ACANTHOCEPHALA FROM INDIA.

II. On a new genus of Acanthocephala of the family Rhadinorhynchidae, from a local fish, *Pangasius pangasius* (Ham.)

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While examining the intestines of *Pangasius pangasius* (Hamilton) from one of the local markets at Calcutta in August 1938, I found 5 acanthocephalan worms. Out of twelve fishes only two harboured the parasites, 3 in one (all males) and 2 in the other (one male and one female). They were all fixed, stained and mounted on a slide. The worms belong to the family Rhadinorhynchidae but do not tally completely with the descriptions of any of the known genera. A new genus *Mehrarhynchus* is, therefore, proposed for these worms, with the new species, *Mehrarhynchus prashadi* as its genotype.

Mehrarhynchus, gen. nov.

Generic diagnosis.—With the characters of the family Rhadinorhynchidae; body of small size with long, cylindrical proboscis, armed with fine recurved hooks; with a short neck devoid of spines; anterior region of the body armed with regular rows of small, triangular spines in both sexes; proboscis-sheath double layered muscular sac; central nerve ganglion situated in the wall of the proboscis-sheath a little away from its posterior end; lemnisci long, filamentous and bifurcated near the end; prostatic glands four, club-shaped masses. Adult in the digestive tracts of fishes.

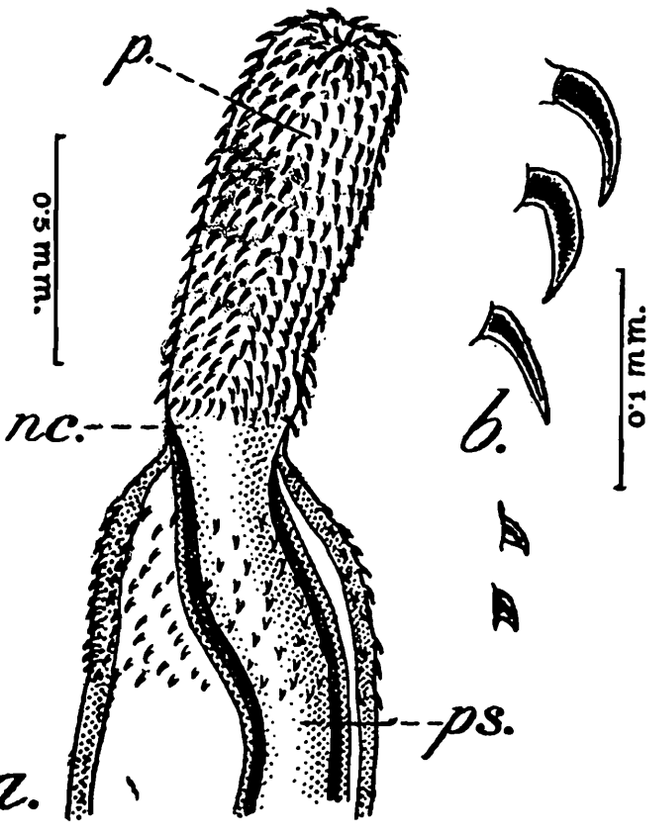
Mehrarhynchus prashadi, gen, *et* sp. nov.

The worms are small and club-shaped. They are whitish in colour. In two specimens the proboscis was protruding and in the other three it was pushed out by slight pressure of the cover-slip. In one case the lemnisci and the proboscis-sheath were pushed out of the body through a narrow crack near the neck and the female genitalia was also pushed out by pressure near the posterior end of the only female specimen in the collection; these injuries instead of being detrimental were helpful in the study of these organs.

The body shows slight marks of external furrows. Sexual dimorphism is not well marked, as is evident from the measurements, but as only one female was obtained much stress cannot be laid on this point. The males measure 4·62-6·71 mm. in length and 0·68-0·79 mm. in breadth the female 7·96 mm. in length and 1·53 mm. in breadth.

The proboscis is narrow and cylindrical and studded with 20-22 regular rows of 12-14 fine recurved spines in each row. The posterior portion, the neck, is slightly narrow and is devoid of spines. There are

slight variations in the size of the proboscis spines, those of the anterior region are slightly longer than those of the posterior.



TEXT-FIG. 1.—*Mehrarhynchus prashadi*, gen. *et* sp. nov. *a*. Anterior region; *b*. Hooks of the proboscis and body magnified; *nc*., neck; *p*., proboscis; *ps*., proboscis-sheath.

The anterior region of the body (text-fig. 1) has 12-13 rows of 15-17 small and thick hooks in each row. These hooks are covered near the basal portion by cuticular folds, which in some cases completely engulf the hooks. The body-wall is traversed by a regular lacunar system, transverse and longitudinal canals are very prominent and the branching canaliculi traverse the whole of the body-wall. In some places near the middle of the body the circular canals are more marked. Granular nuclei are found all over the body-wall.

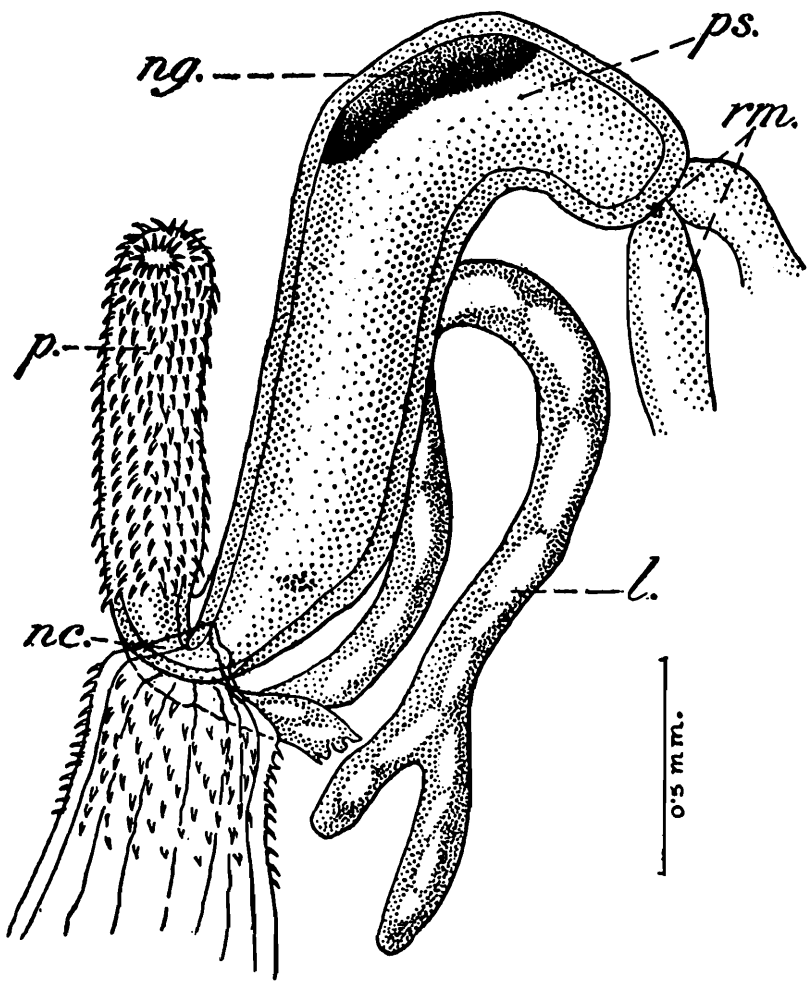
The proboscis-sheath is a narrow, double-layered muscular sac, and is nearly twice as long as the proboscis. It originates at the base of the proboscis and hangs freely in the body cavity. At its posterior end there are a couple of strong muscular bands, the retractors, and there are a few inside the sheath, the protractors. These regulate the retraction and protrusion of the proboscis (text-fig. 2).

The central nervous system consists of a single spindle-shaped ganglion, with a few radiating nerve retinaculi, embedded in the wall of the proboscis-sheath a little away from its posterior end.

The two lemnisci are thin, cylindrical structures, longer than the proboscis-sheath and sometimes even reach up to the anterior testes. The free ends of these are bifurcated as finger-like diverticula.

The male genitalia (text-fig. 3*a*) consist of two oval testes arranged tandem-wise close to each other. The two vasa efferentia coming out of the testes join together to form the vas deferens just behind the prostatic glands. The prostatic glands are four, club-shaped bodies of unequal

size, at the narrow end, in each of these glands, there are a few small nuclei, the ducts from each gland join together to form a thick prostatic



TEXT-FIG. 2.—Anterior region of *Mehrarhynchus prashadi*, gen. *et* sp. nov., showing the internal organs everted out through a crack near the neck.

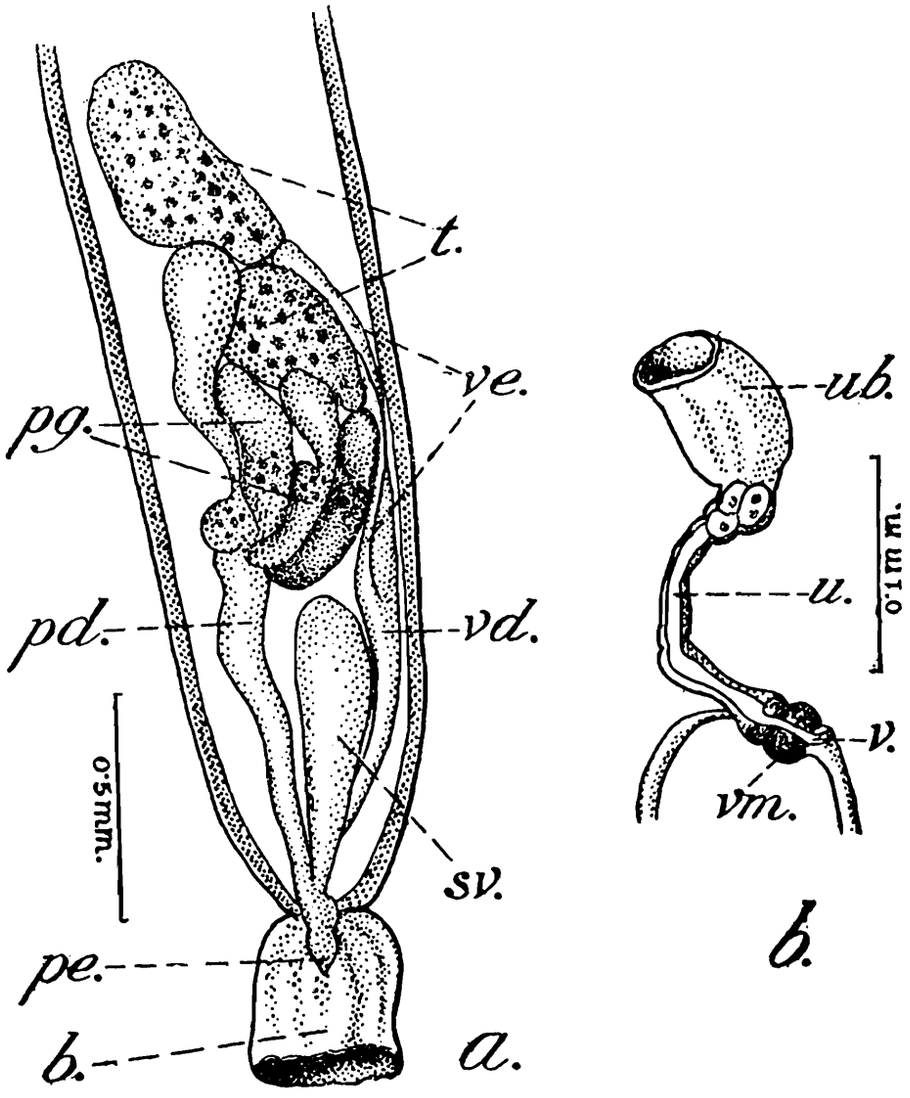
l., leminisci; *nc.*, neck; *ng.*, central nerve ganglion; *p.*, proboscis; *ps.*, proboscis-sheath; *rm.*, retractor muscles.

duct which ends in a muscular penis. The seminal vesicle is a thin-walled sac. The vas deferens joins with the base of the seminal vesicle and jointly opens with the prostatic duct at the base of the penis. The cone-shaped muscular penis hangs on top of the eversible bell-shaped bursa.

The study of the anatomy of the female genitalia (text-fig. 3*b*) has been rendered easier by their being everted out of the body by accidental pressure. These consist of a funnel-shaped uterine bell with a few guard cells near the base of the funnel thus regulating the exit of ripe ova only to the uterus. The narrow, tubular and thin-walled uterus leads on to the vagina which is long and is guarded at its posterior end by two sets of strong muscular bands. These allow of the exit of mature ova in a single file. The vulva or the external genital opening is situated postero-ventrally.

Measurements.—Males 4·62-6·71×0·68-0·79, mm.; female 7·96×1·53 mm.; proboscis 0·95×0·33 mm.; proboscis-sheath 1·83×0·29 mm.; lemnisci 2·71×0·15 mm.; testis anterior 0·22×0·37 mm.; posterior 0·33×0·37 mm.; prostatic glands 0·33×0·15 mm.; seminal vesicle

0·81 mm. long; bursa 0·46×0·53 mm.; uterine bell 0·46×0·20 mm.; uterus 0·31 mm. long; vagina 0·29 mm. long; ova 0·065 mm. long;



Text-fig. 3.—*Mehrarhynchus prashadi*, gen. *et* sp. nov. *a*. Male genitalia; *b*. Female genitalia.

b., bursa; *pd*., prostatic duct; *pe*., penis; *pg*., prostatic glands; *sv*., seminal vesicle; *t*., testes; *u*., uterus; *ub*., uterine bell; *v*., vagina; *vd*., vas deferens; *ve*., vasa efferentia; *vm*., vaginal muscles.

proboscis hooks anterior 0·080 mm., posterior 0·055 mm.; body hooks 0·025 mm.

Discussion.—It is evident from the table (on page 86 and 87) that while the new genus agrees in some points with the existing genera, it differs considerably in the shape and size of the proboscis and the proboscis-sheath, the number of rows of hooks and the number in each row on the proboscis and the anterior part of the body, the lemnisci and its shape, the prostatic glands and the genitalia. From Van Cleave's descriptions of *Serrasentis*[1] and *Telosentis*[2] it is clear that the rows of hooks and their number in each row on the proboscis and the anterior part of the body are very different; the lemnisci in *Serrasentis* are very long while in *Telosentis* they are approximately of the same size as the proboscis. In Van Cleave's other two genera

[1] Van Cleave, H. J., *Roosevelt Wild Life Bull.* II, pp. 73-84 (1933).
[2] Van Cleave, H. J., *Journ. Parasit.* IX, pp. 174-177 (1923).

Aspersentis[1] and *Tegorhynchus*[2] the lemnisci in the first case are short and flattened and in the other long and twice the length of the proboscis, while the rows of hooks and the number in each row on the proboscis and the body and the dimensions of the body in both genera differ from the genus under discussion. In the case of *Leptorhynchoides* Kostylew[3]; the body spines are totally absent, the prostatic glands are eight and the central nerve gland is situated in the middle of the proboscis-sheath, in these points it differs from the present genus. In *Polyacanthorhynchus* Travassos[4], the body is abnormally large, the prostatic glands are eight, the rows of proboscis hooks are nearly double than that of the new genus. In *Rhadinorhynchus* Lühe[5] the dimensions of the body vary considerably, the central nerve ganglion is situated near the middle of the sheath, the only point in which it agrees with the present case is that the lemnisci are finger-like. The description of *Cleaveius* Subrahmanian[6] agrees to some extent with the new genus in the dimensions of the body, but it differs considerably in number of proboscis hooks, the prostatic glands and the lemnisci. Subrahmanian has noted that there are no scattered spines on the anterior part of the body of males but there are 23 regular rows of spines stretching as far as the commencement of the anterior testis; he also observed that in the female only the anterior portion up to 262μ is armed with scattered spines and about two-third of the body is armed with 41 circular rows of spines, the lemnisci in his case are much coiled, the prostatic glands are four compact bodies and the proboscis is short and cylindrical. These points separate *Cleaveius* from the new genus described in this paper.

Host.—*Pangasius pangasius* (Hamilton).

Location.—Intestine.

Locality.—Calcutta (Local market).

Type Series deposited in the collections of the Zoological Survey of India, Indian Museum, Calcutta.

I have great pleasure in naming the species after Dr. Baini Prashad, Director, Zoological Survey of India, as a mark of respectful gratitude for his unceasing help and guidance in my work. The generic name is associated with the name of Dr. Haru Ram Mehra, Reader, Department of Zoology, University of Allahabad, to whom I am indebted for initiating me in the study of this group of Helminths. My thanks are due to Babu A. Mondul for finishing the figures for this paper.

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[1] Van Cleave, H. J., *Ann. Mag. Nat. Hist.*, (10) IV, pp. 229-232 (1929).
[2] Van Cleave, H. J., *Nat. Hist. Juan Fernandez and Easter Is.* III, (1921).
[3] Kostylew, N. N., *Ann. Parasit. Humane et Comp.*, II, pp. 214-223 (1924).
[4] Travassos, L., *C. R. Soc. Biol.* Paris XC, pp. 935-937 (1926).
[5] Lühe, M., *Susswasserfauna Deut.* XVI, p. 60 (1911).
[6] Subrahmanian, K., *Ann. Mag. Nat. Hist.*, (9) XIX, pp. 275-279 (1927).

TABLE I.

Names of genera.	Dimensions of body.	Measurement of proboscis.	Proboscis hooks.		Proboscis sheath.	Body spines.	Central nerve ganglion.	Prostatic glands.	Lemnisci.	Host.
			Long. rows.	No. in each row.						
Serrasentis Van Cleave 1923.	..	clavate	24	15-18, about 80 μ	..	18-23 rows of 6-24 spines, a collar of spines just behind the neck.	..	..	very long	fish, marine.
Telosentis Van Cleave 1923.	6·8-8·6 mm.	cylindrical to club-shaped, 1·14 1·3 mm. × 0·15-0·19.	12	20, 48-60 μ long.	2·2 mm.	posterior extremity near genital opening armed in both sexes with few scattered cuticular spines.	about one-third the distance from posterior extremity.	..	approximately the same length as proboscis receptacle.	fishes.
Aspersentis Van Cleave 1929.	short, cylindrical. ♂ 3·25 × 0·65 mm. ♀ 4·0-6·0 mm.	0·53 × 0·23 mm.	14-16	9 or 10	..	anterior region decked with minute spines. Ventral 100μ few less than 89μ, dorsal 30μ.	located in the proboscis sheath some distance from posterior extremity.	pyriform, closely compacted.	short, flattened in male reaching up to the anterior testis.	..

Rhadinorhynchus Lühe 1911.	♂ 6·0-20·0 × 0·46-0·9 mm. ♀ 14·0-75·0 × 0·6-1·4 mm.	2·5 × 0·18 mm.	14-16	26	5·0 mm. long.	..	near the middle of the sheath.	..	long and finger-like.	fresh water fishes.
Leptorhynchoides Kostylew 1924.	12-24 mm. × 1·0-1·3 mm.	very slightly club-shaped.	14	20	..	absent	near the middle of the sheath.	eight	very long	fishes.
Polyacanthorhynchus Travassos 1926.	♂ 105-110·0 × 1·4 mm. ♀ 335·0 × 3·0 mm.	3·0-3·5 mm. long.	40-46	16-18	..	..	at the posterior extremity of the proboscis sheath.	eight 6·5 × 8·5 mm.	6·0 mm.	fish & alligator.
Tegorhynchus Van Cleave 1920.	♂ 3·0-6·0 × 0·8 mm. ♀ 4·0-8·5 × 1·4 mm.	1·0 × 0·2 mm.	14	17-19	..	..	..	..	long and twice the length of the proboscis.	..
Cleaveius Subrahmanian 1927.	♂ 5·1 × 0·21 mm. ♀ 8·1 × 0·38 mm.	157 μ long, anterior 175 μ middle 105 μ posterior 140 μ in diameter.	18	4, 55-30 μ	630 μ long.	circular rows of hooks are present in both sexes, but scattered hooks are seen at the anterior end of females only.	placed laterally, 157μ from posterior end of proboscis sheath.	four compact bodies.	coiled	fishes.
Mehrarhynchus, gen. nov.	♂ 4·62-6·71 × 0·68-0·75 mm. ♀ 7·96 × 1·53 mm.	cylindrical 0·95 × 0·33 mm.	20-22	12-14	1·83 × 0·29 mm.	12-13 rows of stout, conical spines, 15-17 in each row.	in the posterior third of the sheath.	four club-shaped bodies.	2·71 × 0·15 mm., long with finger-like bifurcation at the end.	Siluroid fish (*Pangasius pangasius*).