

The Growth and Production of Patulin Mycotoxin by *Penicillium expansum* on Apple Fruits and its Control by the Use of Propionic Acid and Sodium Benzoate

L. Larous¹, N. Hendel¹, J.K. Abood² and M. Ghoul¹

(1) Department of Biology, College of Science, University of Setiff, Setiff 19000 Algeria, Email: llarous@yahoo.fr; (2) Department of Animal and Plant Sciences, Sheffield University, Sheffield S10 2TN, UK.

Abstract

Larous, L., N. Hendel, J.K. Abood and M. Ghoul. 2007. The Growth and Production of Patulin Mycotoxin by *Penicillium expansum* on Apple Fruits and its Control by the Use of Propionic Acid and Sodium Benzoate. Arab J. Pl. Prot. 25: 123-128.

Penicillium expansum was the most frequently isolated fungal species in all tested samples of moulded apple fruits. The optimum temperature and RH for the growth of this fungus and for patulin production were 25°C and 90%, respectively, and the high amount of patulin was expressed by isolate 3 at 18°C (345.6 mg/ml⁻¹). The production of patulin correlated well with colony diameter and mycelium dry weight. Examined isolates varied in their inhibitory activity against *Escherichia coli* and *Bacillus subtilis* (isolate 3 had the best activity). The effect of propionic acid (0.05-0.2%) and sodium benzoate concentrations (0.05-0.4%) on the growth of *P. expansum* (isolate 3) and production of patulin from moulded apple surface were investigated. Propionic acid (0.15%) and sodium benzoate (0.3%) reduced the growth of the fungus and patulin concentration by more than 70%. Propionic acid at a concentration of 0.2% and sodium benzoate at more than 0.3% almost prevented the growth of the fungus in the culture medium.

Keywords: *Penicillium expansum*, Patulin, Propionic acid, Sodium benzoate