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Fumonisins from *Aspergillus niger* in grapes and derived products

Jesper Mølgaard Mogensen, Peter Boldsen Knudsen, Thomas Ostenfeld Larsen, Jens Christian Frisvad, Ulf Thrane and Kristian Fog Nielsen

**Introduction**

Black Aspergilli are present on grape clusters from early in the season with increasing frequency during the growth stages of the grapes. Of the various Aspergillus species, *A. niger* is by far the most commonly found on grapes and are shown in one study to occur on more than 80% of samples of grapes and derived products. Although *A. carbonarius* is the most problematic because it consistently produces high amounts of ochratoxin A while only 0-40% of *A. niger* strains produce this toxin, which is the main mycotoxin-related health concern in grape-derived products. The discovery of a fumonisin B2, B4 and B6 production in *Aspergillus niger*, raises concerns about the presence of these mycotoxins in grapes as well as derived products.

**Analysis of wine**

A total of 77 wine samples from 13 countries were analyzed. 18 wine samples (23%) were positive for fumonisins B2 and contained 1-25 μg/L. Of the 18 positive samples, 16 were red wine, 1 was white wine, and 1 was port wine. As ochratoxin A FB2 is more frequently found in red wine (78% positive) compared to white wine (7% positive). This was also confirmed by a later study (Logrieco et al 2010).

**Analysis of retail raisins**

A total of 21 raisin brands collected in Denmark, Germany and The Netherlands were analyzed. In 10 brands (48%), Fumonisins B2 and B4 were detected at 1.3-13 and 0.26-1.3 μg/kg, respectively. Large package variations were observed with up to 3-fold differences between four packages of the same brand, indicating a non-homogeneous infection level, which may be due to contaminated raisins.

**Conclusion**

- Fumonisins are frequently present in grape and derived products. This indicate that *A. niger* is apparently a commonly contaminant of grapes in the fields.
- Although frequently detected the amount of fumonisin is significantly below the regulatory limit set for similar food types (maize).
- The low levels found is presumably due to efficient removal of damaged grapes, initiated after problems with ochratoxin A in grapes and derived products were reported in the late 1990s. This lead to very strict regulations (EC472/2002), including a maximum allowance of 10 μg/kg ochratoxin A in dried vine fruits and 2 μg/kg in wine.

**References**


