Title Influence of sulphur dioxide, controlled atmospheres and water availability on in vitro germination, growth and ochratoxin A production by strains of *Aspergillus carbonarius* isolated from grapes

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Abstract

The potential for control of germination, growth and ochratoxin A (OTA) production by five strains of *Aspergillus carbonarius* isolated from grapes (*Vitis vinifera*) using sodium metabisulphite (NaMBS, mg L^{-1}) or controlled atmospheres (25 and 50% CO_2) at different water activity levels (0.985, 0.965 and 0.93a_w) on grape juice-based media at 25 °C was determined. The efficacy of NaMBS against the five strains was relatively similar. Generally, germination was inhibited by >500 mg L^{-1} of NaMBS. However, mycelial growth was stimulated by low NaMBS concentrations (100 and 250 mg L^{-1}). Up to 1000 mg L^{-1} was required for complete inhibition of growth. The production of OTA was inhibited by up to 750 mg L^{-1} NaBMS. However, at lowered a_w (0.93) OTA production was inhibited by 500 mg L^{-1}. The ED_{50} and ED_{90} ranges were determined for both growth and OTA production. The efficacy of controlled atmospheres × a_w showed that there was very little effect on spore germination, even by 50% CO_2, regardless of a_w treatment. However, 50% CO_2 inhibited growth after 5 days exposure, although after 10 days growth was not as effectively controlled. OTA production by *A. carbonarius* strains was influenced predominantly by the a_w treatment and less so by the controlled atmospheres used.