

Cytochemical characterization of pollen development in (*Argania spinosa* L.)

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The morphological and ultrastructural studies carried out in this work show that the mature pollen of the argan tree is tri-cellular, prolate and 5-colporate, displaying a well developed and structured exine of the rugulate-striate type. In the present study we also report the presence of both lipid and polysaccharide storage materials in the cytoplasm of the vegetative cell at the mature pollen. Lipid materials mainly appear in the form of individual, spherical lipid bodies of 0.5-0.7 μm in diameter which are densely stained by Sudan Black B. They start to accumulate immediately after the first asymmetric division, reaching its maximum at the tri-cellular stage, where they begin to change their spherical shape, tending to fuse and collapse due probably to the mobilization of triacilglicerids to provide energy to the maturing pollen grains after the loss of their major nutrient source –the tapetum-.

The pollen of the argan also accumulates significant amounts of periodic acid-Schiff (PAS)-positive starch granules, which start to be synthesized inside amyloplasts at the vacuolated/late microspore stage. At the mature tri-cellular pollen stage, conspicuous roundly-shaped starch granules of 0.7-1.2 μm in diameter fill the cytoplasm of the vegetative cell, together with the abovementioned lipid bodies.

Both lipid and polysaccharide materials are also abundantly detected on the surface of the exine after using the corresponding histochemical techniques.

The relationships between the ultrastructural details observed, the composition of the storage reserves, the exine-associated materials and the type of pollination (80% anemophylous) are widely discussed.