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SHORT COMMUNICATION

TERATOLOGICAL ABERRATIONS IN PARICTEROTAENIA POROSA (RUD., 1810) (CESTODA: DILEPIDIDAE)

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Abstract. During the studies on the helminth fauna of *Larus ridibundus* L. in the locality Jaroslavice (South Moravia), one sexually mature cestode specimen with marked teratological aberrations of rostellar hooks was found in the set of 5,122 normal specimens of *Paricterotaenia porosa*. The hooks of this cestode differed from the normal ones in the shape and size. Also the size of eggs was different.

Teratological aberrations in the morphological and anatomical structure of cestodes have been described in many cases. The aberrations concerned particularly the structure of scolex and genital organs and multistrobilation. The majority of cases were described in epizootologically important species to which a greater attention was paid (*Taenia solium*, *T. crassiceps*, *T. saginata*, *T. taeniaeformis*, *Hymenolepis nana*, *Anoplocephala magna*, *Moniezia benedeni* and others) (Esch and Murrell 1969, Namitokov 1972, Shults and Gvozdev 1972, Schiller 1973). Cestodes with teratological aberrations have been found in Chondrichthyes (Dailey and Overstreat 1973, Kurochkin 1981), fishes (Kurochkin 1981), reptiles (Srivastava and Capoor 1978) and terrestrial and sea mammals (Skryabin 1971, Mueller 1973, Kurochkin 1981). Records of anomalous cestodes in birds were only occasional. Skryabin (1915) (in Shults and Gvozdev 1972) described a bifurcation of strobila in *Raillietina microcantha* from pigeon.

MATERIAL AND METHODS

A total of 531 specimens of *Larus ridibundus* were examined in the locality Jaroslavice (South Moravia) and 5 123 cestode specimens belonging to the species *P. porosa* were recovered from them. The cestodes were stained with alum carmine and the permanent mounts prepared from them were examined in the microscope.

RESULTS AND DISCUSSION

Paricterotaenia porosa is the most frequent parasite of the black-headed gull in the locality under study. The parasites were found in the small and large intestines of the host. The incidence of infection was 32.9 %. The gulls examined were of different age, and even 2—5-day-old birds were found to be infected. The intensity of infection was 6—120 cestodes per host. The cestode specimen described below was found in May in an adult female of black-headed gull together with normally developed specimens of the same species.

The cestode was sexually mature. The strobila was 31.556 mm long and the last and widest segments measured 1.372×0.754 mm. The scolex (Fig. 1A) measured

0.192 mm horizontally and beared four oval, muscular, well developed suckers, the larger diameter of which was 0.157—0.171 mm. The rostellum was short, thick and measured 0.161—0.122 mm. The rostellar sheath was 0.420 mm long and reached behind the posterior margin of suckers. The rostellum was armed with a circle of 10 hooks arranged in one row and measuring 0.049—0.059 mm in length and 0.007—0.10 mm in width near the root. The root process was 0.007 mm long and it was lacking in some of the hooks. The shape of both the root process and blade of hooks was different in individual hooks. The hooks were irregularly bent and their blades were spirally coiled (Fig. 1B). The bursa was sac-like, 0.170—0.230 mm long and 0.042—0.052 mm wide. The cirrus sac was smooth, thick, and 0.031—0.038 mm long. The genital pores were alternating. The bursa always crossed the secretory canals. The external seminal vesicle was spherical and lied approximately at the level of bursa end. The testes were oval, rarely slightly lobular, and measured 0.017—0.045×0.035—0.056 mm. The vitellarium resembled the testes in the shape and was situated almost in the middle of the segment.

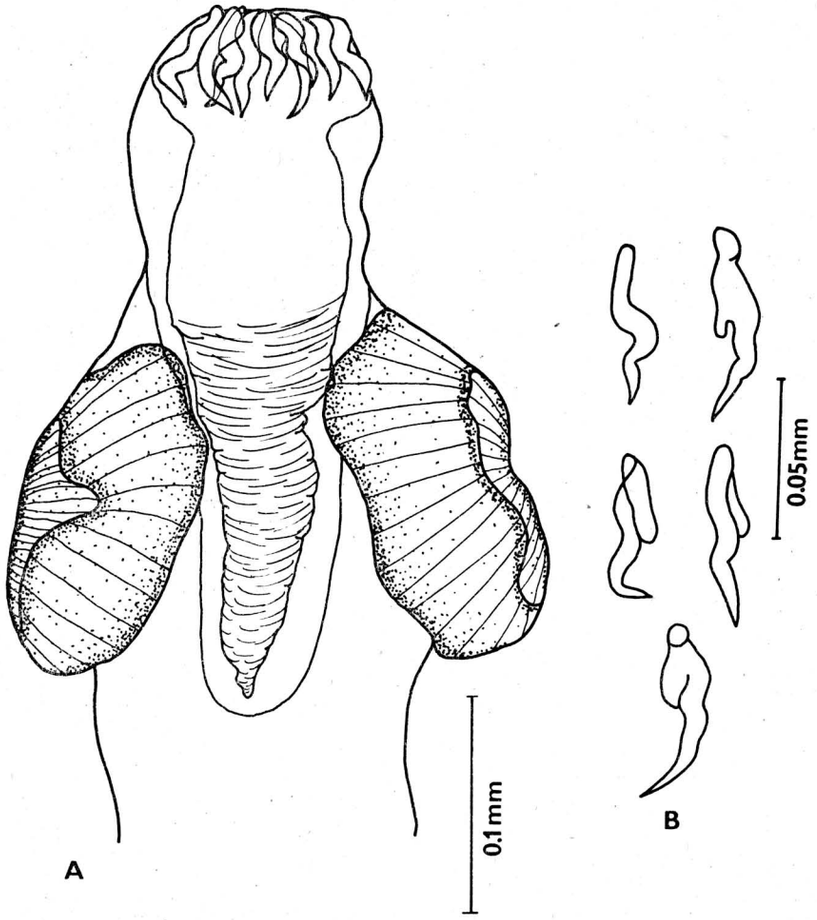

Fig. 1. A — scolex of *Paricterotaenia porosa* with anomalously shaped hooks. B — hooks.

The ovary was two-winged and lobed. The last segments of strobila were saccular and measured 0.744—0.784×0.864—0.980 mm. They were completely filled with the uterus with markedly small eggs. The eggs measured 0.010—0.021×0.010—0.021 mm.

The size, shape and topography of individual organs in this cestode did not differ from that in normally developed specimens. The compared characters and their measurements conformed to the description of *P. porosa* published, e.g., by Matevosyan (1963). Only the number, size and shape of rostellar hooks and markedly small size of eggs in the last segments of strobila were different.

Many papers dealing with teratological aberrations in cestodes have been published in the last decade. However, only few of them discussed the causes of aberrations. In none of the described cases this problem was solved, though it might throw some light, for example, upon the mechanism of embryonal development of the cestodes or phylogenetic relations between different taxonomic groups. From the systematical point of view, the occurrence of teratological aberrations in cestodes should be given more attention, particularly in the descriptions of new species. It was just on the basis of descriptions of anomalous specimens that new cestode species were discovered, as those of the families Acolidae, Anabiliidae and Nematoparataeniidae (Kurochkin 1981).

The papers describing teratological aberrations in cestodes can be divided into two groups. One group deals with the cestodes kept in vitro for several generations and the other with those found in spontaneously infected definitive hosts. To the first group belongs, for example, the paper by Schiller (1973) describing teratological aberrations of scolex in *T. crassiceps* larvae bred in the laboratory. The author reported cases where scoleces with different number of suckers or with hooks of different shape etc. were found to develop simultaneously on the wall of a cysticercoid. On the basis of studies of an extensive material he arrived at the conclusion that the described anomalies were induced by inherited changes in the gene pool of the studied population of *T. crassiceps*. These changes can often result even in the sterility, as it was reported by some other authors. For example, Esch and Murrell (1968) verified experimentally in *T. multiceps* bred in the laboratory that the eggs produced by anomalous cestodes could be physiologically changed to such an extent that they were sterile. These results suggest that the teratological aberrations were induced by the fact that the gene pool of the experimental cestode species was weakened by laboratory breeding.

Another situation, however, is in the case that anomalous cestode specimens were found in spontaneously infected hosts. In these cases the cause of teratological aberrations cannot be explicitly determined. Consequently, it may be even assumed that these changes are a reflection of the mutagenicity of the environment or a mechanism of ontogenetic regulation within the species. According to Kurochkin (1981), the anomalies as division, branching and formation of sacs of the plerocercoid may be induced by its mechanical damage.

It may be expected that in nature the occurrence of cestodes with teratological aberrations is much more frequent than the recorded findings suggest. Therefore all further information about these anomalies is important not only from the theoretical viewpoint, but, if we admit the correlation between the origin of aberrations and the outer environment, the anomalies can become also an indicator of the quality of the environment.

ТЕРАТОЛОГИЧЕСКИЕ АБЕРРАЦИИ У *PARICTEROTAENIA POROSA* (RUD., 1810) (CESTODA: DILEPIDIDAE)

П. Коубек

Резюме. При изучении гельминтофауны обыкновенной чайки (*Larus ridibundus* L). из местонахождения Ярославице (южная Моравия) среди 5 122 нормальных цестод вида *Paricterotaenia porosa* была обнаружена одна половозрелая цестода с выразительными тератологическими изменениями крючков хоботка. От нормально развитых крючков эти крючки отличались не только формой, но также размером. Были также обнаружены разницы между размером яиц этой цестоды и размером яиц нормальных цестод.

REFERENCES

DAILEY M. D., OVERSTREET R. M., *Cathetocephalus thatcheri* gen. et sp. n. (Tetraphyllidea: Cathetocephalidae fam. n.) from the bull shark: A species demonstrating multistrobilization. J. Parasitol. 59: 469—473, 1973.

ESCH G. W., MURRELL K. D., Comparative observations on infection rates of normal and anomalous *Taenia multiceps* in laboratory mice. J. Parasitol. 54: 181—182, 1968.

MATEVOSYAN E. M., Osnovy tsestodologii. (Fundamentals of cestodology). Izd. AN SSSR, Moskva, 687 pp., 1983. (In Russian.)

MUELLER J. F., Accessory suckers (?) in *Taenia taeniaeformis* from the California Bobcat. J. Parasitol. 59: 562, 1973.

NAMITOKOV A. A., An interesting case of multiple anomaly of the dwarf tapeworm. Parazitologyia 6: 161—162, 1972. (In Russian.)

SCHILLER E. L., Morphologic anomalies in scoleces of larval *Taenia crassiceps*. J. Parasitol. 59: 122—129, 1973.

SHULTS R. S., GVOZDEV E. V., Osnovy obshchey gelmintologii. (Fundamentals of general helminthology). Nauka, Moskva, pp. 161—169, 1972. (In Russian.)

SKRYABIN A. A., A contribution to the teratology of *Phylobothridium delphini* larvae (Cestoda). Zool. zh. 50: 582—584, 1971. (In Russian.)

SRIVASTAVA A. K., CAPOOR V. N., Teratological aberrations in *Crepidobothrium* sp. J. Zool. Soc. India 30: 81—82, 1978.

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