II ON SOME INDIAN CESTODA

PART II.

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The object of the present paper is merely to record a number of parasites for the most part found commonly in certain Indian birds. The characters given for the members of the family Ptychobothridae are after Lühe. Those of the families Tetrabothridae, Davaineidae and Hymenolepidae are after Ransom. The writer hopes in succeeding papers to confine his attention to the anatomical details of a series of families.

Family PTYCHOBOTHRIIDAE, Lühe, 1910.

Scolex unarmed, or rarely armed, and always with two separate, more or less perfectly-developed suckers, which may exceptionally be replaced by a pseudo-scolex. Neck absent. Outer differentiation of segments always present, but very often imperfect, or partly obliterated by secondary formation of folds. Genital organs numerous, but single in each proglottid. Genital apertures single. Cirrus devoid of spines, but with a striated cuticle. Apertures of the cirrus and vagina behind that of the uterus, arranged on the surface, or on the edge. In the first instance, the openings of the cirrus and vagina are on the opposite surface to that of the uterus, and are approximately median. No muscular bulbus in connection with the inner extremity of the cirrus sac. Usually, the receptaculum seminis is missing, but, if present, it has the shape of a small caecum, placed internal to, and in close connection with, the vagina. Ovary and shell-gland median; testes in two side fields. Uterus never takes the shape of a rosette, but usually exists as a wide, uniform cavity. Eggs with a thin shell, without operculum; embryonic development takes place in the uterus, and, on account of the cessation of the egg-production, all the eggs of the tapeworm are ultimately in the same stage of development. The cessation of egg-production however, appears, in some species, to have a relation to the season of the year. Mature in the intestine of fish. Development of larva unknown. There are two sub-families.

CHARACTERS OF THE SUB-FAMILIES.

(1) Apertures of cirrus and vagina arranged on the surface ... ... Ptychobothriinae
(2) Apertures of cirrus and vagina arranged on the edges... Amphicotylinae.

Sub-family *AMPHICOTYLINAE*, Lühe, 1910.

Scolex unarmed. Mouth of cirrus and vagina marginal, irregularly alternate, with a more or less strongly pronounced partiality for being unilateral. The deferens strongly coiled. Mouth of uterus median; aperture of uterus large. In the intestines of fishes. In fresh water there are two genera.

CHARACTERS OF THE GENERA.

(1) Yolk-gland follicles numerous, irregularly formed, in loose coils, and situated, at least partly, between the muscle bundles ... ... *Abothrium.*

(2) Yolk-gland follicles in small numbers, on each side, pressed together very closely, on the outer edge of the nerve strands, between the main longitudinal nerves and the muscles ... ... *Bathybothrium.*

Abothrium (Van Ben.), 1871.

Scolex unarmed, not very long, with two strong (but not specially deep) suckers. Segmentation of the posterior part of the strobila is often indistinct on account of the superficial wrinkling of the skin. The ripe segments are considerably wider than long. Nerve strands lateral, dorsal to the cirrus sac and vagina. Vesicula seminis lies exclusively between the two nerve strands, in the two lateral fields. Yolk-glands irregular in shape, in two broad lateral fields, situated partly between the bundles of the longitudinal muscles. The yolk-glands of each proglottid do not appear to be distinctly separated. Ovary somewhat bean or kidney-shaped, median, and situated, along with the aperture of the uterus, ventrally. Shell-gland dorsal to ovary. Aperture of uterus, in mature proglottides, is a uniform sac, almost filling the whole of the nerve areas.

The uterine apertures appear as a more or less distinctly marked median, longitudinal, furrow, running the length of the proglottides. There are three species.

CHARACTERS OF THE SPECIES.

(1) Yolk-glands partly internal to the longitudinal muscles. Parasitic in Gadoid fishes ... ... *A. rugosum.*

(2) Yolk-glands only between the longitudinal muscles. Parasitic in Salmonidae ... ... *A. crassum.*

(3) Yolk-glands partly external to the longitudinal muscles. Parasitic in *Clupea finta* (Cuvier) ... ... *A. fragile* (After Lühe)

Abothrium crassum (Bloch, 1779) Lühe, 1910.

ZEV $\frac{6+39}{7}$	Pyloric caeca of *Salmo sebago.*	Sebago Lake, Maine, U.S.A.	H. B. Ward.

One specimen named and presented by Professor H. B. Ward of the University of Illinois.

Literature:—Lühe, 1910.

Family TETRABOTHRIIDAE, Linton, 1891.

= Tetrabothridae, Diesing, 1850 (in part).

Family diagnosis:—Taenioidea. Scolex unarmed, without rostellum. Suckers with an outwardly projecting auricular appendage on the anterior border. Neck short. Segments of the strobila, with the exception of the hindermost segments, always much broader than long. A single set of reproductive organs in each segment. Genital pores unilateral. Genital cloaca deep. Cirrus pouch small, and nearly spherical, united with the genital cloaca by a muscular cloacal canal. Yolk-gland in front of ovary. Eggs with three transparent envelopes. Adult in birds and mammals.

Type-genus:—*Tetrabothrius*, Rudolphi, 1819.

Genus **Tetrabothrius**, Rudolphi, 1819.

= *Amphotercotyle*, Diesing, 1863 (type, *A. elegans*, Diesing, 1863).
= *Prosthecocotyle*, Monticelli, 1892 (type, *Taenia fosteri*, Krefft, 1871).
= *Bothridiotaenia*, Lonnberg, 1896 (type, *Taenia erostris*, Lonn., 1889).

Generic diagnosis:—Tetrabothriidae. With the characters of the family.

Type-species:—*Bothriocephalus macrocephalus*, Rudolphi, 1810.

Tetrabothrius erostris, Lonnberg, 1889.

ZEV $\frac{69+7}{7}$ *Sterna bergii*. (Tern). Tamblegam, Ceylon. T. Southwell. Ten specimens.

This parasite has previously been recorded from Ceylon by Shipley.

Synonym:—*Taenia immerina*, Abildg., 1790.

Literature:—Shipley, 1903; Johnston, 1912; Ransom, 1909; Fuhrmann, 1908; Monticelli, 1892.

Family DAVAINEIDAE, Fuhrmann, 1907.

(See *Rec. Ind. Mus.*, Vol. IX, Part V, Dec. 1913).

Sub-family *DAVAINEINAE*, Braun, 1900.

Sub-family diagnosis:—Davaineidae. Suckers armed around periphery with several rings of hooklets which are unstable or persistent. Uterus breaks down into numerous egg capsules, each containing one or more eggs. Para-uterine organs not present. Adult in mammals and birds.

Type-genus:—*Davainea*, Blanchard and Railliet, 1891.

Genus **Cotugnia**, Diamare, 1893.

Generic diagnosis:—Davaineinae. Segments broader than long. Several layers of longitudinal muscles, alternating with layers of transverse muscle fibres. A double set of reproductive

organs in each segment, close to the longitudinal excretory canals. Genital canals pass dorsal of longitudinal excretory vessels and nerve. Testicles numerous, filling the median fields, and extending dorsal of the female organs and excretory vessels to the extreme edge of the medullary parenchyma. Uterus breaks down and the eggs become enclosed singly in egg capsules. Adult in birds.

Type-species:—*Cotugnia digonopora* (Pasquale 1890) Diamare, 1893.

Cotugnia digonopora (Pasquale, 1890) Diamare, 1893.

ZEV $\frac{6162}{7}$ *Corvus macrorhynchus.* (Crow). Calcutta. T. Southwell. Two specimens.

ZEV $\frac{6163}{7}$ *Gallus gallus?* (Hen). Berhampur, Bengal. Major Lane, I.M.S. Five specimens.

Length 70 mm. Greatest breadth 6 mm. Length of last segment 1·2 mm. Head 1·4 mm. broad. Suckers ·45 mm. broad, globular and prominent. Spines on rostellum exceedingly minute. Neck absent. Genital pores double and situated about the middle of the segment. Calcareous corpuscles large.

Synonym:—*Taenia digonopora*, Pasquale, 1890.

Literature:—Pasquale, 1890; Diamare, 1893; Stiles and Hassall, 1896; Ransom, 1909.

Genus **Davainea**, Blanchard and Railliet, 1891.

= *Bothriotaenia*, Railliet, 1892,
(type, *Dibothrium longicolle*, Molin, 1858).

Generic diagnosis:—Davaineinae. A single set of reproductive organs in each segment. Genital pores unilateral or occasionally irregularly alternate. Uterus breaks down into egg capsules each containing one or several eggs. Adult in mammals and birds.

Type-species:—*Davainea proglottina* (Davaine 1860) Blanchard, 1891.

Davainea friedbergeri (Von Linstow, 1878) R. Blanchard, 1891.

ZEV $\frac{6051}{7}$ *Pavo nigripennis.* (Black shouldered peacock). Berhampur, Bengal. Major Lane, I.M.S. One specimen.

I very doubtfully refer a single damaged specimen to the above species. It measured 140 mm. long and the greatest breadth was 5 mm. The genital pores were unilateral.

Synonyms:—*Taenia friedbergeri*, Von Linstow, 1878.
Taenia agama, Megnin, 1878.
Taenia infundibuliformis var. *phasianorum*, Megnin, 1878.
Taenia cesticillus var. *phasianorum*, Neumann, 1878.

Literature:—Stiles and Hassall, 1896.

Davainea echinobothrida (Megnin, 1881) R. Blanchard, 1891.

ZEV $\frac{6177}{7}$	*Gallus bankiva.* (Hen).	Berhampur, Bengal.	Major Lane, I.M.S.	Over thirty specimens.

Synonyms:—*Taenia infundibuliformis*, Megnin (part.), 1880.

Taenia echinobothrida, Megnin, 1880.

Literature:—Stiles and Hassall, 1896; Ransom, 1905

Davainea corvina, Führmann, 1905.

ZEV $\frac{6146}{7}$	*Pica rustica.* (Magpie.)	Zoological Gardens, Calcutta.	Two specimens.	

Our specimens agree exactly with the description given by Führmann.

Synonym:—*Davainea polycalcaria*, von Linstow, 1906.

Literature:—Führmann, 1905; von Linstow, 1906.

Examples of this parasite were also obtained as under:—

Nine specimens,	*Corvus macrorhynchus.*	Chilka Lake, Orissa.	T. Southwell.
Twenty-one ,,	*Corvus macrorhynchus* and *Corvus splendens.*	Sabour, Bihar.	T. Southwell.
Twelve ,,	*Corvus splendens.*	Calcutta.	T. Southwell.
Six ,,	*Corvus macrorhynchus* and *Corvus splendens.*	Colombo, Ceylon.	T. Southwell.

Davainea cesticillus (Molin, 1858) R. Blanchard, 1891.

ZEV $\frac{6138}{7}$	Small intestine of chick.	?	H. B. Ward.

One specimen named and presented by Professor H. B. Ward of the University of Illinois. The locality is not given; presumably it is from the United States (Nebraska ?).

Literature:—Molin, 1858; R. Blanchard, 1891.

Family HYMENOLEPIDIDAE, Railliet and Henry, 1909.

For characters of family see *Rec. Ind. Mus.*, Vol. IX, Pt. V, December 1913.

Sub-family *HYMENOLEPIDINAE*, Ransom, 1909.

= Hymenolepinae, Perrier, 1897.

Sub-family diagnosis:—Hymenolepididae. Rostellum armed with a single crown of hooks, or more rarely rudimentary and unarmed. Segments always broader than long. Longitudinal muscles in two layers. A single set of reproductive organs in each segment. Genital pores unilateral. Genital canals pass on the dorsal side of the longitudinal excretory vessels and nerve. Vas deferens always short, with seminal vesicle. Uterus persistent, sac-like. Eggs with three transparent shells. Adult in mammals and birds.

Type-genus:—*Hymenolepis*, Weinland, 1858.

Genus **Hymenolepis**, Weinland, 1858.

= *Diplocanthus*, Weinland, 1858; = *Lepidotrias*, Weinland, 1858; = *Drepanidotaenia*, Railliet, 1892; = *Dicranotaenia*, Railliet, 1892; = *Echinocotyle*, Blanchard, 1891; = *Triorchis*, Clerc, 1903.

Generic diagnosis:—Hymenolepidinae. Rostellum generally well developed, and armed with a single crown of hooks, or more rarely, rudimentary and unarmed. Suckers in adult rarely armed with hooklets of fine spines; are generally unarmed. Testicles three in each segment. Vas deferens with internal (*i.e.* inside the cirrus pouch) as well as external seminal vesicle (outside the cirrus pouch). Sacculus accessorius generally absent. Adult in mammals and birds.

Type-species:—*Hymenolepis flavopunctata*, Weinland, 1858.

= *Hymenolepis diminuta* (Rudolphi, 1819) Blanchard, 1891.

Sub-genus **Hymenolepis**, Weinland, 1858.

Sub-generic diagnosis:—*Hymenolepis*. Rostellum generally well developed, and armed with a single crown of hooks, or more rarely rudimentary and unarmed. Suckers in adults generally unarmed, or, rarely, their entire surface may be covered with rudimentary spines. Sacculus accessorius generally absent. Adult in mammals and birds.

Type-species:—*Hymenolepis flavopunctata*, Weinland, 1858.

= *Hymenolepis diminuta* (Rud., 1819) Blanchard, 1891.

Hymenolepis capillaroides? Führmann, 1906.

ZEV $\frac{6164}{7}$ *Corvus macrorhynchus*. (Crow). Calcutta. T. Southwell. Twenty-eight specimens.

The specimens under consideration are placed in the above species with a little uncertainty. The rostellum in every specimen was slightly damaged and the exact size and number of spines could not be determined. If not absolutely identical, our specimens are closely related to *Hymenolepis capillaroides*, Führmann.

The specimens measured 25 to 30 mm. long. The last segments were ·22 mm. long, ·22 mm. broad, and the edges were slightly salient. In one specimen, only, which was more mature than the rest, and which had contracted to a greater degree, the greatest breadth was ·58 mm. The head is ·14 mm. long, and ·2 mm. broad. As far as could be ascertained, there was a single row of 10 hooks, ·021 mm. long, on the rostellum. The suckers were ·098 mm. in diameter. Neck ·4 mm. long. The genital pores unilateral. The testes are three in number, and have a diameter of ·06 mm. Two were situated posteriorly, one on each side, and the third was lateral and somewhat anterior. The variable disposition of the testes noted by Führmann (1906) was not seen in our specimens. The cirrus bulb measured ·12 mm. long, and was situated anteriorly. The internal extremity abutted on the posterior edge of the preceding segment. It will be noted

that the last segments in our specimens are square. The segments figured by Führmann for this species are broader than long, but possibly those figured were not the posterior gravid segments.

Literature:—Führmann, 1906.

Hymenolepis sp.

ZEV $\frac{6050}{7}$	*Chenopus atrata.* (Black Australian swan).	Berhampur, Bengal.	Major Lane, I.M.S.	Numerous specimens.

Our specimens are without heads and were badly preserved. They measured 17 mm. long and ·6 mm. broad. The segments are all much longer than broad, the genital pores are all on one side and are situated anteriorly. The cirrus pouch is enormous. It is placed at the anterior end and lies transversely across two-thirds of the segment. It is one-third the length of the segment. The penis is also very long and covered with exceedingly minute spines. As far as could be ascertained, the testes were three in number, and posterior and median in situation. Near them, and on the side opposite to that on which the genital pore occurs, was a darkish mass, which appeared to be the ovary. No further anatomical details could be determined.

Hymenolepis sp.

Two specimens from *Chrysophlegma flavinucha* (woodpecker), Zoological Gardens, Calcutta. The specimens, which have been permanently stained and mounted, were so badly preserved that, although they appear to be new species, I have been obliged to defer a careful description until more material can be collected. They measure 25 mm. long and are thin and filamentous. The last few segments were gravid. The rostellum is comparatively long, and, owing to contraction, appears wrinkled. There appears to be a single row of ten hooks. Suckers unarmed. There is no neck. The first segments are much broader than long and the last few are slightly longer (·26 mm.) than broad (·19 mm.). The reproductive apertures are almost, but not quite, unilateral. The testes are very large and are three in number, two being posterior, (one on each side of the middle line) and the third being anterior to one of the former. The genital cloaca is large, and the cirrus small The ovary and vittelarium appear to be situated between, and anterior to the two posterior testes. The receptaculum seminis (?) was enormous, and situated anteriorly, in the middle of the segment. The uterus occupied the whole of the last segments, and appeared to be divided into two, by a dorso-ventral septum running from the anterior to the posterior end of the segment.

Sub-genus **Drepanidotaenia,** Railliet, 1892.

Head provided with a single row of uniform hooks, few (8-20) in number, with dorsal root much longer than ventral root,

the latter always small, with prong directed posteriorly when the rostellum contracts.

Type-species:—*Drepanidotaenia lanceolata* (Bloch, 1782) Railliet, 1892.

Larval stages have been found in small crustaceans.

This genus does not appear to differ from *Hymenolepis*, Weinland, 1858.

Drepanidotaenia gracilis (? Zeder, 1803) Krabbe, 1869, Railliet, 1892.

ZEV $\frac{6048}{7}$	*Phenicopterus roseus.*	(Flamingo).	Zoological Gardens, Calcutta.	T. Southwell.	About two hundred specimens.

Synonyms:—*Taenia collo-longissimo*, Bloch, 1782 ?
Taenia gracilis (Zeder) Rudolphi, 1810 ?
Halysis gracilis, Zeder, 1803 ?

Literature:—Stiles and Hassall, 1896; Führmann, 1908.

Stiles gives the following description of this worm:—

"About 270 mm. long, by 1·5 to 2 mm. broad. Head sub-globular. Rostellum cylindrical, obtuse, armed with a simple crown of 8 hooks, 77-80μ long. Neck very short,. .genital pores unilateral. Receptaculum pyriform; penis unarmed. Genital sinus provided with large spines." Our specimens, although extremely small, undoubtedly are of the same species. They measured only 3 mm. long and ·5 mm. broad. The posterior segments measured ·15 mm. long and ·6 mm. broad, and were not fully mature. They showed a tendency to become square. The genital pores are unilateral. The rostellum is cylindrical and measures ·3 mm. long. It is marked by transverse wrinkles. The hooks are eight in number and they measure ·08 mm. long. These hooks are attached to the extreme end of the rostellum. There is no neck. The testes are three in number, and are situated posteriorly, two being lateral and one median. The vas deferens runs nearly straight to the anterior aporose corner of the segments and swells into a very large vesicula seminalis. The cirrus is long. The penis was not observed. Unfortunately the female reproductive organs did not appear to be sufficiently developed to admit of description.

For notes on the systematic position of this genus see Führmann, 1908.

Genus **Diorchis**, Clerc, 1903.

Generic diagnosis:—Hymenolepidinae. Rostellum with a single crown of ten hooks with long dorsal and short ventral roots, or exceptionally, with very short dorsal root and with ventral root nearly as long as the blade. Surface of the suckers may be armed with minute spines. Inner longitudinal muscular layer consisting of 8 bundles, 4 dorsal and 4 ventral. Two testicles in each segment. Adult in birds.

Type-species:—*Diorchis acuminata* (Clerc 1902) Clerc, 1903.

Diorchis americana, Ransom, 1909.

ZEV $\frac{5953}{7}$ *Dendrocitta* sp. (Tree pie). Zoological Gardens, Calcutta. T Southwell. Eighteen specimens.

In our specimens the surface of the suckers was armed with very minute spines, but the longitudinal bands of muscles were not well defined. The segments were mature, but not gravid, and were extremely short. Three fairly well defined sizes were noticed, for which the following are the dimensions:—

	I.	II.	III.
Length of specimens	9 mm.	12 mm.	16 mm.
Extreme breadth	·7 mm.	·5 mm.	·9 mm.
Breadth of head	·1 mm.	·1 mm.	·1 mm.

Literature:—Ransom, 1909.

Sub-family *DIPYLIDIINAE*, Stiles, 1896.

Genus **Gryporhynchus**, Nordman, 1832.

= *Acanthocirrus*, Führmann, 1907.
(type, *Acanthocirrus macrorostratus*, Führmann, 1907).

Generic diagnosis:—Dipylidiinae. Rostellum armed. Genital pores unilateral. Genital canals pass between the longitudinal excretory vessels. Root of cirrus with one or two pairs of powerful spines lying in special pockets. Testicles few (6-8). Uterus sac-like. Adult in birds.

Type-species:—*Gryporhynchus pusillus*, Nordman, 1832.
= larva of *Acanthocirrus macropeos* (Wedl, 1856).

Gryporhynchus (Acanthocirrus) macropeos, Wedl, 1855.

ZEV $\frac{6161}{7}$ *Ardeola grayi.* (Pond heron). Zoological Gardens, Calcutta. T. Southwell. Over one hundred specimens.

Our specimens measured 4 mm. long, and each consisted of about 30 segments. The last segments measured ·3 mm. long, and ·3 mm. broad. The neck is 1 mm. long. The number of hooks could not be satisfactorily counted as many of them were missing. They measured ·03 mm. long. The genital pores are unilateral, and are situated in the anterior $\frac{1}{4}$ of the segment. The penis is ·13 mm. long, ·018 mm. broad, and covered with exceedingly minute spines. There are six testes. The cirrus sac is situated transversely at the anterior and extends two-thirds the distance across the segment. The uterus, in gravid segments, consisted of two circular sacs, one on each side, which appeared to communicate with each other.

Synonyms:—*Taenia macropeos*, Wedl, 1856.
Acanthocirrus macropeos, Führmann, 1908.

Literature:—Führmann, 1907; Führmann, 1908; Ransom, 1909; Lühe, 1910.

For a discussion of the synonomy of this species the reader is referred to Ransom and Führmann (above).

Sub-family *PARUTERININAE*, Ransom, 1909.

= Paruterinae, Führmann, 1907.

Sub-family diagnosis:—Hymenolepididae. Scolex usually armed, rarely without rostellum. A single (double in *Stilesia* provisionally placed in the sub-family) set of reproductive organs in each segment. Uterus simple or double, with a single para-uterine organ, or multiple with several para-uterine organs, into which the eggs pass in the final stage of development of the segment. Adult in birds and Amphibia. (*Stilesia* in mammals).

Type-genus:—*Paruterina*, Führmann, 1906.

Genus **Metroliasthes**, Ransom, 1900.

Generic diagnosis:—Paruterininae. Scolex unarmed, without rostellum. Genital pores irregularly alternate. Genital canals pass between dorsal and ventral longitudinal excretory vessels and dorsal of the nerve. Testicles rather numerous (20 to 40) in posterior portion of segment. Uterus single in origin and consisting, when fully developed, of two spherical sacs touching in the median line and more or less fused with one another. A para-uterine organ, developing in front of the uterus, and into which the eggs pass, becomes transformed finally into a spherical egg capsule. Adult in birds.

Type-species:—*Metroliasthes lucida*, Ransom, 1900.

Metroliasthes lucida, Ransom, 1900.

ZEV $\frac{6179}{7}$	*Gallus bankiva*? (Hen).	Angul, Orissa	Vety. Asstt., Angul, Orissa.	Twenty-one specimens.

Our specimens measured 12 cms. long and 1·7 mm. broad.

Literature:—Ransom, 1905.

Genus **Nematotaenia**, Lühe, 1899.

Generic diagnosis:—Paruterininae. Scolex unarmed, without rostellum. Segmentation of strobila distinct only at posterior end. Strobila circular in cross section. Genital pores alternate. Genital canals pass dorsal of longitudinal excretory vessels and nerves. Uterus horse-shoe shaped, disappears early. Eggs, through the action of numerous para-uterine organs, become inclosed in egg capsules, 3 or 4 in each capsule. Adult in Amphibia.

Type-species:—*Taenia dispar*, Goeze, 1782.

Nematotaenia dispar (Goeze 1782) Lühe, 1910.

ZEV $\frac{6778}{7}$	*Bufo* sp. (Toad).	Lucknow.	Capt. F. H. Stewart, I.M.S.

A few fragments are referred to this species with some hesitation. Only one damaged scolex was available. The anterior extremity was unsegmented, and the worm was circular in cross section. Segmentation was distinct only towards the posterior extremity. The fragments in no case measured more than 7 mm.

Literature:—Lühe, 1910; Ransom, 1909.

Family ICHTHYOTAENIIDAE, Ariola, 1899.

Head with four unarmed suckers. Genitalia as in other Tetraphyllidae. The uterus does not open to the exterior by a pore. The openings of the cirrus and vagina are situated at the side. Yolk-glands double, situated laterally and consisting of numerous follicles. Ovary situated behind the shell gland. Adult in reptiles and birds.

Genus **Ichthyotaenia**, Lonn., 1894.

Scolex armed with four suckers and often a fifth apical sucker. Genital pores marginal, irregularly alternate. Testes numerous. The vagina forms coils at the posterior margin of the proglottides in the middle, which replace a receptaculum seminis. Parasitic in fishes, birds and reptiles.

Ichthyotaenia (Acanthotaenia) nilotica, Beddard, 1913.

ZEV $\frac{6045}{7}$ *Varanus bengalensis.* Balugaon, Orissa. T Southwell. Numerous specimens.

Our specimens agree in every detail with the excellent description given by Beddard of this species in the P.Z.S., London, March 1913, and to this paper the reader is referred for a discussion of the relationship of the genus.

The lizard was caught near a small freshwater ditch 8 miles north of Balugaon, and about 3 miles from the west shore of the Chilka lake.

Ichthyotaenia (Proteocephalus) pusillus, Ward, 1910.

ZEV $\frac{6437}{7}$ *Cristovomer namaycush.* Lake Temnogami, Ontario, Canada. H. B. Ward.

One specimen named and presented by Professor H. B. Ward of the University of Illinois.

Literature:—Benedict, 1900; George La Rue, 1909; George La Rue, 1911; Johnstone, 1911; Beddard, 1913.

Ichthyotaenia (Proteocephalus) ambloplitis (Leidy, 1887) Benedict, 1900.

ZEV $\frac{6429}{7}$ Stomach of *Amia calva.* Put-in-Bay, Ohio, U.S.A. H. B. Ward.

Two specimens, named and presented by Professor H. B. Ward of the University of Illinois.

Literature:—Benedict, 1900; George La Rue, 1909; George La Rue, 1911; Johnstone, 1911; Beddard, 1913.

Considerable confusion exists with reference to many of the genera included in the family Ichthyotaeniidae, Areola, 1899. It is not proposed in the present paper attempting to review the anatomical relationships of the various genera in question. Details relating thereto are given in the papers cited. La Rue

(1911), as a result of a prolonged investigation of the three genera *Proteocephalus*, Weinland, *Ichthyotaenia*, Lonnberg, and *Tetracotylus*, Monticelli stated that "the genera *Proteocephalus*, Weinland, and *Ichthyotaenia*, Lonnberg, are synonyms. The name *Proteocephalus*, being the older should be retained to designate the species"

Unfortunately I have not the material before me for the proper discussion of the question, and I have therefore left the species in the nominal genus to which they were referred by their authors.

ADDENDUM.

Professor Albert Hassall of the United States Department of Agriculture (Bureau of Animal Industry) has called my attention to certain remarks I made in my report "On some Indian Cestoda, Part I" (*Rec. Ind. Mus.*, Vol. IX, Part V, December, 1913) regarding the occurrence of certain cestode parasites in particular hosts.

As a result, I have examined the material again and now wish to make the following remarks and corrections.

Cysticercus cellulosae (pp. 292 and 293 of above paper).

I remarked upon the fact that it was unusual to find this larva in the muscles of *Bos taurus*. The armature on the head led me to the above identification. Professor Hassall, referring to this identification remarks that "we have been in the habit of determining the armed larval form in the sheep as a larval stage of *Taenia solium* (*i.e.* as *C. cellulosae*), but on closer examination Dr. Ransom determined that it was an entirely different form, and experiment proved this to be a fact. Perhaps .. you may find that these forms represent new species."

Unfortunately, I have been unable to obtain a copy of Dr. Ransom's paper (Occurrence of *Cysticercus* of *Taenia solium* in sheep. *Amer. Ass. Adv. Sc. N.Y., U.S.* (703), June 19, 1908). My material consists of three cysts only. The further elucidation of the exact nature of these larval forms will depend on my being able to obtain more and fresh material.

I was in error with regard to the identification of *Cysticercus fasciolaris* and *C. pisiformis* (page 292). The data with reference to the above species should read as follows :—

Hymenolepis murina (Duj., 1845) R. Blanchard, 1891.

ZEV $\frac{2367}{7}$	*Mus decumanus.*	Calcutta?	Col. A. Alcock, I.M.S.
ZEV $\frac{4672}{7}$	*Mus rattus*?	Lahore, Punjab,	Punjab Civil Vety. Dept.
ZEV $\frac{4689}{7}$	No history.		
ZEV $\frac{5146}{7}$	*Mus rattus*?	Berhampur, Bengal.	Major Clayton Lane, I.M.S.
ZEV $\frac{927}{7}$	*Mus rattus*?	Calcutta.	Major R. Milne, I.M.S.

Cysticercus fasciolaris, Rudolphi, 1808.

(Larval form of *Taenia crassicollis*, Rudolphi, 1810).

ZEV $\frac{4\,8\,7\,7\,8}{7}$ Liver of *Mus rattus.* Amritsar, Punjab. Capt. G. I. Davis, I.M.S.

Large numbers of larval forms of *C. fasciolaris* were removed from their cysts. The error arose in consequence of the above two forms being mixed in the same bottle.

Thysanosoma sp., Diesing, 1835.

The specimens referred to *T actinioides* on page 286 were two in number. One specimen consisted of a scolex and about 12 segments only; the other was a mature worm. The measurements of the latter were as follows:—

Entire length of worm	... 90 mm.
Greatest breadth	... 13 mm.
Length of longest segment	... 1 mm.
Breadth of head	... 19 mm.

Scolex unarmed. Rostellum absent. There was no neck. The suckers are four in number and symmetrical. They face slightly forward. Proglottides numerous and always much broader than long throughout the entire length of the worm. The posterior flap of each segment markedly overhangs the succeeding segment both dorsally and ventrally. As I had only one complete specimen, sections were not prepared but I concluded from an examination of the external character that the specimen was *Thysanosoma actinioides.*

A more careful examination which I have just made has, however, conclusively proved that the specimen, although probably belonging to the genus *Thysanosoma*, does not agree with any known species of that genus.

The following details have been definitely established:—

The head is unarmed. There are four symmetrical suckers directed slightly forward. There is no unsegmented portion succeeding the head, but the neck portion is flattened dorso-ventrally. The posterior edge of each segment very markedly overlaps the succeeding segment both dorsally and ventrally, but the free edge of this flap is puckered or frilled and *not* broken up into fimbriae. The gonads appear in the 11th segment, on one side only, and the genital pores are absolutely unilateral. Details with reference to the reproductive organs could not be made out satisfactorily as the material was badly preserved, but sections of the terminal segment led me to the definite conclusion that many para-uterine organs were present surrounding small clusters of embryos.

It is clear that these characters distinguish this worm both from *T actinioides* and from *T giardii.* The only other known species of this genus is *T gambianum*, Beddard (Contributions to the anatomy and systematic arrangement of the *Cestoidea*, by

F. E. Beddard, F.R.S., P.Z.S., September 1911, London). Our specimens agree with *T gambianum* in all the anatomical details which I have been able to elucidate, particularly with reference to the unilateral genital pores, the probable presence of numerous para-uterine organs, the absence of armature on the head and the absence of a "neck." At the same time, judging from Beddard's figures, I am of opinion that our specimens are not *T. gambianum.*

Beddard's specimens were from the Gambian Pouched Rat (*Cricelomys gambianus*). Our specimens are recorded as being obtained from *Rhinoceros sondaicus*, but no locality or date is given, nor is the name of the collector known. The absence of armature on the head, the absence of a neck, together with unilateral genital pores and the presence of para-uterine organs leads me to place our specimens in the genus *Thysanosoma.* A determination of the species will not be possible until more material is available.

In view of the preceding facts, the details given on page 286 of my report (*vide ante*) under "*Thysanosoma actinioides*, Diesing, 1835" should read as follows:—

Thysanosoma sp.

ZEV $\frac{+680}{7}$ *Rhinoceros sondaicus.* ?

Literature:—Beddard, 1911.

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