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On the occurrence of trypanosomes in the blood of some freshwater teleosts of Lucknow (U.P.), India

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Abstract. Out of 2150 specimens of freshwater teleosts observed for the presence of haemoflagellate in their blood only 75 (3·48%) were found to be infected by trypanosomes. Siluroids were infected in higher numbers than others and the infection was found in blood only during winter months.

Keywords. Piscine; haemoflagellates; parasite; fish hematology.

1. Introduction

Distribution of piscine trypanosomes has been well reported from many parts of the world (Kudo 1923; Laird 1951; Saunders 1959; Baker 1960; Abolarin 1970; and So 1972) including the Indian sub-continent (De-Mello and Valles 1936; Quadri 1955, 1962; Hasan and Qasim 1962; Tandon and Joshi 1973). But not much is known regarding the wider distribution of this haemoflagellate parasitising the freshwater fishes of India. This paper deals about the instances of infections encountered by the author during the period 1970–73, while making haematological studies and a survey for the occurrence of any such haemoflagellate(s) in the freshwater teleosts of Lucknow.

2. Materials and methods

Live fishes were obtained from their local habitats around Lucknow, from river Gomati, Chinhat Lake and various ponds of the suburb. The observations were made round the year. A total of 2150 fishes were observed, which belonged to 34 species of 13 families and 7 orders of the class Teleostomi. The systematic position of these fishes is based mainly on the revised classification of Misra (1959), for Indian fishes. The presence of trypanosomes in the blood of various fishes was noted from the Leisman's or Wright's stained preparations. The number of parasites present in each stained blood slide were counted under high power of

microscope. This was done to ascertain the intensity of infection, within an individual specimen.

3. Results and discussion

Data given in table 1, for 2150 specimens of freshwater fishes reveal the following.

(i) A total of 75 fishes of 13 species and 8 families contained trypanosomes in their blood. Of these 58 belong to suborder Siluroidei. It shows that the siluroid fishes which are devoid of scales on their outer skin are more prone to trypanosome infection. This is mainly due to easy approach of the intermediate host (the leeches) to the skin of these fishes.

(ii) The highest rates of infection were in *C. gachua* (20%), which however, seems to be incidental since only out of 20 fishes examined 4 were found hosting these parasites.

(iii) The high intensity of infection (about 30–60 trypanosomes per slide) was observed in *N. notopterus, H. fossilis, C. batrachus* and *C. gachua.* Three species (*P. stigma, M. vittatus* and *C. punctatus*) showed mild (15–28 trypanosomes per slide) infection and rest of the six species (table 1) viz., *Mystus aor, M. seenghala, Mastacembelus armatus, W. attu* and *L. bata* had poor (3–12 parasites each slide) infection.

A comparative cyto-morphological characteristics of trypanosomes drawn out from the stained blood smears of these fishes (Tandon and Joshi 1973; Joshi 1973) conspicuously show that out of the 13 species of fishes four (*W. attu, M. armatus, H. fossilis* and *N. notopterus*) were parasitised by the same species of *Trypanosome* viz., *T. danilewskyi* var. nov. *T. saccobranchi* (Quadri 1962) but the rest of the 9 host species contained 9 new species of trypanosomes, of which 2 new species have already been reported (Tandon and Joshi 1973). Besides, this is the first report on trypanosomiasis in *N. notopterus, P. stigma, C. mrigala, L. bata, W. attu, M. aor, M. seenghala, C. gachua* and *M. armatus.* None of the host fish was found to have multispecies infection, though polymorphism was found in a few cases (Joshi 1973).

3. It would be useful to mention here, that all these instances of haemoflagellate infections were found only during the colder months of the years 1970–73, (November, December, January and February), though the observations and screening of the blood smears were made round the year. This is mainly because during these months, water in ponds, lakes and rivers remains most quiescent, highly oxygenated (0·182–0·365 ml/L of O_2) least turbid and warm (6–18° C), and more transparent (Joshi 1973; Jhingran 1975). Ecophysiologically these conditions would appear to be more suitable for the propagation of the intermediate host (the leeches) and probably to the parasites too. It is suggested that further surveys be made all over the country for the possible distributions of these haemoflagellates since, these cause considerable physiological disorders in fishes (Tandon and Joshi 1973, 1974).

Table 1. Instances of trypanosome infection in some freshwater fishes (Class—Teleostomi).

Species and taxonomic position		No. of fishes examined	No. of infected fishes	Infection per cent	No. of parasites observed/ slide (range)*
1		2	3	4	5
Order—Clupeiformes					
Suborder—Notopteroidei					
Family—Notopteridae					
Sps.	*Notopterus notopterus*	50	4	2·6	30–50
	N. Chitala	70	..	..	..
Order—Cypriniformes					
Div.—Cyprini					
Suborder—Cyprinodei					
Family—Cyprinidae					
Sps.	*Chela gora*	55	..	..	..
	Esomus danrica	40	..	..	..
	Amblypharyngodon mola	40	..	..	..
	Rasbora daniconius	37	..	..	..
	Puntius sophore	49	..	..	..
	P. ticto	28	..	..	..
	P. stigma	46	1	2·1	15–28
	Cirrhina mrigala	60	1	1·6	..
	Labeo rohita	70	..	..	..
	L. bata	82	1	1·2	5–12
	L. fimbriatus	46	..	..	..
	L. calbasu	46	..	..	..
	L. diplostomum	4	..	..	..
Div.—Siluri					
Suborder–Siluroidei					
Family—Siluridae					
Sps.	*Wallago attu*	65	2	3·0	5–7
	Ompoak bimaculatus	37	..	..	..
Family—Saccobranchidae					
Sps.	*Heteropneustes fossilis*	180	22	11·1	30–48
Family—Clariidae					
Sps.	*Clarias batrachus*	200	28	14·0	30–56

* At least for three slides, in cases where only one specimen was found parasitised.

Table 1 (*Contd.*).

1		2	3	4	5
Family—Bagridae					
Sps.	*Mystus aor*	40	1	2·5	5–12
	M. bleekeri	51	..	..	..
	M. seenghala	64	3	4·6	..
	M. vittatus	100	2	2·0	15–20
	Rita rita	107	..	..	..
Family—Sisoridae					
Sps.	*Bagarius bagarius*	60	..	..	..
Order—Beloniformes Suborder—Scomberesocoidei Family—Belonidae					
Sps.	*Xenentodon cancila*	71	..	..	..
Order—Ophiocephaliformes Family—Ophiocephalidae					
Sps.	*Channa punctatus*	160	5	3·1	20–24
	C. gachua	20	4	20·0	40–60
Order—Symbranchiformes Suborder—Symbranchoidei Family—Amphiponidae					
Sps.	*Amphipnous cuchia*	8	..	..	..
Order—Perciformes Suborder—Percoidei Family—Nandidae					
Sps.	*Nandus nandus*	34	..	..	..
Family—Anabantidae					
Sps.	*Anabas testudineus*	90	..	..	..
	Colisa fasciatus	64	..	..	..
Order—Mastocembeliformes Family—Mastocembelidae					
Sps.	*Mastocembelus armatus*	40	1	2·5	3–8
	Macrognathus aculeatum	36	..	..	..
	Total	2150	75	3·48	

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