EPISTHMIUM BILQEESAE SP.N. (ECHINOSTOMITDAE: ECHINOSTOMINAE) FROM A BIRD HOST, *EGRETTA GARZETTA* (LITTLE EGRET) IN JAMSHORO, SINDH, PAKISTAN

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Abstract

A new species *Episthmium bilqeesae* (sp.n.) is described from avian host *Egretta garzetta*. The new species is characterised by having: different size and shape of the body, number of collar spines (24), size of esophagus, size and position of acetabulum, position of cirrus sac, size of gonads, arrangement and number of vitelline follicles, position of uterine coils and few number of eggs.

Introduction

Variety of birds show trematode infections in their internal organs. The bird *Egretta garzetta* (Little Egret) belongs to the family Ardeidae, it is a species of small Heron. The little Egret besides the sub-content is found in parts of Europe, Africa, Asia, and Australia. It mainly feeds in fish, but also feeds on amphibians, small reptiles, mammals and birds as well as mollusks, insects, spiders and worms. Five birds *Egretta garzetta* were collected randomly, out of five one was found infected. Five trematodes were collected from bird, these were identified as belonging to the genus *Episthmium* (Luhe, 1909) and family Echinostomatidae Loss, 1899 and sub family Echinochasminae Odhner, 1910.

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. Five specimens of trematodes were recovered from the small intestine of a host. The specimens were thoroughly washed in saline solution to get rid of mucus. Later these were fixed in 70% ethanol. The specimens were 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 specimens were 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 photomicrographs were prepared through Olympus Digital Microscope MIC-D at SARC/ PARC, Karachi University campus, 75270. Specimens are deposited in senior author's collection, Department of Zoology, University of Sindh, Jamshoro. Out of five specimens, three were identified and differentiated as *Episthmium bilqeesae* sp.n.

Systematic Position

Family: Echinostomatidae Loss, 1899
Subfamily: Echinochasminae Odhner, 1910
Genus : *Episthmium* Luhe, 1909
Episthmium bilqeesae sp.n. (Figs.1-7)
Host: *Egretta garzetta* (Little egret)
Locality: Jamshoro, Sindh, Pakistan.
Site of infection: Small intestine
No.of hosts examined/ infected: 5/01
No. of specimens recovered: 03
Etimology: Species name refers to the late Eminent Professor/Parasitolgist Dr. Bilqees Fatima Mujib of University of Karachi, Sindh, Pakistan.

Description is based upon three mature, egg bearing, permanently, mounted specimens: Body of fluke is small plump shaped, spinose and fusiform, slightly curved at the level of ovary, measure 1.2-1.45 (1.32) long. Maximum body width is 0.29-0.41 (0.37) at level of anterior testis, in the posterior half of the body. Anterior end slightly narrower and posterior end is rounded. Entire tegument with scale like spines arranged in densely

alternating transverse rows, start from below the oral sucker up to the posterior part of the body. Tegumental spines appear approximately equal in size and shape.

Head collar well developed, it bears 24 spines, of which 12 are on each lobe. Lateral spines slightly larger 0.03 in size while the dorsal spines are hardly 0.01 in size.

Oral sucker terminal, oval to elongate 0.07-0.08 (0.073) by 0.05-0.05 (0.05) in size.

Pre-pharynx long 0.06-0.07 (0.063) by 0.02-0.03 (0.02). Pharynx muscular, nearly equal in size to the oral sucker, 0.07-0.07 (0.07) by 0.06-0.08 (0.06) in size. Esophagus very short.

Cirrus sac pyriform or flask shaped, lies above the ventral sucker, measures 0.21-0.23 (0.21) by 0.06-0.08 (0.06), opens into the genital pore above the acetabulum and below the intestinal bifurcation.

Ventral sucker muscular, rounded, situated at 2nd, quarter of the body, attached to the extreme lateral corner of the body 0.21 by 0.17 in size. Distance between oral sucker and ventral sucker 0.29-0.31 (0.303).

Ovary rounded, pre-testicular, contiguous with ventral sucker, measure 0.08-0.1 (0.08) by 0.09-0.09 (0.09). Testes are tandem, contiguous, smooth and spherical. Anterior testis slightly larger in size than the posterior testis, 0.2-0.22 (0.21) by 0.17-0.21 (0.19), posterior testis is 0.19-0.22 (0.21) by 0.17-0.2(0.19) in size.

Uterus short, relatively with few larger eggs. Vitelline follicles few in lateral fields, commence from below the pharynx between intestinal bifurcation, extend laterally up to the posterior extremity meet behind the uterus. Eggs are oval in shape with double walled, 0.07-0.08 (0.07) by 0.3-0.05 (0.03) in size.

Discussion

Description is based upon three mature, egg bearing and permanently mounted specimens. Out of three, two specimens are more identical in having same size and shape of body, position of gonads and position of cirrus sac and genital opening. Slight differences noted between the two mentioned specimens and the third one are in the body size, position of gonads, position of cirrus sac, position of genital opening and uterine coils. Presently, it is preferable to designate it as *Episthmium bilqeesae* sp.n.

Episthmium bilqeesae sp.n. is distinguished from earlier reported species of the genus *Episthmium* Luhe, 1909 reported from avian hosts in Pakistan mainly in having following differentiating characters:

Number of collar spines
Body shape and size
Size of pre-pharynx
Length of esophagus
Size and shape of cirrus sac
Size of ovary
Shape and size of testes
Arrangement of vitelline follicles.
And densely arranged body spines.

The present specimens are smaller in size than *E.jamshorensis* (recovered during present study and submitted for publication) and *E.egrettae*, Unar *et al.,* 2008 reported in Sindh, Pakistan. The body size in present specimens is 1.45-1.48 (1.46) by 0.21-0.29 (0.26), while body size in *E.egrattae* is 1.84 and in *E.jamshorensis* it is 1.67 by 0.55. (Table-1)

The present specimens are different from *E.egrattae* Unar *et al.,* 2008 described from the intestine of *Egretta garzetta* in Pakistan, mainly in shape and size of body, number of collar spines, size of pharynx, size, shape and position of ventral sucker, shape position and size of cirrus sac, size and shape of testes and ovary, arrangement of vitelline follicles, position of uterus, number and size of eggs. In present forms the size of body is smaller, elongated and curved at the level of ovary, the number of collar spines are 24 in number, smaller size of pre-pharynx, pharynx and esophagus. Acetabulum smaller in size situated at lateral corner in 2$^{nd.}$ quarter of the body, cirrus sac flask shaped located above the acetabulum, testes rounded, vitelline follicles start from below the intestinal bifurcation and are not confluent, uterus occupy part of lateral posterior region, extend up to the base of anterior testis and excessively in present specimen than *E.egrettae.*

The present form is closer to *E.jamshorensis* recovered from *Egretta garzetta* (same host) in having: nearly equal size of oral sucker, pre-pharynx, ventral sucker and ovary approximately of same size and position and also the size of eggs which are nearly equal. But it is distinguished by having: larger body size, maximum width at the level of acetabulum, number of collar spines are 28, longer esophagus, testes located in the posterior most region of hind body, anterior testis spherical, posterior testis vertically elongated larger in size. Vitelline follicles commence from the pharynx and reach behind the uterus.

Present form differ from the *E.colymbi* Shigin in Skrj. et Bashkirova, 1956 in having: longer body size, shape and position of acetabulum, shape, size and position of cirrus sac, position of ovary, position and shape of testes and arrangement of vitelline follicles. *E.colymbi* has comparatively larger body size, acetabulum is located in middle of the body, ovary is overlaped by acetabulum, testes situated approximately near the ovary, anterior testis is larger roughly rounded and posterior testis is indented and smaller in size, vitelline follicles commence from below the pharynx.

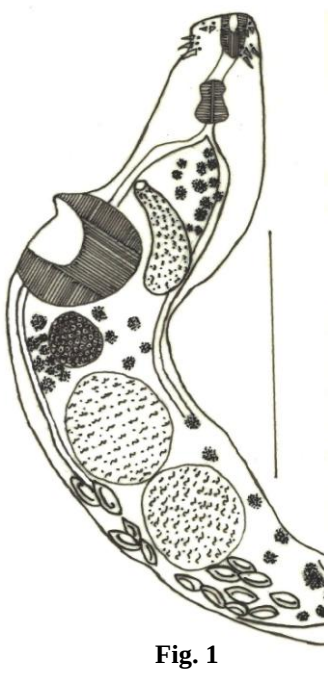

Fig. 1

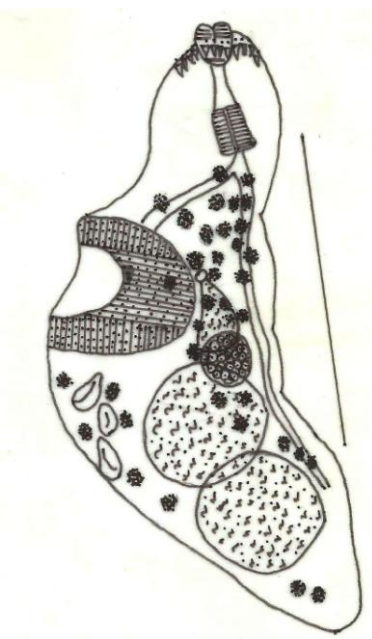

Fig. 2

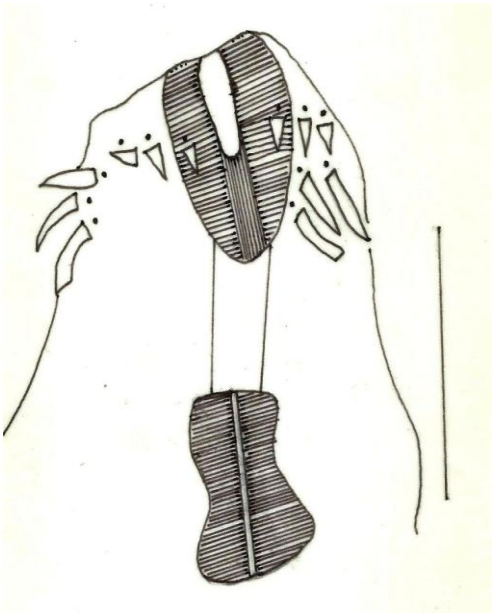

Fig. 3

Figs. 1,2. ***Episthmium bilqseeae*** **sp.n. holotype, entire worm Scale. Figs.1-2. 0.5mm.**

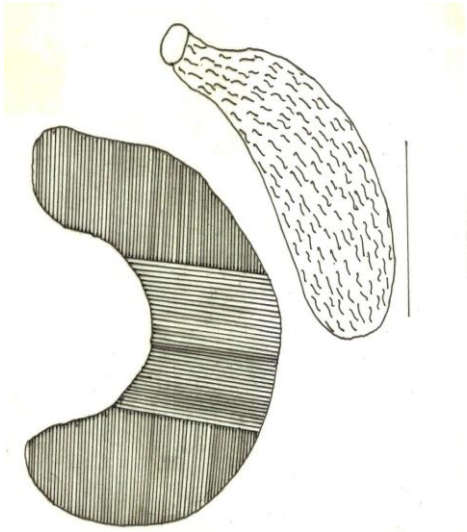

Fig. 4

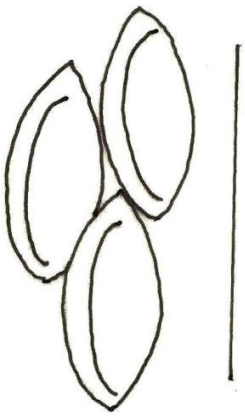

Fig. 6

Fig. 5

Fig. 7

Fig.3 Head collar spines enlarged with oral sucker, pre-pharynx and part of muscular pharynx
Fig.4 Cirrus sac and post bifurcal genital opening.
Fig.5 Body spines enlarged.
Fig.6 Eggs enlarged.
Scale. Fig.3. 0.1mm, Fig.4. 0.05mm, Figs. 5-6. 0.1mm

Fig.7 ***Episthmium bilqeesae*** **sp.n. entire worm, holotype. Photomicrograph (70x).**

Present form also differ from *E.bursicola* (Creplin, 1837) Lühe, 1909, Bhutta and Khan, 1975 from *Bubulcus ibis* in Punjab Head works, Punjab, Pakistan in having: different host, body size, number of collar spines, position and size of gonads and arrangement of vitelline follicles. *E.bursicola* is reported from *Ardea cinerea, purpurea, Circaetus gallicus* and the body size is comparatively larger, ovary situated far from the acetabulum, testes situated almost at posterior end of hind body, anterior testis is rounded and posterior testis is

elongated in shape and vitelline follicles are confluent in the posterior body region and commence from below the pharynx.

Present form also differ from *E. africanum* (Stiles, 1901) Lühe, 1909 in having: different host, locality, shape and size of the body, position of ventral sucker, shape and position of gonads and arrangement of vitelline follicles. *E. africanum* is recovered from the host *Milvus parasiticus* in Africa. Body size is comprartively larger, position of ovary is far from the acetabulum, testes situated in middle of the body, anterior testis is rounded, nearly equal in size to posterior testis and posterior testis is oval shaped, cirrus sac rounded closer to the acetabulum, vitelline follicles commence from the below pharynx.

Present form also differ from *E. caninum* (Verma, 1935) Yamaguti, 1958 in having different locality and host, size of esophagus, position of cirrus sac, size and shape of gonads, comparatively longer esophagus, cirrus sac overlaping ventral sucker, anterior testis smaller, spherical and posterior testis is elongated, vitelline follicles confluent, commence from below the intestinal bifurcation.

Present specimen differ from *E. solanensis* Shuvajit Chakrabarti and Anindita Ghosh 2012 in having different locality, host, size and shape of the body, position of oral sucker, size of pre-pharynx and pharynx, size and position of acetabulum, size and shape of gonads, size and shape of cirrus sac, arrangement and number of vitelline follicles, position and number of uterine coils. *E. solanensis* is reported from *Bubulcus ibis* in India. It has comparatively larger body size, oral sucker subterminal, short pre-pharynx, large pharynx, larger acetabulum located in middle 2$^{nd.}$ quarter of the body, larger ovary placed slightly towards right side above the anterior testis. Testes larger, anterior testis transversely elongate and posterior testis longitudinally elongate, cirrus sac larger and seminal vesicle bipartite in shape. Vitelline follicles profusely extends from the level of pharynx up to posterior region of the body, uterus occupy space below the acetabulum and above the ovary.

Present form appears un-matched from species reported worldwide and those reported in Pakistan, it is therefore proposed as *E. bilqeesae* sp.n. in Jamshoro, Sindh, Pakistan.

Table 1. Comparative body measurements of three species of genus *Episthmium* Luhe 1909, recovered in Sindh, Pakistan.

S. No species	***Episthmium egrettae* Unar *et al.*, 2008**	***Episthmium jamshorensis* sp.n. (submitted for publication)**	***Episthmium bilqeesae* sp.n. (present specimen)**
Hosts	*Egretta garzetta*	*Egretta garzetta*	*Egretta garzetta*
Locality	Jamshoro, Sindh, Pakistan	Jamshoro, Sindh, Pakistan	Jamshoro, Sindh, Pakistan
Body size	1.84	1.67 by 0.55	1.45 by 0.29
Collar spines	26	28	24
Oral sucker	0.07 by 0.06	0.06 by 0.05	0.07 by 0.04
Pre pharynx	0.06 by 0.01	0.07 by 0.02	0.06 by 0.03
Pharynx	0.09 by 0.10	0.06 by 0.06	0.07 by 0.06
Esophagus	———	0.15 long	Very short
Ventral sucker	0.34 by 0.27	0.24 by 0.3	0.21 by 0.17
Sucker ratio		1:2.6	1:3-4
Genital pore	Situated b/w the intestinal bifurcation and acetabulum	Situated b/w the intestinal bifurcation and acetabulum	Situated b/w the intestinal bifurcation and acetabulum
Cirrus sac	0.71 by 0.14	0.24 by 0.8	0.23 by 0.08
Ovary	0.15 by 0.14	0.08 by 0.08	0.1 by 0.09
Testes	Ant:0.37 by 0.35 Post:0.33 by 0.31	Ant:0.2 by 0.27 Post:0.25 by 0.24	Ant:0.22 by 0.17 Post:0.19 by 0.17
Vitelline follicles	Commence from below the pharynx and extend up to posterior region of body.	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	Vitelline follicles few in lateral fields, commence from below the pharynx between intestinal bifurcation, extend laterally up to the posterior extremity meet behind the uterus.
Eggs	76 by 30	0.08-0.09 by 0.04-0.06	0.08-0.09 by 0.04-0.05

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