

Rhamnolipids effect on mycotoxins production

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Contamination of foodstuffs and agriculture commodities by mycotoxin-producing fungi is an increasingly severe problem, not only due to the substantial economic losses caused by the significant reductions in crop yield, but also to their toxicity to humans and animals. Mycotoxins are a heterogeneous group of extremely toxic secondary metabolites synthesized by certain filamentous fungi such as *Aspergillus* spp. that exhibit carcinogenic, mutagenic and teratogenic activities. Consequently, maximum allowable concentrations of mycotoxins in food and feed have been established. Several strategies including chemical, physical and biological methods have been investigated to reduce fungal and mycotoxins contamination in crops. Among them, biological control is one of the most promising approaches to overcome mycotoxins contamination in both pre- and post-harvested crops.

Biosurfactants have been reported as promising biocontrol agents against toxigenic fungi, due to their ability of reducing fungal growth and mycotoxins production. Furthermore, these compounds are easily biodegradable, being a healthier and environmental friendly alternative to the synthetic fungicides. Rhamnolipids (RLs) are a class of glycolipid biosurfactants produced mainly by *Pseudomonas aeruginosa* strains. Besides their excellent surface active properties, RLs have been reported to exhibit interesting biological activities, including antifungal activity (Rodrigues et al. 2017). However, their effect on the production of mycotoxins has not been reported so far. In this work, the effect of RLs produced by *P. aeruginosa* #112 on mycotoxin production by *Aspergillus flavus* MUM 08.201 and *Aspergillus niger* MUM 92.13 was evaluated. In the case of *A. niger* MUM 92.13, RLs (0.375 mg/mL) inhibited fumonisin B₂ production by 44%, whereas for *A. flavus* MUM 08.201, aflatoxin B₁ production was reduced by 99% at the same RL concentration. The results herein obtained demonstrate, for the first time, that RLs can be considered a “green” alternative to the synthetic fungicides commonly used.

Rodrigues, A. I., Gudiña, E. J., Teixeira, J.A., Rodrigues, L.R. (2017) “Sodium chloride effect on the aggregation behavior of rhamnolipids and their antifungal activity”. *Scientific Reports*, 7(1), 12907.