

THE OCCURRENCE OF A SPINY-HEADED WORM PALLISENTIS NANDAI IN NANDUS NANDUS FROM PONDS INSIDE CHANDPUR FISHERIES CAMPUS

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Examination of 89 specimens of *Nandus nandus* collected from a pond inside Chandpur Fisheries Campus, East Pakistan, revealed the presence of the worm, *Pallisentis nandi*, in cysts attached to visceral organs, mainly the liver and the wall of intestine. Their percentage of incidence and infection intensity, recorded monthwise, did not show any seasonal variation during the period from November 1965 to April 1966. Morphological features of this species were compared with those of the other species namely *Pallisentis ophicephali* found in the fishes of the family Ophicephalidae. Massive infestation with this worm did not, however, cause any apparent detriment to the host and in none of the 89 specimens there was any appreciable pathological effect.

Introduction

The Acanthocephalans or spiny-headed worms are all endoparasitic, found in all classes of vertebrates, though especially in fishes and birds. *Nandus nandus* is a common fish found in the ponds, 'beels' ditches, canals and other fresh-water areas in East Pakistan. The fish is of predatory nature with a large mouth feeding on small fishes and other fish food organisms. The genus *Pallisentis* is represented by only one species, *Pallisentis nandi* in *Nandus nandus*. The worms are located in cysts attached to visceral organs mainly the liver and wall of intestine. The present paper is intended to discuss briefly the occurrence of *Pallisentis nandi* in *Nandus nandus*, examined during the period from November, 1965 to April, 1966.

Materials and Methods

Fish specimens were collected from the ponds and ditches inside Fisheries Campus at Chandpur, Comilla. These were dissected fresh and all the affected areas in the viscera were examined and the worms were collected with the aid of fine forceps. Complete counts of the worms were made in all the cases. Most of the specimens have been observed to evert proboscis spontaneously in a few hours time when left in a dish of tapwater. For identification specimens with fully everted scolex were examined under a binocular microscope with magnification 3×12.5 . The identification was based on characters of the proboscis armature, trunk spination, cement glands etc. Whole specimens were stained in Granacher's borax carmine and mounted in Canada balsam. The incidence and intensity were recorded monthwise.

Experimental Results

89 specimens of *Nandus nandus* were examined during the period from November, 1965 to April,

1966 out of which 88 specimens were found infested. The lone exception was in the month of December, 1965 when 12 fish specimens were examined. Table 1 shows the number of hosts examined and the number infected in each month with their intensity of infestation. 98.8% of the 89 specimens of *Nandus nandus* were infected. The overall average intensity of the parasite in the host was found to be 23.1 during the period of investigation. In few cases over 80 worms were found to harbour the liver and the intestinal wall of the individual. In no instance was an individual *Nandus nandus* infected with more than one species of *Pallisentis*.

Description of the Species.—Proboscis (Fig. 1) invaginable, armed with 4 rows of 10-12 hooks in each row arranged in alternating radial rows. The hooks in the anterior rows are stouter and longer than those in the posterior rows. The structure and arrangement of the proboscis hooks are shown in Fig. 2. The hooks of the first row at the anterior end measure about 0.07 mm in length. The neck is devoid of hooks or spines. The trunk is spined, divided into two distinct regions. A thickly banded zone is formed by 13-15 circles of about 16-20 spines at the anterior end of the trunk. While the remainder of the trunk excepting a small portion at the posterior extremity is provided with widely spaced rings of spines. Proboscis receptacle present. Lemnisci two; long, cylindrical. Testes of two elliptical lobes. Cement glands long, cylindrical, syncytial containing a number of nuclei. The vagina of the female is at the posterior end of the animal (Fig. 3). Males measure from 7 to 11.5 mm while the females measure from 8 to 13 mm in length. The length of the proboscis measures from 0.23 mm to 0.30 mm and the same being not proportional with the total length of the parasite. The maximum breadth varies from 0.5 to 0.6 mm in male and 0.60 to 0.66 mm in female. Total length, length of the proboscis, neck, spiny girdle etc. of *Pallisentis nandus* well as those of *Pallisentis ophicephali* are shown in Table 2.

TABLE I.—INCIDENCE AND INTENSITY OF *Pallisentis nandi* IN *Nandus nandus*.

Months of observation	No. of host		% of	
	Examined	Infected	Incidence	Intensity
November, 1965	11	11	100	10.6
December, 1965	12	11	91.6	14.9
January, 1966	32	32	100	25.9
February, 1966	14	14	100	25.1
March, 1966	13	13	100	33.5
April, 1966	7	7	100	20.1

Discussion

Several species of *Pallisentis* have been recognised in India. These are; *P. allahabodi* (Agarwal, 1958) in *Ophicephalus punctatus*, *P. basiri* (Farooqi, 1958) in *Rhynchobdella aculeata*; *P. colisai* (Sarkar, 1956) in *Colisa faciatius*; *P. gaboos* (MacCallum, 1918; Van Cleave, 1928) in *Ophicephalus striatus*; *P. nandi* (Sarker, 1953) in *Nandus nandus*; *P. nagpurensis* (Bhalerao, 1931; Baylis, 1933) in *O. striatus* and *P. ophicephali* (Thaper, 1930) in *Ophicephalus marulius*. Other species were *P. cleatus* (Van Cleave, 1928; Harada, 1935) in *Monopterus javanensis*, *Anguilla pekinensis* and *Parasilurus asotus* from China and also in *Anguilla japonica*, *Parasilurus asotus* and *Amyda species* from Korea. In course of the present investigation with fresh water fishes of East Pakistan, the authors came across only two species i.e. *P. ophicephali* in *Ophicephalus striatus* and *P. nandi* in *Nandus nandus*. The two species are almost identical but differing from each other by the number of rows forming the spiny girdle and the size of the specimens. The number of rows of spines forming the girdle in *Pallisentis nandi* varies between 13 and 15, the most frequent number being 14. While the same in *Pallisentis ophicephali* varies between 15 and 16, the most frequent number being 16. The total length of *Pallisentis ophicephali* unlike that of *P. nandi* varies very widely between males and females. The males usually measure from 6.5 to 12.0 mm and the females from 11.5 to 28.0 mm in length.

In many cases the presence of Acanthocephalans is correlated with an unhealthy state of the host. In some cases massive infections with acanthocephalans have been reported without apparent detriment to the host. Exactly how many ways the *Pallisentis* species can injure their host remains in doubt. The main type of injury in this case is principally caused by the proboscis hooks which remain attached to the hosts tissue. The numerous worms which remain attached to the liver do cause injury and inflammation at the point of attachment of the spiny proboscis. But in none of the 88 infected specimens of *Nandus nandus* there was any appreciable pathological effect.

Excepting in December 1965, the incidence of *Pallisentis* was cent per cent in all the months of observation commencing from November, 1965. The mean number of *Pallisentis nandi* per infected host varied between 10.6 and 33.5 in different months. There appears to be little or no seasonal change in the percentage of incidence and intensity of infestation by *Pallisentis nandi* in *Nandus nandus* examined during November, 1965 to April, 1966. The incidence and intensity of these worms have not been recorded for the rest of the

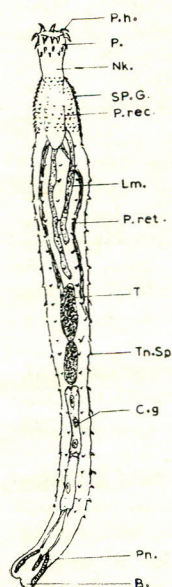


Fig. 1.—Entire view of *Pallisentis nandi* (male). (P.h., Proboscis hook; P., Proboscis; Nk., Neck; sp. G., spiny girdle; P. rec., Proboscis receptacle; Lm., Lemniscus; P. ret., Proboscis retractor; T., Testis; Tn. Sp., Trunk spines; C.g., Cement gland; Pn., Penis; B., Bursa.)



Fig. 2.—Structure and arrangement of proboscis hooks in *Pallisentis nandi*. (P.h., Proboscis hook; R.P.h., Root of proboscis hook; P., Proboscis; Nk., Neck.)

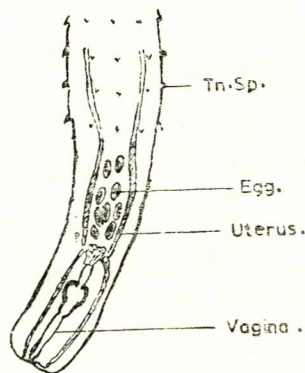


Fig. 3.—Posterior extremity of *Pallisentis nandi* (female). (Tn. Sp., Trunk spines).

TABLE 2.—MEASUREMENTS OF VARIOUS PARTS OF *Pallisentis nandi* AND *Pallisentis ophicephali*.

Parasite	Sex	Specimen No	Total length (mm)	Proboscis length (mm)	Neck length (mm)	Length of spiny girdle (mm)	Max. diameter (mm)	No. of rows of spines in the girdle
<i>Pallisentis nandi</i>	Male	1	6.2	0.27	0.23	0.42	0.50	14
		2	7.1	0.23	0.22	0.47	0.50	15
		3	9.5	0.25	0.27	0.50	0.60	13
	Female	1	9.5	0.25	0.23	0.55	0.62	15
		2	10.3	0.23	0.23	0.55	0.66	15
		3	11.5	0.30	0.22	0.52	0.60	15
<i>Pallisentis ophicephali</i>	Male	1	7.6	0.22	0.28	0.46	0.55	15
		2	9.5	0.25	0.25	0.52	0.50	15
		3	11.0	0.23	0.25	0.57	0.66	15
	Female	1	14.9	0.25	0.25	0.58	0.63	16
		2	18.0	0.28	0.31	0.62	0.73	16
		3	22.5	0.23	0.33	0.74	0.71	16

months from May to October. It is, therefore, not possible at this stage to predict any seasonal variation of their incidence and intensity. Statistical analysis of the data did not reveal any correlation between season and incidence of the parasite.

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