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EPISTHMIUM JAMSHORENSIS SP.N., (TREMATODA:ECHINOSTOMATIDAE) FROM THE BIRD *EGRETTA GARZETTA* (LITTLE EGRET) IN SINDH, PAKISTAN

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ABSTRACT

The new species (*Episthmium jamshorensis*) is characterized by having 28 number of collar spines, different size and shape of body, size and shape of the oral sucker, short pre-pharynx, size and position of testes, position of ovary and arrangement of Vitelline follicles.

Key words: *Episthmium jamshorensis*, new species, *Egretta garzetta*, Jamshoro, Sindh, Pakistan

INTRODUCTION

The genus *Episthmium* Luhe, 1909 is worldwide in distribution. It was erected to accommodate trematodes from birds, fishes and rarely from some mammals. The genus *Episthmium* belongs to the family Echinostomatidae Loss, 1899 and sub family Echinochasminae Odhner, 1910.

E.caninum Verma, 1935 was originally described from dogs in Calcutta and also rarely reported from the cat in Lucknow, India (Pande, 1973). A single new species reported from *Egretta garzetta* in Pakistan is *E.egrettae* Unar, 2008. The species reported from India are *E.chauhani* Rai, 1962 from Fabricii of *Bubulcus ibis*; *E. corvus* (Bhalerao, 1926) Price, 1931, Gupta and Pande, 1963; *E. solanensis* Shuvajit Chakrabarti and Anindita Ghosh, 2012. Other species reported worldwide are from Africa, Europe, Siberia, Egypt, India, Philippines, Berlin, Ghana, Nile river, Azerbizhan, Georgia, Poland, Brazil, North Queensland, Magnolia, and Argentina.

MATERIAL AND METHODS

Five birds *Egretta garzetta* were shot down from Jamshoro District, Sindh, Pakistan at random intervals. The birds were autopsied in the laboratory for collection of intestinal Helminth parasites. Single specimen of a trematode was recovered from the small intestine of a host. The specimen was thoroughly washed in saline solution to get rid of mucus. Later it was fixed in 70% ethanol. The specimen was gently placed over a clean glass slide, pressed lightly with another slide, tied with thread and placed in F.A.A. solution for twenty four hours. The specimen was stained with Mayer's carmalum, dehydrated in graded series of alcohol, cleared in clove oil, rinsed with xylene and permanently mounted in preserva media. Drawings were prepared with the aid of a Camera Lucida, measurements are given length by width in millimeters and photomicrograph was prepared through Olympus Digital microscope MIC-D at SARC/ PARC, Karachi University campus. Specimen was deposited in senior author's collection, Department of Zoology, University of Sindh, Jamshoro.

RESULTS

***Episthmium jamshorensis* sp.n**
(Fig:1-6)

Host: *Egretta garzetta* (Little tern)
Locality: Jamshoro, Sindh, Pakistan.
No of hosts examined/infected: 5/01
No of specimen recovered: 01
Etimology: Species name refers to the host locality.

Description is based upon single, mature, egg bearing and permanently mounted specimen:

Body of fluke is flattened, spinose, pulmp shaped, small sized 1.67 long, maximum width at acetabular region measure 0.55.

Head collar is reniform 0.1 by 0.08 in size. It bears 28 spines of which 14 are on each lobe, interrupted dorsally in oral region. The spines of outer row are in five pairs and larger than inner row 0.04 by 0.01, lateral row spines has three pairs 0.02, dorsal spines has six pairs 0.02-0.015, approximately equal to lateral spines.

The oral sucker is terminal, oval to elongate and much smaller than ventral sucker 0.06 by 0.05 in size.

Pre-pharynx is 0.07 by 0.02 long, is followed by muscular pharynx 0.06 by 0.06 in size.

The esophagus is long measure 0.15, divided into two blind intestinal caeca. The intestinal caeca are not obivious due to dense distribution of Vitelline follicles posterior to uterus.

Cirrus sac is large, muscular, balloon shaped overlaps acetabulum below intestinal bifurcation measure 0.24 by 0.8. Genetial opening situated between post bifurcation and acetabulum.

The acetabulum is rounded, located at 2nd. quarter of the body, much larger than the oral sucker 0.24 by 0.3 in size. Sucker ratio is 1:2.6.

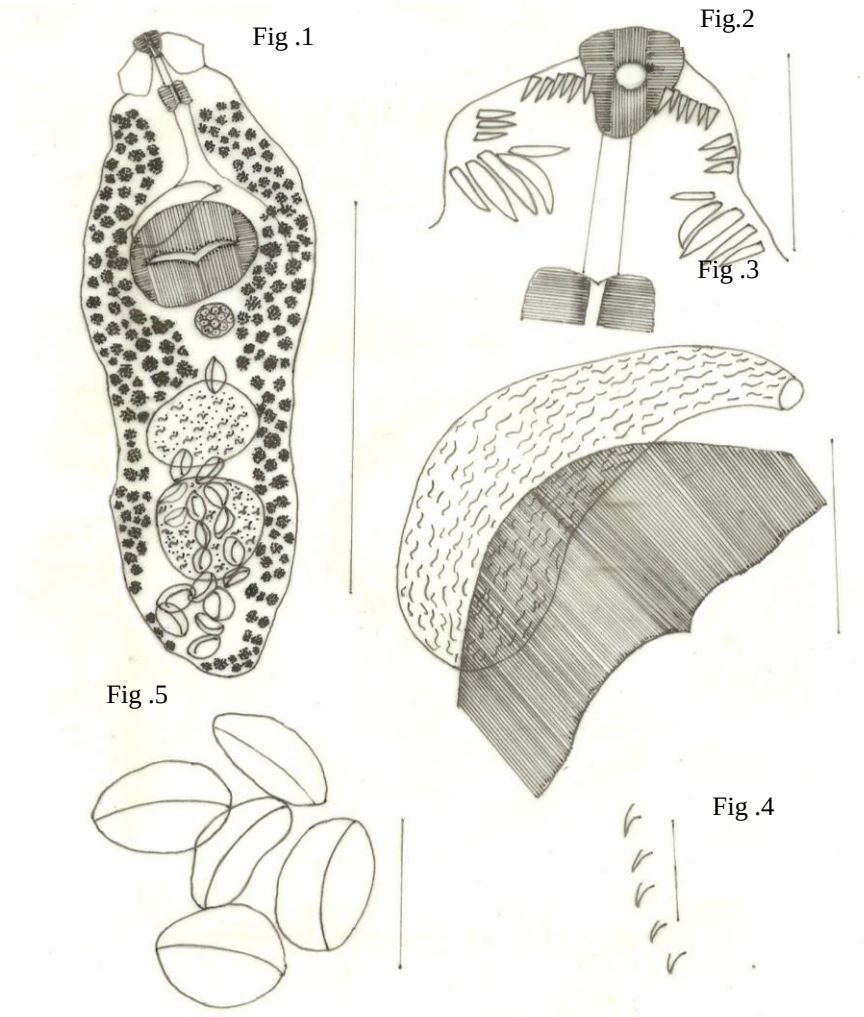

Fig. 1. *Episthmim jamshorensis* sp.n., holotype, entire worn.
Fig. 2. Head collar spines enlarged with oral sucker, pre-pharynx and part of muscular pharynx.
Fig. 3. Citrus sac and post bifurcal genital opening.
Fig. 4. Body spines enlarges.
Fig. 5. Eggs enlarges.

Fig. 6. *Episthmium jamshorensis* sp.n. entire worm, holotype, Photomicrograph (126 x).

Ovary spherical, smaller, pretesticular, closer to acetabulum 0.08 by 0.08 in size.

Testes tandem, post ovarian, located in the posterior most region of the hind body. Anterior testis is spherical measure 0.2 by 0.25, posterior testis jis vertically elongated 0.25 by 0.24 in size.

Vitellaria extends from pharynx in the anterior region up to the posterior end of the body, arranged in lateral fields and meet behind the uterus at of tip of the posterior region of the body.

Uterus short, relatively with few but larger size eggs in the hind body.

Eggs oval to rounded, double walled 0.08- 0.09 by 0.04-0.06 in size.

DISCUSSION

The genus *Episthmium* Lühe, 1909 is worldwide in distribution. It was erected to accommodate trematodes recovered from bursa fabricii or intestine of the birds, rarely of mammals. The genus *Episthmium* belongs to the family Echinostomatidae Loss, 1899 and sub family Echinochasminae Odhner, 1910.

Available literature indicates fairly good number of species of the genus *Episthmium*, mainly reported from avian hosts in Africa, Europe, Siberia, Egypt, India, Philippines, Berlin, Ghana, Nile river, Azerbizhan, Georgia, Poland, Brazil, North Queensland, Magnolia, Argentina, and Pakistan.

Type species is *Episthmium africanum* (Stiles, 1901) Luhe 1909 recovered in *Milvus parasiticus*. Also in *Numida Ptilorhyncha*, *Theristicus hagedash*, *Ardea*, *Botaurus*, *Circaetus*, *Falco* in Africa. And other species *E. prosthovitellatum* (Nicoll, 1914); *E. intermedium* Skrjabin, 1919; *E. oscari* Travassos, 1922; *E. proximum* Travassos, 1922; *E. wernickii* (Marco del pont, 1926); *E.corvus* (Bhalero, 1924) Price, 1931; *E. gallinum* Tubangui et Masilungan, 1941; *E. skrjabini* (Oshmarin in Skrjabin *et al.*, 1947); *E. suspensus* (Braun, 1901) Travassos, 1922; *E.colymbi* Shigin in Skrj. et Bashkirova, 1956; *E. matherossianae* (Shakhtakhtinskaia, 1958) Sulgotowska, 1960; *E. chauhani* Rai, 1962; *E. ghanense* Hodasi, 1967; *E. solanensis* Shuvajit Chakrabarti and Anindita Ghosh, 2012 recovered from different hosts and countries.

Episthmium bursicola Lühe, 1909 is the only species, which has been reported from the bird *Bubulcus ibis* in Pakistan (Bhutta and Khan, 1975).

E.egrettae Unar *et al.*, 2008 reported from intestine of *Egretta garzetta* in Sindh, Pakistan.

The present species differ in having larger body size 1.67 by 0.55 than *E. raniovarus* (1.17x0.42), *E. gallinum* (1.1x0.4), *E. corvus* (1.06-1.06x0.46-0.49), *E. sulphuratus* (0.910x0.260) and *E. skrjabini* (0.79x0.306), while it is smaller than *E. proximum* (7x2), *E. oscari* (6x2), *E. africanum* (3.3-4.0x0.7-0.8), *E. wernickii* (3.0x--), *E. bursicola* (2.787x0.727), *E. chauhani* (2.68-4.12x0.92-1.56), *E. intermedium* (2.68-3.48x0.88-1.04), *E. colymbi* (2.37x0.725), *E. ghanense* (2.2-1.4x0.5-0.4), *E. prosthovitellatum* (2.0-2.4x0.75-0.9) and *E. mathevossianae* (1.85-1.65x0.58-0.56), *E.egrettae* (1.84x0.41) and *E. solanensis* (2.688-4.64 by 0.656-1.194).

The number of collar spines in present specimen is 28, while in *E. bursicola; E. skrjabini* these are 22; in *E. ch* *olanensis* it is 24; *E. wernickii* 10-12 and in *E. eg*

Fig.6. *Episthmium jamshorensis* sp.n., entire worm, holotype. Photomicrograph (126x).

minal, while in all other species it is rounded; in *E. africanum* and *E. solanensis* the oral sucker is sub-terminal.

Pre-pharynx in present specimen is large and *E. egrettae* approximately same in length, while in *Episthmium bursicola; E. africanum* and *E. solanensis* it is short.

In present specimen the esophagus is long 0.2mm, while in *E. egrettae* it is short 0.04; in *E. solanensis* it is also short than present specimen and other all rest of species the esophagus is long.

In present specimen the cirrus sac is large, balloon shaped overlaps acetabulum, while in *E. egrettae* it is small and winding around the lateral side of the ventral sucker; in *E. africanum* it is small, rounded above the acetabulum; in *Episthmium colymbi* it is smaller, oval and overlaps the acetabulum; in *Episthmium bursicola* it is approximately of same shape and situated above the acetabulum and in *E. solanensis* its overlapping anterior half scetabulum and larger in size.

In present specimen the ventral sucker is located in the 2nd quarter of the body wider than long and it is nearly rounded in shape, while in *E. africanum*; *E. colymbi* and *E. bursicola*; the acetabulum is rounded; in *E. egrettae* it is vertically elongated to rounded and in *E. solanensis* it is larger than present specimen (0.4-0.5 by 0.36-0.54).

In present specimen the ovary is rounded, smaller in size, located below and nearer to the acetabulum, while in *E. africanum* it is rounded, located far from the acetabulum, in *E. colymbi* the ovary over laps the acetabulum, in *E. bursicola* and *E. egrettae* the ovary is below the acetabulum, located at lateral side of the body and in *E. solanensis* the ovary is larger, located toward right side anterior to testis.

In present specimen the anterior testis is spherical and posterior testis appears to be vertically elongated and larger from anterior testis, located in the posterior hind body, while in *E. africanum* anterior testis is small and

rounded, posterior testis is oval to elongated and located in 3rd. quarter of the body, in *E. colymbi* the anterior testis is elongated, larger and the posterior testis is much smaller, also indenteded in shape, both testes are situated in third quarter of the body, in *E. bursicola* the anterior testis is rounded, nearly equal in size to posterior testis, which is elongated in shape, located in hind body, in *E. egrettae* the testes appear to be antero-posteriorly elongated, situated in the hind body and in *E. solanensis* the testes are larger than present specimen (anterior 0.335-0.672 by 0.368-0.688 and posterior 0.448-0.8 by 0.32-0.52). anterior testis transversely elongate and posterior one longitudinally elongate.

Vitellaria in present specimen commence from near the pharynx in anterior region and also in *E. solanensis* it is extend from pharynx, while in all other species the vitellaria extends below the pharynx and extends to the posterior end of the body in lateral fields and meet behind the posterior testis.

In present specimen the uterus occupy posterior region of the body, while in *E. solanensis* it is present below the acetabulum and above the ovary.

Present specimen also differ from *E. caninmum* (Verma, 1935) Yamaguti, 1958 in body shape and size. The cirrus sac in present specimen is balloon shaped and larger, while in *E. caninmum* it is small and roughly rounded. The ovary in present specimen is smaller closer to acetabulum as in *E. caninmum*. In present specimen the anterior testis is spherical and posterior testis is vertically elongated, located in posterior most region of the hind body, while in *E.caninmum* anterior testis is broader than longer and posterior testis is vertically elongated, located in third quarter of the hind body.

Vitelline follicles in present specimen commence from at the level of pharynx, extend up to posterior region of the body and meet behind the uterus, while in *E. caninmum* vitelline follicles start from below the pharynx at the level of intestinal bifurcation, proceed up to the hind body and meet behind the uterus.

As the present specimen do not exactly match with the species reported world-wide and that reported in Pakistan i.e. *E. egrettae* Unar, 2008 from the same host i.e. *Egretta garzetta* in Sindh, Pakistan, it is desirable to propose a new species *Episthmium jamshorensis* Species name refers to the host locality.

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