Type of presentation: Poster

LS-14-P-6014 ULTRASTRUCTURE OF THE RETINA IN THE LAND SNAIL MEGALOBULIMUS ABBREVIATUS

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Aims: In a previous study, the eye of the land snail *Megalobulimus (Strophocheilus)* sp. was described at light microscopic level. Some questions remain, however, about the types of photoreceptors, and about the existence of other neurons (ganglion cells or second order sensorial neurons), and glial cells in the retina. In order to clarify these questions, an ultrastructural study of the retina of *M. abbreviatus* was made.The existence of the glial cells in the retina was investigate by immunohistochemistry for glial fibrillary acidic protein (GFAP), which has not yet been investigated in the retina of the gastropod mollusks.

Methods and Results: Snails *Megalobulimus abbreviatus* were anaesthetized (menthol solution for 30 min). The isolate eyes were fixed for 2 h in 4% paraformaldehyde and 0,5% glutaraldehyde buffered with 0,1 M phosphate pH 7,4 (PB), post-fixed in 1% OsO_4 in PB for 1 h, dehydrated and embedded in Durkupan ACM (Fluka) resin. Ultrathin sections were obtained on MT 6000-XL ultramicrotome and stained (2% uranyl acetate and 2% lead citrate). The sections were analyzed with Jeol JEM 1200EXII at Electron Microscopy Center of UFRGS. Two types of cells with sensorial aspects were observed in the retina of *M. abbreviatus*. A sensory cell (type I) possesses apical projections toward the vitreous body, which are composed of overlapped long and slender microvilli, constituting the rhabdomere (Fig. 1). The rhabdomeric portion of the inner layer of retina is thicker (28-32 µm) in the central portion than the peripher alone (2-3,6 µm) of the retina. Another sensorial cell (type II) was visualized in the peripheral areas of the retina. These cells have cilia in their apical end and few microvilli (Fig. 2). Type-I sensorial cell should be the principal photoreceptor, because of its well-organized rhabdomeric pattern and its central location in the retina. The pigmented cells are more numerous in the central portion of the retina. The nuclei of the photoreceptor and pigmented cells are located in the basal portion of the retina, the nuclear layer. The outmost layer of the retina consists of neuritic processes, the plexiform layer, that contain some axonal projections with dense-core vesicles (Fig. 3). These projections appear originate from a central ganglion of the animal. The photoreceptors may project toward the optic nerve without making synapses in theplexiform layer. Exocytosis of these dense-core vesicles could occur without specialized synapses. GFAP-immunoreaction and cells with glial aspect were observed in the nuclear and plexiform layers of the retina of the snail *M. abbreviatus*.

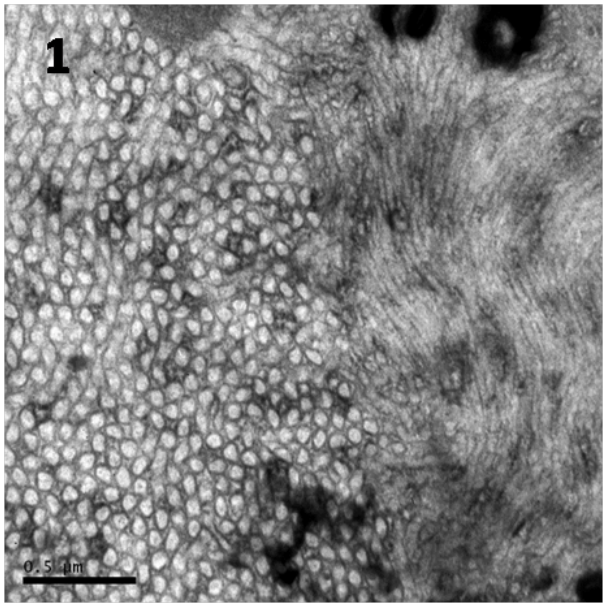

Fig. 1: Electron micrograph of central area of the retina of M. abbreviatus, showing the arrangement of microvilli with two different orientations in rhabdomere.

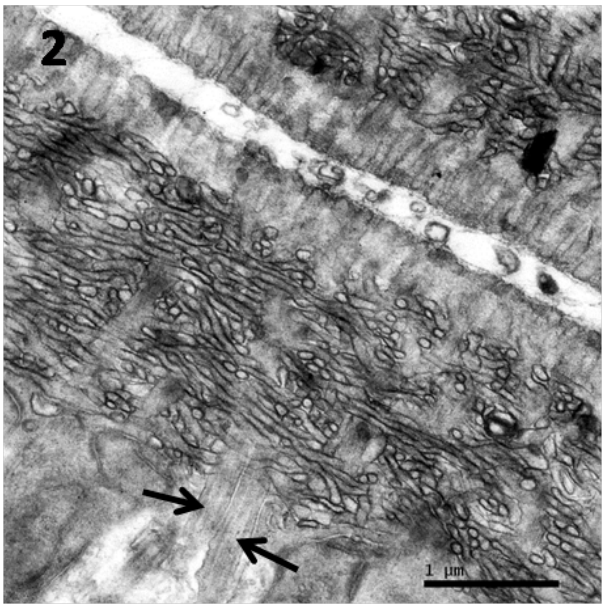

Fig. 2: Electron micrograph of retina in eye periphery of M. abbreviatus, showing the type-II sensorial cell with cilia (arrows). The microvilli of the type-I sensorial cells are shorter than in the central retina.

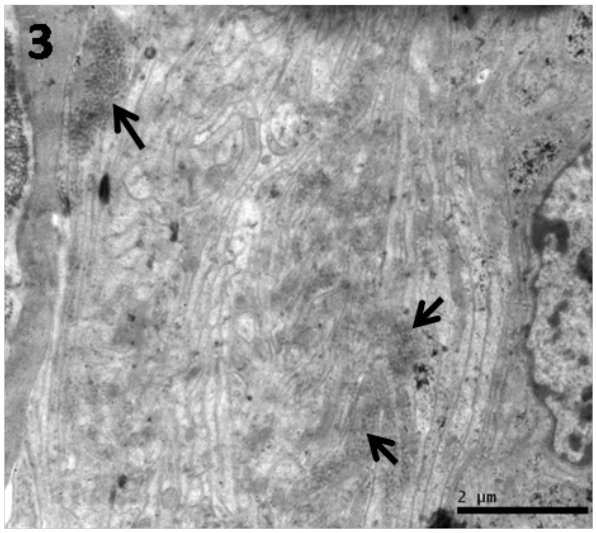

Fig. 3: Electron micrograph of the central area of retina of M. abbreviatus, showing the plexiforme layer, which is situated between the nuclear layer and the basal lamina(asterisk). The basal lamina is surrounded by a thin capsule of connective tissue. Axonal processes containing dense-core vesicles are showed (arrows).

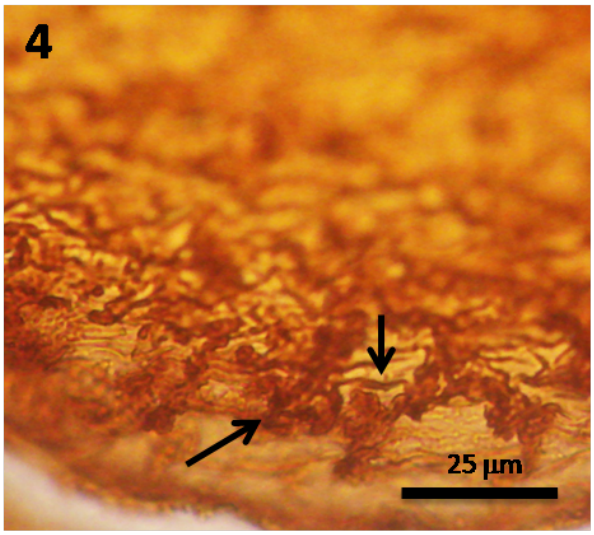

Fig. 4: Light micrograph of the eye (demelanized) of M. abbreviatus, showing the intense GFAP-immunoreaction in the external layer of the retina.