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SHORT COMMUNICATIONS

THE SYSTEMATIC STATUS OF FILARIA EPHEMERIDARUM LINSTOW, 1872

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Abstract. A reexamination of original Linstow's specimens from *Ephemera vulgata* has revealed that *Filaria ephemeridarum* Linstow, 1872 is in fact represented by invasive larvae of the nematodes parasitic as adults in salmonid fishes and mostly known as *Cystidicoloides tenuissima* (Zeder, 1800). Study of the corresponding literature has shown that the valid name of these parasites is *Cystidicoloides ephemeridarum* (Linstow, 1872) comb. n., while *Fusaria tenuissima* Zeder, 1800 is considered to be *species inquirenda*.

In 1872 Linstow described under the name *Filaria ephemeridarum* larvae of spirurid nematodes which he had found in the body cavity of mayflies *Ephemera vulgata* and *Oligoneuria* (= *Oligoneuriella*) *rhenana* in Germany (surroundings of Göttingen). The description and illustrations of the larvae given by Linstow were, however, inadequate and, therefore, Seurat (1916) reported that their specific identification was not possible. Landa (1969) reported these larvae under the name *Spiroptera ephemeridarum* as frequent parasites of mayfly nymphs *Ephemera danica* in Czechoslovakia. In the opinion of Prof. A. G. Chabaud (see Arvy and Peters 1973) these nematodes belong either to the subfamily Rhabdochoninae or Cystidicolinae. On the basis of his foregoing studies on the development of some fish spirurids Moravec (1972) considered *F. ephemeridarum* to be a member of either the genus *Cystidicoloides* or *Rhabdochona*.

According to information given by Dr. G. Hartwich, no nematode specimens designated *Filaria ephemeridarum* are present in the collections of Zoologisches Museum der Humboldt-Universität in Berlin; however, Linstow's collection includes one slide (Kat. Nr. Q 3897) containing 4 nematode specimens mounted in glycerine jelly and labelled "*Filaria Ephemerae vulgatae*". In the opinion of Dr. Hartwich they represent either Linstow's type material of *F. ephemeridarum* or at least its part. A reexamination of these specimens has confirmed that these represent invasive female larvae of the species parasitic in adulthood mainly in salmonid fishes and reported mostly under the name *Cystidicoloides tenuissima* (Zeder, 1800); both their morphological structure (structure of mouth, tail, striation of cuticle, shape of deirids, etc.) (Plates I, II) and measurements are typical of this species (Moravec 1971a, b).

Opinions on the systematic status of this species were rather confused in the past. In 1894 Linstow described a new species of spirurids, *Filaria ochracea*, from grayling (*Thymallus thymallus*) from Germany; later on, the same author (Linstow 1909) reported this parasite (under the name *Spiroptera ochracea*) as well from brown trout (*Salmo trutta*); *S. ochracea* was recorded from *Th. thymallus* also from Finland (Jääskeläinen 1921). On the basis of literature analysis Spassky and Roytman (1959) synonymized this Linstow's species with the species originally described as *Fusaria tenuissima* Zeder, 1800, because, according to the latter authors, this common parasite of salmonid fishes (*F. ochracea*) was usually designated *Spiroptera tenuissima* in older literature. Recently this widespread Holarctic species has mostly been reported under the name

Cystidicoloides tenuissima (Zeder, 1800) and a number of nominal species have become its synonyms (see e.g. Rasheed 1965, Moravec 1967, Margolis 1968, De and Moravec 1979).

Even though the original description of *Fusaria tenuissima* given by Zeder (1800) is very poor, it is obvious that Zeder's nematodes belonged to a species different from that reported later as *Spiroptera tenuissima* by Linstow (1909), whose description was based on Nufer's (1905) data. There is no doubt that the nematodes reported by Nufer (1905), Linstow (1909) and other authors as *Ascaris tenuissima* or *Spiroptera tenuissima* were identical with "*Filaria ochracea*".

On the other hand Zeder (1800) reports that *Fusaria tenuissima* is characterized by presence of lateral alae, their posterior end of body is long, awl-shaped, with a rounded tip (posterior body end of male is very similar to that of female), being provided in the male with a number of minute papillae distributed equably in front of sexual organs („Zeugungstheilen"); the approximate length of males was 4—6 mm, that of females 5—8 mm (2—3 and 2.5—4 „Linien", respectively). Zeder (1800) found these nematodes only in the intestine of *Gadus lota* (= *Lota lota*) from Bambergschen Ruppe in April 1788 (GFR — the Rhine R. basin). According to this description Zeder's nematodes were probably identical with *Raphidascaris acus* (Bloch, 1779) (Anisakidae), a frequent intestinal parasite of *L. lota* in Europe; also John (1877) took this Zeder's species for very young specimens of *Ascaris mucronata* (= *Raphidascaris acus*). Considering their body measurements, these might also belong to the species *Ichthyobronema hamulatum* (Moulton, 1931) (Quimperiidae), a specific parasite of *L. lota*, but the latter has not been recorded so far from Central Europe. Accordingly,I consider *Fusaria tenuissima* Zeder, 1800 to be *species inquirenda*.

It follows from the above discussion that the spirurid nematodes parasitizing largely the stomach and intestine of salmonids are not identical with *Fusaria tenuissima* Zeder, 1800, but they represent a different species which is conspecific with *Filaria ochracea* Linstow, 1894 and belongs to the genus *Cystidicoloides* Skinker, 1931. However, these nematodes were earlier described from their invasive larvae as *Filaria ephemeridarum* Linstow, 1872 and this specific name is in accordance with the rules of the International Code of Zoological Nomenclature (chapter IV, Article 17) applicable and valid; according to the principles of priority the correct name of this nematode species is *Cystidicoloides ephemeridarum* (Linstow, 1872) comb. n.; the following are its synonyms: *Filaria ephemeridarum* Linstow, 1872; *F. ochracea* Linstow, 1894; *Ascaris tenuissima* Rudolphi, 1809 sensu Nufer, 1905, nec Zeder, 1800; *Spiroptera tenuissima* (Rudolphi, 1809) sensu Linstow, 1909, nec Zeder, 1800; *S. salvelini* Fujita, 1922; *Cystidicola harwoodi* Chandler, 1931; *Metabronema canadense* Skinker, 1931; *M. truttae* Baylis, 1935; *Spiroptera denticulata* (Rudolphi, 1809) sensu Dinulescu, 1942, nec Rudolphi, 1809; *Sterliadochona ssavini* Skrjabin, 1946; *S. pedispicula* Maggenti et Paxman, 1971.

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СИСТЕМАТИЧЕСКОЕ ПОЛОЖЕНИЕ НЕМАТОДЫ *FILARIA EPHEMERIDARUM* LINSTOW, 1872

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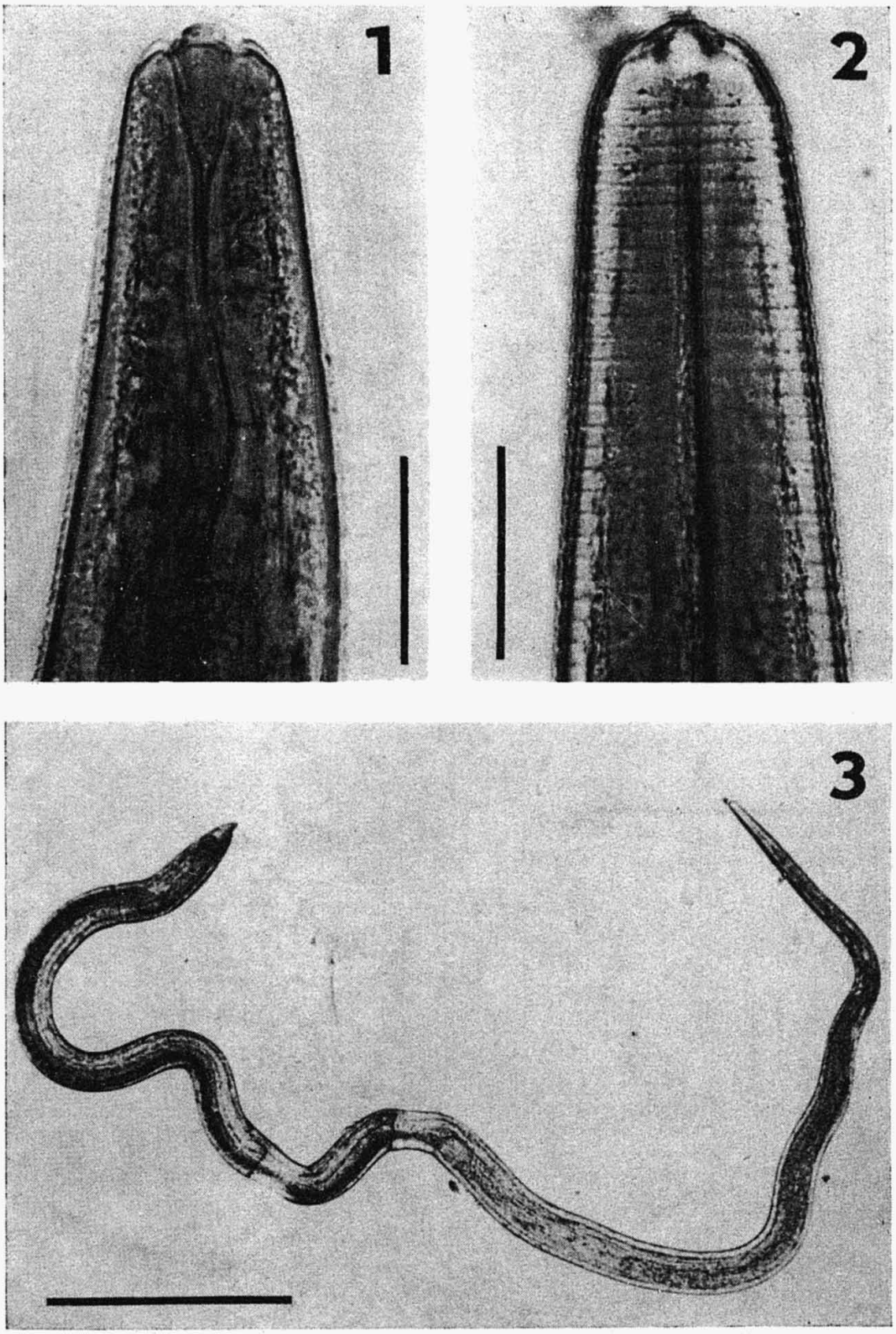
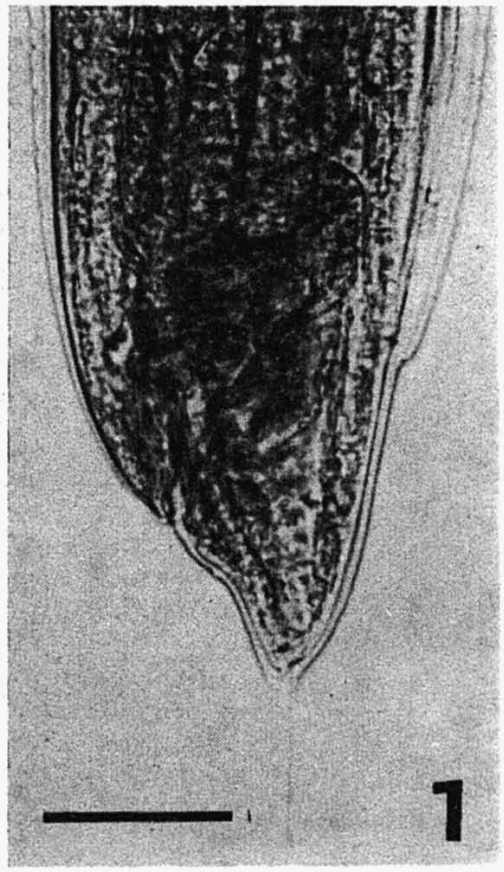
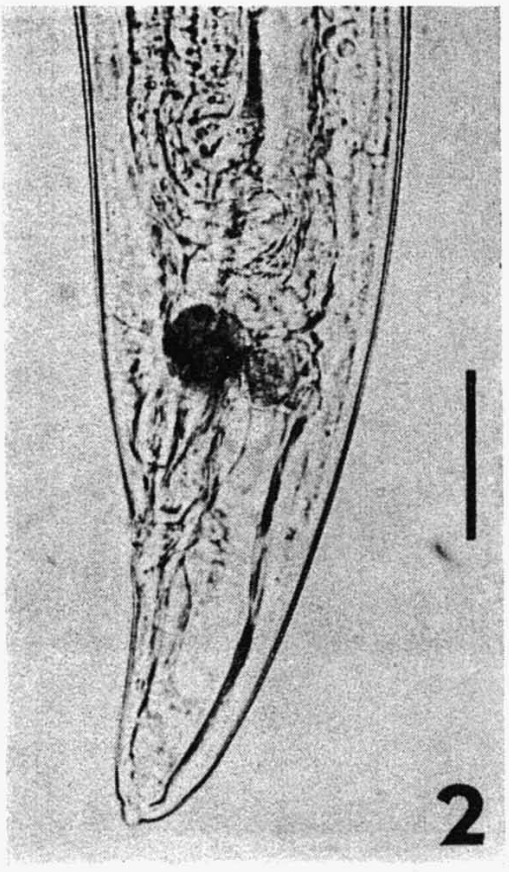
Резюме. При изучении оригинальных экземпляров *Filaria ephemeridarum* Linstow, 1872, выделенных Линстовым из *Ephemera vulgata*, обнаружено, что этот паразит в действитель-



Figs. 1—3. Linstow's original specimens (cotypes) of "*Filaria ephemeridarum*" mounted in glycerine-jelly.

Fig. 1. Anterior end of body with distinct structure of vestibule (scale = 0.05 mm). **Fig. 2.** Anterior end of body with typical transverse striation of cuticle (scale = 0.05 mm). **Fig. 3.** A cotype specimen – general view (scale = 1 mm).





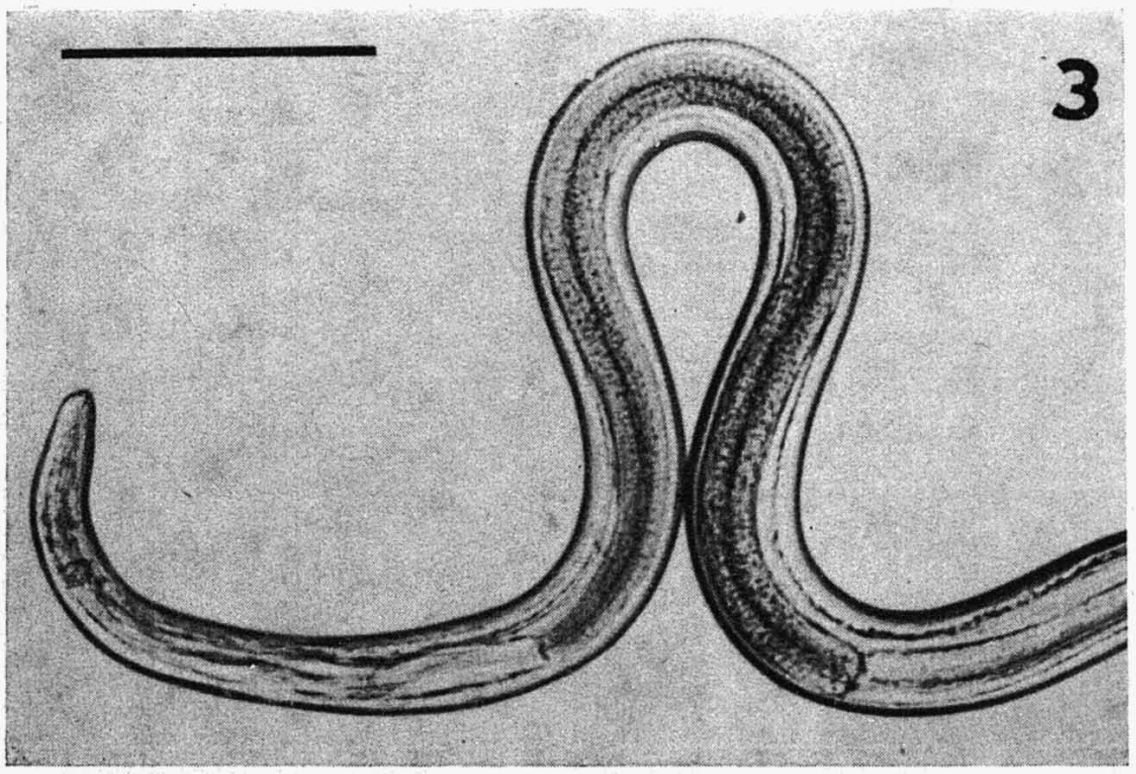


Fig. 1. Tail of female specimen of "*Filaria ephemeridarum*" from Linstow's original material (mounted in glycerine-jelly) (scale = 0.05 mm). **Fig. 2.** Tail of male invasive larva of *Cystidicoloides ephemeridarum* from body cavity of *Ephemera danica* (native) (scale = 0.05 mm). **Fig. 3.** Anterior end of body of *C. ephemeridarum* invasive larva from body cavity of *Ephemera danica* (native) (scale = = 0.5 mm).