

STOMACH NEMATODES OF THE SHOVELER *ANAS CLYPEATA* LINNAEUS, 1758 (ANSERIFORMES: ANATIDAE) WINTERING IN IRAQ

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ABSTRACT

Three Spirurid nematodes: *Amidostomoides acutum* (Lundahl, 1848) Seurat, 1918, *Epomidiostomum uncinatum* (Lundahl, 1848) Seurat, 1918 and *Tetrameres* sp. Creplin, 1846 were isolated from the stomach (proventriculus and gizzard) of the shoveler *Anas clypeata* from central Iraq. A brief description, morphometric and meristic characters for the nematodes were provided. Incidence of the three nematodes discussed with pertinent literatures.

Key words: Iraq, Shoveler, Spirurid nematodes, *Amidostomoides acutum*, *Epomidiostomum uncinatum*, *Tetrameres* sp.

INTRODUCTION

The Shoveler, *Anas clypeata* Linnaeus, 1758 is a widespread duck. It is a very common visitor in Iraq, and constitutes the second most wintering duck in number after *Anas crecca* (Salim *et al.* 2006).

Worms of *Tetrameres* are among the most common parasites of waterfowl (Bergan *et al.*, 1994; Cole and Friend, 1999), as well as the species of *Amidostomoides* and *Epomidiostomum*.

Gizzard worm infection is considered as contributing factor for losses in birds (Herman and Wehr, 1954), because mature worms feed on blood (Fedynich & Thomas, 2008) causing death for birds at high intensity of infection, for example *A. acutum* (Cole and Friend, 1999).

Little is known about the parasites harbored by *A. clypeata* in Iraq, it was found infected with four trematodes: *Echinostoma* sp., *E. revolutum*, *Notocotylus* sp. and *N. urbanensis* (Mhaisen, 1994; Mizhir, 2002 and Al-Awadi *et al.*, 2010).

This study aims to investigate the stomach helminthes of this wintering bird in Iraq.

MATERIALS AND METHODES

Twenty two of the shoveler (10 males and 12 females) were collected in Baghdad during the period from September to November, 2012. Birds were identified according to (Allouse, 1962) and Salim *et al.* (2006). The proventriculus and gizzard for each duck separated and examined for parasites by the dissecting microscope (Kruss) and the compound microscope (Olympus BH). Three nematode species were isolated, killed and preserved in 70% ethanol, cleared by lactophenol and identified according to (Yamaguti, 1961) and Yorke and Maplestone (1962). Measurements are in millimeters given as means followed by the range in parentheses,

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calculated using ocular and stage micrometers. Photomicrographs were taken with a digital camera Infinity lite-K100.

RESULTS

Amidostomoides acutum (Fig.1)

Synonyms: *Strongylus acutus* Lundahl, 1848 (Cram,1927), *Amidostomum anatinum* Sugimoto 1928, *A. fuligulae* Maplestone 1930, *A. orientale* Rijikov *et* Pavlov 1959(Czapliński, 1962a).

Fourteen worms were isolated from the koilin lining of the gizzards in the present study. It is reddish worm, body cylindrical, attenuated anteriorly, cuticle transversely striated. Mouth opening surrounded with four papillae, the conical tooth at the apex is situated on dorsal plate of bottom of buccal capsule. Pharynx cylindrical widening toward back.

Male: Eight males were isolated. Body 9.70 (9.22 -10.62) long, 0.17 (0.14-0.19) wide, dorsal tooth 0.0040 (0.003 -0.005) long, internal diameter of buccal capsule 0.012 (0.011-0.013), its depth is 0.010 (0.009 – 0.015). Pharynx 0.612 (0.566- 0.740) long, 0.038 (0.032-0.056) width. Nerve ring distance from anterior end 0.321(0.264-0.374). Spicules equal or almost equal, with three branches 0.131(0.129 - 0.158) long.

Female: Six females were isolated. They are larger than males 16.44(14.31-18.11) long, 0.19 (0.15 - 0.25) wide. Dorsal tooth 0.007 (0.007- 0.008)long. Internal diameter of buccal capsule 0.013 (0.012- 0.014), its depth 0.015 (0.012-0.017). Nerve ring distance from anterior end 0.321 (0.290- 0.397).Vulva distance from posterior end of the body 2.98 (2.65- 3.99). Eggs 0.072 (0.053-0.104) X 0.059(0.038- 0.0936). Tail length 0.342 (0.312- 0.424).

Epomidiostomum uncinatum (Fig.2)

Synonyms: *Epomidiostomum anatinum* Skrjabin,1916; *Amidostomum anatinum* BayLis,1928; *Strongylus uncinatus* Lundhal, 1848 (Czaplinski, 1962b; Yorke and Maplestone, 1962).

Seven worms were isolated. It is a slender worm. Mouth directed straight towards, the oral opening surrounded with 6 cephalic appendages. Buccal capsule short.

Male: Four males were isolated, shorter and thinner than female. Body 6.72(6.62-7.95) long, 0.150 (0.153- 0.245) wide. Inner diameter of buccal capsule 0.009(0.007-0.010), its depth 0.008 (0.006-0.009). Pharynx 0.870 (0.744-0.890) long, 0.050 (0.048-0.067) wide. Excretory pore at 0.382 (0.378-0.400) from the anterior end of the body. The nerve ring 0.070 (0.056-0.078), It distance 0.234 (0.227-0.250) from anterior end. Two brown equal or nearly equal spicules 0.124(0.117- 0.135) long, the distal end of each one is cleaved into three unequal branches.

Female: Three females isolated. Body 10.42(9.67-11.21) long, 0.223 (0.200-0.276)wide at vulva region. Pharynx 1.036(0.890-1.122) long, 0.065(0.050-0.087) wide. Excretory pore at 0.386 (0.340-0.450) from the anterior end of the body. Nerve ring 0.054(0.050-0.062), at a distance 0.322 (0.275-0.437) from anterior end. The vulva is smooth, behind the middle of the body, it placed at a distance of 2.45 (2. 42- 3.00)from the posterior end. Eggs 0.75(0.67-0.77)long, 0.040 (0.037-0-055) wide. Body narrows behind the anus rapidly.

Tetrameres sp. (Fig.3)

Synonyms: Yamaguti (1961) considered the genus *Tetrameres* as a synonym of *Tropisurus*.

Description: The description of this worm based only on a single male found free in the lumen of the proventriculus of one shoveler female. It is white and filiform with spines on the cuticle. Body cylindrical, with pointed posterior end, 3.912 long, 0.096 wide, gold-brown to dark-brown irregular artifacts were noticed distributed on the body, concentrated in the first anterior quarter of it. Four longitudinal series of spines on the body, commence at the level of the posterior end of the buccal capsule at the distance of 0.024 from anterior extremity. Nerve ring located at 0.022 from anterior extremity. Two unequal spicules, the spicules lengths are 0.090 and 0.225. Gubernaculum absent. Tail pointed posteriorly. Postanal papillae or spines seems five or six pairs in addition to few spines.

DISCUSSION

In the present study the specimens of *A. acutum* were more than those of *E. uncinatum*. This result agrees with Kinsella and Forrester (1972) and Fedynich and Thomas (2008). Also there are three cases of double infection for *A. clypeata* with the gizzard nematodes *A. acutum* and *E. uncinatum*. Multiple infection with genera and species of gizzard worms can occur within a single individual bird (Tuggle and Crites, 1984). The present finding agrees with (Hussen *et al.*, 2012), and (Kavetska *et al.*, 2012) who had confirmed the presence of mixed nematode infection, including *Amidostomoides* and *Epomidiostomum* in their study.

The present findings of *A. acutum* agree with Czaplinski (1962a) who gave the first detailed description of the morphology for *A. acutum* after the original description of Lundahl 1848. It was isolated from *Anas clypeata*, *A. crecca*, *A. fuligula*, *A. fusca*, *A. mollissima*, *A. nigra*, *A. penelope*, *A. platyrhynchos*, *A. querquedula*, *A. strepera*, *Anser anser*, *Eider mollissimus*, *Melanitta fusca*, *Nettion crecca*, *Oidemia nigra*, *Fuligula fuligula*, *Fulica atra* (Cram, 1927; Czaplinski, 1962a; Broderston *et al.*, 1977; Borgsteede, 2005 and Kavetska *et al.*, 2011).

In Iraq, *A. acutum* was found in the gizzards of *Netta rufina* and *Anas platyrhynchos* by Shubber (2006) and Mohammad and Al-Moussawi (2011) respectively. *E. uncinatum* was recorded by Mohammad and Al-Moussawi (2011) from *Anas platyrhynchos*. Hamza (2009) recorded *Epomidiostomum* sp. in local chickens.

The most features of *Tetrameres* specimen in the present study agree with *T. fissispina* of Cram (1927) and Johnston and Mawson (1950). However, decision on specific identify of the worm to the species level needs more male and female specimens.

Tetrameres spp. are cosmopolitan, the most hosts are aquatic birds. They were found in Anseriform birds: *T. fissispina* isolated from *Anas superciliosa*, *T. crami* from *A. clypeata*, *T. pavonis* found in *Aythya marila* and *A. fuligula*, *T. somateriae* in *Melanitta fusca*, *T. spinosa* observed exclusively in *Aythya* (Johnston and Mawson, 1950, Broderston *et al.*, 1977 and Kavetska *et al.*, 2012), and in birds of other orders: Ardeiformes, Charadriiformes, Galliformes, Gruiformes and Passeriformes (Cram, 1927; Johnston and Mawson, 1950; Broderston *et al.*, 1977, Kinsella and Forrester, 2008 and Kavetska *et al.*, 2012).

In Iraq *Tetrameres* sp. was recorded from *Anas strepera*, *Anas querquedula*, *Aythya ferina*, *Fulica atra*, *Gallinula chloropus*, *Netta rufina* and *Porphyrio poliocephalus* (Abdullah, 1988; Al-Mayah, 1990; Mizhir, 2002; Shubber, 2006 and Al-Awadi, *et al.*, 2010).

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In view of the present findings, it is obvious that the shoveler and other waterfowl birds as well as other Iraqi birds need more attention and more detailed studies.

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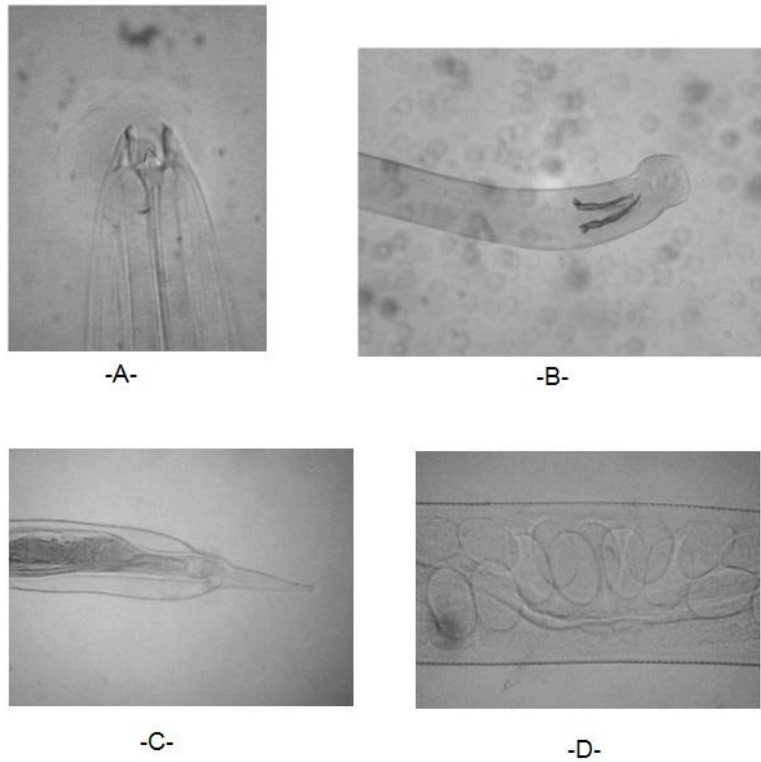


Fig.1 : Photomicrographs of *Amidostomoides acutum*

- A. Anterior end.
- B. Posterior end of the male.
- C. Posterior end of the female.
- D. Eggs.

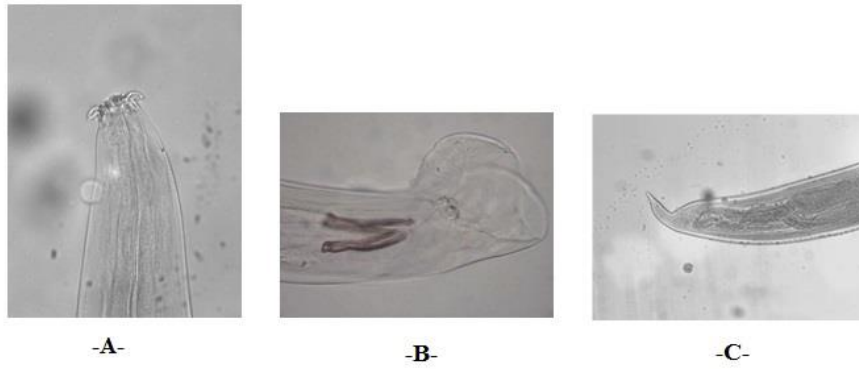


Fig.2 : Photomicrographs of *Epomidiostomum uncinatum*.

- A. Anterior end.
- B. Posterior end of the male.
- C. Posterior end of the female.

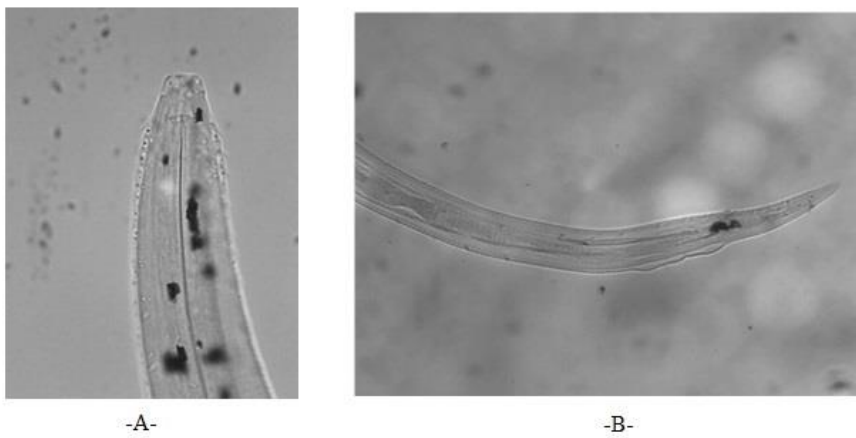


Fig.3: Photomicrographs of male of *Tetrameres* sp.

- A. Anterior end.
- B. Posterior end.

الديدان الخيطية في معدة (أبو مجرف) *Anas clypeata* Linnaeus, 1758 أ المُشْتَتِي في العراق

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الخلاصة

تم الحصول على ثلاثة أنواع من الديدان الخيطية من معدة أبو مجرف *Anas clypeata* المجموع من وسط العراق ، وهي: *Amidostomoides acutum* (Lundahl, 1848) Seurat, 1918 و *Epomidiostomum uncinatum* (Lundahl, 1848) Seurat, 1918 و *Tetrameres* sp. Creplin, 1846.

تم توضيح أهم الصفات الشكلية المستخدمة في التشخيص، و إستعراض لأهم الدراسات المحلية للديدان الثلاثة ومناقشتها ومقارنتها مع الدراسات الأخرى.