

HYMENOLEPIS MURIS-SYLVATICI (RUDOLPHI, 1819) = VARIOLEPIS CRENATA (GOEZE, 1782)

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Abstract. The paper records the finding of the bird cestode *Variolepis crenata* (Goeze, 1782) in *Apodemus sylvaticus* L. The identity of *Hymenolepis muris-sylvatici* (Rudolphi, 1819) with the species *Variolepis crenata* (Goeze, 1782) has been proved on the grounds of the author's material; ecological factors influencing the specificity of the parasite are also discussed.

The helminths of small rodents have been studied in detail by various Czechoslovak authors (ERHARDOVÁ 1955a, b, c, 1956, 1958, HOLÍŠOVÁ and KOČIŠ 1955, TENORA 1958, 1963, 1964a, b, TENORA and BARUŠ 1955a, b, a.o.). During ecological studies of cestodes of small mammals and of their life history we found in *Apodemus sylvaticus* L. from a locality near Nový Bydžov a cestode species, recorded in the literature under the name *Hymenolepis muris-sylvatici*. In our further studies we came to the conclusion that the species concerned is the bird cestode *Variolepis crenata*. This fact was pointed out by SPASSKY and SPASSKAJA in 1960. On the grounds of publications by these two authors concerning findings of the bird cestode *Passerilepis passeris* in rodents of the species *Eutamias sibiricus*, on my own finding of the typical bird cestode *Dilepis undula* in various mammal species and also ERHARDOVÁ's finding (1958) of this cestode in rats, I started to study this cestode species in detail. On the mentioned locality we examined, apart from 422 species of *Apodemus sylvaticus*, also 51 blackbirds (*Turdus merula*), 10 starlings (*Sturnus vulgaris*) and 4 red-backed shrike (*Lanius collurio*), finding the cestode *Variolepis crenata* 4 times in *Turdus merula* and twice in *Sturnus vulgaris*. In addition we examined 1628 beetles belonging to 20 species. Cysticercoids of this cestode were found only in *Carabus hortensis*.

DESCRIPTION OF THE SPECIES

Length 25—65 mm, width 0.8—1.5 mm. Both the specimens from *Apodemus sylvaticus* and from blackbirds and starlings are within this variety of sizes. Scolex (Fig. 1A, B) 190—200 μ in diameter. Spherical suckers 75—76 μ in diameter. Rostellum 58 by 48 μ , rostellar pouch 160 by 50 μ . The 10 hooks on the rostellum of the fraternoid type. Length of hooks 22—24 μ . The mature proglottids (Fig. 1E, F) contain three oval testes situated triangularly, one testes in poral, two in aporal

Table 1. Comparison of dimension of the cestode *Variolepis crenata* according to the various authors

	Baer 1931 ¹	Kostylew 1915	Yamaguti 1935	Joyeux and Baer 1936
	<i>Hymenolepis muris-sylvatici</i>	<i>Hymenolepis crenata</i>	<i>Hymenolepis serpentulus</i>	<i>Hymenolepis crenata</i>
length	160 mm	30 mm	150 mm	200 mm
width	500 μ	208 μ	2,18 mm	1,8–2,5 mm
scolex $\varnothing$	110–170 μ		180 μ	250–350 μ
suckers $\varnothing$	72–95 μ	66–82 μ		120 μ
No. hooks	10	—	10	10
length of hooks	23 μ	23 μ	24 μ	22–26 μ
rostellum	—	—	50 μ	—
rostellar pouch	—	—	—	—
testes $\varnothing$	—	—	—	—
cirrus pouch	100–150 $\times$ 40–50 μ	—	150 $\times$ 50 μ	130–180 $\times$ 30 μ
ova $\varnothing$	—	82–83 $\times$ 30–33 μ	48–60 $\times$ 31–45 μ	—
oncosphere $\varnothing$	—	—	35–39 $\times$ 30–36 μ	65 $\times$ 40 μ

position. Size of testes 160 by 140 μ . Ovary in the centre of the proglottid at its lower margin. Cirrus pouch 200 by 60 μ . Spherical receptaculum seminis above the ovary. Opening of the sexual pore in anterior third of proglottid. Size of ova 105 by 82 μ . Oncosphere 65 by 40 μ in diameter. All these signs are the same in specimens from *Apodemus sylvaticus* and from birds. In Table 1 we compared the data on *Variolepis crenata*—*Hymenolepis muris-sylvatici*—from various host species, as recorded by different authors.

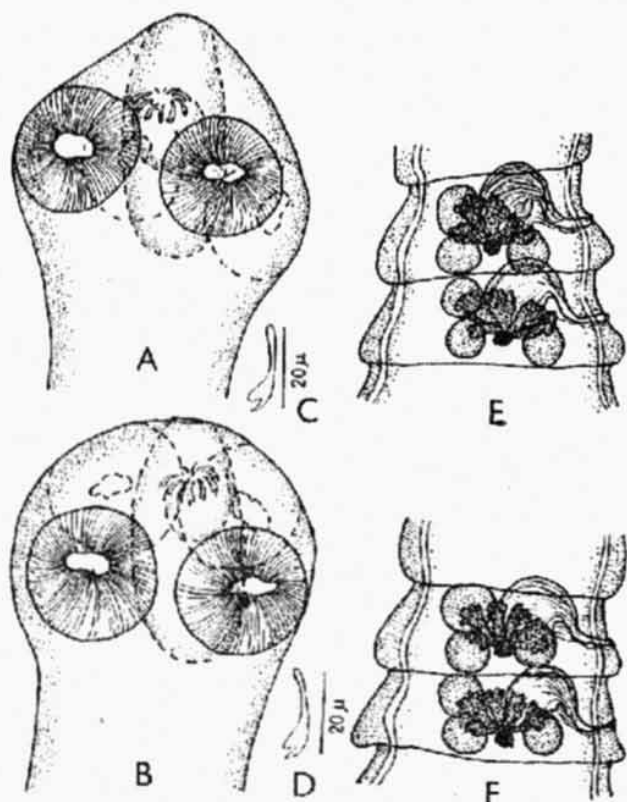


Fig. 1. *Variolepis crenata*: a — scolex, c — hook, e — proglottids of cestode from birds; b — scolex, d — hook, f — proglottids of cestode from *A. sylvaticus*.

ECOLOGICAL REMARKS

The specimen of *Apodemus sylvaticus*, in which we found 4 cestodes of the species *Variolepis crenata*, was caught at the edge of a mixed forest with a predominance of beech and birch trees, a few pine trees, with hazel, blackthorn and other shrubs

Skrjabin and Mathevosjan 1948	Ryšavý 1957	Results of our measurements	
		from birds	from <i>A. sylvaticus</i>
<i>Dicranotaenia muris-sylvatici</i>	<i>Variolepis crenata</i>	<i>Variolepis crenata</i>	<i>Variolepis crenata</i>
11–16 mm 570 μ 110–170 μ 72–95 μ 10	28–32 mm 1.2 mm 205 μ 68–92 μ 10	25–65 mm 1–1.2 mm 200–205 μ 74–80 μ 10	25–45 mm 0.8–1.2 mm 190–200 μ 07–76 μ 10
23 μ —	22–23 μ —	22–24 μ 56–58 $\times$ 46–49 μ	20–24 μ 54–57 $\times$ 44–48 μ
— 150 $\times$ 100 μ 100–130 $\times$ 40–50 μ — —	— 115 $\times$ 76 μ 163 μ — —	160 $\times$ 50 μ 160–164 $\times$ 140–150 μ 168–190 μ — —	170 $\times$ 48 μ 158–160 $\times$ 140 μ 180–196 μ — —

at its edge. Close by was a cherry orchard, attracting many starlings during the ripening of the cherries. During the year we observed almost all known definitive hosts of this cestode: *Turdus merula*, *Turdus musicus*, *Dryobates major*, *Pica pica*, *Motacilla alba*, *Oriolus oriolus*, *Corvus corone*, *Lanius collurio* etc. As mentioned in the foregoing text, during a certain period of the year the starling is the predominant bird species.

The cestode *Variolepis crenata* has been described under various synonyms from various hosts, systematically very distant within the class Aves: *Upupidae*, *Picidae*, *Turdidae*, *Laniidae*, *Fringillidae*, *Motacillidae*, *Sturnidae*, *Oriolidae*, *Corvidae* a.o. Several times this species was also found in *Apodemus sylvaticus* in England and Switzerland (JOYEUX and BAER 1936) and from there described under various names: *Taenia muris-sylvatici* Rudolphi, 1819, *Hymenolepis muris-sylvatici* Baer, 1931.

All these hosts live on the same habitats; food and other ecological factors influence the occurrence of this cestode species in systematically so very distant hosts. Beetles, here the intermediate hosts, are an essential component in the food of the bird hosts. In the mentioned locality, we found cysticercoids of this species in *Carabus hortensis*, but this is probably not the only intermediate host. Our results indicate that, under certain circumstances, the cestode *Variolepis crenata* can occur also in *Apodemus sylvaticus*. The observations by HOLÍŠOVÁ (1960) that *Apodemus sylvaticus* is occasionally feeding on beetles confirms our results.

DISCUSSION

The species *Variolepis crenata* can parasitize systematically distant hosts, belonging to various bird orders. Under certain conditions, this cestode can be found in

mammals. The influence of ecological factors on the specificity of parasites, observed with this cestode species, has been discussed by the author in earlier studies (PROKOPIČ 1957a, b, 1958, 1959). The species *Apodemus sylvaticus* lives on the same biotope with a multitude of dominant insectivorous birds, the definitive hosts of this cestode, devouring occasionally beetles—the intermediate host of this cestode. Similar cases are known to occur with the species *Dilepis undula* (Schrank, 1788), *Passerilepis passeris* (Gmelin, 1790) etc. Also here, the decisive factors are a common habitat and common food. The relative relation to food is reflected in the relative dominance of the definitive hosts of this cestode species. While the insectivorous birds are the dominant hosts—their basic food consists of insects, *Apodemus sylvaticus* is the occasional or accidental host—occasionally feeding on insects.

CONCLUSION

The paper reports on the finding of the bird cestode *Variolepis crenata* (Goeze, 1782) in *Apodemus sylvaticus* L. The influence of ecological factors on the specificity of parasites has been pointed out. On the grounds of our own material we proved the identity of the species *Hymenolepis muris-sylvatici* (Rudolphi, 1819) with the species *Variolepis crenata* (Goeze, 1782).

For these reasons, the following names should be listed in synonymy to the species *Variolepis crenata*:

Syn.: *Taenia crenata* Goeze, 1782 — *Taenia serpentulus* Schrank, 1788 — *Taenia turdorum* Gmelin, 1790 — *Taenia punctata* Brugiera, 1791 — *Taenia corvi-frugilei* Viborg, 1795 — *Taenia cornicis* Gmelin, 1790 — *Ilalysis glandarii* Zeder, 1803 — *Diplacanthus angulata* Volz, 1899 — *Hymenolepis serpentulus* Cohn, 1901 — *Taenia corvi cornicis* Rudolphi, 1810 — *Taenia angulata* Rudolphi, 1810 — *Taenia muris-sylvatici* Rudolphi, 1819 — *Taenia corvorum* Rudolphi, 1819 — *Hymenolepis crenata* Kostylew, 1915 — *Hymenolepis muris-sylvatici* Baer, 1931, Joyeux and Baer, 1936 — *Dicranotaenia crenata* Lopez-Neyra, 1942 — *Dicranotaenia serpentulus* Lopez-Neyra, 1942 — *Staphylocystis muris-sylvatici* Yamaguti, 1959 — *Meyhewia crenatea* Yamaguti, 1959.

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THE FINDING OF *PARAERGASILUS RYLOVI* MARKEWITSCH, 1937 (COPEPODA: ERGASILIDAE) ON THE TERRITORY OF CZECHOSLOVAKIA

In systematic studies of parasitic copepods, collected during ichthyo-parasitological investigations in Czechoslovakia in the years 1962 to 1966, numerous specimens of *Paraergasilus rylovi* Markewitsch, 1937 were found. The genus *Paraergasilus* Markewitsch, 1937, to which these copepods belong, is new for Czechoslovakia. Originally, these copepods were considered nonparasitic (MARKEVICH A. P., Publ. House Acad. Sci. Ukrain. S. S. R. Kiev, 1956 (in Russian)) and are listed among the typical parasites only since 1962 [SMIRNOVA in BYKHOVSKY B. E. et al. Publ. House Acad. Sci. U. S. S. R., Moscow-Leningrad, 1962 (in Russian)].

Paraergasilus rylovi was located in the nasal cavities of *Abramis ballerus*, *A. brama*, *Alburnus alburnus*, *Blicca bjoerkna*, *Cyprinus carpio*, *Leuciscus cephalus*, *Pelecus cultratus*, caught in the river Latorica near Královský Chlmec in eastern Slovakia. Intensity of invasion 1–2 specimens, extensity approximately 30%.

Description: Body of female approximately 0.5 mm long, elongated, expanded in middle portion, tapering to posterior end (Fig. 1a, b). Antennae I (Fig. 1c) composed of six segments with spines unequally distributed, most of them present on second and sixth segment (6). Antennae II (Fig. 1d) of three segments, of