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Volatile and fixed composition of sulphite-free white wines obtained after fermentation in the presence of chitosan

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7 **RUNNING TITLE: Effects of chitosan on white grape must fermentation**

8 9 **Abstract**

10 Consumers are increasingly interested in healthier wines containing reduced levels or totally absent
11 of sulphites. In the present investigation distinct fermentations of white musts either in the presence
12 of chitosan or sulphur dioxide were carried out in order to compare the volatile and fixed
13 composition of the wines produced, and evaluate the impact of chitosan as an alternative to sulphur
14 dioxide.

15 Chitosan promoted a 24 h extended lag-phase and diminished the titratable acidity of wines by
16 about 1 g L⁻¹ as a consequence of the absorption of tartaric and malic acids onto the polymer
17 surface. The volatile composition of wines was analysed at the end of the alcoholic fermentation
18 and then after 12 months of storage in glass bottle. Hexanoic, octanoic and decanoic acids were
19 significantly higher in chitosan added wines, which further contained an increased amount of ethyl
20 and acetate esters. Results demonstrated that, when added before the alcoholic fermentation,
21 chitosan may affect both the acidic and volatile composition of wines, likely due to its polycationic
22 behaviour and interaction with yeast wall constituents. This also suggests that attention to wine
23 acidic balance should be paid before its use in other vinification steps such as must clarification or
24 wine fining.

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