, cervical papillae slightly posterior to nerve ring, while, the tail is conical and pointed in both sexes.

The same nematodes with these characters reported by Charles et al. (2000) which isolated from the turtle *Geoemyda yuwonoi*. The same genus but with different species found in large intestine of *Nyctimystes cheesmani* (Bursey et al. 2009), and lizard *Norops tropidolepis* (Bursey et al. 2004), and *Nactus pelagicus* (squamata: Gekkonidae) (Bursey et al. 2010). While, William and Allan (1997) isolated *F. wardi* from feaces of a false map turtle *Graptemys pseudogeographica* from southern Illinois.

According to Baker (1986) the taxonomy of the genus *Falcaustra* is confused because of the large number of species and the fact that many descriptions are inadequate, Charles et al. (2004) reported that *F. Heosemydis* represents the 29th oriental species and the main distinguished by distribution pattern and number of caudal papillae, length of spicules and absence of pseudosucker.

Research Highlights

I believed that nematode *Falcaustra heosemydis* (Nematoda: Kathlaniidae) were recorded from large intestine of turtles *Glemmys caspica* for the first time in Basrah city/ southern Iraq, and may be this nematode infect another organism in the same aquatic habitat, like, fishes.

Finding and Policy Aspects

As it is clear in this research the wild turtles are infected with intestinal nematodes and one of them *Falcaustra heosemydis* and a clear results can other studies done.

Justification of Research

The present research showed that turtles in our habitat with different parasites inside the body so it is importance to establish the scientific findings and make a full description and confirm a taxonomy.

Conclusion

The result of this research showed that the turtles with different parasites and one of them the nematode *F. heosemydis* with percentage infection 90% and intensity of infection 2.8 and the best way are lactophenol to clarification the nematode.

Recommendation

Further research needs to isolates and confirmation the parasites inside turtles body in our region.

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Limitations

The nematode under this study with high importance and record as a first time in our region and must be make a further studies as it is found in turtles may be found in another hosts like, fishes or other reptiles in the same region.

Authors' Contribution and Competing Interests

The author's with Veterinary Parasitology interest.

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