

Title Ultrastructural analysis of drying damage in parchment *Arabica coffee* endosperm cells
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Abstract

The objective of this work was to evaluate and compare the alterations in the structure of coffee seed endosperm subjected to different temperatures and drying conditions. The seeds were dried at 40, 50 and 60, with an airflow of $0.33 \text{ m}^3 \text{ s}^{-1} \text{ m}^{-2}$. After drying, 10 seeds were randomly selected and prepared for the histochemical tests with Sudan IV and scanning and transmission electron microscopy, according to the laboratory's routine techniques. The histochemical results showed that, for the coffee parchment beans dried at 40 °C, there was no change in the cellular integrity of the plasma membrane and vesicles. In contrast, in the endosperm of parchment coffee beans dried at 60 °C, fused oil bodies that gave rise to large droplets in the intercellular space were observed, indicating a rupture of the vesicles and plasma membrane. Scanning electron microscopy showed that, for the parchment Arabica coffee beans dried at 40 °C, the internal cellular content remained intact and full of cellular material and the space between the plasma membrane and the cell wall was empty. However, in seeds dried at 60 °C, a rupture of the cells was observed, represented by occluded intercellular spaces, indicating a leaking of part of the protoplasm. The results from the transmission electron microscopy corroborated the undamaged and the damaged structure of the coffee parchment beans dried at 40 and 60 °C, respectively.