

A new acanthocephalan of the genus *Pallisentis* recovered from intestine of *Channa striatus* from Imphal-East, Manipur (India)

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ABSTRACT

The new species is characterized by possessing medium body size, 4 rows of 9 hooks each, a faded fork like structure present in the proboscis, a collar of spine consisting of 15 rows of 8- 10 spines each, cylindrical testes, poorly developed uterine bell. The eggs are present in the middle portion of the body and spines are present only in one third portion of the whole body length and the rest portion is devoid of spine. The present specimen deals with the description of *Pallisentis heingangyensis* n. sp. recovered from the intestine of *Channa striatus* from Heingang river, Imphal East, Manipur.

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KEY WORDS : Acanthocephalan, *Channa striatus*, Heingang river, Manipur, *Pallisentis*.

Introduction

The Acanthocephala represents a group of parasitic worms in gastro-intestinal tract of all vertebrate groups especially more commonly in fishes and birds. They are found worldwide. Inside the host body, they penetrate their thorny proboscis into the intestinal wall adhering firmly and absorb nutrients. The genus *Pallisentis* is distinguished solely by the number of hooks in proboscis, hook circle which proved to be a variable traits.

The Acanthocephalan genus *Pallisentis*¹³ are known to occur only in freshwater fishes. This genus has more than 60 species till now. During March 2019, three host fishes were examined and found to be infected by a variety of parasites. Some specimens are found to be closely related to *P.basir*⁵ and on detail observation, there are certain differences. The aim of present study is to explore and to assign taxonomical status to *Pallisentis* species prevalent in food fishes of rivers in Imphal-East, Manipur.

Materials and Methods

Fishes were collected from the Heingang river, Imphal East, Manipur. They were brought to the lab, dissected and examined for parasites. The parasites

were kept in refrigerator before fixing for complete eversion of the proboscis. The parasites were flattened under slight pressure of cover glass and fixed in A.F.A (alcohol-formal- acetate). The parasites were stained in acietoalum carmine, dehydrated through ascending series of alcohol grades, cleared in xylene and mounted in DPX. Then covered with coverslips and sealed with nail polish. After preparation of permanent slide, specimens were examined under Olympus CH20i light binocular research microscope and photomicrographs were taken by Nikon stereozoom microscope SMZ 1270.

Diagrams were drawn with the help of Camera Lucida. Measurements were taken with the help of ocular micrometer. All measurement were given in mm, unless otherwise mentioned.

Observation

Pallisentis irilensis n.sp. Fig.1(A-G), Fig. 2(A-H).

Female (5)

Body 7.62- 12.27 mm long and 0.23- 0.65 mm wide. Proboscis trapezoid shaped 0.12- 0.18 mm long having hooks and thickening at the base giving a comb like appearance. Proboscis sheath 0.27- 0.47 mm long. Trunk with collar of spine arranged in 15 rows bearing 8-

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TABLE-1 : Comparison of *Pallisentis basiri*⁵ with its nearest relative.

Characters	<i>Pallisentis basiri</i> ⁵	<i>P. heingangyensis</i> (Present specimen)
Body	8.28mm	8.19- 9 .35 mm
Proboscis(length)	1.1 mm	0.4 – 0.8 mm
Hook rows	4	4
Neck	-	0.25 – 0.76 mm
Proboscis sheath	0.4 mm	0.13 – 0.63 mm
Spineless area(length)	-	0.03 – 0.09 mm
Collar	-	0.01-0.03mm
Trunk spine	-	8-12
Anterior testis	-	0.41 – 0.81 mm
Posterior testis	-	0.22 -1.35 mm
Cement gland	0.9mm	0.32 – 4.30 mm
Saeftigen's pouch	0.78 mm	0.13 – 0.54 mm
Cement reservoir	-	0.02- 0.10 mm
No of nuclei in cement gland	9	13
Seminal vesicle	-	0.01- 0.02 mm
bursa	-	0.10 – 0.63 mm
Leminici (Length)	0.76 mm	0.06 – 0.08 mm

10 spines each.

Trunk Spines conical in shape and longer than the collar spine, becoming progressively smaller towards posterior region, present indistinct segmentation in the posterior end of the body. Arrangement of spines similar in both males and females.

Leminisci slender, two unequal in length, long one measuring 1.05- 1.67 mm and short one measure 0.87- 0.91 mm. Posterior end of the body rounded with terminal genital opening, uterine bell poorly visible. Vagina having

thick muscular tissues. The cavity of gravid female is filled with ovarian balls and embryonated egg 0.06- 0.15 mm long and 0.09 mm wide. The female is larger than male.

Male (4)

Body 8.19- 9.35 mm long, 0.13 - 0.28 mm wide. Proboscis short, trapezoid and measures 0.05- 0.08 mm in length, and 0.07- 0.09 mm wide, armed with 3 circles, recurved hooks, similar in shape but different in size. Hooks of first circle stouter and largest 0.22 mm long

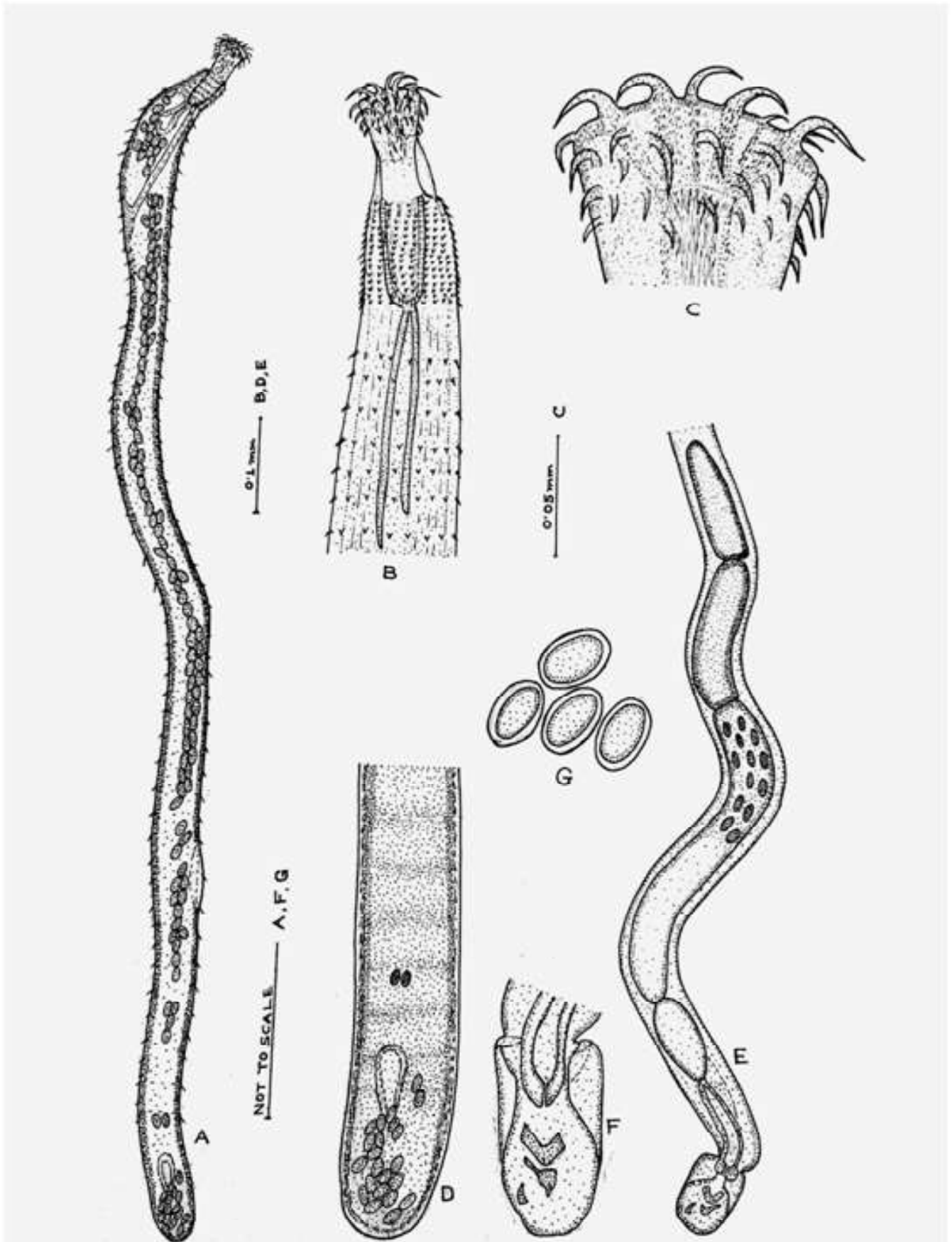


Fig. 1(A-G) : *Pallisentis heingangyensis* n. sp. (Camera lucida drawing)

A - whole body of female, B - Anterior end of male, C- Enlarged view of proboscis, D- Posterior end of female, E - Posterior end of male, F - Enlarged view of bursa (male) and G - Eggs.

and basal row smallest 0.15 mm long. Each hook consists of a curve blade, a horizontally directed root, handle sunk in proboscis wall and posteriorly directed guard also embedded in proboscis wall. Neck small 0.25- 0.76mm long and 0.24mm in wide. Proboscis sac, single layered 0.63- 0.23 mm long and 0.25 mm wide. Lemnisci tubular, subequal, longer than proboscis receptacle. Left lemnisci 0.076- 0.08 mm long. Right lemnisci 0.03- 0.09 mm long. Body spination consists of collar and trunk spines. Collar spines arranged in 15 transverse circle with 8- 10 Spines. Distance between non-spiny area situated between collar spine and trunk spine is 0.03- 0.09 mm long and 0.38 mm wide. Trunk spines start after a short non-spiny area.

Anterior testis 0.41- 0.81 mm long, 0.30 mm wide. Posterior testis 0.32 - 1.35 mm long, 0.27 mm wide. Seminal vesicle 0.03- 0.43 mm long. Cement gland single, syncytial, cylindrical mass with 13 nuclei lying just behind testis 0.32- 1.35 mm long and 0.38 mm wide. Cement reservoir 0.5 mm long. From each testis a vas deferens runs down in close association with cement gland and cement reservoir. Saefftigens pouch elongated sac 0.13- 0.54 mm long, 0.33 mm wide, opening by a narrow tubular duct which runs down and open into bursa where duct of cement reservoir open into it and supported by muscular tissue.

Taxonomic Summary

Genus : *Pallisentis*
Species : *P. heingangyensis* n. sp.
Type of host : *Channa striatus*
Local name : Porom
Site of infection : Intestine
Type locality: Heingang river, Imphal-east, (24°54'8.451"N to 24°49'24.695"North Latitude, 93°56'38.739"East to 93°55'4.426" East Longitude.
Deposition of Specimen: Holotype and Paratype specimens were deposited to the Meuseum of Parasitology Section of, Centre of Advanced Studies in Life Sciences, Manipur University, Canchipur, Imphal, Manipur (India).
Etymology: The species is named after the name of locality from where it has been recovered that is "Heingang" river.
Ethical approval: All the procedures and protocols performed in research studies using animal species like fishes were in accordance with the ethical standards of the Institutional Animal Ethics Committee of Manipur University (M.U/D.LSc./IAEC/1/19).

Discussion

Worker¹³ recognised two classes, the

Eoacanthocephala and Metacanthocephala. The genus *Pallisentis* was grouped under class Eoacanthocephala, order Gyraacanthocephala, family Quadri-gyridae and subfamily Pallisentinae. The latter class includes worms recovered from man. Since the present specimens are from fish host they are included in class Eoacanthocephala.

The body of present specimen is elongate, medium sized proboscis, trapezoid in shape with few hooks. Proboscis receptacle single layered with ganglion near its base. Trunk spines limited in anterior third of the body, lemnisci long, cement gland syncytial, eggs small and arranged in middle portion of the body like a line, starting just below from proboscis sac. Therefore, these are included in family *Quadrigyridae*

Although some similarities are found in certain characters as compared to previous species, the present specimen of the genus *Pallisentis* appears to be different from the previous species in having characters viz., body size, number and size of proboscis spines, proboscis shape, trunk spines, egg size and shape of bursa.

The entire body of male and female in present specimen is larger than *P.jagani*⁷, *P.mehra*⁶ and *P.pandai*.

P. heingangyensis n. sp has 4 circle of 36 spines on the proboscis which is different from *P.cleatus*¹³ while *P. magnum*⁸ has 29-30 proboscis spines.

In the present specimen, the size of proboscis 0.4- 0.8 mm. is different as compared to *P.magnum*⁸ which is 0.2 mm.

*P.nagpurensis*³, *P.allahabadi*² and *P.umbellatus*¹³ are totally different in morphological feature from the present specimen.

P.gaboes, *P.colisae*¹⁰ and *P.cleatus*¹³ are different from the present specimen. in the number of spine at trunk.

The present specimen shows some resemblances with the already known nine species of this genus viz., *P.allahabadi*², *P.basiri*⁵, *P.cleatus*, *P.colisai*¹⁰, *P.gaboes*, *P.namdai*⁹, *P. nagpurensis*³, *P. ophiocephalis* and *P.magnum*⁸. Out Of which, the present specimen comes very close with *P.basiri*. However, it differs from the same in many morphological characters (Table-1).

The present specimen differs from *P. basiri*⁵ by having spine throughout the body and shape of bursa but it resembles to *P.magnum*⁸ in having spines upto anterior third part of the body. However. it differs in number of hooks, shape of proboscis, number of collar spine, size of testis and size of eggs.

In the present specie, the eggs are smaller than *P.cleatus*¹³ and differs in shape of egg from *P.basiri*⁵ and *P.magnum*⁸.

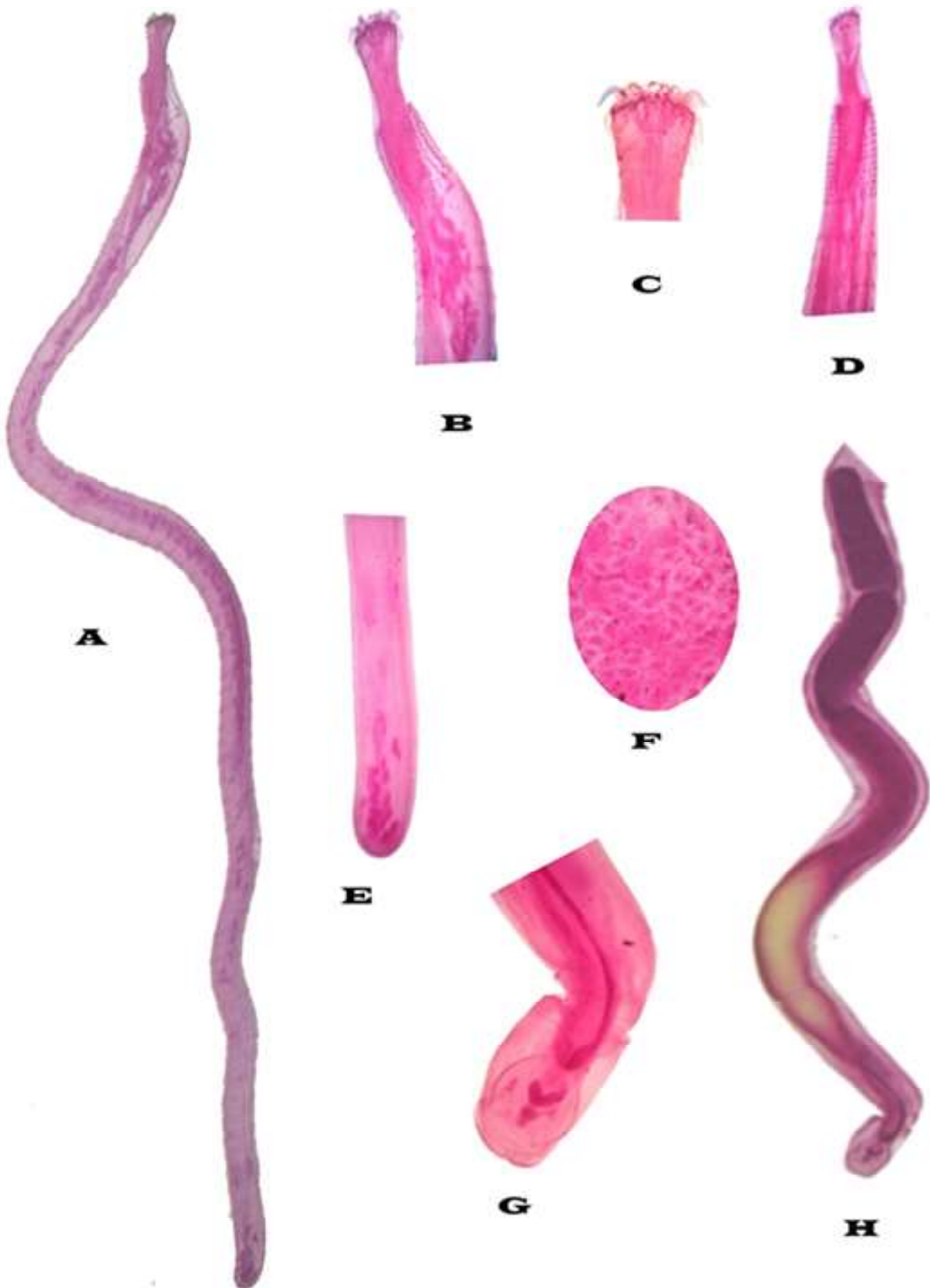


Fig. 2(A-H) : Photomicrographs of *Pallisentis heingangyensis* n. sp.

A-Whole body of Female, B - Anterior end of female, C- Enlarged end of Female proboscis, D - Anterior end of male, E - Posterior end of female showing uterus , F - Egg, G - Enlarged view of bursa and H - Posterior end of male showing anterior and posterior testis.

Due to the differences in the above mentioned morphological features differentiating between the present

from the previously described species, the specimen is proposed as a new *P.heingangyensis* n. sp. referring to the locality where the hosts were collected.

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