

**THE ORGANIZATION OF THE LUMINAL SYSTEMA OF MEMBRANES IN THE MIDGUT OF THE SHARPSHOOTER *BUCEPHALOGONIA XANTHOPHIS* (BERG) (HEMIPTERA: CICADELLIDAE): A CHALLENGE OF PARADIGM?**

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In the majority of insects, a peritrophic membrane (PM) envelopes the food bolus and compartmentalizes the midgut lumen and the digestive process. In Hemiptera, a PM is absent, but the enterocytes are not in direct contact with food, due to the existence of a luminal system of membranes known as perimicrovillar membranes (PMM), which considerably increases the surface area of the midgut epithelium. A typical PMM are found in some extant Heteroptera. On the other hand, in some species of aphids, a modified permicrovillar membranes (MPM) can be observed associated to the enterocyte microvilli. As a member of the Auchenorrhyncha suborder, the sharpshooter *B. xanthophis* was studied anatomically and ultrastructurally. For ultrastructural analysis by TEM, the midgut was fixed in modified Karnovsky solution in sodium cacodylate buffer, post fixed in 1% osmium tetroxide and embedded in Spurr resin. For lanthanum tracer study, 1% of lanthanum nitrate was added to sodium cacodylate buffer. The gut of *B. xanthophis* is composed of 3 basic regions: foregut, midgut and hindgut. The foregut is a simple slender esophagus. The midgut consists of a filter chamber (an association of the anterior and posterior midgut and Malpighian tubules), a conical and a tubular domain of the ventriculum. The hindgut is a long flattened tube and ends in the rectum. Ultrastructurally, all 3 epithelia of the filter chamber have their apical surface modified into microvilli, reduced cytoplasm and well developed basal membrane infoldings with mitochondria. The enterocytes have microvilli at the apex and a few basal membrane infoldings. Golgi and rough endoplasmic reticulum can be seen mostly around the nucleus. Secretion vesicles can be observed throughout the ventriculum. Associated with microvilli there is a perimicrovillar-like system of luminal membranes called flame-like luminal membranes (FLM), forming a closed compartment, according to lanthanum experimental results. The FLM originates from constrictions of the microvillar tips, which form membranes that projects into the lumen, keeping their association with the microvilli. Formerly, the PMM was considered as a structure present in the whole order Hemiptera, but the occurrence of a new kind of luminal system of membranes, which differs significantly from PMM and MPM, opens a new discussion concerning the actual evolutionary origin of these systems of membranes.

Financial support: CNPq, FAPESP