**Pseudocapillaria indica** sp. n. (Nematoda: Capillariidae) from the snakehead, *Channa gachua* (Hamilton) (Pisces), from southern India

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**Abstract.** A new nematode species, *Pseudocapillaria indica* sp. n., is described from the intestine of the freshwater fish *Channa gachua* (Hamilton) from Kerala, India. It resembles *P. tomentosa* (Dujardin, 1843), differing from it mainly in the structure of the proximal end of spicule, the shape and structure of the stichocytes and in having smaller eggs (size 0.036-0.048 x 0.023-0.027 mm) which have a different type of superficial structure. *Pseudocapillaria indica* is the first capillariid species described from freshwater fishes of India and from the whole Oriental Region.

During studies on the helminth parasites of freshwater fishes carried out by one of the co-authors (M. Razia Beevi) in Kerala, India, nematodes referable to the family Capillariidae were recovered from the intestine of the snakehead, *Channa gachua* (Hamilton), collected from a locality near Trivandrum in 1989. These nematodes, belonging to the genus *Pseudocapillaria* Freitas, 1959, represent a new, hitherto unknown species which we describe below.

**MATERIALS AND METHODS**

The nematodes, fixed and stored in 70 % ethanol, were transferred to 4 % formaldehyde and cleared with glycerine for examination. Drawings were made with the aid of a Zeiss microscope drawing attachment. After examination some of the specimens were embedded in glycerine-gelatin as permanent mounts; remaining specimens are stored in 70 % ethanol. All measurements are given in millimetres.

**RESULTS**

*Pseudocapillaria indica* sp. n.  

**Description:** Medium-sized nematodes, anterior end of body narrow, rounded, with indistinct mouth papillae. Cuticle smooth. Two fairly wide, inconspicuous lateral bacillary bands present, extending along whole length of body. Muscular oesophagus relatively long. Stichosome consisting of single row of 34-35 large stichocytes subdivided into many transverse annuli; most stichocytes conspicuously long, including about 15 annuli, only several anteriormost and posteriormost stichocytes short; 1-2 stichocytes of lighter colour alternating with 1-2 darker (more granular) ones. Nerve ring encircling muscular oesophagus approximately at border of its first and second fourths. Two distinct glandular cells present at junction of oesophagus and intestine.

**Male** (body fragments of 2 specimens; measurements of holotype in parentheses): Length of body not established; body fragment (without anterior end) of male holotype containing posterior part of stichosome (3.70) long and (0.068) wide; fragment of posterior end of male paratype 2.30 long and 0.082 wide. Spicule well sclerotized, 0.240-0.282 (0.282) long, with smooth surface; its proximal end somewhat expanded, simple, without folded, lobular rim; distal end rounded. Width of spicule at anterior end 0.009 (0.009), at middle 0.006 (0.006), at posterior end 0.004 (0.004). Spicule sheath nonspiny, with fine transverse striations; evaginated sheath of holotype (0.135) long and (0.009) wide. Posterior end of body rounded, provided with two large, round lateral lobes, each of them bearing one minute papilla on its inner side; dorsal cuticular membrane absent. Testis reaching anteriorly almost to oesophago-intestinal junction. Cloacal tube long, spicular canal not distinguished. Length of tail 0.018-0.021 (0.021).

**Female** (2 complete specimens and body fragments of several others; measurements of allotype in parentheses): Body length of gravid female 14.76-14.77 (14.76), maximum width 0.082-0.095 (0.095). Width of lateral bacillary bands 0.036 (0.036). Length of entire oesophagus 5.83-5.90 (5.90), representing 38-39 (38) % of body length. Length of muscular oesophagus 0.330-0.336 (0.330), of stichosome 5.50-5.57 (5.57); stichocytes 34-35 (34) in number. Distance of nerve ring from anterior extremity 0.081-0.096 (0.096). Vulva situated (0.014) behind end of oesophagus in allotype and at this level in paratypes; vulvar lips not elevated. Eggs oval, polar plugs not protruding. Egg wall two-layered, inner layer thin, hyaline, outer layer relatively thick, with sparse irregular sculpture on
Fig. 1. *Pseudocapillaria indica* sp. n. A - anterior end of female; B - stichocyte; C - vulva region; D - oesophageal region of body with marked lateral bacillary band; E - egg; F,G - posterior end of male, ventral and lateral views; H - posterior end of female; I-K - proximal end, middle region and distal end of spicule; L,M - caudal end of male, ventral and lateral views.
surface; content of eggs uncleaved. Size of eggs 0.036-0.048 x 0.024-0.027 (0.036 x 0.024), thickness of their wall 0.003 (0.003); polar plugs 0.003 (0.003) long and 0.006 (0.006) wide. Eggs arranged in single file in uterus. Ovary extending posteriorly to about mid-length of rectum. Posterior end of body rounded, anus distinctly sub-terminal; length of tail 0.021 (0.021).

**Type host:** snakehead, *Channa gachua* (Hamilton) (fam. Channidae).

**Site:** intestine.

**Type locality:** Kannanmooab Thodu (a sewage-polluted canal), Trivandrum, Kerala, India (12 December 1989).

**Occurrence:** in 4 of 104 *C. gachua* examined (prevalence 3.8 %); mean intensity of infection 2.5 specimens per fish; range 3-4.

**Deposition of types:** Institute of Parasitology, Academy of Sciences of the Czech Republic, České Budějovice, Helm. Coll. No. N - 597.

**Etymology:** The specific name of this species relates to the country of its origin.

**DISCUSSION**

By its general morphology, especially the structure of the male caudal end and the presence of a nonspinous spicular sheath, this species belongs to the genus *Pseudocapillaria* Freitas, 1959 as amended by Moravec (1982, 1987); the absence of a cuticular membrane from the male tail shows that it is a member of the nominate subgenus *Pseudocapillaria*.

In his review of capillarids parasitic in fishes, Moravec (1987) lists a total of six species in the subgenus *Pseudocapillaria*: *P. (P) carangi* (Parukhin, 1971), *P. (P) echenei* (Parukhin, 1967), *P. (P) magalhae* (Lent et Freitas, 1937), *P. (P) microspicula* (Mamaev, Parukhin et Baeva, 1963), *P. (P) sphyraena* (Parukhin, 1971), and *P. (P) tomentosa* (Dujardin, 1843). In 1988, two additional species belonging to this subgenus, *P. bainiae* (Justine et Radujkovic, 1988) and *P. parablenii* Moravec, Orecchietta et Paggi, 1988 were described from the marine fish *Parablenius gattorugine* from Yugoslavia and Italy, respectively (Justine et Radujkovic 1988, Moravec et al. 1988). As pointed out by Moravec (1990), the latter name is a junior synonym of the former one. Of all these *Pseudocapillaria* species, only *P. tomentosa* is known from freshwater fishes, while all remaining species are parasitic in marine fishes.

*Pseudocapillaria indica* sp. n., the second species of the subgenus *Pseudocapillaria* known to parasitize freshwater fishes, is very similar in morphology to *P. tomentosa*, a common and widespread intestinal parasite of mainly cyprinids and catostomids in the Holarctic Region. These two species differ principally in the size and structure of their eggs and in the structure of the proximal end of the spicule. Mature eggs of *P. indica* are markedly smaller than those of *P. tomentosa* (0.036-0.048 x 0.024-0.027 mm as compared to 0.063-0.078 x 0.030-0.039 mm) and bear on their surface rough, sparse irregular sculpture, as opposed to the very dense sculpture seen on the eggs of *P. tomentosa* (see Fig. 27 P of Moravec 1987). The proximal end of the spicule of *P. indica* sp. n. is simple, while that of *P. tomentosa* possesses a folded lobular rim. Moreover, in contrast to *P. tomentosa*, the stichocytes of the new species are conspicuously long and their cell nuclei are rather small and inconspicuous, whereas those of *P. tomentosa* are shorter and are provided with very large and conspicuous cell nuclei (see PI. I, Fig. 1 of Moravec 1983). The structure of the bacular bands seems to be different in these two species. Marked differences in geographical distribution (Holarctic Region vs. Oriental Region) and host type (mainly Cypriniformes vs. Perciformes) are also noteworthy.

*Pseudocapillaria indica* can be easily distinguished from other species of the subgenus *Pseudocapillaria* parasitizing fishes morphologically (for a key to species see Moravec 1987); moreover, all these are parasites of marine fishes.

No specifically identified adult capillarids have so far been reported from freshwater fishes of India and neighbouring countries (Sood 1989). The only record of adult capillarids from India is that of Rai (1969) who described a female designated as *Capillaria* sp. from the stomach of the siluroid fish *Mystus seenghala*. Larval capillarids identified as *Capillaria* sp. were found by Moorby (1938) in the mucous coat or encysted in the peritoneal layer of the mid-gut of the Indian freshwater fishes *Puntius jerdoni* (syn. of *Barbus puckelli*), *Puntius (=Barbus) ticto* and *Lepidocephalus (=Lepidocephalichthys) thermalis*; the author considered these fishes to serve as second intermediate hosts, while a piscivorous vertebrate, probably a predatory fish, bird or turtle, might be the definitive host. Consequently, *P. indica* is the first known capillarid species maturing in freshwater fishes in India and in the whole Oriental Region.

*Pseudocapillaria indica* does not seem to be a frequent parasite of *C. gachua* in the type locality. As mentioned above, only 4 out of 104 *C. gachua* examined in 1989 harboured this parasite, with an intensity of infection of 3-4 nematodes per fish. In an attempt to obtain more nematodes to study, an additional 100 *C. gachua* were examined from the same locality in 1992, but no capillarids were found.
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