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Muhammad Moosa Abro
Government College Hyderabad
Postgraduate Center, Hyderabad
Sindh Pakistan.

Ali Murtaza Dharejo
Department of Zoology,
University of Sindh, Jamshoro,
Pakistan.

Muhammad Munif Khan
Department of Zoology,
University of Sindh, Jamshoro,
Pakistan.

Nadir Ali Birmani
Department of Zoology,
University of Sindh, Jamshoro,
Pakistan.

Correspondence

Muhammad Moosa Abro
Government College Hyderabad
Postgraduate Center, Hyderabad
Sindh Pakistan.

A New record of Genus *Macrobilharzia* Travassos, 1922 (Trematoda: Schistosomatoidea) in *Phalacrocorax niger* from Sindh, Pakistan

Muhammad Moosa Abro, Ali Murtaza Dharejo, Muhammad Munif Khan and Nadir Ali Birmani

Abstract

Two specimens (one male and one female) of genus *Macrobilharzia* were collected from intestinal portal vein of single little cormorant. Body of schistosome was flat, long, tapering at both ends, zigzag ceca joins to form common cecum in posterior quarter of body; male larger than female, possess well developed gynaecophoric canal and 120-122 testes; female shorter, having inter-cecal ovary, long uterus and follicular vitellaria. On the basis of these characteristics the specimens are identified as *Macrobilharzia macrobilharzia* Travassos, 1922 and recorded for first time in little cormorant from Pakistan. Therefore, it is new host and locality record.

Keywords: *Macrobilharzia macrobilharzia*, Schistosome, *Phalacrocorax niger*, Pakistan and Sindh

Introduction

Avian schistosomes have wide distributions and complete their life cycle in two hosts [1]. Study has confirmed that cercariae of some schistosomes genera including *Austrobilharzia*, *Bilharziella*, *Gigantobilharzia*, *Trichobilharzia* cause cercarial dermatitis in human. Moreover, it damages organs of host and produce inflammation at entry site. Some avian schistosomes reach lungs of host, where they cause hemorrhage, inflammation and damages tissues. They also enter vessels of liver, intestine and nearby organs [2]. Moreover, they produce further impacts on host such as tissue lesion, inflammation, production of granuloma and local swelling [3-6]. Out of 14 genera of avian schistosomes, *Macrobilharzia* scantily reported in literature. Its' type species is *Macrobilharzia macrobilharzia* Travassos, 1922 reported from the portal vein of *Anhinga anhinga*, *Plotus anhinga* and Cormorant [7]. It is reported from few localities of Asia, America and Europe.

Only report available on the avian schistosomes in Pakistan is of Birmani *et al.* [8].

Little cormorant is aquatic and piscivorous bird and mostly inhabit in fresh water inlands, lakes, and coastal areas. The captured fishes are usually brought to the surface to swallow them. Moreover, it badly affects commercial and recreational fishing significantly damage fish stock and affect fish quality [9-11]. District Sanghar is well equipped with aquatic habitats to attract aquatic migrant as well as resident birds including Little Cormorant *Phalacrocorax niger* [12]. These freshwater habitats are favourable places for the development of gastropods (snails), which play important role in the life cycle of Schistosomes and other trematode parasites. By ingesting these snails, *P. niger* acquire infection from these habitats. Akram, Dharejo *et al.* and Abro *et al.* [13-16] studied helminths of Little cormorant in Pakistan. *Macrobilharzia* is not reported in Pakistan, so far, this is first record in present locality.

Material and methods: In order to survey the helminth parasites of migratory cum resident birds, the study was designed to examine the Little cormorants of Sanghar district of Sindh, Pakistan. Eleven little cormorants were caught from study area and brought in Parasitology laboratory of Department of Zoology, University of Sindh, Jamshoro. They were anaesthetized with chloroform in killing jar and placed on dissection tray for removal of visceral organs. Organs were teased in separate Petri dish having normal saline and examined under stereomicroscope. The collected schistosomes were fixed, stained, dehydrated and mounted as per method described by Gracia and Ash [17] and Schmidt [18]. The drawing lines were made with camera Lucida. The size of specimen and organs were measured in millimeter (mm).

The identification was made with help of keys given by Yamaguti ^[19], Gibson *et al.*, ^[20] and other literature.

Results: During present study eleven little cormorants were examined for presence of helminth parasites. One host was infected with 02 specimens of schistosome in portal vein of intestine. Infection rate was 9 percent. The detail description is given below.

Family Schistomatidae

Subfamily Schistosomatinae

Genus *Macrobilharzia* Travassos, 1922

Male

Male is larger than female. Body of male schistosome is long, flat, tapering at both ends, measuring 24 mm long and 2.5 mm wide; maximum width at end of first quarter of body. Oral sucker is terminal and 1.2 far from ventral sucker. Esophagus is 1.2 in length bifurcated into ceca in front of ventral sucker. Posterior part of esophagus is surrounded by esophageal glands. Gynaecophoric canal is large and run below ventral sucker. Ceca zigzag, reunited and form common cecum at posterior part of last quarter of body. Common cecum is 0.90 in length. Testes are 120-122 in number, distributed from ventral sucker up to end of third quarter of body, arranged in triplet zigzag fashion. Post-testicular area extended in entire fourth quarter of body.

Female

Female is smaller than male. Body of female schistosome is long, flat, measuring 12.65 in length and 1.35 in width. Oral sucker is terminal. Esophagus is short, measuring 0.5 in length bifurcated into ceca, surrounded posteriorly by esophageal glands, in front of ventral sucker. Ceca found laterally, zigzag, reunited to form common ceca at last part of fourth quarter of body. Common cecum is 0.55 in length. Ovary tubular, measuring 0.65 in length and 0.35 in width. Uterus long, filled with eggs. Vitellaria distributed scantily.

Taxonomic summary

No. of specimens recovered:	02
No. of hosts found positive:	01
Site of infection:	Portal vein of intestine
Locality:	Sanghar, Sindh, Pakistan
Record:	New host and locality record

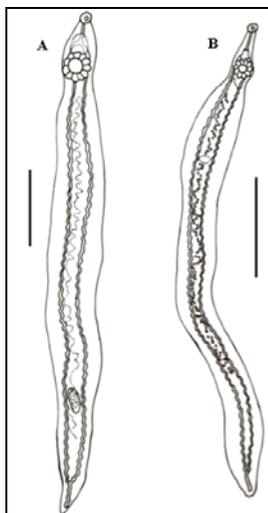


Fig 1: *Macrobilharzia macrobilharzia*. A. Female and B. Male. Scale bar: A. 4 mm; B. 5 mm.

Discussion

Genus *Macrobilharzia* was erected by Travassos, 1922 to accommodate schistosomes having zigzag ceca, united posteriorly to form short common cecum, numerous testes, well develop gynaecophoric canal and spirally curved ovary, long uterus filled with eggs. Carmichael ^[21], Morand and Muller-Graf ^[22] for phylogenetic and systematic studies scored fourteen genera of avian schistosomes on the bases of 24 and 37 generic features respectively. They have mentioned 11 generic features for systematic and phylogenetic studies of *Macrobilharzia*. These features include Gynaecophoric canal, genital pore, ovary shape, position of testes, number of testes, number of eggs in uterus, presence or absence of prostate gland cells and Laurer's canal, cirrus pouch and acetabulum. The present species has above mentioned features and it is first time that, this species is described on the basis of complete male and female specimen. Previously, either male or female was unknown. Present species resembles *Maerohilharzia macrohilharzia* in having terminal oral sucker with no pharynx but differ in small number of testes (120-122) which are (230-250) in *M. macrobilharzia*. Since, only single pair has been collected during current study, therefore, identified as *Macrobilharzia macrobilharzia* and question of small number of testes rest for discussion of other researcher to investigate it further. *Phalacrocorax niger* is a new host recorded and Pakistan is a new locality for this Schistosome.

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