**Title** A biochemical approach to elucidate the pathway of patulin degradation by a biocontrol yeast

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**Abstract**

Patulin contaminates apple fruits as a consequence of blue mould, a postharvest disease caused by *Penicillium expansum*. The basidiomycetous yeast *Rhodotorula glutinis*strain LS11 is a biocontrol agent of postharvest pathogens. *R. glutinis* LS11 intracellularly degrades patulin to desoxypatulinic acid, a product that is non-toxic to microorganisms that are inhibited by patulin. On stored apples, the yeast lowers the accumulation of patulin even in fruits infected by *P. expansum.* Exposure to a high concentration (500 ppm) of patulin dramatically inhibits/delays the growth of *R. glutinis* LS11, which needs to gradually get accustomed to the mycotoxin. To test if patulin degradation by strain LS11 is induced, this yeast was grown in the presence of 10 ppm of patulin. After incubation, half of the cells were further incubated with 125 ppm of mycotoxin, the other half being used for extraction of proteins. Both kinds of sample were assayed for patulin degradation. HPLC analyses showed that patulin degradation was significantly faster in LS11 cells preconditioned with 10 ppm of patulin (desoxypatulinic acid was also detected as the major degradation product) as well as with intracellular protein extracts from cells grown in the presence of the same toxin concentration, as compared to respective controls. SDS-PAGE showed a differential band of approximately 45 kDa in intracellular proteins extracted from LS11 cells incubated with 10 ppm of patulin. Further studies are in progress to purify and characterize this protein. This will help to elucidate the patulin degradation pathway and to identify the enzymes involved.