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POSTER ABSTRACT PRESENTATIONS

SESSION TITLE: MOLECULAR ORGANIZATION OF CELLS AND ORGANELLES

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Abstract P-22: The Tannoglobule is a Phenolic Compounds Compartment of the Maloideae (Rosaceae) Pericarp Cells

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Background: In the Maloideae, pericarp cells were discovered, previously not described for this subfamily, the structural units of tannosome. Data on the tannosomes merge in the vacuoles to form tannoglobules has been obtained for the first time.

Methods: The samples were fixed in glutaraldehyde and subjected to a standard procedure of dehydration, contrast and pouring with some modifications. A JEM-1400 transmission electron microscope (JEOL, Japan) was used for the analysis of ultrathin sections.

Results: We were the first to observe tannosomes, structural units not detected in earlier studies of Maloideae, in the cells of the external zone of the pericarp. Electron microscopic studies showed that some chloroplasts of the subepidermal layer (hypodermal) cells contained electron-dense material that had the appearance of isolated small particles attached to the internal surface of the swollen thylakoid membrane or granular bead-like structures that protruded into the lumen. According to our observations, the tannosome is released from the chloroplast as a shuttle, regardless of the tannosome formation pathway. Tannosomes were sometimes scattered over the entire cytoplasm as small electron-dense membrane-enclosed structures similar to the endoplasmic reticulum (ER). This allowed the assumption that tannins were also synthesized in ER cisterns and subsequently transported to the vacuoles. These particles were subsequently merged in the vacuoles to form large tannin aggregates or tannoglobules. Our study revealed the variable morphology of tannin deposits in the vacuoles: they could be represented by coarse- or fine-grained electron-dense material, separate electron-dense bodies of oval or round shape (two to five or more per section), or isolated conglomerates or a continuous layer of flakes on the internal side of the tonoplast. The tannoglobules detected in the vacuoles of pericarp cells may represent one of the forms of the deposition of polyphenol compounds as reserve substances.

Conclusion: Thus, we have shown specific compartmental of polyphenolic substances, namely the formation of tannoglobules in the Maloideae pericarp cells. These formations can be a temporary storage place for these substances, playing an important adaptive and protective function.

Key Words: Tannosome • tannoglobules • polyphenolic substances • Maloideae

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