

Changes in Xylem Conductance in Grape Berries at Veraison

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Abstract

The report of development of grape (*Vitis vinifera* L.) berries is abundant and can be a reference for many fleshy fruits researches. Using soluble dye diffusion method could imply the xylem functionality of developing grape berries. Dye uptake from cut pedicels of pre-veraison berries can move throughout the central and peripheral xylem to distal end, but were restricted within brush area as uptake into post-veraison berry. However, when using the pressure membrane method, stain was transported throughout the peripheral vasculature in post-veraison berry. It reveals that most tracheary elements remained continuity throughout berry maturation. The pathway of phloem unloading in berries shift from symplastic to apoplastic pathway when veraison. The concentration of total soluble sugars in the apoplastic space of berry begins to increasing when 70 days after anthesis. The observation of cross section of receptacle tissue from post-veraison berry by CryoSEM shows many tracheary elements containing white lacy patterning, which indicates high concentrations of solutes inside the vessels. High viscosity caused by solutes accumulated in apoplast and xylem conduits might be an origin of hydraulic resistance of xylem after veraison.

Key words: anatomy; apoplast; calcium; dye; hydraulic resistance

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