

Title Early detection of *Botrytis cinerea* latent infections as a tool to improve postharvest quality of table grapes

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Abstract

Detection of *Botrytis cinerea* latent infections on grapes before storage is essential for effective control strategies. In the present study, a molecular detection method was developed to detect and quantify *B. cinerea* in grape tissues. Preliminary investigations, conducted on local varieties by fruit freezing, identified the 'Red Globe' variety as the less contaminated one and confirmed the preferential localization of latent infections in the berry-pedicel attachment zone (berry calottes) and pathogen presence on stamens. A quantitative real-time PCR (qPCR) detection method, based on a probe designed on *B. cinerea* intergenic spacer (IGS) regions and a reported probe for *Vitis vinifera* as internal control, was utilized to reveal the presence of symptomless infections on bunches. The system proved to be highly specific and sensitive, enabling quantification of as little as 10 fg of *B. cinerea* DNA and detection of single conidia in artificially inoculated grape berries; moreover, it allowed reliable detection of the pathogen in naturally infected asymptomatic tissues. In particular, the qPCR assay revealed the presence of *B. cinerea* in 80 and 65% of apparently healthy calottes and stamens, respectively, with an efficiency higher than that obtained from freezing and plating techniques. Furthermore, significant correlations ($R^2 = 0.89$ and 0.94) were found between qPCR results and the actual disease incidence on bunches from which calottes and stamens were sampled.