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ULTRASTRUCTURE OF TISSUE REACTION IN CYSTICERCUS BOVIS INFECTION

Young larva of *Taenia saginata* after emigration from blood vessels of interstitial muscle tissue induces necrosis of the surrounding tissue and excessive inflammatory reaction which gradually disappears during the development of the cysticercus. About 40—50 days p.i., the cysticercus is located in a cyst formed from dilated lymphatic capillary the wall of which is only in some sections changed by a granulomatous inflammation (Blažek K., Schramlová J., Proc. XXX. Meeting of Pathol., vet. sect. 2—3, 1979, Blažek K. et al., Vet. Med., in press).

During the studies of the ultrastructure of cellular reaction in early phase of infection (14—23 days p. i.) the plasma of large macrophages was found to contain numerous lysosomes, a large number of free ribosomes, foreign cell debris and vacuoles with material of various stage of density or empty vacuoles (Fig. 3). In the zone of cysticercus contact with host tissue, extrusion of marginal parts of macrophage cytoplasma in form of vesicles was observed on days 14 and 23 p.i. Vesicles of various density and size were found also among microvilli (Fig. 2). A homogeneous substance of medium density was present between macrophages and layer of microvilli in some parts of cysticercus surface.

The fibroblasts possessed increased granular endoplasmic reticulum sometimes dilated in form of cisternae. Large bundles of collagenous fibrils were formed on days 21 and 23 p.i. On the periphery of the lesion, there were numerous lymphoid cells containing ribosomes in the transparent plasma, occasionally a vacuole and paranuclearly situated mitochondria.

A similar picture occurred also on day 28 p.i. Cells of immunoblast or plasmocyte type were rather numerous.

On day 51 p.i., there were macrophages in the zone of cellular proliferation, and a strongly electron-dense substance appeared between the cells of tissue reaction and larva surface (Fig. 4). Immunoblasts and plasmatic cells were rather numerous here, but fibroblast activity, from a morphological viewpoint, was lower than before (Fig. 1).

On days 168 and 261 p.i., histiocytes possessed enormously swollen mitochondria with more sparse crists and numerous ribosomes sometimes protruding from the cytoplasma. An electron-dense substance was present on the cell surface and among microtriches. The endoplasmic reticulum of fibroblasts was only slightly enlarged. Collagenous fibrils were few in number. Immunoblasts were found regularly. In contrast to the early phase of infection, the proliferating cells were close to one another.

Our observations suggest that the excessive activation of histiocytes in the early phase of infection is important for the nutrition of rapidly developing larva and belongs to protective mechanisms mediating the formation of cellular and humoral immunity. The presence of macrophages in the early phase of infection is significant, since the macrophages can participate in the mechanism of immune defence reaction of the host; they accept the antigens and process them for the proper immunocytes (Büchner T.: Entzündungszellen im Blut und im Gewebe, Fischer Verlag, Stuttgart, 1971). The activation of fibroblasts is an evidence of live proteosynthesis. The substance found in the contact zone is preliminarily considered a product of interaction between parasite and host. It is present already about on day 20 p.i., but also in the zone of histiocyte proliferation in the cyst wall in the late phase of infection. The finding of immunoblasts is in agreement with the detection of the phenomenon of cellular hypersensitivity by migration inhibition test Blažek K. et al., Folia parasit. 27, 145 to 149, 1980).

The activity of macrophages and some other cells of cellular defence reaction observed at ultrastructural level demonstrates the extraordinarily high metabolic and antigenic activity of the larva during the first month after infection. The findings show what is the morphological picture of the effect of secretory antigens which were demonstrated in the cultures of *T. saginata* larvae (Rickard M. D., Adolph A. J., Vet. Parasitol. 1: 389—392, 1976).

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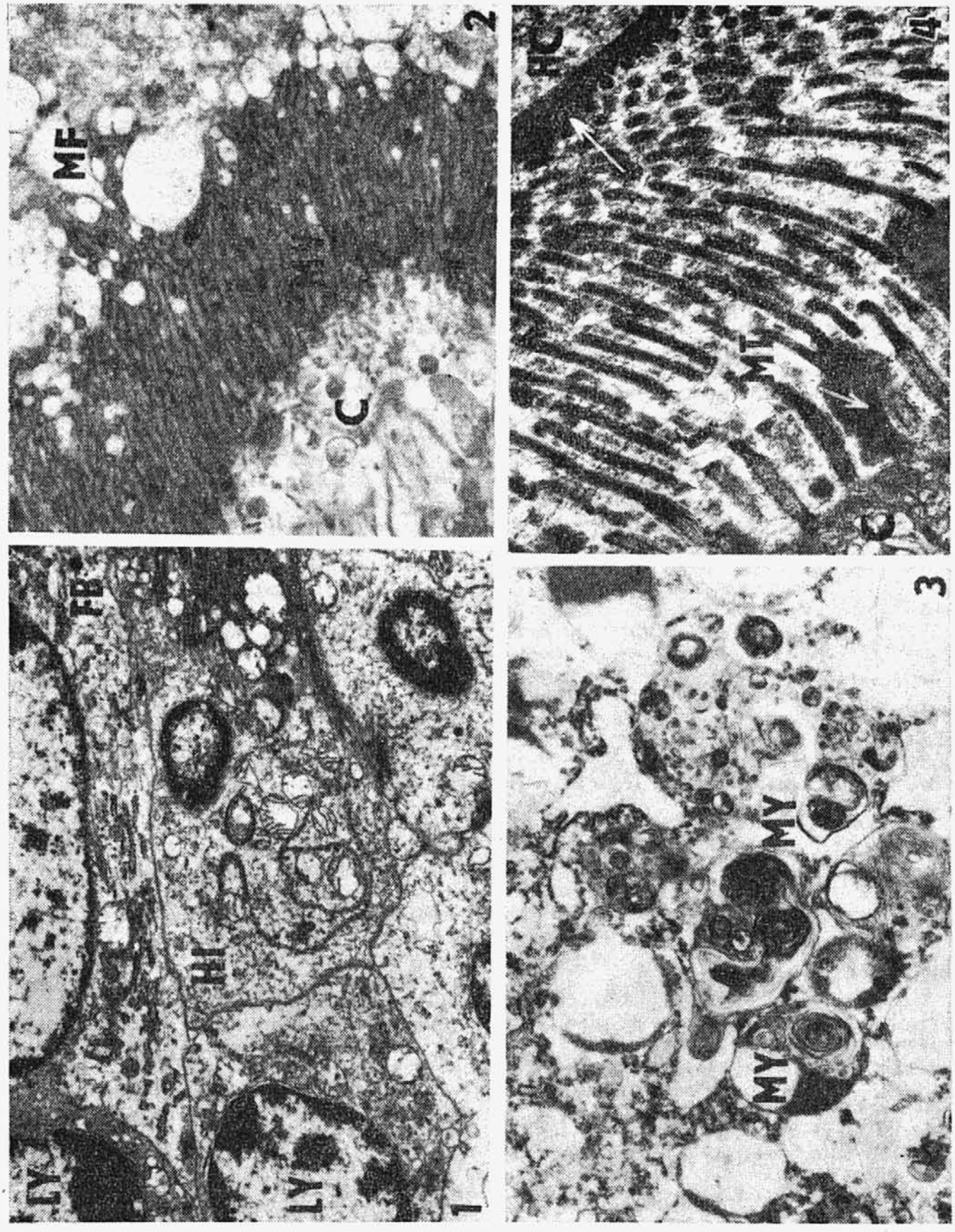

Fig. 1. Granulomatous tissue around the cysticercus. FB — fibroblast, LY — lymphoid cells, HI — histiocyte. (× 7200).

Fig. 2. Contact zone between cysticercus (C) and macrophage (MF) on day 14 p.i. MV — microvilli. (× 31 800).

Fig. 3. A part of macrophage cytoplasma. Cytosomes with myelinlike bodies (MY) formation, partly of the character of multivesicular bodies. (× 15 900).

Fig. 4. Contact zone between cysticercus (C) and cell of tissue reaction (HC) on day 51 p.i. MT — microtriches. Arrow indicates electron-dense substance. (× 34 800).