

## SHORT COMMUNICATIONS

### SCANNING ELECTRON MICROSCOPY OF THE TREMATODE *BRACHYLAIMUS AEQUANS* (LOOSS, 1899)

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**Abstract.** The surface structure of the trematode *Brachylaimus aequans* has been studied by scanning electron microscopy. The sensory endings in the regions of oral and ventral suckers and genital pore form mostly papillae without finger-like process. Papillae with finger-like process occur sporadically. Uni- and tripointed spines are present in the tegument on the ventral and lateral sides and on the dorsal side of anterior end of body. The spines are lacking in the regions of the oral and ventral suckers, and genital and excretory pores.

The present study is a part of the complex investigation of *Brachylaimus aequans* which was chosen as a model type of the family Brachylaimidae. The studies of this family have been performed by the Institute of Parasitology, Czechoslovak Academy of Sciences, České Budějovice in cooperation with the Institute of Zoology, Academy of Sciences of the Kazakh SSR, Alma-Ata. The results concerning the functional morphology will serve as a basis of subsequent immunological studies of this trematode family. Previous papers dealing with *B. aequans* concerned its histochemistry and ultrastructure (Ždárská and Soboleva 1987, Ždárská et al. 1988, Soboleva et al. 1988).

## MATERIALS AND METHODS

Eight adult specimens of *Brachylaimus aequans* (Looss, 1899) at the age of 6-8 days were studied. They were recovered from laboratory white mice experimentally fed with metacercariae from snails *Macroclamys schmidtii*. After isolation from the intestine, the trematodes were washed in saline and fixed in Baker's fluid. Then they were dehydrated through a graded ethylalcohol series and dried in CO<sub>2</sub> at critical point, mounted on stubs with silver paste, coated with gold and examined in a Stereoscan Jeol 35-C scanning electron microscope operating at 15 kV.

## RESULTS

The body tegument (Pl. I, Figs. 1, 3) forms deep folds over the whole surface, particularly on the anterior end of body and on the ventral side. The folds are arranged transversely on the ventral side of body, radially around the oral sucker, and circularly around the ventral sucker. They are lacking in the region around the genital pore. The spines are developed only in the tegument on the ventral and lateral sides and on the anterior end of the dorsal side of body (Pl. I, Fig. 2). The spines are arranged irregularly and possess 1-3 ribs with sharp points (Pl. I, Fig. 3). The largest spines occur on the lateral side and on the dorsal side of anterior end of body (Pl. I, Fig. 2).

No spines are present on the posterior part of the dorsal side, on the ventral side in front of the ventral sucker, and in the region around both suckers and genital and excretory pores.

Sensory papillae are concentrated in the oral and ventral suckers (Pl. II, Figs. 1, 2) and around the genital pore. No papillae were observed around the excretory pore on the posterior end of body (Pl. I, Fig. 1) and around the opening of Laurer's canal. The sensory papillae are finely folded and have no opening or cilium. Only some of the papillae possess a very short finger-like process. The papillae in the oral and ventral suckers (Pl. II, Figs. 1, 2) are arranged in 3 circles. A large number of irregularly arranged papillae without finger-like process are accumulated in the region of the genital pore.

## DISCUSSION

Unipointed and tripointed spines were demonstrated in 6—8-day-old specimens of *B. aequans*. It is possible, however, that the spines are not yet fully developed at this age and may later turn into multipointed spines in older trematodes, as it was observed by Bennett (1975a, b) in *Fasciola hepatica*. According to this author, 10-day-old specimens of this species have only unipointed spines from which multipointed spines develop after two or more weeks. The tripointed spines of *B. aequans* differ in their marked striation and sharp points from the spines of *Hasstilesia*, namely of *H. tricolor* studied by Crites and Jilek (1981) and of *H. ovis* studied by Žďárská et al. (1983), in which even fully developed spines have only little visible ribs and short points. The conspicuous structure of ribs and points of *B. aequans* spines resembles the spines of the genera *Leucochloridium* (*L. variae*, *L. paradoxum*) and *Urogonimus* (*U. macrostomus*) studied by Bakke (1976a, b, 1978, 1980, 1982) in SEM.

The sensory papillae in *B. aequans* adults are essentially identical with the papillae described by Žďárská and Soboleva (1980) in the metacercariae of this species, in which two types, with and without finger-like process, are distinguished. The papillae with a free cilium, which have been found in the superfamily Brachylaimoidea only in the genus *Leucochloridiomorpha* (Pont and Wittrock 1980), which is bound to water environment, were not demonstrated either in adults or in metacercariae of *B. aequans*. In the other hitherto studied genera of Brachylaimoidea (*Leucochloridium*, *Urogonimus*, *Hasstilesia*, and *Brachylaimus*), which are bound to terrestrial environment, the papillae with a free cilium have not been demonstrated as well.

Like in *Hasstilesia ovis* (Žďárská et al. 1983) and species of the genus *Leucochloridium* (Bakke 1976a), also in *B. aequans* the papillae around the genital pore do not possess a finger-like process. In *Leucochloridiomorpha constantiae*, however, Pont and Wittrock (1980) have observed papillae with a short cilium in the region around the genital pore. The different surface structures of adults of the genus *Leucochloridiomorpha*, i.e. the ciliated papillae and the absence of spines in the tegument, seem to be associated with the phylogenetic position of the family Leucochloridiomorphidae, which is at the lowest rank in the superfamily Brachylaimoidea, and its life cycles are bound to water environment. In contrast to this family, in the other families of Brachylaimoidea the structures facilitating the dehydration were reduced as a result of the adaptation of their life cycles to terrestrial conditions. These structures include also the sensory papillae with a free cilium which perforates the tegument.

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## СКАНИРУЮЩАЯ ЭЛЕКТРОННАЯ МИКРОСКОПИЯ ТРЕМАТОДЫ *BRACHYLAIMUS AEQUANS* (LOOSS, 1899)

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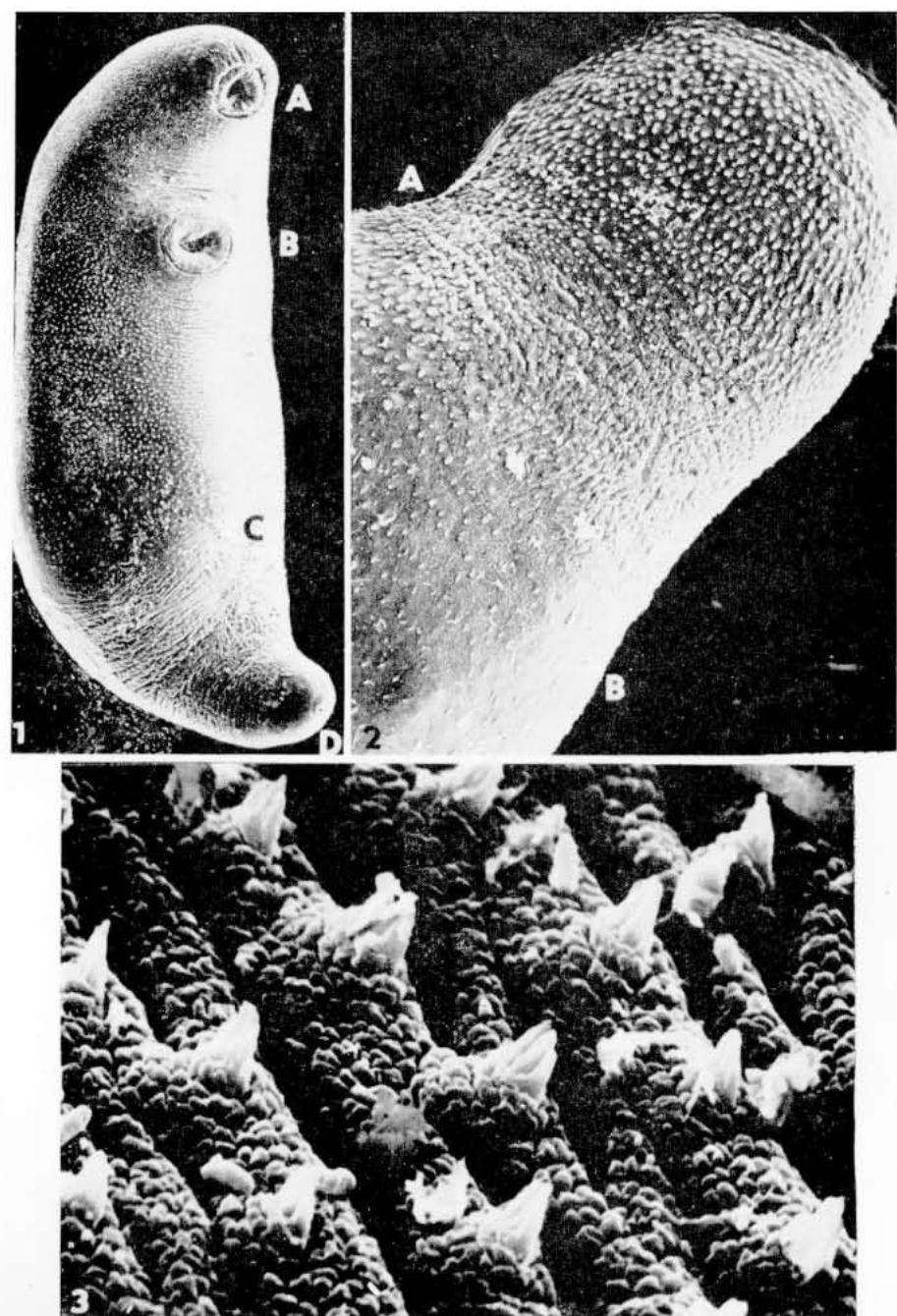
**Резюме.** Поверхностные структуры trematоды *Brachylaimus aequans* изучали с помощью сканирующей электронной микроскопии. Сенсорные окончания в области ротовой и брюшной присосок и полового отверстия образуют большей частью папиллы без пальцевидного отростка. Папиллы с пальцевидным отростком встречаются только местами. В tegumentе вентральной и латеральной сторон и на дорсальной стороне переднего конца тела встречаются шипы с одним или тремя остриями. Шипы отсутствуют в области ротовой и брюшной присосок и полового и экскреторного отверстий.

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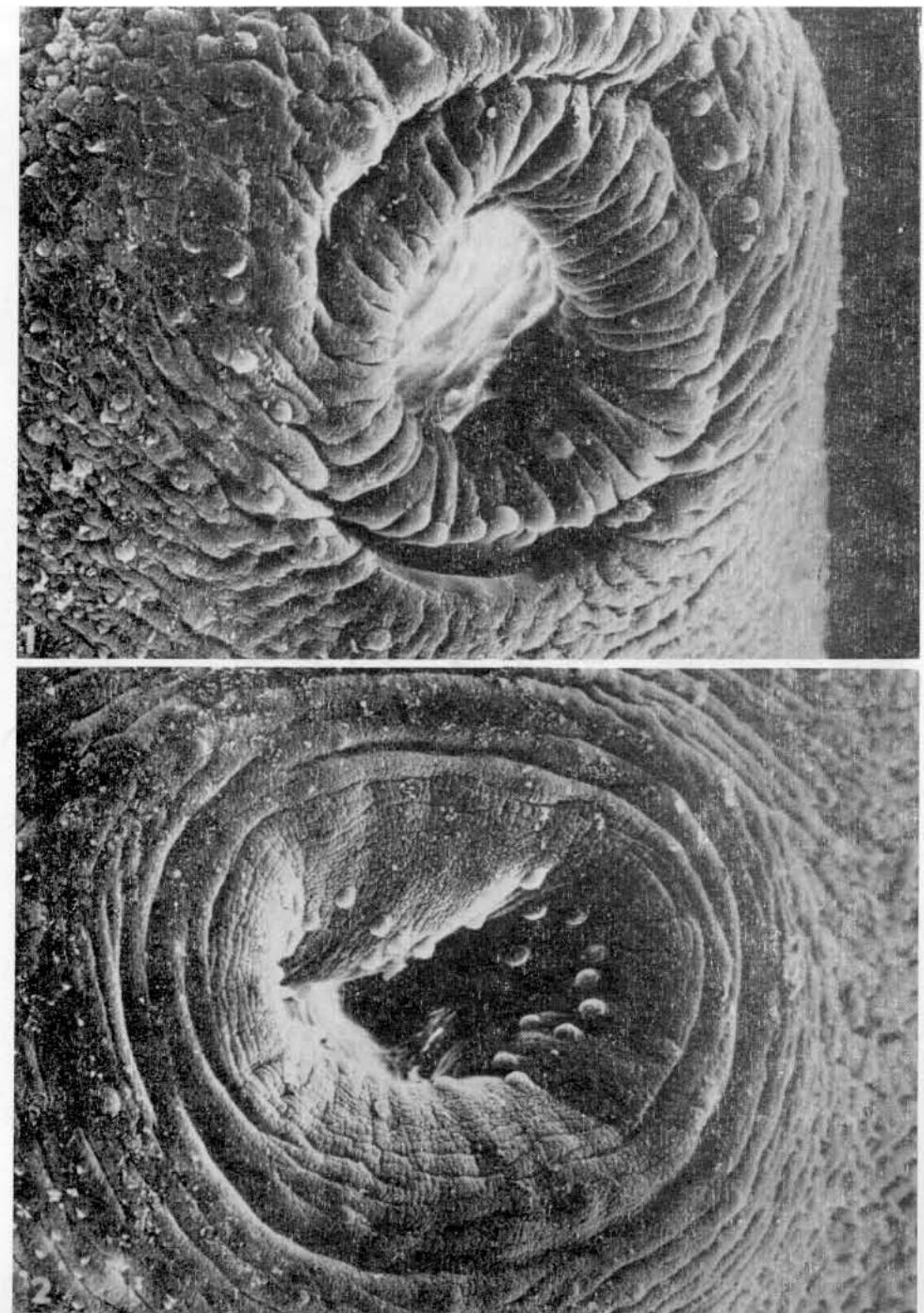
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**Fig. 1.** Adult *B. aequans*. A — oral sucker, B — ventral sucker, C — genital pore, D — excretory pore ( $\times 280$ ). **Fig. 2.** Distribution of spines on the dorsal side of anterior end of body. A — ventrolateral side, B — dorsal side ( $\times 720$ ). **Fig. 3.** Detail of tegument with spines behind the ventral sucker ( $\times 12\,000$ ).



**Fig. 1.** Detail of oral sucker of *B. aequans* from Plate I, Fig. 1 ( $\times 2\,450$ ). **Fig. 2.** Detail of ventral sucker from Plate I, Fig. 1 ( $\times 2\,450$ ).