

## **P52 – Susceptible and tolerant *Vitis vinifera* cultivars present distinct cell wall metabolism during ripening and under infection by *Botrytis cinerea***

Santos, Helena<sup>\*1,2</sup>; Weiller, Florent<sup>1</sup>; Hansen, Jeanett<sup>3</sup>; Jørgensen, Bodil<sup>3</sup>; Rego, Cecília<sup>4</sup>; Reis, Pedro<sup>4</sup>; John P. Moore<sup>2</sup>; Ana Margarida Fortes<sup>1</sup>

<sup>1</sup>BioISI, Faculty of Sciences, University of Lisbon, Campo Grande, Lisbon, Portugal

<sup>2</sup>SAGWRI, Stellenbosch University, Stellenbosch, South Africa

<sup>3</sup>Department of Plant and Environmental Sciences Section for Plant Glyco Biology University of Copenhagen, Denmark

<sup>4</sup>ISA, University of Lisbon, Tapada da Ajuda, Lisbon, Portugal

\*hfsantos@fc.ul.pt

### **Abstract**

*Vitis vinifera* grape berries undergo complex molecular and metabolic changes during ripening and under infection by pathogens. The ‘Trincadeira’ and ‘Syrah’ cultivars are known for their respective susceptibility and tolerance to *Botrytis cinerea*.

This work explores how the cell wall components vary upon ripening of the two cultivars, and how this may reflect their susceptibility degree to the fungal pathogens.

Grape clusters were infected with *B. cinerea* at peppercorn size stage (EL29); and then sampled at green (EL32), veraison (EL35) and ripe (EL38) stages. Visual inspection showed infection of Trincadeira grapes at three ripening stages and Syrah at ripe; however, molecular analysis detected the presence of the fungus in ‘Syrah’ at EL32 and EL35, despite the absence of symptoms.

Analyses of cell wall components with CoMPP and GC-MS were then conducted to explore the mono/polysaccharide composition and seek metabolic markers of ripening and of infection with *B. cinerea*. Data showed that both cultivars show differences in their cell wall composition prior to infection. Increase in extensins and decrease in hemicelluloses were noticed during ripening in both cultivars. Ripe ‘Syrah’ berries presented higher levels of crystalline cellulose, but lower levels of AGPs and rhamnogalacturonan-I than ‘Trincadeira’. Regarding changes upon infection, specific structural components that maintain cell wall integrity, such as cellulose, suffer major turnover, which can impact fruit quality. At green stage, ‘Syrah’ does not show changes between control and infected samples, unlike ‘Trincadeira’, where the sugars arabinose, fucose, mannose, rhamnose and xylose decrease. At veraison, infection leads to a faster decrease of cellulose in both cultivars, and, at ripe, infection causes decrease of xyloglucan in Syrah and increase in cellulose in ‘Trincadeira’, which may affect fruit quality.

Taken together, this data brings knowledge on how berry quality parameters strongly affected by cell wall metabolism (e. g. texture) change during ripening and under infection with pathogens and which changes are cultivar specific.

**Keywords:** *Vitis vinifera*, grapes development, *Botrytis cinerea*, cell wall, CoMPP