

Abstract

Potential of aqueous ozone to control aflatoxigenic fungi in Brazil nuts

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Abstract

The Brazil nut (*Bertholetia excelsa*) is an important non timber forest product (NTFP) from the Amazonian forest. Despite their nutritious value, Brazil nuts are susceptible to contamination with *Aspergillus* section *Flavi* fungi and consequently with aflatoxins. Since aqueous ozone reduces microorganisms population and has oxidant effect on aflatoxins, the effect of ozone on. Both natural and artificially contaminated Brazil nuts were studied in the present work. The former were inoculated with either 1×10^6 or 1×10^7 conidia mL^{-1} of *A. flavus* (MUM 9201). Previous assays were carried out to determine optimal parameters of the treatment. Different aqueous ozone contact time was assayed. The duration was controlled by the addition of a sodium formate solution. Such assays evidenced that the effect of ozone is almost immediate. Also, different ozone concentrations were assayed. The optimum ozone concentration depended on the initial viable spores on the nutshell. Also, the effect of the ozonization on the shell nut color was assessed by measuring chromaticity values of the treated fruits in the $L^*a^*b^*$ space coordinates. High concentrations of ozone affected both the luminosity and the hue of the nutshell. Finally, a concentrated aqueous ozone solution was assayed on both natural and artificially contaminated nuts. The remaining viable spores in the ozone solution were recorded and the rate of inactivation for each treatment was determined by assessing the ratio between the CFU of each treatment and the control. Ozonized nuts were also plated on MEA to recover the fungi population. Aqueous ozone was effective in reducing the conidia of *Aspergillus flavus* and the natural fungal population associated to Brazil nuts, although it seems to affect external appearance of the shell. The aqueous ozone solution may be recommended to control other mycotoxin producer *Aspergilli*, since ozone is regarded a generally recognized as safe (GRAS) product and it has been already used in many agricultural products, including the organically labels one like Brazil nuts.