Uttar Pradesh J. Zool. 29(3) : 399-404, 2009 **ISSN 0256-971X**

ACANTHOCEPHALAN PARASITES OF CERTAIN FISHES FROM MANIPUR, INDIA: ONE KNOWN SPECIES OF GENUS *PALLISENTIS* AND ONE NEW SPECIES OF GENUS *ACANTHOCEPHALUS*

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The present investigation deals with the description of one known species, *Pallisentis ophiocephali* (Thapar, 1930) Baylis, 1933 from fish host *Channa striatus* (Bl.) from a new locality and description of one new species, *Acanthocephalus loktakensis* from fish host *Channa gachua* (Ham.). *A. loktakensis* differs from all species of the genus *Acanthocephalus* in the size proboscis hooks and size of roots of hooks. The hooks increase in size from the apex towards the middle and thence gradually decrease towards the base.

Key words : *Pallisentis ophiocephali, Acanthocephalus loktakensis* n.sp.,

INTRODUCTION

Pallisents ophiocephali (Thapar, 1930 Baylis 1933) (Fig. 1)

The genus *Pallisentis* was created by Van Cleave (1928) with *P. umbellatus* as its type species. Thapar (1930) described *Farzandia* as a new genus with *F. ophiocephali* as its type species. Bhalerao (1931) added *F. nagpurensis* from the fish host, *i.e. Ophiocephalus striatus.* Baylis (1933) regarded *Farzandia* a direct synonym of the genus *Pallisentis* assigned the two above mentioned species to it.

A large number of species of the genus *Pallisentis* have been reported from fresh and marine water fishes of India. Sarkar (1953) described *P. nandai* from *Nandus nandus*. In 1954, he further described *P. colisai* from *Colisa fasciatus*. Agarwal (1958) described *P. allahabadi* from *Ophiocephalus punctatus*. Farooqi (1958) described *P. basiri* from *Rhynchobdella aculeata.* Tadros (1966) described *P. buckleyi* Sahay *et al.* (1967) described *P. guntei* from a hill stream fish *Lepidocephalichthys guntea.* Saeed & Bilqees (1971) described *P. magnum.* Rai (1971) described *P. pandei* from the intestine of *Ophiocephalus punctatus*. Gupta & Gupta (1979) described *P. clupei* from *Clupea longiceps* from Quilon sea, Kerala. Gupta & Verma (1980) described *P. cavasii, P. fasciatusi* and *P. gomti.* Mithal & Lal (1981) described *P. indica* and *P. croftoni* from genus *Ophiocephalus*. Soota & Bhatacharya (1982) dealing with the validity of 10 species of genus *Pallisentis* Van cleave, 1928 from Indian subcontinent accepted only *P. ophiocephalis* (Thapar, 1930) and *P. colisai* (Sarkar, 1954) as valid species. *P. allahabadi, P. nagpurensis, P. nandai* and *P. magnum* have been synonymised with *P. ophiocephali* and remaining species with *P. colisai*. Gupta & Sinha (1991) further reported *P. fotedari* from a marine fish host *Clupea longicep* and also presented a key to the species of the genus *Pallisentis*. In the same year Koul *et al.* (1991) also reported *P. jagani* from the fish host *Channa channa* in Jammu.

During the present investigation a large number of specimens of present form were collected from the intestine of *Channa striatus* (Bl).

MATERIALS AND METHODS

The specimens collected from the lumen of intestine were freed of mucus and debris by vigorous shaking in physiological saline. The specimens were left in water for relaxation till their proboscis became fully extended. The worms were preserved in AFA fixative. For the preparation of microscopy, stains were not used as unstained specimens were sufficient for identification. The worms were cleared in lactophenol. Worms cleared in lactophenol were temporarily mounted in glycerin jelly.

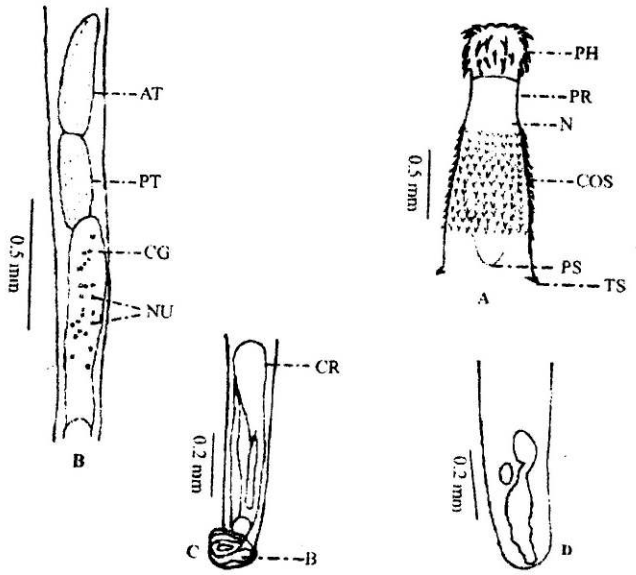

Fig.1 : *Pallisentis ophiocephali.* **A.** Anterior portion of Male; **B.** Middle portion of Male; **C.** Posterior portion of Male; **D.** Posterior portion of Female.

(AT : Anterior testis; B : Bursa; CG : Cement gland; COS : Collar spine; CR : Cement reservoir; N : Neck; NU : Nuclei; PH : Proboscis Hook; PR : Proboscis; PT : Posterior testis; PS: Proboscis sheath; TS : Trunk spine)

OBSERVATIONS

Body elongated, cylindrical, spinose, with anterior and posterior extremity slightly curved. Male worms are comparatively shorter than the female worms. Proboscis globular armed with 4 circles of recurved hooks. Similar in shape but different in size, each row having 8-10 hooks. Proboscis receptacle cylindrical, simple layered, muscular. A pair of long cylindrical unequal lemnisci projecting from the base of proboscis, hang in trunk pseudocoel. Body spination consists of collar spines and trunk spines.

Male : Body 8.76- 8.79 mm long, 0.49-O.56 mm wide. Proboscis 0.18-0.22 mm long, 0.23- 0.26 mm wide. Neck 0.21- 0.22 mm long, 0.21-0.25 mm wide. Proboscis hooks of first circle 0.07- 0.08 mm tong, second circle 0.06-0.07 mm long, of third circle 0.05-0.06 mm long, of fourth circle 0.04-0.04 long. Proboscis sheath 0.56-0.745 mm

long and 0.24-0.27 mm wide. Lemnisci long, slender and unequal in length. Shorter lemniscus 0.46 mm long and longer lemniscus 0.9 mm long. Collar spines 13-15 rows with 14-24 in each. Trunk spines in 24-27 rows with 10-20 in each. Testes unequal, elongated, overlapping. Anterior testis 0.61-1.08 mm long, posterior testis smaller than anterior testis, 0.54-0.85 mm long. Cement gland 1.181-2.0 mm long, 0.19-0.28 mm wide with 23-24 nuclei. Cement reservoir elongated, 0.47-0.63 mm long, 0.19-0.22 mm wide, open by pair of duct in bursa. Seminal vesicle 0.5-0.59 mm long, 0.07-0.16 mm wide.

Female **:** Body 9.96-10.76 mm long, 0.41-0.52 mm wide. Proboscis 0.21-0.22 mm long, 0.25-0.26 mm wide. Neck 0.2-0.22 mm long, 0.21-0.22 mm wide. Proboscis hooks of first circle 0.08-0.09 mm long, of second circle 0.07-0.07 mm long, of third circle 0.05- 0.06 mm long, of fourth circle 0.04- 0.05 mm long. Proboscis sheath 0.46-0.75 mm long, 0.22-0.28 mm wide. Short lemniscus 0.945-1.8 mm long and longer lemniscus 1.09-1.75 mm long. Collar spines 13-13 with 20 in each row. Trunk spines 58-64 with 10-24 in each. Eggs 0.06-0.08 mm long, 0.04-0.07 mm wide.

DISCUSSION

Soota & Bhatacharya (1982) considered *P. ophiocephali* and *P. colisai* as valid species due to absence of saefttigen's pouch in all the species reported from the subcontinent. Gupta & Sinha (1991) differ from the view of Soota a & Bhatacharya (1982) regarding their statement of absence of saefftigen' s pouch in all the species reported from the subcontinent. The authors mentioned that this structure was present in *P. magnum* and *P. kalriai.* According to them other authors *viz.* Farooqi (1958), Sahay)' et al. (1967), Gupta & Verma (1980) and Mithal & Lal (1981) observed the presence of saefftigen' s pouch. They further mentioned that Khan & Bilqees (1987) while describing *P. sindensis* from *Channa striatus* from Kinjhar lake (Pakistan), did not agree with Soota & Bhatacharya (1982) for recognizing only two species valid namely *P. ophiocephali* and *P. colisai.* Because according to authors important diagnostic characters such as number of proboscis hooks, number of collar spines, size of proboscis hooks and size of eggs were not considered for differentiation of species.

The present from comes under the family Quadrigyridae Van Cleave, 1920 due to the following characters: body small to medium sized, elongate; proboscis globular to elongate with few hooks in spiral rows; trunk spines in circular rows, limited in anterior third of the body, may reach mid body region or beyond it; lemnisci long filiform. The present form comes under the genus *Pallisentis* due to division of trunk spines into two separate regions.

Bhatacharya (1997) also mentioned a key for the identification of the and species of the genus *Pallisentis* in his Ph.D. thesis. He laid emphasis on the way of diminishing of proboscis hooks. In *P. ophiocephali* size of proboscis diminishes gradually towards base while in *P. colisai* these diminishes abruptly at the base of proboscis.

In the present form the size of proboscis hook diminishes gradually toward base also resembles in further characters mentioned by Bhatacharya (1997) *i.e.* size ratio of between second and third circles of hooks 1 : 1.4, cement gland nuclei 16 or more.

Hence, on the basis of the above mentioned characters, the present form is assigned as *P. ophiocephali.*

Host	:	*Channa striatus*
Habitat	:	Intestine
Locality	:	Loktak Lake, Bishnupur District, Manipur

Remarks **:** The difference in measurement from other description of *P. ophiocephali* with tile present form considered to be intra specific in nature. This is the first report from Manipur.

Acanthocephalus loktakensis n. sp. (Fig. 2)

The genus *Acanthocephalus* was erected by Koetreuther in 1771 with type species *A. anguillae* (Muller, 1780) Luhe, 1911. Since the erection of the genus a number of species have been reported from fish, amphibian and reptilian hosts from different parts of the world. There is only one earlier report of the present genus from India from the fish host *Schizopygopsis stoliczkae* by Datta (1936) *viz. A. kashmirensis* n.sp. Datta & Soota (1956) reported *A. kahulensis* n. sp. from an amphibian host *Rana* sp., Kabul, Afghanistan. Golvan (1960) proposed a new family Paracanthocephalidae for this genus and *Fresnyarhynchus* Yamaguti, 1963 preferred to regard *Paracanthocephalus* as a synonym of Acanthocephalus. Jain *et at.* (1982) reported *A. goaensis* from a marine fish *Pristipona hasta* from Goa. Bhatacharya (1997) reported *A. manipurensis* n. sp. From an amphibian host *Bufo* sp. from Manipur.

During tile present investigation only one male specimen of a new form was collected from the intestine of fish host *Channa gachua.*

OBSERVATIONS

Body small, ventrally curved, trunk nearly cylindrical. 4.7 mm long and 0.625 mm wide. Neck short, 0.125 mm long and 0.3 mm wide. Proboscis cylindrical, 0.45 mm long and 0.3 mm wide. Proboscis hooks 14 rows with 5 hooks in each row, all hooks are unequal in size. H1-0.08 mm long, H2-0.09 mm long, H3-0.09 mm long, H4-0.09 mm long H5-0.08 mm long. Roots of hooks measure 0.06-0.07 mm long and 0.016-0.02 mm wide. Proboscis sheath cylindrical, 0.5 mm long and 0.25 mm wide. Lemnisci longer than proboscis sheath, unequal, shorter lemniscus, 0.55 mm long and 0.125 mm wide; longer lemniscus 0.75 mm long and 0.125 mm wide. Testes post equatorial, tandem, anterior testis, 0.5 mm long and 0.3 mm wide Posterior testis longer than anterior testis, 0.55 mm long and 0.3 mm wide. Cement gland six, elongated, compact, as a mass, 0.25-0.375 mm long and 0.075-0.1 mm wide. Muscular sac meets bursa. Bursa, 0.25 mm long and 0.375 mm wide.

DISCUSSION

The present form is assigned to the family Echinorhynchidae Cobbold, 1879 due to the presence of compact or pyriform cement gland. It belongs to the sub family Echinorhynchinae Travassos, 1920 in having lemnisci more or less clavifonn. Further it is included under genus *Acanthocephalus* Koelreuther, 1771 due to small size body, trunk nearly cylindrical, short neck, proboscis fairly long ovoid, hooks increase in size from the

apex towards the middle and thence gradually decrease the base, testes tandem, cement glands 6, close together in tandem pairs.

The present form comes closer to *A. ranae* (Schrank, 1788 Luhe, 1911 with respect to number of proboscis hooks but differs in size of proboscis hooks and size of roots of hooks. Moreover, *A. ranae* has been reported from only amphibian hosts barring some reports from reptilian hosts. The present form diners from *A. kabulensis* Datta & Soota, 1956 in having 14 rows of 5 hooks in each row while 7-9 rows with 4-7 hooks per row in the latter. *A. kabulensis* has also been reported from an amphibian host. *A. kashmirensis* Datta, 1936 differs from the new form as it has 13-18 rows with 6-8 hooks per row *A. lucidus* Van Cleave (1925) has size of proboscis but in present form the hooks increase in

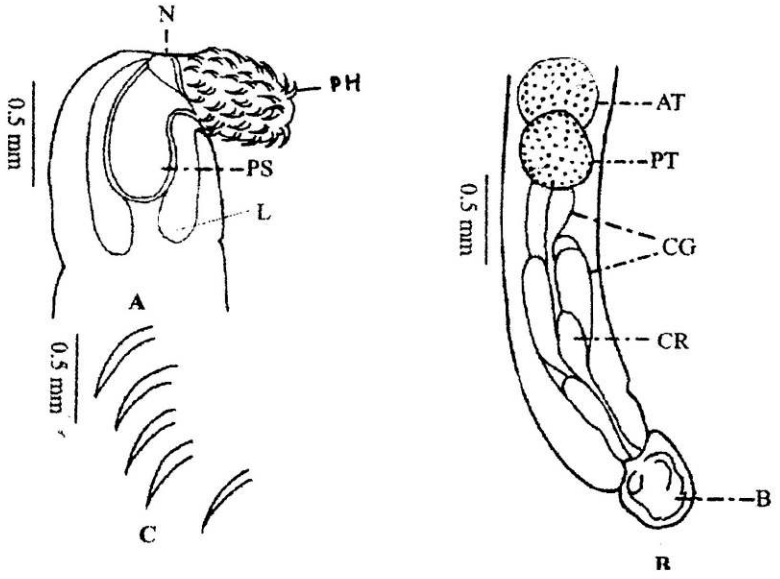

Fig.2 : *Acallthocephalus loktakensis* n.p. **A.** Anterior portion; B. Postenor portion; **C.** Hooks

(AT: Anterior testis; B: Bursa; CO : Cement gland; CR: Cement reservoir; L: Lemnisci; N: Neck; PH: Proboscis Hook; PT : Posterior testis; PS: Proboscis Sheath)

size from the apex towards the middle and thence gradually decrease towards the base. The present form differs from *A. goaensis* in the number of proboscis hooks and roots of hooks.

The present form also differs from *A. manipurensis* n. sp. Bhatacharya, 1997 in not having similarity in size of proboscis hooks of different rows.

In view of all these difference this form is considered new to science and named *Acanthocephalus loktakensis* after the name of the locality where the host found.

Host	:	*Channa striatus*
Habitat	:	Intestine
Locality	:	Lóktak Lake, Bishnupur District, Manipur

Remarks : The present report is the third report of this genus from Indian fish host, and second report from fresh water fish host of India.

ACKNOWLEDGEMENT

The authors are indebted to the Director. Zoological Survey of India, Kolkata for giving laboratory facilities. Thanks are also due to Dr. S.B Bhatacharya of ZSI for identifying the specimens and to University Grants Commission, New Delhi for granting a major research project to the first author.

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