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SPECIAL TEGUMENT ARRANGEMENT IN POSHARMOSTOMUM GALLINUM METACERCARIA AS REVEALED BY SCANNING ELECTRON MICROSCOPY

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Abstract. The body tegument of *Postharmostomum gallinum* metacercaria forms high ridges connected with one another to form a marked net-like structure on the whole body surface. In contrast to the remaining parts of the tegument, the network of ridges is covered by a glycocalyx layer.

During scanning electron microscopic studies of metacercariae of the family Brachylaimidae (Joyeux et Foley, 1930), those of *Postharmostomum gallinum* Witenberg, 1923 were found to possess a special net-like structure on their body surface. This type of superficial structure corresponds with the interlacing network of ridges in *Leucochloridiomorpha constantiae* metacercariae from the family Leucochloridiomorphidae. Both families belong to the superfamily Brachylaimoidea.

MATERIALS AND METHODS

P. gallinum metacercariae were obtained from the pericardial cavity of spontaneously infected snails *Ponsadenia semenovi* Martens, 1864 collected in the vicinity of Alma-Ata. They were fixed in 3% glutaraldehyde in 0.1 cacodylate buffer at 4 °C, washed in cacodylate buffer and distilled water and dehydrated through a gradient alcohol series. Then they were dried in CO_2 at critical point, mounted on stubs by means of silver paste, coated with gold and examined in a Stereoscan Jeol 35-C scanning electron microscope at 15 kV.

RESULTS

The metacercariae of *P. gallinum* were barrel-shaped and their whole body tegument including the oral and ventral suckers formed a network of interconnected ridges (Pl. I, Figs. 1—3). Transverse and longitudinal ridges prevailed on the body, whereas radial ridges occurred on the suckers. The ridges thus divided the body surface of metacercaria into mostly oblong fields. Minute chessboard arranged spines were visible on the bottom of these fields on both ventral (Pl. II, Fig. 1) and dorsal (Pl. I, Fig. 3) sides of body. The ridges were covered by a layer of phlegmy matter representing the glycocalyx (Pl. II, Figs. 1, 3). The surface of oral and ventral suckers was not covered with spines between the network of ridges, but there were only slight elevations (Pl. I, Fig. 2; Pl. II, Fig. 2). Papillae with opening were localized in the oral and ventral suckers (Pl. II, Fig. 2) and single papillae were found also on the lateral side of metacercaria body (Pl. II, Fig. 3). Papillae of other type were not demonstrated.

DISCUSSION

A special net-like structure of the body surface observed in *Postharmostomum gallinum* metacercaria is the second demonstration of this special tegument structure

in the superfamily Brachylaimoidea. This structure is formed by interconnected tegument ridges covered with glycocalyx, which is lacking in the depressions between these ridges. Since a similar structure has already been observed by Font and Wittrock (1980) in the metacercariae of *Leucochloridiomorpha constantiae*, which is a member of the most primitive family (Leucochloridiomorphidae) of the superfamily Brachylaimoidea, the presence of this structure, in addition to other characters, gives evidence that the family Leucochloridiomorphidae belongs to the superfamily Brachylaimoidea. The last revision of this superfamily was made by Gvozdev and Soboleva (1978). On the basis of the tegument structure of metacercariae, the genus *Postharmostomum* is very close to the family Leucochloridiomorphidae. The functional significance of this structure in both *L. constantiae* and *P. gallinum* remains uncleared. Considering that the metacercariae of Brachylaimoidea do not encyst, i.e. that their tegument gets into immediate contact with the tissue of the intermediate host, it may be supposed, in agreement with the opinion of Harris et al. (1974) concerning *L. constantiae*, that a protective zone against the effect of the intermediate host tissue, i.e. against the effect of enzymes and cellular defence, is involved. We assume that this is also a mechanic protection of the metacercaria surface. Both metacercaria species are localized in contractile organs of the intermediate hosts — *L. constantiae* in the uterus and *P. gallinum* in pericardial cavity. The interlacing network of ridges protects them against the contact of their whole body surface with the host tissue and the glycocalyx layer hinders the effect of contractions on the metacercaria.

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СПЕЦИАЛЬНОЕ УСТРОЙСТВО ТЕГУМЕНТА МЕТАЦЕРКАРИИ *POSTHARMOSTOMUM GALLINUM* ОБНАРУЖЕННОЕ С ПОМОЩЬЮ СКАНИРУЮЩЕЙ ЭЛЕКТРОННОЙ МИКРОСКОПИИ

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Резюме. Тегумент тела метацеркарии *Postharmostomum gallinum* образует высокие гребни, соединенные друг с другом и образующие сетевидную структуру на поверхности целого тела. В отличие от других частей тегумента, гребни сетевидной структуры покрыты слоем гликокаликса.

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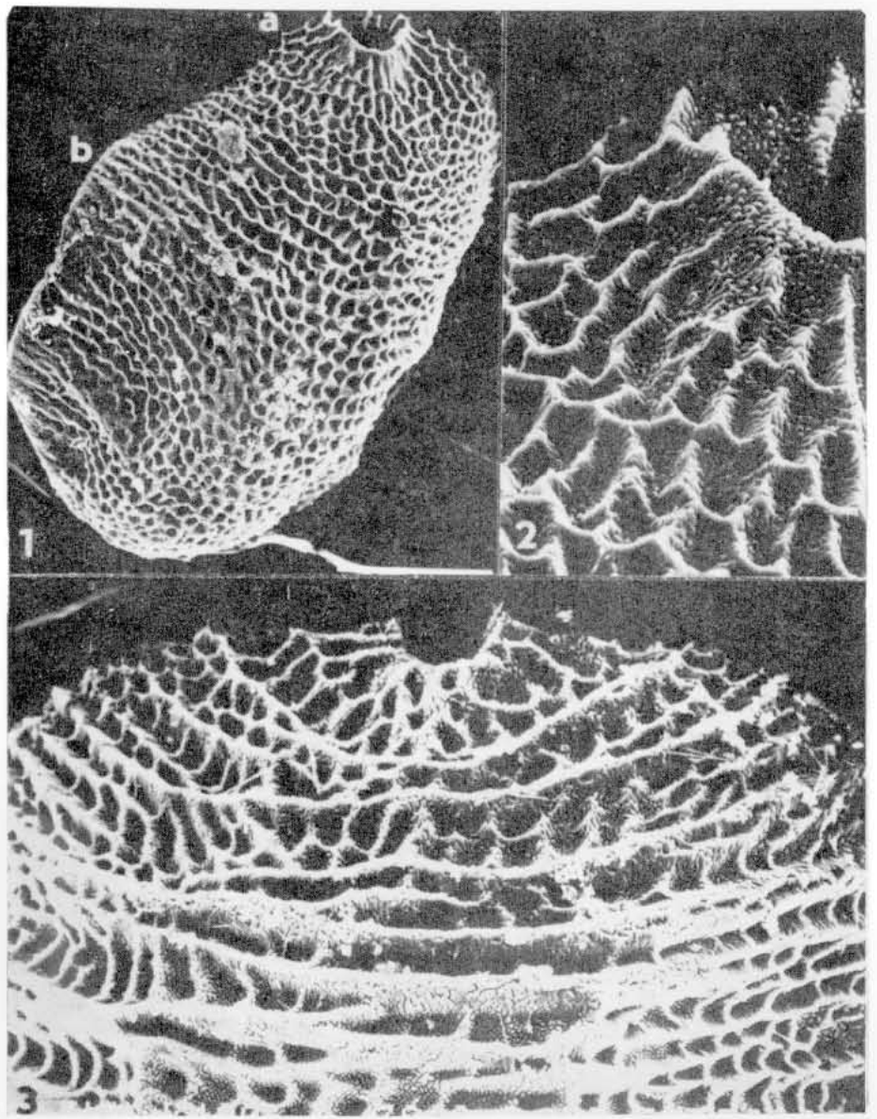

Fig. 1. Network of tegumental ridges on the body surface of *P. gallinum* metacercaria (lateral view). a — oral sucker, b — ventral sucker (× 200). **Fig. 2.** Detail of oral sucker from Fig. 1 (× 700). **Fig. 3.** Net-like structure on the dorsal side of anterior end of body and oral sucker (× 460).

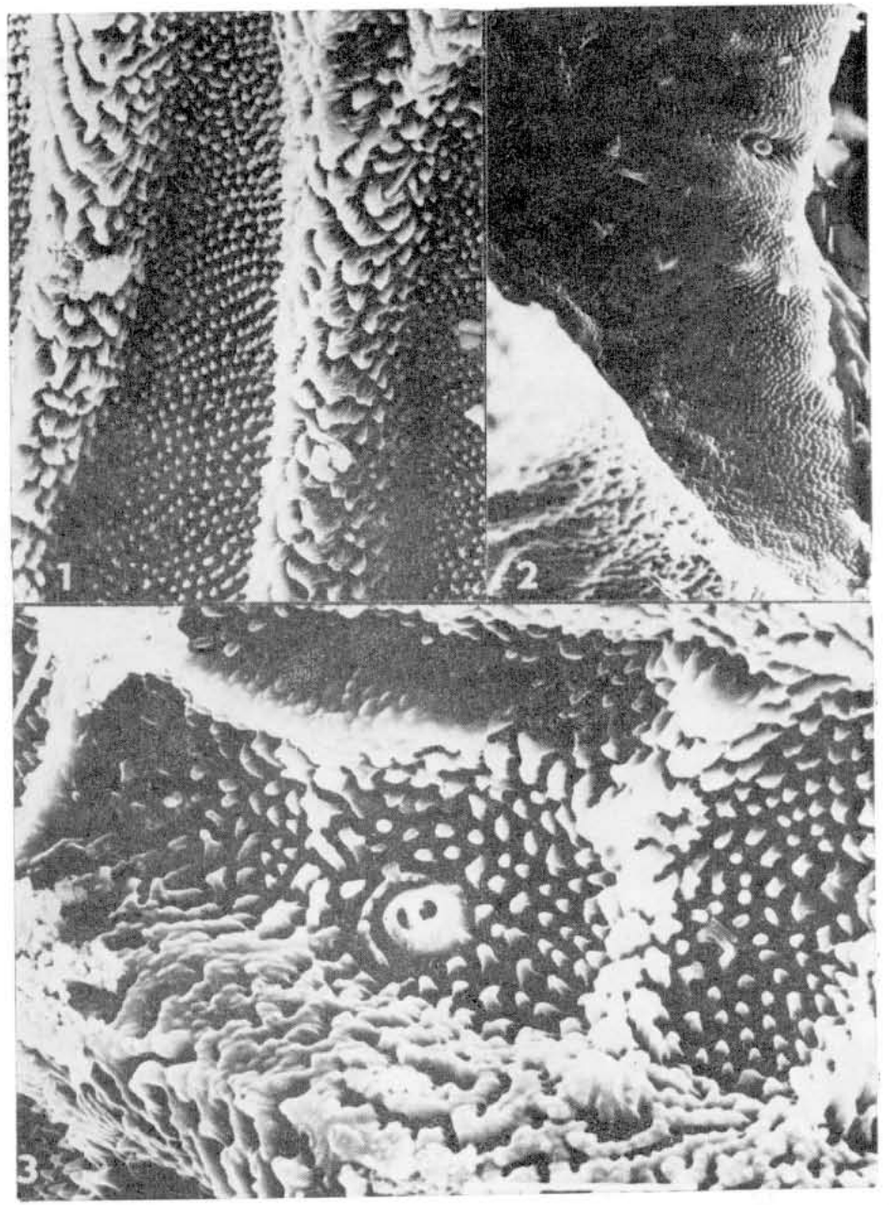

Fig. 1. Ventral side of anterior body end of *P. gallinum* metacercaria. Detail of ridges of the net-like structure and depressions with spines (× 1,800). **Fig. 2.** Tegument of ventral sucker cavity with a papilla with opening (× 1,300). **Fig. 3.** Network of ridges covered with glycocalyx and papilla with opening from the lateral side of metacercaria (× 3,000).