

M-679. Occurrence of Ochratoxin A and Its Producing Fungi in Portuguese Wine Grapes

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Mycotoxins are toxic secondary metabolites produced by filamentous fungi that have been detected in several food commodities including grapes and wine. A survey was conducted in order to assess the mycotoxin producing fungi in grapes used for wine production.

93 Portuguese grape samples were examined for the presence of ochratoxin A (OTA) and the OTA producing fungi *Aspergillus carbonarius* and *A. niger* aggregate. Samples came from 11 vineyards from four winemaking regions in the North and South of the Portuguese mainland, during the harvest seasons of 2001, 2002 and 2003. Grapes were examined at 3 maturation stages, from setting to the harvesting period. The detection of fungi in grape samples was made by plating methods with and without surface disinfection, and OTA was detected by HPLC-FD analysis after immunoaffinity cleanup. Also, the influence of the composition of grape variety at the 3 maturation stages on OTA production by an *A. carbonarius* strain was investigated.

OTA was detected from 14% of the 656 isolates tested. Most of the OTA producing strains (94.5%) were isolated at harvest time. At this stage, the percentage of grape samples with OTA producing strains detected without surface disinfection was 56%. With surface disinfection, *A. carbonarius* was isolated from 10% of the samples. OTA was detected in grapes at the 3 maturation stages. The average OTA concentrations in 60 samples at pea berry, early veraison and ripe berry were 263, 149 and 35 ng/kg, respectively. Experiments with the *A. carbonarius* strain demonstrated that OTA production differs significantly with the composition of the berries at different maturation stages ($P < 0.001$), with a mean value of OTA production at pea berry, early veraison and ripe berry of 3402, 1530 and 22 $\mu\text{g}/\text{kg}$, respectively. The production of OTA by *A. carbonarius* was correlated positively with the total acidity of grapes ($r_s = 0.855$, $P < 0.001$) and negatively with reducing sugars content ($r_s = -0.835$, $P < 0.001$).

Our data demonstrate that OTA synthesis in grapes occurs since early maturation stages. These data must be taken into account for the establishment of critical control points for OTA synthesis in grapes and for preventive actions to reduce OTA levels. Nevertheless, the OTA concentrations in Portuguese grapes were below the maximum recommended limit of 2 $\mu\text{g}/\text{l}$ in wine at all stages.