STUDIES ON METACERCARIA OF FRESHWATER FISHES OF INDIA

VIII. On Two New Species of Neascus Hughes, 1927

BY K. C. PANDEY, Ph.D.

(Lecturer, Zoology Department, Lucknow University, Lucknow, India)

Received November 4, 1969

(Communicated by Dr. B. S. Chauhan, F.A.SC.)

ABSTRACT

Neascus channi and N. xenentodoni are described from the Cranium of freshwater fishes Channa punctatus (Bloch) and Xenentodon caneiila (Hamilton) respectively. The former is characterised by ratio of its suckers, position of ventral sucker, pattern of reserve excretory system and by absence of a cyst while the latter chiefly differs from all the known species of Neascus by ratio of fore-and hind-body, by ratio of suckers and by presence of a cyst.

With a view to examining fishes of “Kukrail” (a tributary of river Gomti) for larval flukes, the author collected on 20th January 1964, with the help of a fisherman, five specimens of Channa punctatus (Bloch). These fishes when examined in the laboratory were all found infected with metacercariae of the Neascus group of Strigeid larvae. The maximum number of metacercariae obtained from a host specimen was three. Unfortunately, this metacercaria could not be obtained again from C. punctatus, although specimens of this fish were collected several times from “Kukrail”. Thirty-two specimens of the fish, C. punctatus (Bloch), were also examined from various natural water reservoirs present round about Lucknow, besides three hundred and eighteen specimens purchased from the fish market, but none was found infected with this metacercaria. The infection of this metacercaria appears to be quite rare in the fish as only once this metacercaria was found in five specimens collected from “Kukrail”. The present metacercaria differs from all the known species of larval genus Neascus and it is, therefore, described below as a new species.

Neascus channi N. sp.

The metacercariae were found free inside the cranium of the host. They performed active moments of contraction and elongation, when taken out in
Studies on Metacercaria of Freshwater Fishes of India—VIII

saline. Some of the metacercariae occasionally showed twisting movements of their bodies. The body (Fig. 1) is aspinose, foliaceous with a well-marked fore-body and a hind-body. The fore-body tapers anteriorly but broad posteriorly and measures $0.50-0.82$ mm. in length and $0.33-0.39$ mm. in maximum width. The hind-body is much smaller as comparison with the fore-body and appears as a mere appendage of the latter. It is $0.16-0.22$ mm. long and $0.15-0.19$ mm. in maximum width in the middle region.

![Fig. 1](image1.png) ![Fig. 2](image2.png)

**Figs. 1–2.** Fig. 1. *Neascus channi* n. sp. Ventral view of a metacercaria (drawn from a live specimen). Fig. 2. *N. channi* n. sp. Ventral view of a metacercaria showing the excretory canals of the reserve system (drawn from a live specimen).

The oral sucker is terminal and measures $0.03-0.06$ mm. in diameter. The ventral sucker is slightly larger than the oral sucker, located near about the junction of the middle and posterior third of the fore-body, and measures $0.04-0.05$ mm. in diameter. The pseudosuckers are absent. The hold-fast organ is strongly developed, circular in outline and much larger than ventral sucker. It is located at the hind end of the fore-body behind the ventral sucker. At the posterior border of the hold-fast organ are present the hold-fast glands in the form of two separate masses. The mouth leads through a short pre-pharynx into a small and feebly muscular pharynx. A short oesophagus is present. The intestinal caeca are long and extend upto the end of hind-body. They are thin-walled and better seen in live specimens. The gonads (Fig. 1) are in the incipient stage of development. They are represented by three masses one large and two small, of deeply stainable cells, located in the hind-body. The bursa copulatrix is oval and located at the posterior end of the hind-body.

A small triangular excretory bladder (Fig. 2) is located at the posterior end of the body and opens outside by the terminal excretory pore. The excretory canals are considered under two subdivisions, viz.,

1. A primary system of excretory canals (or flame cell system),
2. A reserve system of excretory canals (or secondary excretory system),
The primary system of excretory canals is greatly obscured by the extensive development of the reserve system which is fairly clear. The excretory canals of the reserve system (Fig. 2) are as follows: Two main reserve excretory canals arise, one on each side, from the cornua of the excretory bladder and run anteriorly along the lateral regions of the body upto the level of the oral sucker where they are joined by a transverse canal. From this transverse canal arise one median and four lateral longitudinal canals. The median longitudinal canal runs posteriorly along the median line of the body upto the posterior border of the hold-fast organ where it divides into two longitudinal canals which are interconnected by two cross-connections and eventually open into the anterior side of the excretory bladder. There are three transverse canals connecting the median longitudinal canal with the main reserve excretory canals. Of these three transverse canals, the first one occurs slightly in front of the ventral sucker, the second one at the posterior border of the ventral sucker, while the third one at the posterior border of the hold-fast organ or at the junction of the fore- and hind-body. The four lateral longitudinal canals arising, two on each side, from the transverse canal in the anterior part of the body, run posteriorly slightly ahead of the ventral sucker where they open into the first transverse canal. These lateral longitudinal canals of each side are further connected with one another, with the median longitudinal canal, and also with the main reserve excretory canal of their own side by short transverse canals usually nine in number. The whole system forms a network-like pattern. Small round excretory concretions of different sizes are present in the fluid contained in all the canals of the reserve excretory system. This fluid with the concretions is ejected, off and on, through the excretory pore.

Discussion:—Since Hughes (1927) created the larval group "Neascus" for strigeid metacercariae a large number of species have been described from different parts of the world. The present form resembles closely Neascus grandis Muller and Van Cleave, 1932, N. vetastai Kaw, 1950, N. pyriformis Chandler, 1951, N. nolfi Hoffman, 1955 and N. chelai Khera, 1958. The present form differs from N. grandis and N. vetastai by the post-equatorial position of the ventral sucker. It differs from N. nolfi and N. pyriformis by ratio of suckers and from N. chelai by being a distome.

Neascus xenentodoni N. SP.

One specimen of Xenentodon cancila (Hamilton), out of three obtained from the fish market on 29th July, 1963, was found infected with metacercarial cysts; the site of infection being the liver. Subsequently, more specimens of this fish were obtained, from time to time, from the market and
examined in the laboratory. Fortunately, on 11th September, 1963, two more specimens were found infected with cysts containing the said metacercaria. In all seventeen fishes were examined, but only three were found infected. Usually, the cysts were superficially placed so as to be visible from outside as small pimples, but some were found buried deep into the hepatic tissue. A study of this metacercaria showed it to belong to the strigeid larval genus *Neascus* and described here as a new species.

The cysts (Fig. 3) are oval to round in outline, devoid of pigments, measuring 0.52–0.67 mm. in diameter. They contained a dense fluid besides the metacercariae. The cyst wall is thin being parasitic in origin and larger than the metacercaria which freely performs active movements while within the cyst. The body (Fig. 4) is aspinose and divisible into a large leaf-like fore-body and a small bluntly pointed hind-body; the former measures 0.67–1.05 mm. × 0.24–0.30 mm., while the latter measures 0.18–0.30 mm. × 0.14–0.27 mm. The ventral sucker is larger than oral sucker, located in the post-equatorial region of the fore-body and measures 0.04–0.07 mm. in diameter. The lateral pseudosuckers are absent. The hold-fast organ is located in the hind part of the fore-body. The gland associated with the hold-fast organ is an elongated mass, placed adjoining the posterior border of the latter.

The pharynx being absent, the mouth directly leads into a short oesophagus. In mounted specimens, the intestinal caeca are not clearly traceable,

Figs. 3-5. Fig. 3 *N. xenentodon* n. sp. Encysted metacercaria (drawn from a live specimen). Fig. 4. *N. xenentodon* n. sp. Ventral view of a metacercaria (drawn from a live specimen). Fig. 5. *N. xenentodon* n. sp. Ventral view of a metacercaria showing reserve excretory system (drawn from a live specimen).
but in live specimens they were seen extending up to the end of the hind-body. The rudiments of gonads are confined to hind-body. They are in the incipient stage of development and represented by three dark staining masses of cells. The bursa copulatrix is oval and located at the end of the hind-body.

The excretory system of this form conforms to the usual type found in the *Neascus* group. The excretory bladder is V-shaped (Fig. 5) located at the hind end of the body and opens outside by a terminal excretory pore. The two main collecting canals of primary system originate, one on each side, from the cornua of the excretory bladder and run through the lateral fields of the body—these could only be traced up to the level of the ventral sucker. Other details of the primary system could not be made out.

The reserve system consists of two main reserve excretory canals. One on each side of the body, arising from the cornua of the excretory bladder. They run in the lateral fields almost up to the level of the oral sucker where they are connected with each other by a short transverse canal. One median and two lateral longitudinal canals arise from this transverse canal. The median longitudinal canal runs posteriorly along the middle line of the body up to a level slightly ahead of the excretory bladder where it is connected with the main reserve excretory canal of each side by another transverse canal. Just in front of this transverse canal one more direct connection by a transverse canal exists between the median longitudinal canal and main reserve excretory canal of each side. The two lateral longitudinal canals run backwards and, behind the posterior border of the hold-fast organ where they are connected by two transverse canals with the median longitudinal canal and also with the main reserve excretory canals of their own side. In front of the hold-fast organ there are three similar transverse canals. Direct connections by three short transverse canals are found on each side between the main reserve excretory canal and lateral longitudinal canal of that side. Beside these prominent canals, a number of extremely fine canals connect the main reserve excretory canals with the median and lateral longitudinal canals. All the canals of the reserve system contain a transparent fluid laden with oval or round concretion of various sizes.

Discussion:—Only three species, viz., *Neascus vetastai* Kaw, 1950, *Neascus chelai* Khera, 1956 and *Neascus elongatus* (Singh, 1957) n. comb. (excluding the one described in preceding pages by the writer) have been described from India. The present form chiefly differs from *N. vetastai* by absence of a pharynx, from *N. chelai* in being a distome and from *N. elongatus* by having its body divided into two distinct regions and by absence of a pharynx.
This form also differs from *N. channi* n. sp. in having the hold-fast gland in the form of one mass and by absence of a pharynx.

**Key to the Indian Species of Neascus Hungnes, 1927**

I. Ventral sucker absent .... *N. chelai* Khera, 1958.
   Ventral sucker present ............ II

II. Hold-fast gland in two masses .... *N. channi* n. sp.
   Hold-fast gland in one mass ........ III

III. Genital rudiment in one mass .... *N. elongatus* (Singh, 1957) n. comb.
   Genital rudiment in three masses .... IV

IV. Oral sucker equal to ventral sucker.... *N. vetastai* Kaw, 1950.
   Oral sucker larger than ventral sucker.... *N. Xenentodoni* n. sp.

**Acknowledgements**

I am indebted to Dr. S. C. Baugh for guidance, to Prof. M. B. Lal, Head, Zoology Department now Vice-Chancellor of Lucknow University for laboratory facilities and to Dr. B. S. Chauhan, Deputy Director, Zoological Survey of India, for his valuable advices and sparing sometime to go through the manuscript. I am also thankful to Government of India for awarding a Research Training Scholarship.

**References**


