FLORA AND FAUNA

2016 Vol. 22 No. 1 PP 69-75 ISSN 0971 - 6920

KNIPOWITSCHIATREMA STERNULAI SP.N (TREMATODA:HETEROPHYIDAE) IN *STERNULA ALBIFRONS*(LITTLE TERN) (AVES: LARIDAE) OF HYDERABAD, SINDH, PAKISTAN

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Received **:** .15.2.16; ***Accepted*** : 24.3.16

ABSTRACT

Knipowitschiatrema sternulai sp. nov. is described from the intestine of a bird *Sternula albifrons* (Little tern). The new species is characterized by having: smaller body size, a short pre-pharynx, 1st quarter position of acetabulum, elongated seminal vesicle, saccular with narrow anterior portion, situated far below the acetabulum, roughly spherical ovary, size of testes, commencement of vitelline follicles from level of testes and smaller size of eggs.

Figures : 03 References : 04 Table : 01

KEY WORDS : Hyderabad, *Knipowitschiatrema sternulai*, New species, Pakistan, Sindh, *Sternula albifrons*.

Introduction

The genus *Knipowitschiatrema*[1] belongs to the family Heterophyidae[3] species of the genus are reported from Russia, France, Britain, W. Mediterranean and Pakistan (species recovered and studied during present study). The species are reported from birds and the larva is found in gills of *Belone acus*. The present new species *K. sternulai* is reported from the host little tern *Sternula albifrons* in Pakistan.

Two species are reported from avian hosts are *K. Nicolai* Issaitschikow[1] from *larus argentatus* in Russia and *K.echinatum*[4], from *Larus-argentatus michallis* in France. *K. pakistanensis sp.n.*, has been recovered and reported from the same host *Sternula albifrons*(during present study) in Pakistan.

ACKNOWLEDGEMENTS : Authors wish to thank Mr. Muzfar Ahmed Senior Scientific Officer Pakistan Agricultural Research center (PARC) Southern zone Agricultural center SARC, University of Karachi-75270, for providing digital Olympus MICD camera for photography of specimen.

Authors also wish to extend their gratitude to Dr Noor-un- Senior scientific officer Pakistan Agricultural Research center (PARC) Southern zone Agricultural center SARC, University of Karachi 75270, access to the literature and for their moral help.

Authors also wish to extend their thanks to the Medical Zoology Laboratory staff for their help and support in the autopsy examination of birds and preparation of Parasites for study.

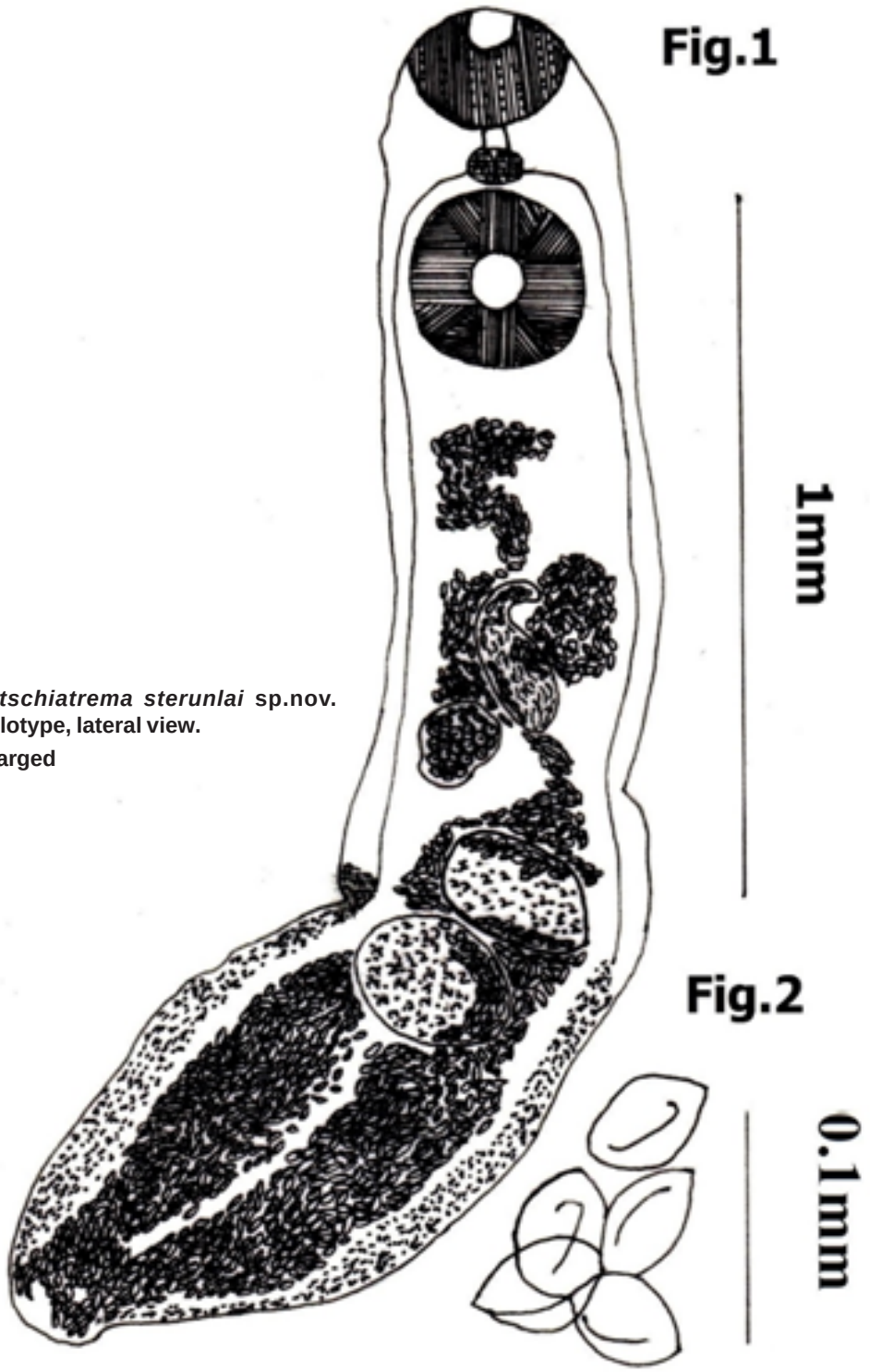

Fig.1 : *Knipowitschiatrema sterunlai* sp.nov. entire worm, holotype, lateral view.

Fig.2 : Eggs enlarged

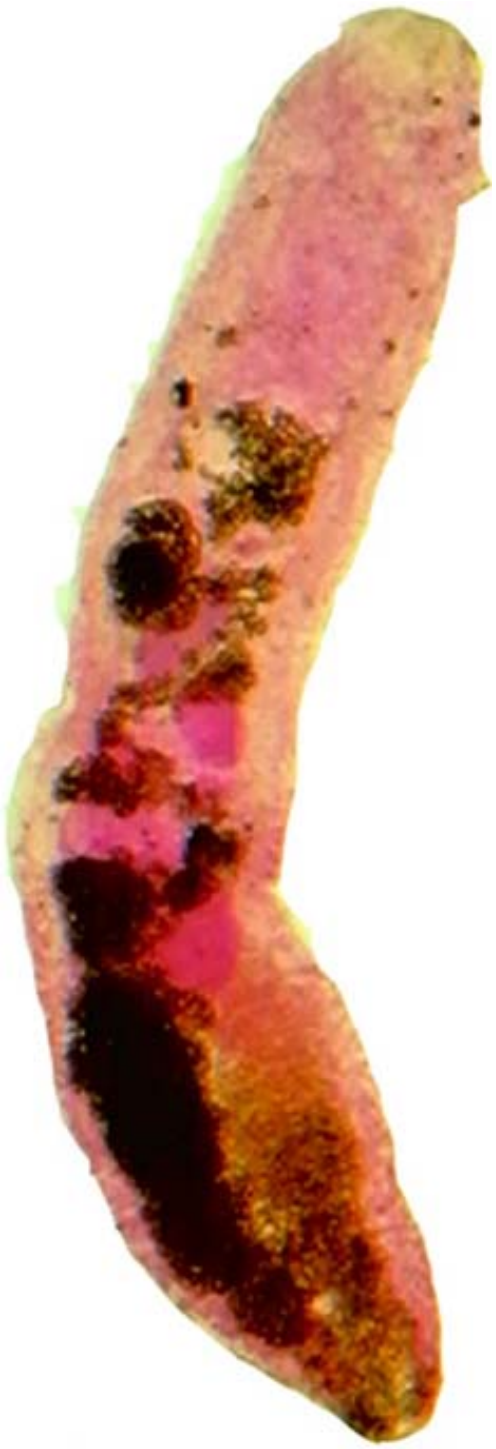

Fig.3 : *Knipowitschiatrema sterunlai* sp.nov. entire worm, holotype, Photomicrograph 80X.

Materials and Method

Five live birds Little terns (*Sternula albifrons*) were purchased from Hyderabad bird market, and brought to the parasitology laboratory Department of Zoology, University of Sindh, Jamshoro, Pakistan. The birds were anesthetized, dissected and examined for collection of internal helminth parasites. During examination of gut contents and visceral organs one mature specimen was recovered from the small intestine of a bird. Later the specimen was fixed in hot steaming 70% ethanol, where the trematode expands and instantly dies. Later the specimen was gently placed over a clean glass slide, pressed lightly with another, tied with thread and fixed in F.A.A. solution for twenty four hours, stained with Mayer's carmalum, dehydrated in graded series of ethanol, cleared in clove oil and rinsed with xylene. Finally the specimen was permanently mounted in Canada balsam for further study. Line Drawings were prepared with the aid of a Camera Lucida. Measurements were given in millimeters (mm). Photomicrograph was prepared with the courtsey of Vertebrate Pest Control Institute, Southern Zone Agricultural Research Center, Karachi University Campus, Karachi 75270. The specimens are deposited in the parasitological Laboratory, University of Sindh, Jamshoro 76080.

***Knipowitschiatrema sternulai* sp. nov.**

(Figs.1-3)

Host : *Sternula albifrons* (Little tern)

Site of infection : Small Intestine

Locality : Hyderabad, Sindh.

Number of hosts examined/ infected: 05/01

No of specimen recovered: 01

Etimology : species name refers to the host bird.

Description is based upon one mature, egg bearing and permanently mounted specimen.

Body sub-cylindrical, anterior and posterior ends broadly rounded. Total body is 2.27 x 0.51 in size. Maximum width is attained at the posterior region of the body below the testes. (Fig.1)

The oral sucker is terminal, broader than long and smaller than the ventral sucker, measure 0.15 x 0.22 in size. The distance between oral and ventral sucker is 0.08.

Pre-pharynx is very short 0.03 x 0.03 in size. Pharynx muscular, rounded and much smaller than

TABLE-1: Comparative body measurements of four species of genus *Knipowitschiaterma*[1]

Species	***K.nicolai***	***K.echinatum***	***K.pakistanensis***	***K.sternulai* sp.nov**
Host	*Larus argentatus*	*Larus argentatus* michallis;*L.fuscus*	*Sternula albifrons*	*Sternula albifrons*
Locality	Russia	Britain, France	Hyderabad, Sindh, Pakistan	Hyderabad, Sindh, Pakistan
Body size	3.126-3.54 x 0.473-0.524	4.6-7 x 0.49-0.69	2.89-3.25(12.28) x 0.36-0.4 (1.52)	2.27 x 0.51
Oral Sucker	Sub-terminal, larger than the acetabulum	————--——	0.13-0.16(0.58) x 0.17-0.19(0.18) terminal, smaller than than acetabulum, more elongated.	0.15 x 0.22 terminal, smaller than the acetabulum, wider than long.
Pre-pharynx	Long & wide	————————-	0.09-0.1(0.095) x 0.02-0.03(0.025) long.	0.03-0.03, short.
Pharynx	Muscular, rounded	————————-	0.11-0.11(0.11) x 0.13-0.13(0.13), globular.	0.04 x 0.07rounded.
Esophagus	Absent		0.49-0.51(0.51) x 0.09-0.09(0.09)	Absent
Acetabulum	Smaller than oral sucker, enclosed in genital atrium.	————————-	0.26-0.27 (0.265) x 0.23-0.23 (0.23), larger than oral sucker, not enclosed in genital atrium.	0.24 x 0.23 larger than oral sucker, not enclosed in genital atrium.
Sucker ratio			1:1.8-2.0	1:1.6
Distance b/w oral sucker & acetabulum	————————-	————————-	0.71-0.75(0.73)	0.08

Seminal vesicle	Quite larger, twisted in shape	————————-	0.42-0.47(0.445) x 0.11-0.13(0.21) larger, flask shaped, voluminous size	0.23 x 0.07, smaller size, elongated, saccular with narrow anterior portion.
Distance b/w seminal vesicle &acetabulum	Situated immediately below the acetabulum.	————————-	Situated immediately below the acetabulum, nearly touching it.	0.3 situated far below the acetabulum.
Ovary	Rounded, located near middle of the body.	————————-	0.09-0.09(0.09) x 0.1-0.1(0.1) rounded, located near the posterior region of the body.	0.16 x 0.1 roughly spherical, located near middle of the body.
Testes	Rounded, equal in size	————————-	Ant: 0.1-0.11(0.105) x 0.12-0.15 (0.135), roughly spherical, smaller size Post:0.14-0.18(0.16) x 0.15-0.16 (0.155), oval, larger size.	Ant: 0.12 x 0.22roughly rounded, smaller size Post: 0.16 x 0.22 rounded, slightly larger in size.
Uterus	Passes between testes, ovary, seminal vesicle.	————————-	Passes between testes, ovary, seminal vesicle.	Passes between testes, ovary, seminal vesicle reaches above the seminal vesicle.
Vitelline follicles	Commence from post testicular to lateral fields in hind body, also appear in mid-posterior region of the body.	————————-	Vitellaria arranged laterally in posterior region of the body below the testes.	Commence from the level of testes, arranged in posterior region of the body.
Eggs size	————————-	————————-	0.06-0.07(0.065) x 0.02-0.03(0.025)	0.06 x 0.04

the acetabulum and oral sucker is 0.04 x 0.07 in size. Ceaca terminate at posterior extremity at level of testes.

Ventral sucker much larger rounded and located in the first quarter of the body, nearer to oral sucker 0.24 x 0.23 in size. Sucker ratio being: 1:1.6

Seminal vesicle located far below the ventral sucker, it is elongated, saccular with narrow anterior portion 0.23 x 0.07 in size. The distance between acetabulum and seminal vesicle is 0.3.

Ovary is roughly spherical and smaller in size, pre-testicular near middle of the body measure 0.16 x 0.1 in size.

Testes tandem, anterior testis smaller and roughly spherical, while posterior testis is larger and rounded in shape. Anterior testis is 0.12 x 0.22 and posterior testis is 0.16 x 0.22 in size.

Vitelline follicles commence from the level of testes in the posterior region of the body andare arranged laterally.

Uterus fills the space below the testes and turns between the testes, ovary and seminal vesicle, reaches above the seminal vesicle to open into genital opening below the acetabulum.

Eggs are smaller and double walled measure 0.06 x 0.04 in size.

Discussion

Present specimen *Knipowitschiaterma sternulai* sp. nov. appears different from the earlier reported species of the genus *Knipowitschiaterma*[1], *i.e K. nicolai* from *larus argentatus* (larva in gills of *Belone accus*); Black sea in Russia and *K. echinatum*[4], recovered from *Larus-argentatus michallis*; in France. Also in *L. fuscus* in Britian and *K. pakistanensis* sp. n.recovered from the same host i.e *Sternula albifrons* in Pakistan. (During present study).

Workers[2], conducted a survey on the trematode fauna of *Larus audouinii* in the Alboran sea, South-western Mediterranean. The authors found a total of 10 trematode species including *Knipowitschiatrema nicolai*.

Total body size in present specimen is 2.27 x 0.51, while body size in *K. nicolai* is 3.126-3.54 x 0.473-0.524; in *K. echinatum* the body size is 4.6-7 x 0.49-0.69 and body size in *K. pakistanensis* is 2.89-3.25 x 0.36-0.4.

The oral sucker in present specimen is terminal, smaller than acetabulum, more broader than elongated, while in *K. nicolai* the oral sucker is sub-terminal and larger than acetabulum, while in *K. pakistanensis* the oral sucker is terminal and smaller than acetabulum and elongated in shape.

Pre-pharynx in present specimen is very short, while in *K. nicolai* pre-pharynx is wider than long, and in *K. pakistanensis* it is much longer than the present specimen.

In present specimen the acetabulum is larger, rounded, not enclosed in genital atrium and located in the 1st. quarter of the body, while in *K. nicolai* the size of acetabulum is smaller and it is enclosed in a genital atrium and situated in the 2nd quarter of the body, in *K. pakistanensis* it is larger, rounded, not enclosed in a genital atrium and located in the 2nd quarter of the body.

The distance between oral and ventral sucker in present specimen is 0.08, while in *K. pakistanensis* it is 0.71-0.75 (0.73).

Seminal vesicle in present specimen is elongated, saccular with narrow anterior portion, and smaller in size and opens through the genital pore just below the acetabulum about 1st. quarter of the body length. The distance between the acetabulum and seminal vesicle is 0.3, while in *K. Nicolai* and *K. pakistanensis* sp. n the seminal vesicle is situated immediately below the acetabulum, nearly touching it.In *K. nicolai* the seminal vesicle is quite larger and twisted in shape, the genital atrium is wide, thick walled opening in the median line about 2nd.quarter of the body length from anterior extremity, while in *K. pakistanensis* sp. n. the seminal vesicle is larger, voluminous and opens through the genital pore below the acetabulum, about 2nd quarter of the body length from the anterior extremity.

In present specimen the ovary is roughly rounded and smaller in size, located near middle of the body, while in *K. nicolai* it is rounded and located near middle of the body similar to present specimen, in *K. pakistanensis* the ovary is rounded, smaller in size than present specimen, located in posterior part of the body.

In present specimen the anterior testis is smaller and the posterior testis is slightly larger in size, while in *K. nicolai* the testes are rounded and equal in size, in *K. pakistanensis* the anterior testis is smaller and the posterior testis is larger and oval in shape.

In present specimen, uterus passes

between the testes, ovary, seminal vesicle and reaches above the seminal vesicle, while in *K. Nicolai* and also in *K. pakistanensis* the uterus passes between the testes, ovary, and seminal vesicle.

Vitelline follicles in the present specimen commence from the level of testes, while in *K. Nicolai* and *K. pakistanesis* the vitelline follicles start from post testicular area.

The shape and size of body, size of pharynx, position of acetabulum, distance between acetabulum and seminal vesicle, shape and size of seminal vesicle, shape of ovary, shape and size of testes, arrangement of vitelline follicles, suggest to propose a new species *K. sternulai* sp. nov. (Table-1) recovered from the same host i.e *Sternula albiferons* in Hyderabad, Sindh, Pakistan.

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