

First record of genus *Strongyloides* Grassi, 1879 (Nematoda: Strongyloidae) in Pakistan

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Abstract: Nematodes belonging to the genus *Strongyloides* Grassi, 1879 were collected from the host bird Black Coot, *Fulica atra* (Gruiformes: Rallidae) from different water bodies of Sindh Province, Pakistan. A total of 1663 ♀ were collected from the intestine and gizzards of 69 hosts. These specimens have resemblance with *Strongyloides avium* Cram, 1929 and identified as such. However, this genus is being reported for the first time from Pakistan.

Keywords: Avian nematode, *Strongyloides avium* Cram, 1929, *Fulica atra*, Sindh, Pakistan.

1.

INTRODUCTION

Members of the genus *Strongyloides* are intestinal nematodes of amphibians, reptiles, birds, and mammals. At least 52 valid species have been described, some of which are pathogenic to humans and livestock (Spear, 1987). Species of genus *Strongyloides* display an unusual heterogenic lifecycle involving alternating parasitic and free-living adult reproductive stages (Dorrisa *et al.*, 2002).

Migratory birds carry pathogens that can be transmitted between species at breeding, wintering and stopover places where numerous birds of various species are concentrated (Jourdain *et al.*, 2007).

Sindh Province, with freshwater lakes and other water bodies has been regarded as welcoming ground for millions of migratory birds who immigrate to Pakistan from Siberia in winter. As a consequence of geographical and climate factors, a high percentage of Pakistan's bird fauna is migratory with a huge invasion of Palearctic winter visitors, which come to exploit improved food availability. Palearctic winter visitors are normally entirely non-breeding species mainly from the Soviet Union. In terms of number and variety of species this category covers the majority of all migrants, which visit Pakistan (Roberts, 1991).

Reports on avian nematodes in Pakistan include Akhtar (1955), Sarwar (1956), Akram (1972), Bilqees and Jehan (1977), Bilqees and Nighat (1983), Khan *et al.*, (1983), Ahmed (1987), Farooq and Aziz (1992), Akram (1996) and Das and Ghazi (2009). Only single report of Birmani *et al.*, (2011) is available on nematodes of *Fulica atra* from Pakistan. Being a migratory game bird, *Fulica atra* is a popular food item in Sindh Province. Therefore, the interest was developed to investigate this bird for the presence of helminth parasites.

2.

MATERIAL AND METHODS

A total of 105 *Fulica atra* were collected from different water bodies of Sindh Province and brought to the Parasitology laboratory of Department of Zoology, University of Sindh, Jamshoro, Pakistan. After anesthetizing, the birds were dissected and examined for helminth parasites. During examination of gut contents, visceral organs and body cavities, 1663 ♀ nematodes belonging to genus *Strongyloides* Grassi, 1879 were collected from intestine and gizzards of 69 hosts. Live specimens were killed in hot 70% ethanol, cleared in lactophenol and glycerol solutions and preserved in alcohol-glycerol solution. Diagrams were made with the help of camera Lucida. Photographs taken with Camera DP12. Measurements are given in millimeter (mm) and those of eggs in micrometer (µm). Specimens are deposited in the Department of Zoology, University of Sindh, Jamshoro, Pakistan.

3.

RESULTS AND DISCUSSION

Family Strongyloidae Chitwood and McIntosh, 1934
Genus *Strongyloides* Grassi, 1879
Strongyloides avium Cram, 1929 (Figs. 1–4)

Description (based on female specimens only): Body small, thread like in structure, measured 1.17–2.23 X 0.03. Mouth hexagonal but in some specimens

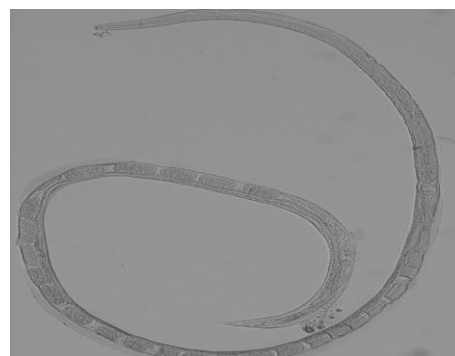


Fig. 1. Photograph of parasitic female of *Strongyloides avium* Cram, 1929

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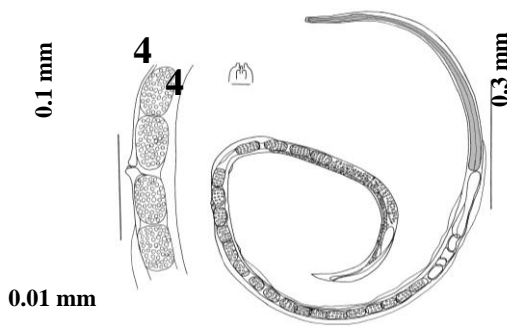


Fig. 2-4. *Strongyloides avium* Cram, 1929

2. Entire parasitic female; 3. Anterior extremity enlarged; 4. Vulva and eggs.

funnel-shaped. Transverse striations present throughout body. Esophagus long, cylindrical, filariform, slightly thickened and rounded at posterior end measured 0.44–0.58 in length. Nerve ring not observed. Anterior posterior ovaries straight. Anterior ovary overlapped by intestine. Vulva opens transversely with slightly protruding margins, at 1.14–1.28 from anterior end. Uterus opens direct to vulva. Eggs elliptical, thin shelled, measured 270–520 X 18–26, arranged in single row within uterus. Tail short, tapering posteriorly. Anus situated at 0.04 from end of tail.

4. CONCLUSION

The genus *Strongyloides* Grassi, 1879 was erected to accommodate nematodes from birds (Yoshino et al., 2009). The present specimens have close resemblance with *Strongyloides avium* Cram, 1929 in all essential features and identified as such. Previously this genus is reported from the avian hosts including

Agelaius phoeniceus, *Anas platyrhynchos domestica*, *Ardea h. herodias*, *Bonasa umbellus*, Bustard, *Butorides v. virescens*, *Butorides v. maculatus*, *Colinus virginianus*, *Columba livia domestica*, Common Gull, *Coturnix c. japonica*, *Dafila bahamensis*, *Fulica americana*, *Gallus gallus domesticus*, *Himantopus candidus*, *Junko h. hyemalis*, *Larus canus*, *Meleagris gallopavo*, *Nyctanassa violacea*, *Passer domesticus kaibito*, *Pavo cristatus*, *Pavo muticus* and *Rallus aquaticus indicus*. *Fulica atra* is the new host record for the genus *Strongyloides* Grassi, 1879. However, this genus is being reported for the first time from Pakistan.

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