

Some Nematodes
from the freshwater fishes of Rhodesia
with the description of a new species
Cithariniella petterae n. sp.

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Summary

Four species of Nematodes were found in freshwater fishes of Rhodesia :
Camallanus kirandensis Baylis, 1928, from the gut of *Labeo altivelis* Peters, and *Philometroides* sp. from under the skin of the same host.

Contraecaecum sp. larva from the body cavity of *Eutropius depressirostris* (Peters), *Hydrocynus vitatus* (Castelnau) and *Mormyrops deliciosus* (Leach).

Cithariniella petterae n. sp. from the gut of *Distichodus schenga* Peters, is distinguished from *Cithariniella khalili* by its much larger size and other characters.

Résumé

Quelques Nématodes de poissons d'eau douce de Rhodésie. Description d'une espèce nouvelle, *Cithariniella petterae* n. sp.

Quatre espèces de Nématodes ont été trouvées dans les poissons d'eau douce en Rhodésie :
Camallanus kirandensis Baylis, 1928, trouvée dans le tube digestif de *Labeo altivelis* Peters, et *Philometroides* sp., trouvée sous la peau du même hôte.

Contraecaecum sp., larve trouvée dans la cavité générale du corps d'*Eutropius depressirostris*, *Hydrocynus vitatus* et *Mormyrops deliciosus*.

Cithariniella petterae n. sp., trouvée dans le tube digestif de *Distichodus schenga*, se distingue de *C. khalili* par sa plus grande taille et d'autres caractères.

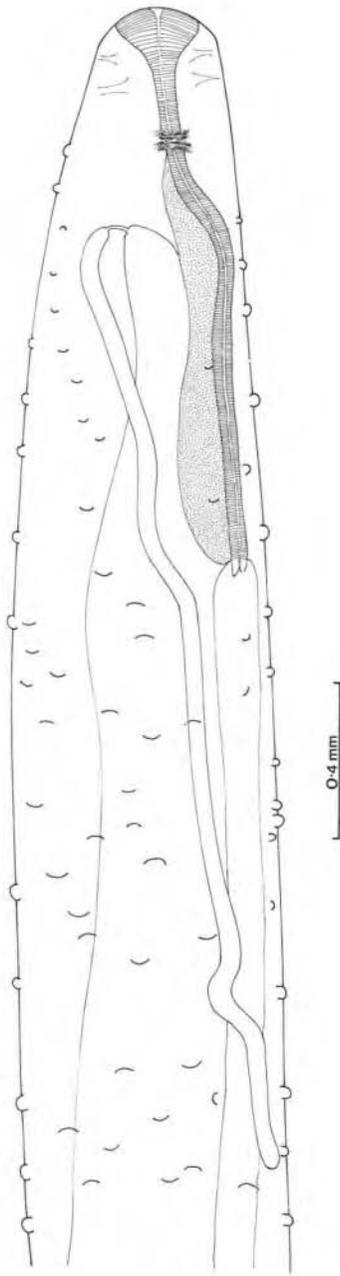


FIG. 1.

Mr. G. W. Begg of the Lake Kariba Fisheries Research Institute, Rhodesia kindly entrusted the writer with some nematodes collected from the freshwater fishes of Rhodesia. As far as can be found from published literature there is no previous record of nematodes from the freshwater fishes of Rhodesia. In fact the helminth parasites of freshwater fishes of this country are inadequately known and only one adult monogenean, 3 adult digeneans, one larval digenean and one larval cestode have so far been reported.

CAMALLANIDAE Railliet and Henry, 1919.

Camallanus Railliet and Henry, 1915.

Camallanus kirandensis Baylis, 1928.

One mature female specimen of this species was recovered from the intestine of *Labeo altivelis* Peters, 1852. This species was originally reported from *Barbus* sp. from Kirando, Lake Tanganyika (Baylis, 1928) and from a saw-fish in Khulna in East Pakistan (Khan et Yassin, 1969). Species of the genus *Camallanus* are parasites of fishes, amphibians and reptiles. This is a new host record and a new locality.

PHILOMETRIDAE Baylis and Daubney, 1926.

Philometroides Yamaguti, 1935.

Philometroides sp.

One mature female specimen of a species of the genus *Philometroides* was recovered from *Labeo altivelis* Peters, 1852, from Banyati River, Rhodesia. The worm was coiled under the skin of the opercular region and could be seen easily through the thin skin of that region. Unfortunately the posterior end was damaged during extraction.

FIG. 1. — *Philometroides* sp. Anterior end of female.

The worm measures 55.9 mm. in length and 0.75 mm. in maximum width. The body is almost uniformly broad and bluntly pointed anteriorly. The cuticle has numerous irregularly scattered, flat papilliform protuberances giving rise to a conspicuous bossy appearance. The mouth is simple and leads directly to a muscular œsophagus which is 1.32 mm. long. Cephalic papillae described in some species of the genus could not be seen in the present specimen. At its anterior end the œsophagus is swollen but gradually narrows down to a uniform diameter. A large œsophageal gland opens into the œsophagus at the level of the nerve ring and extends the whole length of the œsophagus attached to it laterally and ends blindly at the same level where the œsophagus ends. The nerve ring lies at a distance of 0.29 mm. from the anterior end. The intestine is broader than the œsophagus but becomes narrower posteriorly until finally it becomes a solid cord attached to the body wall and ends without an anal opening. The long cylindrical reflex ovaries lie at both ends of the body and are connected to a voluminous uterus which extends almost the whole length of the worm. The vagina and vulva are absent. The embryos with a blunt anterior end and a pointed tail measure 0.89-0.96 mm. in length.

Discussion :

This philometrid nematode is assigned to the genus *Philometroides* Yamaguti, 1935, because it has a cuticle with numerous bosses irregularly scattered and an œsophagus swollen near the anterior end. Species of the genus are found in marine and freshwater fishes and Rasheed (1963) recognized 5 species as belonging to it. Due to the damaged condition of the worm it is not possible to identify it specifically. This is the first record of this genus in African freshwater fishes and the first record of a philometrid from *Labeo altivelis*. Only two other philometrid nematodes have so far been reported from freshwater fishes in Africa, namely *Nilonema gymnarchi* Khalil, 1960, and *Thwaitia bagri* Khalil, 1965.

HETEROCHEILIDAE Railliet and Henry, 1915.

Contracaecum Railliet and Henry, 1912.

Contracaecum sp. (larva).

Contracaecum sp. larvae were collected from the body cavity of the following fishes :

Eutropius depressirostris (Peters, 1852) ;

Hydrocynus vitatus (Castelnau, 1861) ;

Mormyrops deliciosus (Leach, 1818).

Contracaecum sp. larvae were previously reported in Africa from Zaïre (Congo), Mali and Egypt from 32 different species of freshwater fishes and the above 3 hosts are new records. Adult species of *Contracaecum* are generally found in piscivorous animals.

OXYURIDAE Cobbold, 1864.*Citbariniella* Khalil, 1964.*Cithariniella petterae* n. sp.

The specimens on which this new species is based were collected from the intestine of *Distichodus schenga* Peters, 1852, from Monga, Rhodesia. There are 42 females and 2 males.

The whitish worms are of a small size and the cylindrical body ends in both sexes in a long narrow tail. The cuticle has fine longitudinal striations and narrower lateral alae run the full length of the body from just posterior to the head to near the anus in the females. The large excretory pore, situated slightly posterior to the œsophageal bulb, leads into large canals which radiate from the pore in the form of an X. The mouth opening is bound by six small lip-lobes and leads into a shallow buccal cavity at the bottom of which there are three chitinous ribbed flaps. The œsophagus is long and ends in a single bulb which is separated by a constriction from the rest of the œsophagus and is provided with a denticular apparatus. The œsophagus leads into the intestine by a valve. The anterior part of the intestine is enlarged but gradually tapers into a long thin tube and leads into a rectum which opens to the outside by the anal opening. There are two small rectal glands at the junction of the intestine and the rectum.

Males: These measure 2.27 and 2.93 mm. in length and 0.17 and 0.25 mm. in maximum width attained towards the middle of the body. The body is cut away ventrally behind the cloaca and ends in a long narrow tail which bends sharply ventrally. The buccal cavity is 0.011 mm. deep and the total length of the œsophagus including the bulb is 0.665 and 0.704 mm. The bulb measures 0.127-0.139 mm. in length and 0.104-0.127 mm. in width. The nerve ring lies at a distance of 0.181-0.193 mm. from the anterior end and the excretory pore opens at a distance of 0.70-0.86 mm. from the same part.

There is a single testis which extends anteriorly to a level slightly posterior to the excretory pore and the single spicule is simple in outline measuring 0.099-0.105 mm. in length and 0.012 mm. in maximum width. The gubernaculum embraces the spicule dorsally at its distal end and measures 0.35 mm. in length. The cloacal opening is guarded by two large lips, the upper one is provided by two large papillae laterally but no papillae could be seen on the lower lip of the two males examined. There is also a single median large papilla on the tail at 0.077 mm. posterior to the cloaca. The narrow tail is 0.44-0.52 mm. long.

Females: These are larger than the males and measure 3.78-5.19 mm. in length and 0.30-0.41 mm. in maximum width. The buccal cavity is 0.015-0.019 mm. deep and the total length of the œsophagus including the bulb is 0.77-0.95 mm. The bulb measures 0.136-0.174 mm. in length and 0.127-0.164 mm. in width. The nerve ring lies at a distance of 0.185-0.232 mm. from the anterior end and the excretory pore opens at 0.98-1.1 mm. from the same end. The conical long tail measures 0.978-1.124 mm. in length.

There are two large ovaries one at each end of the body and the uteri are coiled and filled with eggs. The vulva lies at a distance of 1.42-1.90 mm. from the posterior end and

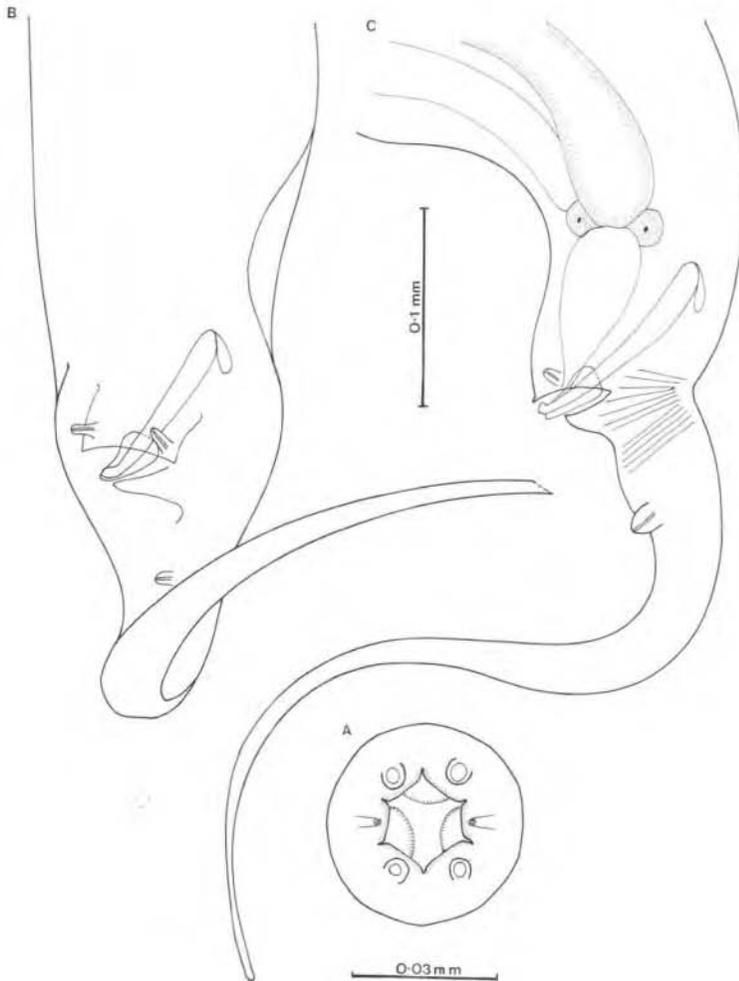


FIG. 2.

FIG. 2. — *Cithariniella petterae* n. sp.: A. - End on view of female head ; B. - Male tail, ventral view ; C. - Male tail, lateral view.

its opening is simple without prominent lips. The ovejector is a muscular organ, it is very wide at the vulvar opening but gradually tapers and points anteriorly for a distance of 0.26-0.29. before it coils and points in the opposite direction. The elongated oval eggs measure $0.116-0.126 \times 0.038-0.045$ mm. and are provided with 5 very long filaments at each pole, seen only on the mature eggs. The eggs are partly embryonated at the time of laying.

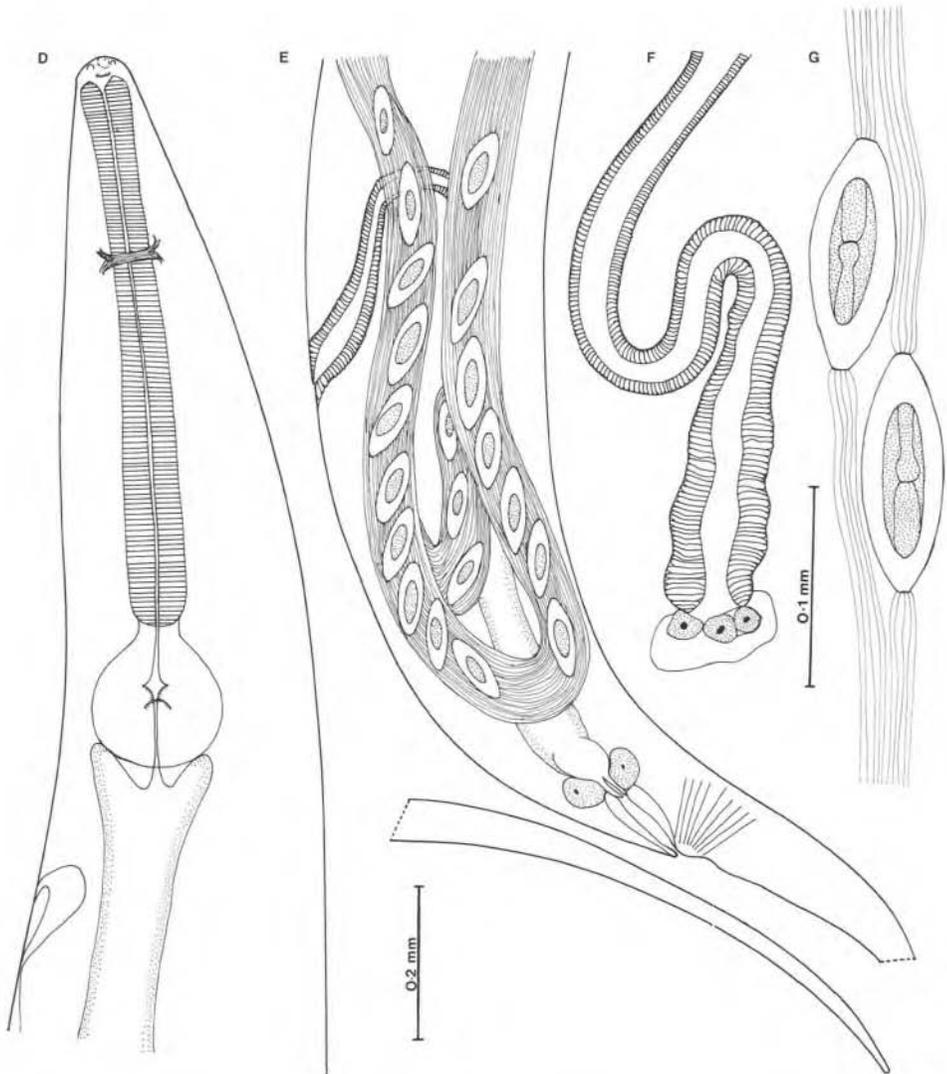


FIG. 3. — *Cithariniella petterae* n. sp.: D. - Anterior end of female; E. - Posterior end of female; F. - Ovejector; G. - Eggs.

Discussion :

The genus *Cithariniella* was erected by Khalil (1964) for the species *C. citharini* collected from *Citharinus citharus* in the Sudan. The genus is characterized by having three chitinous ribbed flaps at the bottom of the buccal capsule, 4 large papillae on the head and a single spicule in the male. Petter *et al.* (1972) reported the same species

from the same host and from *Distichodus brevipinnis* in Senegal and added a second species to the genus namely *Cithariniella khalili* from *Synodontis sorex* and *S. gambiensis* in Senegal and Chad respectively. So far these two are the only species of the genus.

The present specimens are assigned to the genus *Cithariniella* on the basis of the head structures and the presence of a single spicule in the male but they differ from the two species of the genus. From *C. citharini* they differ in the absence of a precloacal sucker-like organ in the male ; in the anterior position of the vulva ; in the shape of the ovejector and in the shape, number and position of the filaments on the eggs. They are similar to *C. khalili* but differ in the general shape of the body ; in the size of the body where they are more than double its size ; in the measurements of the various organs particularly the œsophagus, the spicule and the eggs and in the postanal papillae where as in *C. khalili* there are two adjoining papillae quite distinct from each other ; there is only one large median papilla in the new species. It is not known for certain whether the pair of papillae described on the posterior lip of the cloaca in the males of the two species of *Cithariniella* are definitely absent in the new species or could not be seen in the two available males. In spite of this doubt the present specimens are sufficiently different from the two species of the genus and are therefore referred to a new species for which the name *Cithariniella petterae* n. sp. is proposed after Madame A. Petter.

HOST : *Distichodus schenga* Peters, 1852.

HABITAT : Intestine.

LOCALITY : Monga - Rhodesia.

TYPE : British Museum (Natural History). No. 1972 : 51-63.

Key to species of *Cithariniella*

1. Precloacal single sucker-like organ present in male *C. citharini*
 Precloacal sucker-like organ absent in male 2
2. Two closely adjoining median postanal papillae on male tail *C. khalili*
 Single, large median postanal papilla on male tail *C. petterae*

Oxyurid nematodes seldom occur in fishes but a few species have been reported from Africa and South America. In Africa, in addition to the three species of *Cithariniella*, Petter *et al.* (1972) reported *Synodontisia thelastomatoides*, the only species of the genus, from *Synodontis sorex* in Senegal and from *S. ocellifer* in Chad. The only other oxyurid reported from African freshwater fishes is *Aplectana chamaeleonis* (Baylis, 1920) reported from a cichlid in Ethiopia (Chen, 1966) but this species is common in African amphibians and reptiles and it is probably an accidental infection of the fish host as it is the only species of the genus reported from a fish. In South America three monotypic genera of oxyurids with a single spicule exist in fishes namely

Travenema travenema Pereira, 1938, in *Eurimatus elegans* an anostomid freshwater fish in Brazil, *Ichthyouris ro* Inglis, 1962, from *Cichlasoma festivum* a cichlid from British Guiana and *Laurotravassoxyuris travassosi* Pérez Viguera, 1938, from *Holacanthus tricolor* a cheatodontid marine fish from Cuban waters. Although there are some relationships between the freshwater fishes and their helminth parasites of Africa and South America (Khalil, 1971) there does not exist, at the moment, any particular reason to place the African and South American oxyurid parasites of fishes in one group (Petter *et al.*, 1972), but they are undoubtedly related and some of the African species have their nearest relatives among the South American species. The two African genera *Cithariniella* and *Synodontisia* show some similarities to the family Thelastomatida of insects and this led Petter *et al.* (1972) to presume that they have originated from species of this family by « capture » but they have evolved very little since.

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Références

- BAYLIS (H. A.), 1928. — Some parasitic worms from fishes, from Lake Tanganyika. *Ann. Mag. nat. Hist.*, Ser. 10, 1 (4), 552-562.
- CHEN (P.), 1966. — *Aplectana chamaeleonis* (Baylis, 1929) from a frog and a freshwater fish in Ethiopia. *Ann. Mag. nat. Hist.*, Ser. 13, 9 (103/105), 333-336.
- KHALIL (L. F.), 1964. — *Cithariniella citharini* gen. et sp. nov. (Nematoda): an Oxyurid from a freshwater fish, *Citharinus citharus* in the Sudan. *J. Helminth.*, 38 (1/2), 41-46.
- , 1971. — The Helminth Parasites of African freshwater fishes. Part. I. Zoogeographical affinities. *Revue Zool. Bot. afr.*, 84 (3/4), 236-263.
- RASHEED (S.), 1963. — A revision of the genus *Philometra* Costa, 1845. *J. Helminth.*, 37 (1/2), 89-130.
- KHAN (D.) et YASEEN (T.), 1969. — Helminth parasites of fishes from East Pakistan. 1. Nematodes. *Bull. Dept. Zool. Univ. Punjab.*, No. 4.
- PETTER (A. J.), VASSILIADES (G.) et TRONCY (P. M.), 1972. — Trois espèces d'Oxyures parasites de poissons en Afrique. *Ann. Parasit. hum. comp.*, 47 (4), 569-579.
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