

Ann. Naturhist. Mus. Wien	94/95	B	35–40	Wien, 1993
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***Raillietnema kritscheri* sp. n. (Nematoda: Cosmocercidae) from *Cichlasoma* spp. (Pisces) from Mexico**

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(With 1 Figure and 1 Plate)

Manuscript submitted August 1st, 1992

Z u s a m m e n f a s s u n g

Raillietnema kritscheri sp. n., ein neuer Nematode aus dem Intestinum von zwei Fischarten aus der Familie der Cichliden, *Cichlasoma pearsei* (Typuswirt) und *Cichlasoma synspilum*, aus Mexiko, wird beschrieben. Die Art ist hauptsächlich durch das Fehlen der Lateralflügel, die Struktur und Länge (0,081–0,120 mm) der Spiculae, das Längenverhältnis zwischen Gubernaculum und Spiculae (1:9–10), durch die Zahl und Verteilung der Caudalpapillen und durch die Abwesenheit der Caudalflügel gekennzeichnet. *Raillietnema kritscheri* ist die zweite aus Fischen bekannte Art der Gattung.

S u m m a r y

A new nematode, *Raillietnema kritscheri* sp. n., is described from the intestine of two fish species of the family Cichlidae, *Cichlasoma pearsei* (type host) and *Cichlasoma synspilum*, from Mexico. It is characterized mainly by the absence of lateral alae, by the structure and length (0.081–0.120 mm) of spicules, length ratio of gubernaculum and spicules (1:9–10), and by the number and distribution of caudal papillae and the absence of caudal alae in the male. *R. kritscheri* is the second *Raillietnema* species known to parasitize fish hosts.

I n t r o d u c t i o n

During recent studies on the parasites of some fishes carried out by the Mexican co-authors, numerous nematode specimens referable to the family Cosmocercidae were recovered from the intestine of two *Cichlasoma* species, *C. pearsei* and *C. synspilum*; these proved to represent a previously unknown species of the genus *Raillietnema* TRAVASSOS, 1927 and we assign them to a new species which we describe below.

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Materials and Methods

The material used for the following description was fixed and stored in 70% ethanol. For examination the specimens were cleared with glycerine and en face views were prepared according to ANDERSON's (1958) method. Drawings were made with aid of a ZEISS microscope drawing attachment. For scanning electron microscopy, the nematodes were dehydrated through an ethanol series and amylacetate and subjected to critical point drying. The specimens were coated with gold and examined with the TESLA BS-300 scanning electron microscope at an accelerating voltage of 15 kV. All measurements are in millimetres unless otherwise indicated.

Raillietnema kritscheri sp. n.

(Fig. 1, Plate 1)

Description: Small, whitish nematodes. Lateral alae absent. Somatic papillae indistinct. Mouth opening triangular, three small flat lips present. Outer cephalic papillae four in number; two lateral amphids present. Oesophagus anteriorly with well developed, relatively long pharynx, posteriorly with bulb. Nerve ring at mid-length of oesophagus, excretory pore at level of bulb. Tail of both sexes conical, pointed.

Male (15 specimens; measurements of holotype in parentheses): Length of body 1.95–2.49 (1.99), maximum width 0.109–0.163 (0.136). Length of entire oesophagus 0.503–0.625 (0.625); length of pharynx 0.033–0.048 (0.042), width 0.021–0.027 (0.024), of corpus 0.375–0.453 (0.453), width 0.036–0.042 (0.042), of isthmus 0.027–0.036 (0.036), width 0.024–0.027 (0.027); bulb 0.075–0.099 (0.099) long and 0.078–0.093 (0.093) wide. Nerve ring and excretory pore 0.245–0.286 (0.286) and 0.394–0.476 (0.476), respectively, from anterior extremity. Spicules short, somewhat ventrally bent, well sclerotized, their distal tips pointed; length of spicules 0.081–0.120 (0.120), their width 0.009–0.015 (0.012). Gubernaculum well developed, 0.045–0.054 (0.054) long and 0.009–0.012 (0.012) wide in lateral view. Length ratio of gubernaculum and spicules 1:8.8–10.0 (1:10). Oblique, paired subventral muscle bands present in preanal region. Preanal region with two subventral rows of 5 (5) pairs of larger caudal papillae; anterior to them, some three more pairs of smaller and less conspicuous papilla-like formations present, representing probably somatic papillae. Anterior lip of cloaca with three pairs of small papillae and one larger unpaired median caudal papilla (Plate 1, A, C). One pair of larger lateral caudal papillae (Plate 1, D) present approximately at level of cloacal opening. Mid-region of tail with two pairs of large subventral caudal papillae (Plate 1, A, B). One pair of small caudal papillae located two-thirds of distance from anus to tail tip. Terminal portion of tail with two pairs of caudal papillae located close together. Tail conical, 0.138–0.225 (0.225) long, ending in sharp point. Caudal alae absent.

Female (15 specimens; measurements of allotype in parentheses): Length of body of gravid females 2.48–4.28 (4.28), maximum width 0.122–0.326 (0.326).

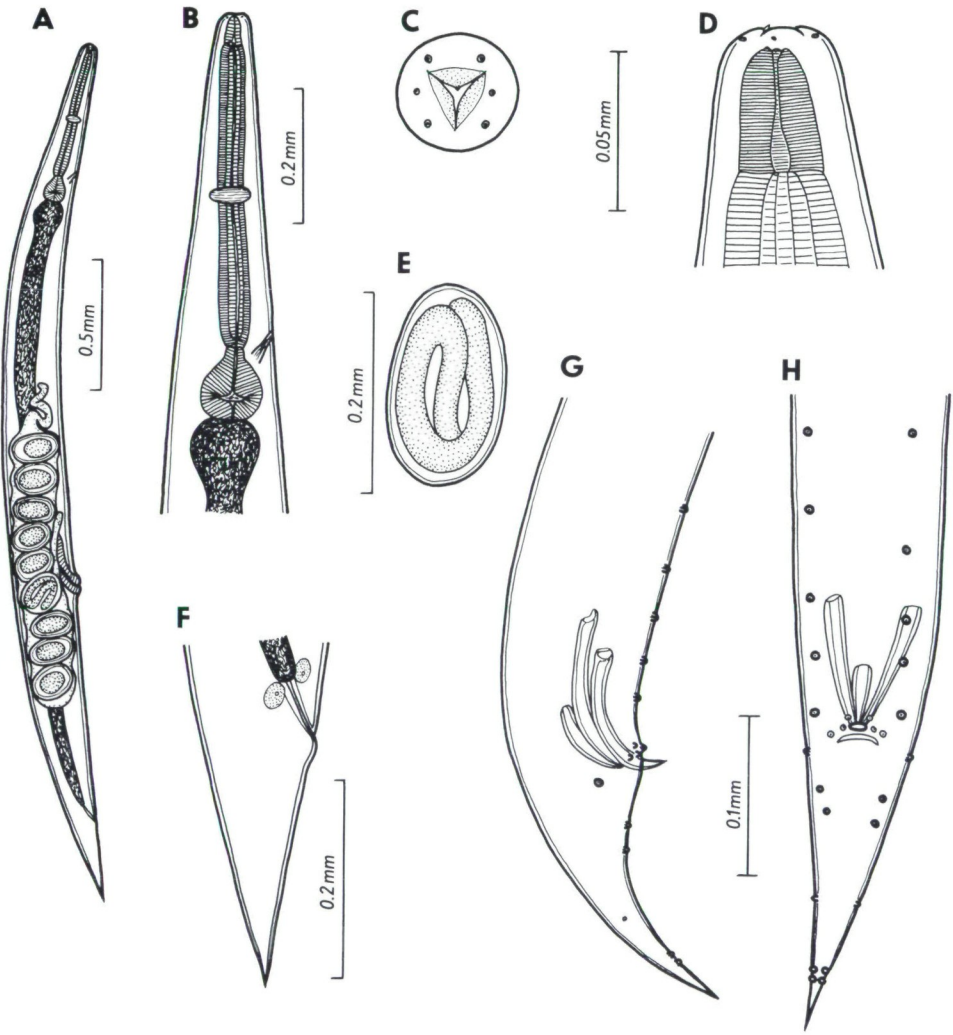


Fig. 1: *Raillietnema kritscheri* sp. n. A – gravid female, general view; B – anterior end of female; C, D – head end of female, apical and lateral views; E – mature egg; F – tail of female; G, H – posterior end of male, lateral and ventral views.

Length of entire oesophagus 0.517–0.707 (0.707); length of pharynx 0.033–0.045 (0.045), width 0.024–0.030 (0.030), of corpus 0.447–0.528 (0.528), width 0.042–0.048 (0.045), of isthmus 0.027–0.039 (0.039), width 0.030–0.036 (0.036); bulb 0.084–0.108 (0.108) long and 0.090–0.111 (0.111) wide. Nerve ring and excretory pore 0.272–0.313 (0.313) and 0.476–0.571 (0.571), respectively, from anterior extremity. Uterus amphidelphic; ovaries short, posterior ovary anterior to level of vulva. Vulva postequatorial, 0.82–1.33 (1.33) from posterior extremity. Vagina directed anteriorly. Eggs thin-walled, oval; fully mature eggs containing formed larva; maximum number of eggs in uterus 15 (15). Larvated eggs present only in females with body length 3.70–4.29. Size of eggs $0.201\text{--}0.240 \times 0.096\text{--}0.141$ ($0.201\text{--}0.240 \times 0.096\text{--}0.129$). Tail conical, 0.183–0.270 (0.255) long, with sharply pointed tip.

Type host: *Cichlasoma pearsei*; other host: *Cichlasoma synspilum* (both Cichlidae, Perciformes).

Site of infection: Intestine.

Type locality: El Vapor (a freshwater lagoon continuous to Terminos lagoon) (18°11' N, 91°55' W), Campeche (3 May 1988).

Other localities (in *C. pearsei*): Chicoasen Reservoir, Chiapas, México and San Pedro River, Balancan, Tabasco.

Deposition of types: holotype (♂), allotype (♀) and most paratypes in the helminthological collection of Instituto de Biología, Universidad Nacional Autónoma de México (Helm. Coll. Nos. 194-1 – holotype and allotype, 194-2 – paratypes), Mexico; 4 paratypes in Naturhistorisches Museum Wien (Coll. No. 16.656), Austria; 4 paratypes in Institute of Parasitology, CAS (Helm. Coll. No. N-596), České Budějovice, Czech Republic.

Etymology: This species is named in honour of the well-known Austrian helminthologist Dr. ERICH KRITSCHER, Naturhistorisches Museum Wien, whose work contributed greatly to the knowledge of European fish parasites.

Discussion

Some morphological features of specimens of the present material, particularly their amphidelphic uteri with only a few large-sized eggs and the presence of markedly short ovaries show clearly that they belong to the genus *Raillietnema* TRAVASSOS, 1927. On the contrary, members of the closely related genera *Aplectana* RAILLIET & HENRY, 1916 and *Oxysomatium* RAILLIET & HENRY, 1916 are noted for the presence of long ovaries and either prodelphic (*Aplectana*) or amphidelphic (*Oxysomatium*) uteri containing a large number of relatively small eggs (SKRYABIN et al. 1961, CHABAUD 1978).

According to BAKER (1985), the genus *Raillietnema* comprises a total of 20 species known to occur mostly in various amphibians and reptiles in South and North America, Africa, Madagascar, and Malaysia; only one species, *R. synodontisi* VASSILIADES, 1973 is known from fishes in Africa.

The five New World *Raillietnema* species are: *R. simplex* (TRAVASSOS, 1925), *R. baylisi* (WALTON, 1933) and *R. spectans* GOMES, 1964 from Brazil,

R. gubernaculatum FREITAS & IBANEZ, 1965 from Peru and Brazil, and *R. longicaudata* (WALTON, 1929) from the USA; all these species are parasitic in amphibians. According to BAKER (1982), *R. gubernaculatum* is probably a synonym of *R. spectans*. All these species differ markedly from *R. kritscheri* sp. n. in the length of spicules, which are approximately twice as long as in the new species, and in the number and arrangement of caudal papillae in the male; except for *R. longicaudata*, the spicules of these species are longer than 0.2 mm (versus 0.081–0.120 mm in *R. kritscheri*). The spicules of *R. longicaudata* measure 0.168–0.180 mm, but this species distinctly differs in other morphological features, for example in the anteriorly directed vagina and different arrangement of caudal papillae and different length ratio of spicules and gubernaculum in the male (see BAKER 1985).

Also most *Raillietnema* species from other continents differ markedly from *R. kritscheri* in the length of their spicules. The only species possessing spicules of a similar length (0.080–0.094 mm) are *R. travassosi* CHABAUD & BRYGOO, 1962 and *R. oligogenos* CHABAUD & BRYGOO, 1962 from chameleons in Madagascar and *R. synodontisi* VASSILIADES, 1973 from upside-down catfishes in Africa. The first two species can be distinguished from *R. kritscheri* mainly on the basis of a different number and arrangement of male caudal papillae (*R. travassosi*) and a much smaller gubernaculum (0.022 mm vs. 0.045–0.054 mm) (*R. oligogenos*) (see CHABAUD & BRYGOO 1962).

R. synodontisi parasitizing several African species of *Synodontis* resembles *R. kritscheri* in the measurements of spicules and gubernaculum as well as in the number and arrangement of caudal papillae in the male (see VASSILIADES 1973, MORAVEC & ŘEHULKA 1987), but differs from it distinctly in the presence of a cuticular membrane on the distal tip of spicules; the two last pairs of male postanal papillae are shifted more anteriorly in *R. synodontisi* when compared with *R. kritscheri*. It is necessary to consider also host types and geographical distribution of both species.

Since *Raillietnema* species are mostly parasitic in amphibians and reptiles, the possibility of the present specimens having been taken with food must be considered, but this appears to be ruled out by the good condition of the specimens and their location in the host. Moreover, heavy infections with another *Raillietnema* species, *R. synodontisi*, were recorded in aquarium-reared upside-down catfishes (*Synodontis eupterus*) in Europe (MORAVEC & ŘEHULKA 1987), which confirms that fishes are true definitive hosts of this African parasite with apparently a direct life cycle permitting its reproduction and transmission in the conditions of aquarium tanks. Consequently, *R. kritscheri* may be considered to be the second known *Raillietnema* species adapted to fish hosts.

Acknowledgements

The authors' thanks are due to Ing. J. NEBESÁŘOVÁ and Mrs. V. NOVÁKOVÁ of the Laboratory of Electron Microscopy, South-Bohemian Biological Centre, CAS, České Budějovice, for their technical assistance and to Dr. HELMUT SATTMANN, Naturhistorisches Museum Wien, for his kindness in translating the summary of the paper into German and his help with preparing the manuscript.

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Plate explanations

Plate 1

Raillietnema kritscheri sp. n.

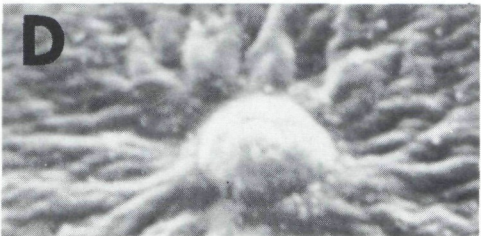
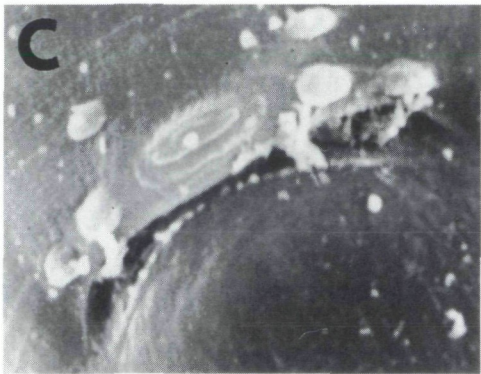
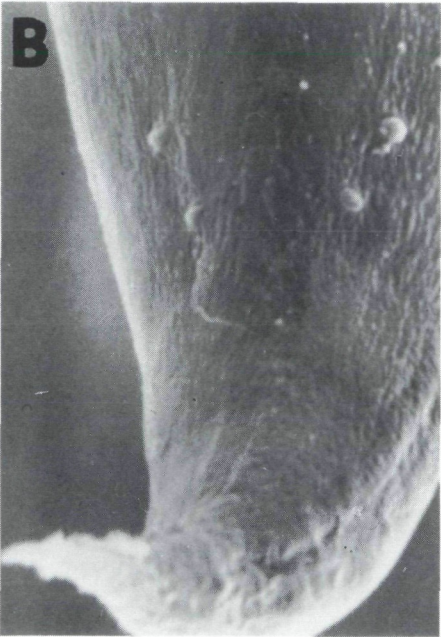
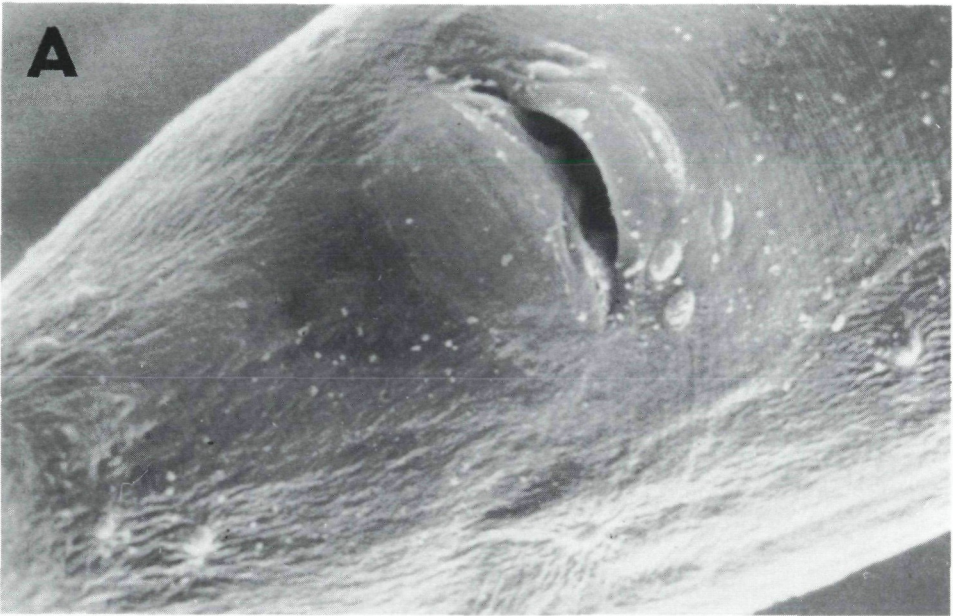
A: Cloacal region of male, ventral view (× 1 650).

B: Posterior part of male tail, ventral view (× 1 430).

C: Cloacal opening with distinct distribution of small papillae on anterior cloacal lip (× 2 330).

D: Lateral adanal papilla on male tail (× 12 000).

F. MORAVEC, G. SALGADO MALDONADO, R. PINEDA LÓPEZ: *Raillietnema kritscheri* sp. n. Plate 1
(Nematoda: Cosmocercidae) from *Cichlasoma* spp. (Pisces) from Mexico



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Zeitschrift/Journal: [Annalen des Naturhistorischen Museums in Wien](#)

Jahr/Year: 1993

Band/Volume: [94_95B](#)

Autor(en)/Author(s): Moravec Frantisek, Maldonado Saldago G., López R. Pineda

Artikel/Article: [Raillietnema kritscheri sp.n. \(Nematoda: Cosmocercidae\) from Cichlasoma spp. \(Pisces\) from Mexico. 35-40](#)