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Short Research Article

Production and use of mycotoxins uniformly enriched with stable isotopes for their dosage in biological samples: (2) production of mycotoxins and their characterization†

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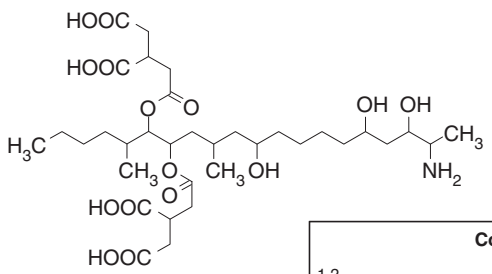
Introduction

Mycotoxins are naturally occurring secondary metabolites produced by fungi. They are implicated in several toxic effects in animal and humans, and represent a real health hazard in all countries of the world.[1] Toxinogenic fungi from three genera (*Aspergillus*, *Penicillium*, and *Fusarium*) are widespread in various agricultural products and constitute an economically important worldwide problem. Pharmaco-



Fumonisin B1

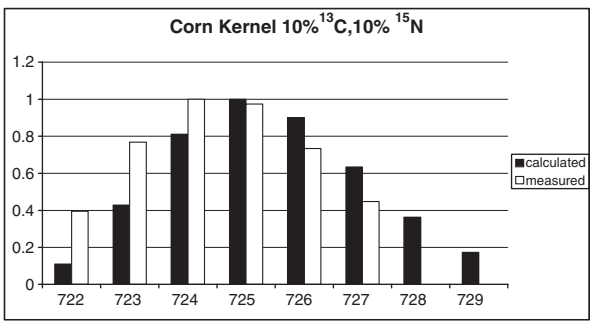


Figure 1 Fumonisin B1 specific isotopic pattern. Comparison between measured and expected isotopic ratios.

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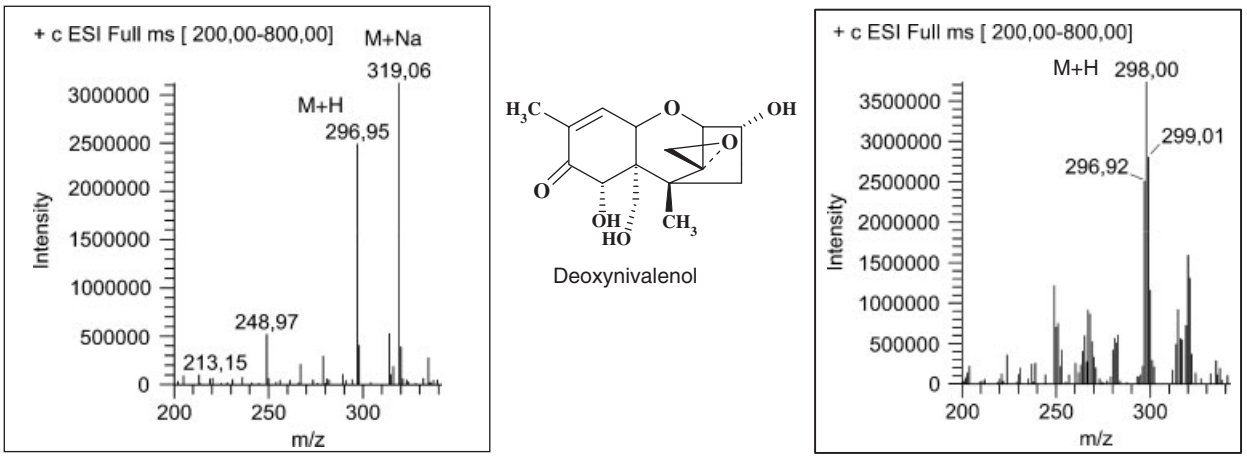

Figure 2 Mass spectra of deoxynivalenol ^{12}C (left) and deoxynivalenol 10% U-^{13}C from raw sample (right).

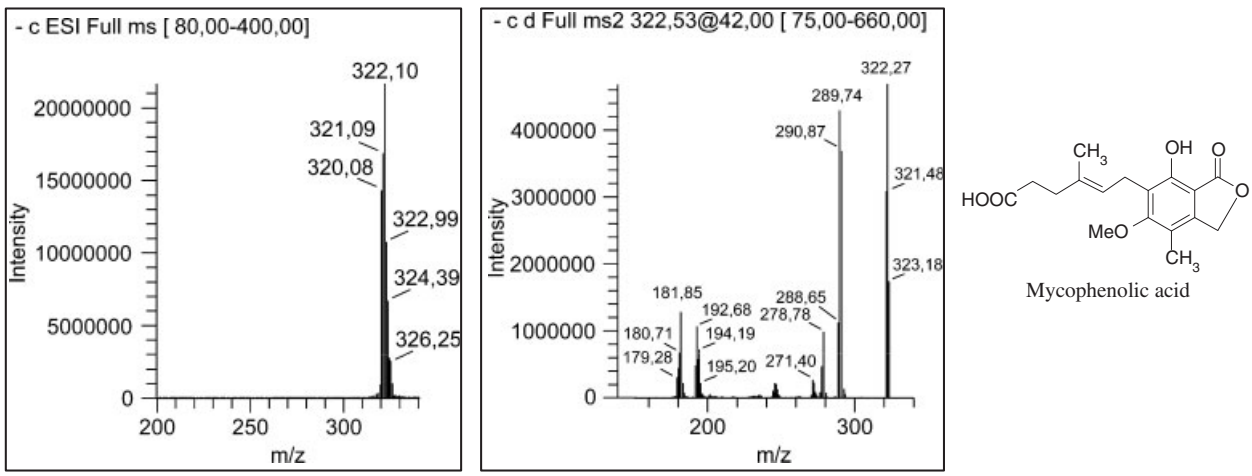

Figure 3 Mass spectra of 10% U-^{13}C mycophenolic acid from *Penicillium brevicompactum* culture on enriched wheat.

logical studies of these compounds often encounter problems.

Mycotoxin production was done using autoclaved 10% ^{13}C and ^{15}N grains and plant dry material as the only nutrient source for the fungi culture. The grains or plant materials were moistened for reach a_W value of 0.98, before sterilization. Then around 30 g of this plant material were inoculated with a suspension of 2×10^5 conidia.

Results and discussion

Uniformly enriched ^{13}C and ^{15}N fumonisins (B_1, B_2, B_3) productions were performed from *Fusarium verticilloides* strain culture on corn grains and the isotopic ratios were close to that expected for a 10% ^{13}C and 10% ^{15}N content (Figure 1).

Using *F. graminearum* and enriched wheat, we produced ^{13}C zearalenone and ^{13}C deoxynivalenol (Figure 2). Other ^{13}C fungal secondary metabolites having therapeutic interest such as mycophenolic acid (immunosuppressor) (Figure 3) or the breast cancer resistance protein (BCRP) inhibitor, fumitremorgin C or ergot alkaloids can be produced following the same techniques (data not shown).[2,3]

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