1990

Binder 041, Cyclocoelidae P-Z [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

Morishitium Witenberg, 1928

Syn. *Pseudhyptiasmus* (Dollfus, 1948)

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body tapered anteriorly. Ceca undulating or not, without diverticles. Testes oblique, in posterior part of body, separated by ovary and uterine coils. Testes and ovary in a straight line. Cirrus pouch entirely or mostly postbifurcal, occasionally prebifurcal. Genital pore postpharyngeal or bifurcal. Uterine coils not extending outward beyond ceca. Vitellaria not united posteriorly. Parasitic in abdominal cavity (?), nasal or nasolacrymal sinus of birds.

Genotype: *M. vagum* (Morishita, 1924) Witenberg, 1928 (Pl. 65, Fig. 798), syn. of *C. distomatum* Morishita — Joyeux and Baer (1927), in ductus nasolacrymalis of *Chrysolophus picta;* loc. not given.

Other species:

M. bivesiculatum (Prudhoe, 1944), n. comb., in *Thereiceryx zeylanicus;* Ceylon.

M. distomatum (Morishita, 1924) Witenberg, 1928, in *Phasianus scintillans;* Japan.

M. dollfusi (Timon-David, 1950) n. comb., in *Pica pica;* France. *Helicella* (*Helicopsis*) *arenosa* as intermediate host and domestic pigeon as definitive host — Timon-David (1955).

M. dumetellae (Zeliff, 1943) n. comb., in air sacs of *Dumetella carolinensis;* Pennsylvania.

M. ominosum (Kossack, 1911) n. comb., in *Grus cinerea;* Germany.

M. sinhaldripa (Fernando, 1950) n. comb. in *Gallus lafayetti;* Ceylon.

M. straightum (Khan, 1935) n. comb., in *Glottis nebularia;* India.

M. undulatum (Canavan, 1934) n. comb., in thoracic air sac of *Megalornis grus lilfordi;* Siberia to India.

MORISHITIUM

Ophthalmophagus Stossich, 1902
Syn. *Geowitenbergia* Dollfus, 1948

Generic diagnosis. — Cyclocoelidae, Cycloecolinae: Body lanceolate. Esophagus sigmoid, ceca simple, without diverticles. Testes oblique, some distance in front of posterior cecal arch. Cirrus pouch ventral to pharynx. Genital pore prepharyngeal. Ovary close to posterior cecal arch, median or submedian. Receptaculum seminis present. Uterine coils intruding into extracecal fields. Vitellaria united posteriorly. Parasitic in orbita, or nasal sinus of birds. Dollfus (1948) proposed a new subgenus *Geowitenbergia*, including *nasicola* Witenb., 1923, *massinoi* Witenb., 1926, and *magalhaesi* Trav., 1921.

Genotype: *O. singularis* Stossich, 1902 (Pl. 68, Fig. 833), in orbita of *Gallinula pusilla;* locality not given. [*Porzana porzana;* Russia — in Sprehn, 1932].

Other species:

O. charadrii Yamaguti, 1934, in nasal sinus of *Charadrius alexandrinus dealbatus;* Japan.

O. magalhaesi Travassos, 1921, in nasal sinus of *Cairina moschata;* Brazil.

O. massinoi Witenberg, 1926, syn. of *O. singularis* (Stoss.) — Dubois, 1930, syn. of *nasicola* Witenberg — Bashkirova (1950), in body cavity of wild duck; Russian Turkestan.

O. nasicola Witenberg, 1923, in nasal sinus of *Rallus aquaticus;* Russia. Also in *Charadrius dubius curonicus;* Japan.

O. plectopteri Dubois, 1930, in intestine (?) of *Plectopterus gambensis;* S. Africa.

OPHTHALMOPHAGUS Stossich, 1902

Synonyms: Hyptiasmus Kossack, 1911; Spanometra Kossack, 1911; Transcoelum Witenberg, 1926

Body flattened, muscular, the ends rounded. Pharynx well developed, the intestines simple, unbranched. The genital pore lies ventral about mid-way of the pharynx. The cirrus pouch reaches posterior a short distance behind the crura. The vitellaria lie lateral to the intestines, and surround them dorsal and ventral, they reach from the bifurcation to the posterior end of the body. The three sex glands lie in a more or less straight line, the posterior testes being near the posterior limit of the intestinal loop. The ovary is somewhat smaller, and between the testes. The coils of the uterus extend lateral to the intestinal crura. The eggs are thick-shelled, yellow, and oval in shape.

Type species: O. singularis Stossich, 1902

OPHTHALMOPHAGUS

Prohyptiasmus Witenberg, 1923

Syn. *Stossichium* Witenberg, 1928

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body large, muscular. Ceca without diverticles. Testes tandem, in posterior part of body, separated by ovary and uterine coils. Cirrus pouch may extend backward beyond anterior cecal arch. Genital pore immediately prepharyngeal. Uterine coils extending outward beyond ceca, may or may not descend on each side of posterior testis. Vitellaria not united posteriorly. Parasitic in nasal or infraorbital sinus or pharynx (?) of birds.

Genotype: *P. robustus* (Stoss., 1902) Witenberg, 1923 (Pl. 78, Fig. 944), in *Fuligula cristata*, Europe; *Anser anser*, W. Siberia.

Other species:

P. magnus (Johnston, 1917) (syn. *Stossichium m.* J.), syn. of *robustus* (Stoss.) — Bashkirova (1950), in pharynx (?) of *Chenopsis atrata;* Australia.

Prohyptiasmus robustus (Stossich, 1902) Witenberg, 1923

syn. Hyptiasmus magnus Johnston, 1917
Stossichium robustum Witenberg, 1928

HYPTIASMUS MAGNUS, sp. n. (Fig. 25.)

Diagnosis.—Large worms, with an elongated, flattened body, widest towards the posterior end. Intestinal limbs separated from the lateral edges of the body by a *wide interval*. Half the cirrus sac lying *behind* the fork of the intestine. Testes *very large*. Three gonads close together. Lateral fields of the yolk glands *not continuous with one another* behind the commissural part of the intestinal limbs. Loops of the uterus *not extending back* behind the anterior border of the posterior testis.

Host.—*Chenopsis atrata*, in the pharynx.

Type specimen in the Australian Museum, Sydney, No. W. 446.

Two specimens of this large fluke were obtained from the pharynx of the Black Swan, *Chenopsis atrata*, in Victoria, by Mr. A. Le Souef, Director of the Zoological Gardens at Sydney.

see reprint

PROHYPTIASMUS

Promptenovum Witenberg, 1923

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body lanceolate. Ceca simple, without diverticle. Testes tandem, in posterior third of body. Seminal vesicle crossing commencement of right cecum. Cirrus pouch at level of esophagus. Genital pore immediately postpharyngeal. Ovary between posterior testis and posterior cecal arch, somewhat to right of median line. Uterus intruding into extracecal fields. Vitellaria united posteriorly(?). Parasitic in infraorbital sinus of aquatic birds.

Genotype: *P. vanbenedeni* Witenberg, 1923 (Pl. 73, Fig. 888), syn.

Monostomum mutabile Zeder of van Beneden, 1858, in *Ardea*, *Vanellus*, *Himantopus*, *Numenius*, *Totanus*, *Rallus*, *Gallinula*, *Fulica*, *Anas*, etc.; Europe.

PROMPTENOVUM

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Spaniometra Kossack, 1911

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body elongate, nearly cylindrical. No acetabulum. Ceca simple, without diverticles. Testes pre-equatorial, separated one from the other by uterine coils. Cirrus pouch small: Genital pore ventral to pharynx. Ovary just in front of posterior cecal arch, slightly to one side of median line. Vitellaria ventral to ceca, united posteriorly. Uterus extending beyond ceca in loose coils; posterior coils descending to posterior extremity, enclosing ovary. Parasitic in eye of birds.

Genotype: *S. oculobia* Cohn, 1902 (Pl. 65, Fig. 788), in *Squatarola squatarola*. (= *Vanellus melanogaster*); Greifswald.

SPANIOMETRA

Szidatiella n. g. Yamaguti, 1958

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body linguiform, large, Pharynx well developed. Ceca without diverticles. Testes diagonal, in posterior part of body, pre-ovarian. Cirrus pouch not extending back of intestinal bifurcation. Genital pore postpharyngeal. Ovary median, just in front of posterior cecal arch, close to posterior testis but separated from anterior testis by uterine coils. Vitellaria lateral to ceca, with narrow space between, not united posteriorly; transverse vitelline ducts post-ovarian. Uterine coils not extending outward beyond ceca (in Szidat's Fig. 5 the uterus is shown overreaching the ceca only slightly) in posterior half of body, confined to intercecal area in anterior half; eggs large, dark brown; miracidia free in uterus. Parasitic in trachea and air sacs of birds.

Genotype: *S. vogeli* (Szidat, 1932) n. comb., syn. *Cyclocoelium v.* S. (Pl. 67, Fig. 811), in *Francolinus ahantensis;* Liberia.

SZIDATIELLA

Tracheophilus Skrjabin, 1913

Generic diagnosis. — Cyclocoelidae, Typhlocoelinae: Body flattened elliptical. No acetabulum. Ceca with simple diverticles on inner wall throughout. Testes rounded, oblique, just inside posterior cecal arch, separated one from the other by uterine coils. Cirrus pouch not extending backward beyond intestinal bifurcation. Genital pore prepharyngeal. Ovary rounded, opposite anterior testis. Uterine coils intercecal. Vitellaria dorsal, lateral and ventral to ceca, usually not united posteriorly. Parasitic in respiratory tract of aquatic birds.

Genotype: *T. sisowi* Skrjabin, 1913 (Pl. 67, Fig. 813), in trachea of *Anas boschas domestica* and other *Anas* spp. France, Russian Turkestan, Volga Delta, Formosa.

Redia without head collar developed in *Planorbis corneus* and *P. planorbis*, produced distomatous cercariae in 8 to 10 days; cercariae encysted in snail tissue in close proximity to rediae; cysts were fed to domestic and wild ducks with positive results — Szidat (1932).

Other species:

T. cymbius (Dies., 1850) Kossack, 1911, in *Himantopus wilsoni;* Brazil. Also in *Podilymbus podiceps, Anser hyperborea, Anas platyrhynchos, Anas rubripes*, U.S.A.; *Anas* spp., *Nyroca ferina*, W. Siberia.

Adults were found in the oronasal passages of *Podilymbus podiceps;* laboratory raised specimens of *Lymnaea stangalis, Physella heterostropha, Helisoma trivolvis* were placed in a dish with swimming miracidia and the snails were dissected at regular intervals after exposure. No specimens of *L. stagnalis* or *P. heterostropha* became infected. Rediae were recovered from *H. trivolvis*. Cercariae developed in rediae and emerged through birth pore to encyst in the tissue near the body wall. As many as 30 metacercariae were recovered from a snail dissected 8 weeks after infection — Stunkard (1934). In Stunkard's specimen the vitellaria are united posteriorly in contrast with Skrjabin's genotype.

T. hepaticus (Sugimoto, 1919) in gall bladder of domestic duck; Formosa.

Yamaguti, 1958

Cyclocoelidae

Tracheophilus sisowi Skrjabin, 1913

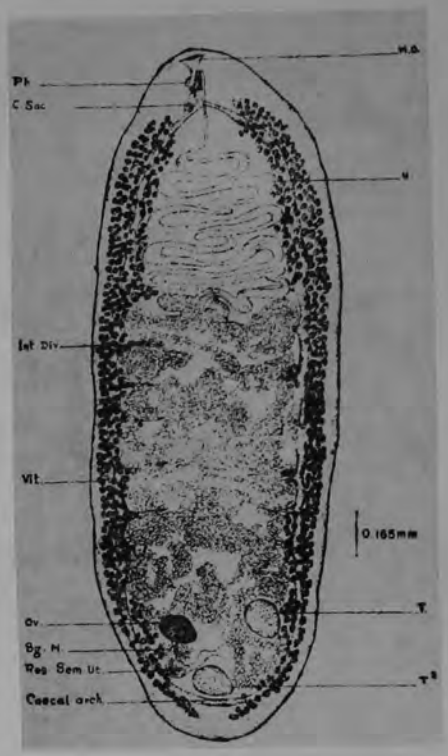
151—JAIN, S. P., 1967. "Occurrence of a new variety of *Tracheophilus sisowi* (fam. Cyclocoelidae) in an Indian avian host—*Anas acuta* (Linnaeus)." *Indian J. Helminth.*, Year 1966, **18** (2), 142–147.

Two specimens of *Tracheophilus sisowi* were recovered from the respiratory tract of *Anas acuta* shot near Varanasi, India. This is the first record of *T. sisowi* in India. The worms are described and the author proposes a new variety, *T. sisowi acirratus* n.var. The new form differs from the type species in having a feebly developed cirrus sac and fewer "blunt" gut diverticula. M.B-B.

Cyclocoelidae

TRACHEOPHILUS SISOWI ACIRRATUS n. var. JAIN, 1966

The specimens of *Trachcophilus sisowi* were obtained from the respiratory tract of *Anas acuta* (Linnaeus), shot in September, 1962 near a lake at Baida, in the suburb of Gyanpur (Varanasi). Only two specimens of the worm were obtained from one of the six hosts examined.



In the living condition, the parasites appear grey in colour except for the caeca which are orange coloured. On being kept in normal saline, they show active movements of their body. The body is elongated and dorso-ventrally flattened with rounded ends. In whole mount, it appears to have more or less an elleptical shape, measuring 8.92 mm. long and 3.16 mm. broad in the middle region of the body, and has more or less a uniform breadth. It has smooth surface.

The mouth is subterminal aud is surrounded by a feebly developed oral sucker, measuring 0.225 × 0.180 mm. in diameter. An acetabulum is absent. The mouth leads through a short prepharynx, measuring 0.075 mm. long, into an oval, strongly muscular pharynx which measures 0.165 mm. in length and 0.045 mm. in width. It bifurcates into two intestinal caeca at a distance of 0.75 mm. from the anterior end. The caeca extend laterally along the body margin. They are united posteriorly just in front of the hinder end where they form an arch. The inner margin of the laterally running caeca give out simple diverticula which are not very prominent.

Testes, two in number, are obliquely situated in the last fifth of the body just inside the caecal arch, are rounded or oval in shape, and are separated by uterine coils. The anterior testis measures 0.420×0.510 mm. and the posterior 0.375 × 0.420 mm. The cirrus pouch is relatively small and tubular structure situated close to the anterior end and its basal part contains a small seminal vesicle which continues into the ejaculatory duct, while a pars prostatica is absent. The genital pore is median and prepharyngeal.

The ovary is roughly ovoid in shape, situated opposite to the anterior testis in level with it and measures 0.225×0.480 mm. in size. The ovary and the two testes together form a tringle. An oviduct arises from the postero-lateral margin of the ovary and proceeds for a short distance towards the median line when it meets the common vitelline duct which comes from the ill developed vitelline reservoir situated close behind the ovary. A receptaculum seminis is present near the vitelline reservoir. The Mehlis' gland, surrounding these organs, is not very conspicuous. The uterus arises from the shell gland complex and makes a few loops in the intertesticular space before ascending forwards.

The uterine coils, lying transversely in the intercaecal field, do not reach the caeca laterally, but overlap the caecal diverticula. They fill the entire intercaecal space between the gonads and intestinal bifurcation and are full of ova. The eggs are large in size, measuring 0.075×0.105 mm. and lack filaments. Developing miracidia may also be seen in mature eggs.

-OVER-

The vitellaria are profusely developed, lie dorsal, lateral and ventral to the caeca, and are follicular in nature. They extend laterally from the level of intestinal bifurcation to almost the hinder end. The vitellaria of the two sides do not meet.

The excretory canal forms a reticular network and excretory pore is subterminally situated on the dorsal side.

Host—*Anas acuta* (Linnaeus).
Location—Trachea.
Locality—Gyanpur, Varanasi (India).

DISCUSSION

There are only three species of the genus *Tracheophilus* Skrjabin, 1913, T. *sisowi*, *T. cymbius* and *T. hepaticus*. In the specimens described here the vitellaria are not united posteriorly, in which respect it differs from *T. cymbius*. It is separated from *T. hepaticus* by having a different size, shape and topography of its organs. There is also a difference of habitat as *T. hepaticus* occurs in the gall bladder while the present species has been obtained from the respiratory tract.

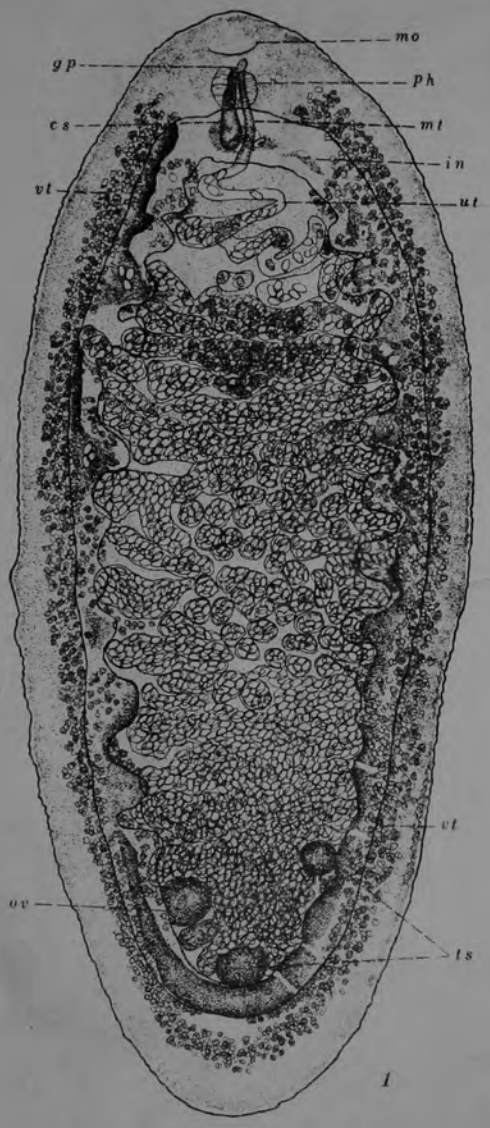
The present form shows closest resemblance to the genotype *T. sisowi* in the general topography of its organs. But it differs from the genotype in having a feebly developed cirrus sac. Furthermore, in the type species the caecal diverticula are blunt and more prominently protruded and the vitellaria extend anteriorly beyond the pharynx. The present specimens, however, lack these characters and hence, it has been considered to represent a new variety. The name *Tracheophilus sisowi acirratus* n. var. is proposed for it.

The present author does not agree with Mönnig (1934), Lapage (1936) and Dawes (1956) who have reduced *Tracheophilus cymbius* as synonym to *T. sisowi* and have also considered the genus *Tracheophilus* synonym to *Typhlocoelum* Stossich, 1902. He is in entire agreement with Yamaguti (1958) and other earlier workers in recognising *Tracheophilus* a genus separate from *Typhlocoelum*. Further agreement is expressed in the separation of the species *Tracheophilus sisowi* from *T. cymbium*. This is maintained mainly on the basis of the characters of vitellaria, which in the latter are not united posteriorly.

From S. P. Jain, 1966 Indian J. Helminth. 18: 142-147

Tracheophilus cymbium (Diesing, 1850) Kossack, 1911

H. W. Stunkard



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TRACHEOPHILUS

Transcoelum Witenberg, 1923

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Ceca straight, without diverticles. Testes tandem in posterior half of body. Cirrus pouch? Genital pore prepharyngeal or pharyngeal. Ovary in front of posterior testis. Vitellaria ventral to ceca, united posteriorly. Uterine coils extending outward beyond outer wall of ceca to lateral margins of body; posterior coils descending and enclosing posterior testis. Parasitic in nasal or infraorbital sinus of birds.

Genotype: *T. oculeum* (Kossack, 1911) Witenberg, 1925 (Pl. 80, Fig. 979), syn. *Hyptiasmus o.* K., in infraorbital sinus of *Fulica atra*, Germany; *Fulica atra, Porzana pusilla;* W. Siberia.

Other species: *T. sigillum* Witenberg, 1926, in nasal sinus of *Fulica atra;* Russia.

Transcoelum oculeum (Kossack, 1911) Witenberg, 1925

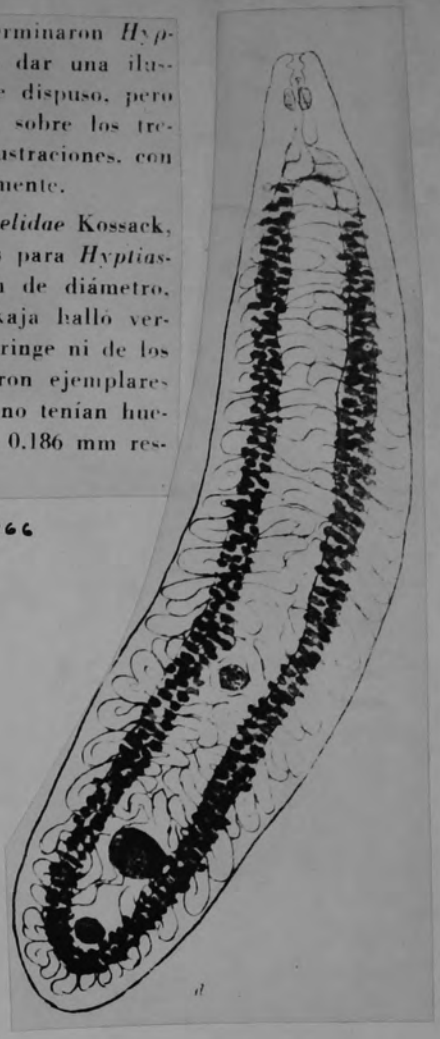
syn. *Hyptiasmus o.* K.

-OVER-

Los ejemplares, teñidos con carmin-ácido, se determinaron *Hyptiasmus oculeus* Kossack, 1911. Kossack sólo pudo dar una ilustración pobre de uno de los dos ejemplares de que dispuso, pero I. Bychowskaja-Pawlowskaja (1953), en su trabajo sobre los trematodes de las aves siberianas, dio dos excelentes ilustraciones, con las que nuestros ejemplares se corresponden exactamente.

Georges Dubois (1959) en su "Revisión des *Cyclocoelidae* Kossack, 1911 (*Trematoda*)" indica las siguientes dimensiones para *Hyptiasmus oculeus*: largo 11.2-12.8 mm, faringe 0.334 mm de diámetro, huevos 0.108 x 0.047 mm. I. Bychowskaja-Pawlowskaja halló vermes de hasta 13.2 mm, pero no dio medidas de la faringe ni de los huevos. Witenberg (1923) y Dollfus (1948) estudiaron ejemplares juveniles de 6.2 y 4.1 mm respectivamente, que aún no tenían huevos en el útero, y cuyas faringes median 0.29 y 0.196 0.186 mm respectivamente.

FROM SZIDAT + SZIDAT, 1966



TRANSCOELUM

Typhlocoelinae Harrah, 1922

Subfamily diagnosis. — Cyclocoelidae: Body spatulate, with rounded extremities. Acetabulum may be present. Pharynx well developed, esophagus short. Ceca with numerous short diverticula directed mesad. Testes posterior, separated by uterus or not. Cirrus pouch may or may not extend backward beyond intestinal bifurcation. Ovary opposite anterior testis. Vitellaria cecal or extracecal, may or may not unite posteriorly. Uterus intercecal.

Key to genera of Typhlocoelinae

1. Testes separated by uterus 2
Testes not separated by uterus; genital pore pharyngeal or prepharyngeal ..... *Typhlocoelum*

2. Testes round; genital pore prepharyngeal ..... *Tracheophilus*
Testes lobate; genital pore pharyngeal or postpharyngeal ..... *Typhlophilus*

Yamaguti, 1958

II. Sous-famille TYPHLOCOELINAE Harrah, 1922

Macko et Buša (1960) ont publié une « Revision de la systématique des Typhlocoelidae », dans laquelle ils ne maintiennent que le seul genre *Typhlocoelum* Stossich, 1902 et une seule espèce, *T. cucumerinum* (Rudolphi, 1809). Mais cette dernière, sur la base d'un examen de soixante-six spécimens recueillis en Slovaquie, est divisée en trois sous-espèces:

1° *T. cucumerinum cucumerinum* (Rud.) d'Anatidés du genre *Aythya*;

2° *T. cucumerinum americanum* (Manter et Williams, 1928) d'*Anas querquedula* L. et d'*A. crecca* L.;

3° *T. cucumerinum cymbium* (Diesing, 1850) d'*Anas platyrhynchos* dom., *A. platyrhynchos* L. et *A. acuta* L.

On ne saurait souscrire à cette conception, et pour plusieurs raisons. Tout d'abord, *T. cymbium* (Dies.), qui est le type du genre *Neivaia* Travassos, 1929, est une espèce brésilienne, bien caractérisée par l'absence de diverticules intestinaux (cf. Dubois 1950, pp. 74, 100 et 139) et dont la détermination des hôtes reste incertaine ou imprecise (*ibid.*, p. 139). On ne peut donc pas attribuer à *cymbium* des parasites d'Anatidés européens, comme l'ont fait Macko et Buša (*op. cit.*, p. 33 et fig. 1-12, puis 1re, 2e et 3e colonnes de mesures et caractéristiques du tableau 2, p. 24).

Notre deuxième raison s'oppose à ce que *Typhlocoelum americanum* Manter et Williams, 1928 soit considéré comme distinct de *cucumerinum* (Rud.). Le seul exemplaire servant de base à la description des auteurs américains ne mesure que 6 mm de longueur (c'est-à-dire la moitié de la taille adulte maximum, cf. Dubois 1950, p. 86, tableau V). Il n'est donc pas étonnant que les testicules soient moins ramifiés que chez les spécimens de grandes dimensions[1]. De plus, *T. cucumerinum* (Rud.) a été trouvé dans la même localité (Lincoln, Nebraska) [Manter et Williams *op. cit.*, p. 90 et fig. 1]. Il est donc arbitraire de rapporter à *T. americanum* les parasites européens qui ont les testicules à peine ou peu lobés (cf. Macko et Buša *op. cit.*, p. 33 et fig. 13-17).

Une troisième raison est basée sur la distinction qu'on doit établir entre *T. cucumerinum* et *T. sisowi* (Skrjabin, 1913): le premier ayant des testicules généralement très ramifiés et même disloqués en masses testiculaires (cf. Macko et Buša *op. cit.*, fig. 18-20, puis 6e et 7e colonnes de mesures et caractéristiques du tableau 2, p. 25); le second (*sisowi*) ayant des testicules arrondis à ovales chez les formes jeunes: 3,9 à 10 mm. (*ibid.*, fig. 1-12, puis 1re, 2e et 3e colonnes du même tableau, p. 24), plus ou moins allongés ou lobés mais jamais ramifiés chez les formes plus grandes: 11,6-14,9 mm (*ibid.*, fig. 13-17, puis 4e et 5e colonnes, pp. 24-25). Cette tendance à la lobulation des testicules en fonction de l'âge ou de la croissance est fréquente chez les Trématodes: Mme Bychovskaja-Pavlovskaja (1949, p. 42, fig. 14*a*) l'a observée pour *T. cucumerinum*. Ainsi, les cinq premières colonnes de mesures du tableau 2 et les figures 1 à 17 de Macko et Buša se rapportent à *Typhlocoelum sisowi* (Skrjabin).

[1] Manter et Williams écrivaient (*op. cit.*, p. 91): « The testes are much less lobed than in *T. cucumerinum*. They appear to be roughly bilobed but more material should be examined to determine their exact nature. »

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En ce qui concerne les hôtes de ces deux dernières espèces, il faut relever la frequence de *T. sisowi* dans le genre *Anas* et la dispersion de *T. cucumerinum* chez les divers Anatidés, avec prédilection pour le genre *Nyroca* (cf. Dubois 1959, pp. 134-138). Ces faits apparaissent nettement dans les conclusions du travail de Macko et Bušа (p. 33), si on les interprète dans le sens que nous venons d'indiquer.

Pour les raisons évoquées ci-dessus, nous identifions le « *Typhlocoelum cucumerinum americanum* (Manter et Williams, 1928) », cité par Macko (1960*a*, pp. 87-88 et fig. 2-3; 1961, pp. 269-270) comme parasite d'*Anas crecca* L. et d'*Anas querquedula* L., avec *Typhlocoelum sisowï* (Skrjabin, 1913). La figure 1 du premier de ces travaux se rapporte encore à *sisowi* d'*Anas* (et non pas à *cymbium*), tandis que la figure 4 est très caractéristique de *cucumerinum* d'*Aythya*.

Même remarque au sujet du récent travail de Macko (1961-62): les mentions de *Typhlocoelum cucumerinum americanum* (pp. 137, 141 et 151) et les figures 44 et 45 se rapportent à *Typhlocoelum sisowi* (Skrjabin).

FROM DUBOIS (1965)

Typhlocoelum Stossich, 1902

Generic diagnosis. — Cyclocoelidae, Typhlocoelinae: Body flattened elliptical. Ceca with simple diverticles on inner wall throughout their length. Acetabulum very small or absent. Testes strongly lobed, oblique, in posterior part of body, not separated one from the other by uterine coils; posterior testis median, just in front of posterior cecal arch, anterior testis just inside right or left cecum. Cirrus pouch usually overreaching intestinal bifurcation. Genital pore ventral or anterior to pharynx. Ovary round, opposite anterior testis or a little anterior or posterior to level of this testis. Uterine coils intercecal. Vitellaria immediately lateral to ceca, not united posteriorly. Parasitic in air sac of aquatic birds.

Genotype: *T. cucumerinum* (Rud., 1809), syn. *T. flavum* (Mehlis, 1831) Stossich, 1902 (Pl. 71, Fig. 863); *T. americanum* Manter et Williams, 1928 — Willey (1935); *Typhlultimum sarcidiornicola* (Megnin, 1890) [1]) in *Avis riparia*, gen. sp. incert. [*T. flavum* in *Fuligula marila;* Rositten]. Also in *Anseranus semipalmata*, Queensland; *Anas boschas domestica*, Formosa; *Anser hyperborea*, *Anas rubripes*, *A. platyrhynchos*, *Oedemia fusca*, *Nyroca americana*, *Spatula clypeata*, N. America; *Melanitta fusca*, *Clangula hyemalis*, *Somateria mollissima*, *Grus grus*, Germany; *Sarcidiornis melanota*, Madagascar and France; *Anas*, *Nyroca*, W. Siberia. Excretory system — Willey (1935).

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[1]) Joyeux and Baer (1927) examined Megnin's original specimen and found the figure given by him to be completely inaccurate. They regard *Monostomum sarcidiornicola* Megnin as a synonym of *Typhlocoelum cucumerinum*.

Other species:

T. gambense Dubois, 1930, in intestine (?) of *Plectopterus gambensis;* S. Africa.

T. obovale Neuman, 1909, syn. of *T. cucumerinum* (Rud., 1809) — Joyeux and Baer (1927), Gower (1938), in trachea of *Cairina moschata* and *Anas boschas brasiliana;* Brazil.

T. reticulare Johnston, 1913, syn. of *T. cucumerinum* (Rud., 1809) — Joyeux and Baer (1927), Gower (1938), in intestine (?) of *Anseranas semipalmata;* Queensland.

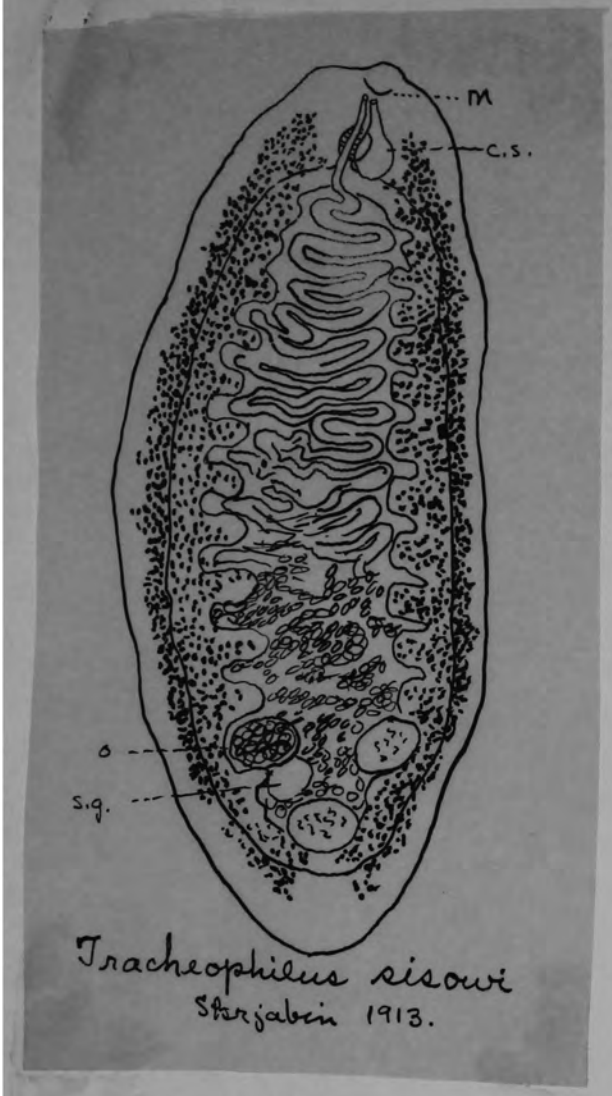
Yamaguti, 1958

TYPHLOCOELUM Stossich, 1902

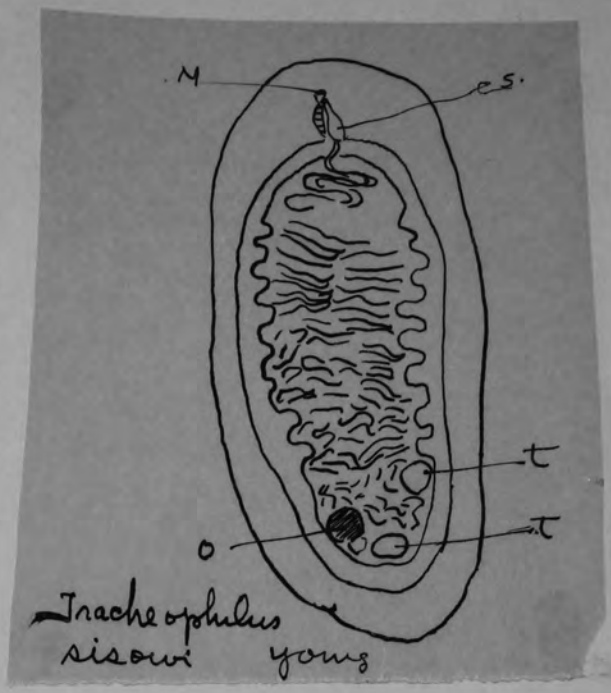
Synonyms: Typhlultimum Witenberg, 1924; Tracheophilus Skrjabin, 1913

With the characters of the family. Medium to large trematodes with a very muscular body, flattened, and broadly rounded at either end. The mouth opening is subterminal may or may not be surrounded by a weak sucker. There is often a small tongue-like projection anterior to the mouth opening. A small ventral sucker may be present. The pharynx is muscular, the esophagus being very short. The intestinal crura have diverticulae from the inner border, they anastomose at the posterior end. The testes may be strongly lobed or entire. Vitellaria lateral, extending dorsal and ventral of the crura. The excretory bladder is similar to Cyclocoelum. The coils of the uterus are very heavy, entirely filling the available space within the crura. Eggs yellow, containing a mature miracidium.

Type species: Typhlocoelum cucumerinum (Rudolphi, 1809)



Tracheophilus sisowi
Sterjabin 1913.



Tracheophilus
sisowi young

notes Typhlocoelum

In the year 1902, Stossich in his work on Monostomes established a new genus, Typhlocoelum, with the following characteristics: "Braccia intestinali fornite lungo la faccia mediana di sacchi ciechi semplici o divisi. Testicoli fortemente lobati, contigui, il posteriore a ridesso del braccia intestinale sinistro. Ovario semplice, sferico, situato sopra il testicolo posteriore, alla destra del testicolo anteriore. Vitellogeni laterali, constituiti da acini piccoli, numerosissini. Tipo: Typhlocoelum flavum Mehlis."

In addition to T. flavum Mehlis 1831 Stossich condidered also T. cucumerinum Rud. 1809 as an apparent species in his genus, while as uncertain species he designated the following: Monostomum sp. Magalhaes (from bronchi of Anas boschas brasiliana), Monostomum sarcidiornicola Megnin (from the trachea of Sarcidiornis melanota of Madagascar).

Dr. Kossack in his recent (1911) work on the Monostomes after careful research decided that the two species T. flavum and T. cucumerinum belonging, according to Stossich to Typhlocoelum, should be united. Therefore, T. cucumerinum according to Kossack becomes type of the genus. In characterizing the genus Typhlocoelum Stossich, Kossack places most importance on (1) the presence of blind sacs on the inner edge of the ceca and (2) on the strongly lobed testes. As species inquirende Kossack numbers in the genus Typhlocoelum the two "doubtful forms" of Stossich (Typhlocoelum sp. Magalhaes and T. sarcidiornicola Megnin), and adds with reservation Monostomum cymbium Diesing 1850 from the oesophagus of Himantopus wilsoni (Brazil) under the designation (Typhlocoelum) cymbium Dies.

This latter species which has been studied in detail by Monticelli differs from the genus Typhlocoelum in the absence of blind sacs on the ceca, and in the entire testes. In its other characters (body form, position of the genital pore and character of the vitellaria) it is near the genus.

In order to lessen the differences with the generic diagnosis, Kossack assumes that Monticelli might possibly have overlooked the blind sacs which are covered by the thick net of vitellaria, whereat he adds that the Monticelli material was not well preserved.

Even if this is true, there remains, assuming the correctness of Monticelli's observations, one character (the smooth edge of the testes) which separates the species from the genus Typhlocoelum. By the same character - the "entire" testes - there is differentiated from the genus the species (Typhlocoelum) sarcidiornicola Megnin in which, so far as a copy of a copy of the original drawing allows decision, typical blind sacs are present. As for the other species of the genus, Typhlocoelum sp. Magalhaes, which was briefly described by Neumann (4) under the name Typhlocoelum obovale, one can bring it into the genus only with great caution. Of this species, in spite of the two descriptions in the years 1888 and 1889, outside of the presence of the blind sacs, we know nothing of the character and position of the gonads. The draw-

ing of Magalhaes, of which an exact copy is herewith given (fig. 5) from his portuguese work, does not contribute to the description. Neumann considered the species as Typhlocoelum on account of the locality and the intestinal blind sacs.

In a collection of parasitic worms from Russian-Turkestan, which I collected during my location at Aulie-Ata in Syr-Darjagebiete, I found in the trachea of an Anas boschas killed January 7, 1909 a specimen of a monostome with the feature characteristic for Typhlocoelum (blind sacs on the inner edge of the ceca) and the differing feature - entire testes. In these two features my species resembled to a high degree T. sarcidiornicola Megnin, but the position of the gonads (in my species directly in the hind edge of the bow of the ceca, in Megnin's species at the level of the boundary between middle and posterior thirds of the body) speaks for its belonging to a separate species, if to the same genus.

Unfortunately my single specimen was a young, not sexually mature individual, without eggs in the uterus, without apparent vitellaria, so that I could not base on it together with T. sarcidiornicola a new genus, although a series of characteristics were present. Fate willed that during the study of my species by my colleague, veterinary-physician P. Sisow, in Paris, I cleared up the determination of numerous specimens of a trematode species which were collected from the trachea of the domestic duck (Anas boschas domestica) from the Paris market. Superficial study showed that the species stood very close to the genus Typhlocoelum, since blind sacs were present on the intestine, according to the shape of its entire testes, and according to their position directly at the hind edge of the ceca-bow it resembled very closely my Turkestan species. For its close relationship spoke also its presence in the trachea, and the host (Anas boschas) withthe single difference that my Turkestan material was collected from a wild duck, the Paris material from a domestic duck.

An exact comparative study of the parasite led me to the conclusion that they belong to one and the same species. As concerns the genus, as seems to me appropriate, those species which differ from the genus Typhlocoelum Stossich in the common, constant character (smooth outline of the testes) should be separated into a special genus which I name Tracheophilus. The fact that we have two indubitable species in which occur entire testes and blind sacs, speaks for the appropriateness of the separation. As type of the new genus I select the Paris species, which, thanks to the large number of examples, I have been able to study very exactly, and which, in honor of its collector, should bear the name Tracheophilus sisowi n.g. n.sp. I consider (Typhlocoelum) sarcidiornicola Megnin as a second species of the genus. Should Kossack's supposition that Monostomum cymbium Diesing possesses intestinal blind sacs be established, then must this species also, on the basis of its smooth testes, be considered in the genus Tracheophilus and not in the genus Typhlocoelum Stossich.

Tracheophilus n.g.

Diagnosis: Monostomes of average size, with flat bodies rounded at

both ends. Mouth opening sub-terminal. Ceca provided on the inner edges with simple, not branched, blind sacs. Genital pore in front of the pharynx. Vitellaria strongly developed, consisting of small follicles and lying on each side, dorsal and ventral to the ceca. Gonads in posterior third of the body. Testes and ovary constantly with smooth outline and round-oval. Uterus fills with its coils the inner body-field between the ceca. Parasites of the air passages of water birds. Type species:

1. Tracheophilus sisowi n.sp. 1913

Parasites with flat, elongate-oval bodies of which the length varies from 6 to 7.5 by 11.5 mm. Only one of the specimens studied reached the latter size (Fig. 1a) and (in this specimen) the sac-like body tightly filled with eggs allowed further details to be revealed. Figure 2 and the description I have made according to an example of medium size (length 7.56 and width 2.98 mm.). The greatest body width lies in the middle, anteriorly and posteriorly the body tapers gradually and the ends are rounded. In one example there occurs at the anterior end a tongue-shaped process (Fig. 2.). The fore-end is somewhat wider than the posterior end, as is characteristic for the genus Typhlocoelum, except that here that character is not so outspoken.

The mouth opening lies subterminal and stands 0.29 mm. from the anterior end. The pharynx measures 0.29 mm. in length and 0.25 mm. in width. It leads into an extraordinarily short oesophagus which goes over on the right side to the especially powerful intestinal ceca. The ceca run backward parallel to the body wall and maintain themselves at a certain distance from the body edge. In the posterior part of the body the two ceca unite into the ceca bow. The outer edge of the intestine is equal and smooth. The inner edge however, bears conspicuous blind sacs, which reach inward but do not extend to the opposite side; they leave considerable space between them. Altogether from 9 to 13 blind sacs leave from each side. The blind sacs show their greatest development in the middle body third; in the region of the ceca bow and the forking of the ceca they are completely absent. These processes are simple, without a trace of branching, therefore differing from the slightly branching blind sacs of the genus Typhlocoelum.

The gonads lie in the hind part of the body, between the ceca. The testes are of equal size. The hind testis lies median, and rests on the inner edge of the ceca bow; the other testis lies farther forward, lateral to it, and is separated from it by coils of the uterus, andin numerous cases by an intestinal blind sac. The testes are entirely smooth, of roundish form, and possess a cross-measure of 0.340 mm. The bursa cirri is weakly developed and, in contrast to the genus typhlocoelum, does not pass over the intestine. The ovary is always somewhat larger than the testes, smooth, round, and has a mid-cross-measure of 0.45 mm. It usually lies at equal height with the forward testis from which it is separated by uterine coils, while between it and the hind testis in addition to coild of the uterus there lies the shell gland. The ovary often has a position more toward the posterior. Usually these three gonads form an equilateral triangle whose point is toward the rear. The

shell gland lies at the hind edge of the ovary and is separated from the testes by coils of the uterus. The uterus fills with its coils the entire body space between the parasite between the ceca and leaves in the posterior part only a small space free for the gonads. The intestinal coils ((Meaning uterine coils?)) are especially strongly compressed together, and irregular, and only in the anterior third do they form regular coils which stand perpendicular to the long body axis. At the level of the forking of the ceca, the uterus bends forward at a right angle, crosses the intestine, runs ventral to the pharynx and opens somewhat in front of it near the male genital opening. In sexually mature individuals the uterus is filled with oval eggs, having the length 0.122 and the width 0.063 mm. The vitellaria are very strongly developed. Their chief mass lie on the outer edge of the ceca. The lateral follicles lie between the outer body edge and the ceca, the inner reach to the inner boundary of the blind sacs. The vitellaria begin in the region of the forward end of the pharynx and end between the ceca bow and the posterior end of the body. At the posterior end of the body they surround the oval excretory bladder lying behind the ceca bow, but they do not come together. The single follicles are very small, but they lie in the form of a thick network.

As host of the parasites we must regard (until further) Anas boschas domestica (Paris) and Anas boschas L. (Russian Turkestan). Position: tracheae.

2. Tracheophilus sarcidiornicola (Megnin) 1890

As already observed, Typhlocoelum sarcidiornicola according to its anatomical features, is a representative of the genus Tracheophilus. Since no specimens of the species are available to me, I limit myself to a collection and repetition of the data present in the literature.

Length of body 5 to 6 mm. Body form elliptical, forward end broader than posterior end. Mouth opening large, round, subterminal, lying in the middle of the round sucker. Esophagus fairly long. The Two ceca unite posteriorly into a ceca bow. The inner edge of the intestine with short, large, undivided blind sacs. Genital opening in the region of the forking of the intestine. Testes proportionally small, of almost regular round form, smooth, lying obliquely behind one another, and at the boundary betweenthe second and last body thirds, at a fairly considerable distance from the ceca bow. The uterus fills with its coils the body space between the ceca and reaches as far posteriorly as the gonads allow. The vitellaria consist of very small follicles which lie toward the outside of the ceca and extend from the forward end of the body posteriorly. They unite at the hind end of the body. Excretory bladder large, lying between the vitellaria and the ceca bow.

Lives in the trachea of Sarcidiornis melanota (Madagascar)

I include here a key to the two unquestionable species of the genus Tracheophilus:

I. Esophagus long, both testes considerable distance from the ceca bow.....Tracheophilus sarcidiornicola

II. Esophagus short, hind testis lying directly on the ceca bow.....Tracheophilus sisowi n.sp.

As species inquirendae can be numbered to the genus Tracheophilus:

3. (Tracheophilus) cymbium (Diesing) 1850

Should the suspicion of Kossack on the presence of blind sacs be established, this would be a typical representative of the genus.

4. (Typhlocoelum ((Tracheophilus?))) obovale (Neumann) 1909

Since the author does not say as to the clief difference between Typhlocoelum and Tracheophilus (lobed or smooth testes), we can consider this species with equal right in one genus or the other. Since the discoverer of the species, Magalhaes, likewise found them in ducks (Anas boschas brasiliensis) wherin he could quote numerous deaths in infected animals, I might here quote briefly the differences from T. sisowi. The length reaches 12 mm., the width 5 mm. The edges of the body are slightly indented, the mouth opening is 0.45 mm. from the anterior end, eggs measure in length 0.154, and in width 0.090 mm. The discoverer believed with reservation that the species was provided for in Monostomum (Typhlocoelum) flavum Mehlis, but left the question open.

To Prof. Dr. M. Braun I am, as always, again indebted with great thanks for friendly interest and for valuable help. Mr. Dampf kindly translated the manuscripts written in Russian.

Komisberg i. Pr., Feb. 1913.

TYPHLOCOELUM

Typhlophilus Lal, 1936

Generic diagnosis. — Cyclocoelidae, Typhlocoelinae: Body linguiform. Pharynx globular, esophagus very short, ceca with diverticles on inner wall throughout. A small muscular acetabulum may be present. Testes lobate, separated one from the other by coils of uterus. Cirrus pouch overreaching intestinal bifurcation. Genital pore postpharyngeal or pharyngeal. Ovary round, opposite anterior testis. Receptaculum seminis present. Uterus intercecal; eggs very small, without filaments. Vitellaria ventral to ceca and diverticles, united posteriorly. Excretory vesicle crescent-shaped, with dorsoterminal pore. Parasitic in intestine of aquatic birds.

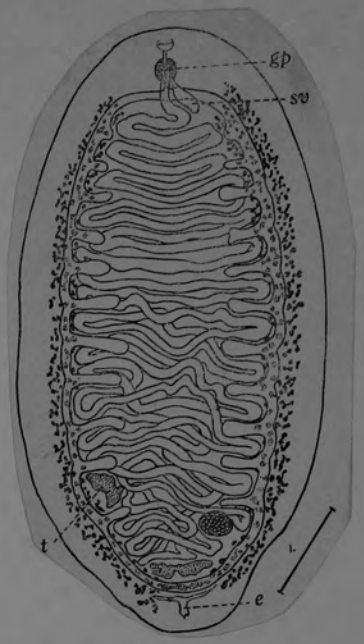
Genotype: *T. shovellus* Lal, 1936 (Pl. 78, Fig. 951), in *Spatula clypeata;* Lucknow; India. Bashkirova (1950) transferred this species to *Typhlocoelum.*

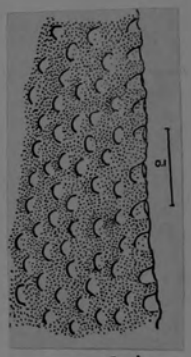
Other species: *T. americanus* Manter et Williams, 1928, in *Spatula clypeata;* U.S.A. Willey (1935) regards this species as a synonym of *Typhlocoelum cucumerinum* (Rud., 1809).

Yamaguti, 1958

Typhlocoelum cucumerinum (Rud., 1809)
syn. Typhlocoelum americanum Manter and Williams, 1928
Typhlophilus americanus (Manter and Williams, 1928)

Host: Spatula clypeata, trachea
Locality: Lincoln, Nebraska





Tegumental pits.

TYRANNIDAE

Uvitellina Witenberg, 1926

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body spatulate. Ceca simple, without diverticles. Testes close to each other in front of posterior cecal arch, not separated by uterus. Ovary anterior and opposite to anterior testis. Uterine coils reaching to lateral margins of body, may extend back of testes. Vitellaria directly ventral or lateral to ceca, in compact series of small follicles, united posteriorly. Parasitic in air sac of birds.

Genotype: *U. pseudocotylea* Witenberg, 1926 (Pl. 69, Fig. 840), in *Himantopus candidus;* Russian Turkestan. Also in *Charadrius placidus;* Japan.

Other species:

U. dollfusi Tseng Shen, 1930, in *Microsarcops cinereus;* Nanking.

U. keri Yamaguti, 1933, in *Microsarcops cinereus;* Japan.

U. macroisophaga Hannum et Wilson, 1934, syn. of *pseudocotylea* Witenberg — Bashkirova (1950), in *Oxyechus vociferus;* California.

U. magniembria Witenberg 1926, syn. of *pseudocotylea* Witenberg— Bashkirova (1950), in *Himantopus candidus;* Russian Turkestan.

U. tageri Yamaguti, 1933, syn. of *vanelli* (Rud.) — Dollfus (1948), Bashkirova (1950), in *Vanellus vanellus;* Japan.

U. vanelli (Rud., 1819) in *Vanellus vanelli;* Vien. Mus.

Yamaguti, 1958

Uvitelllna indica Siddiqui and Jairajpuri, 1962

(Fig. 65)

Three specimens of *Vanellus indicus* were examined in Lahore and 12 flukes recovered from their air sacs.

The body of the flukes is elongate, somewhat spatuate in shape with a comparatively narrow anterior end. The tegument is thick and unarmed but slightly frilled throughout. The oral sucker is feebly muscular, wider than long. The ventral sucker is absent. The prepharynx is very short. In mounted specimens it is not discernible, while in the living material it can be seen easily. The pharynx is larger than the oral sucker, more muscular and subglobular. The oesophagus is short. The intestinal bifurcation is at a distance of 0.484 – 0.666 mm from the anterior extremity. The intestinal caeca are broad, long and united posteriorly just behind the testes and are full of yellowish brown homogeneous matter.

65

The testes are just in front of the caecal arch. They are almost equal, rounded to slightly oval in shape, entire or slightly irregular in outline and situated one behind the other slightly obliquely in the intercaecal field. The cirrus sac is small, somewhat curved, extending from the posterior margin of the pharynx to the posterior margin of the intestinal fork or slightly behind it. It encloses a saccular vesicula seminalis, a long ductus ejaculatorius and a poorly developed pars prostatica. The genital pore is just post-pharyngeal. The ovary is spherical or oval in shape, entire in outline and smaller than the testes. It is slightly antero-sinistral to the anterior testis. The vitelline follicles are small, numerous and extend on each side from the level of the intestinal fork along the intestinal caeca and become confluent posteriorly. For the most part they lie along the extra-caecal fields but at places they may come to lie on the ventral surface of the caeca or even surround the caecal arch. The uterus is voluminous, thrown into numerous irregular transverse coils which in the anterior one third of the body are intercaecal, while in the posterior two third of the body they extend into the extra-caecal fields. Anteriorly the uterus extends upto near the intestinal fork, while posteriorly some of its coils extend beyond the caecal arch. The oval eggs are large, numerous and thin-shelled containing fully developed ocellate miracidia. The excretory vesicle is short, simple and transversely elongated. The excretory pore is dorsal and subterminal.

MEASUREMENTS

(All measurements in millimetres)

Body length	7.423 – 0.332
Body breadth	1.605 – 2.302
Oral sucker	0.156 – 0.235 ×
	0.245 – 0.318
Pharynx	0.245 – 0.324 ×
	0.184 – 0.362
Oesophagus	0.107
Ovary	0.215 – 0.294 ×
	0.156 – 0.303
Anterior testis	0.421 – 0.588 ×
	0.431 – 0.545
Posterior testis	0.470 – 0.575 ×
	0.392 – 0.606
Cirrus sac	0.294 – 0.313 ×
	0.117 – 0.156
Mehlis' gland	0.196 – 0.294 ×
	0.156 – 0.245
Eggs	0.102 – 0.142 ×
	0.048 – 0.073

—over—

Host: *Vanellus indicus*
Location: Air sacs
Locality: Lahore

Discussion

The present flukes resemble *Uvitellina indica* Siddiqui and Jairajpuri, 1962 in all essential features and have been identified as such. They have, however, been reported for the first time from Pakistan.

From BHUTTA AND KHAN, 1975

UVITELLINA

Wardianum Witenberg, 1923

Generic diagnosis. — Cyclocoelidae, Cyclocoelinae: Body markedly tapered anteriorly. Ceca without diverticles. Testes juxtaposed inside cecal arch. Ovary just pretesticular, median or submedian. Uterine coils not extending beyond outer wall of ceca. Vitellaria directly lateral to ceca, not united posteriorly. Parasitic in air sac of birds.

Genotype: *W. triangulare* (Harrah, 1922) Witenberg, 1923 (Pl. 70, Fig. 845), in *Tringa maculata;* Iowa.

Other species:

W. taxorchis (Johnston, 1917) in *Limosa novae-hollandiae;* Australia. Also in *Himantopus leucocephalus, Gallinago gallinago.*

W. wilsoni (Harrah, 1922), syn. of *triangularum* (Harrah, 1922) — Bashkirova (1950), in intestine (?) of *Gallinago wilsoni;* Iowa.

Yamaguti, 1958

Wardianum taxorchis (Johnston, 1917)
syn. Cyclocoelum taxorchis Johnston, 1917

CYCLOCŒLUM TAXORCHIS, sp. n. (Fig. 23.)

Diagnosis.—Middle sized worms, widest a little behind the middle, gradually narrowed towards the anterior end, and widely rounded behind. Pharynx small, *œsophagus long*. Genital pore at posterior end of pharynx. Cirrus sac *long, reaching the intestinal* limbs. Testes *side by side, one on either side of the middle line*, equal in size. Fields of the yolk-glands *extend forwards as far as* the pharynx, separated in the posterior end by a distinct interval. Coils of the uterus only in one or two exceptional cases reach beyond the inner edge of the intestinal limbs.

Host.—*Limosa novæ-hollandiæ*, in the body cavity.

Type specimen in the Australian Museum, Sydney, No. W. 444.

Ten specimens of this species were obtained from the body cavity of the Godwit, *Limosa novæ-hollandiæ*, by Dr. Harvey Johnston, at Lord Howe Island.

see reprint

Cyclocœlum taxorchis differs from all the other species of the genus in the arrangement of the testes side by side on either side of the middle line. From each of the species separately it shows a number of characteristic differences, and appears to be most closely related to *C. brasilianum*[23] which is parasitic in the South American bird *Totanus flavipes*, a bird closely related to *Limosa novæ-hollandiæ*, the host of the Australian fluke under consideration. The latter resembles *Cyclocœlum brasilianum*, and differs from the other species in its small pharynx and long œsophagus and in the forward extension of its yolk gland fields.

It differs from it, however, in the cirrus sac reaching the intestine, which it always fails to do in *C. brasilianum;* in the testes being equal in size while they are unequal in the Brazilian form and in the very characteristic arrangement of the testes.

WARDIANUM