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Biocontrol agents and mycotoxins: how do they interact?

I. Valenti¹, C. Pizzatti¹, M. Saracchi¹, A. Kunova¹, P. Cortesi¹, D. Bulgari¹, M. Pasquali¹

¹*Department of Food, Environmental and Nutritional Sciences, University of Milan, 20133 Milan, Italy. E-mail: irene.valenti@unimi.it*

Fusarium mycotoxins contaminating agricultural products are a serious threat to both animal and human health. Deoxynivalenol (DON) is probably the most common contaminant of cereal grains worldwide, while enniatin B (ENB) is among the most frequently detected emerging mycotoxins. In this work we analysed the dynamics of interaction that occur between these two mycotoxins and the promising *Streptomyces* sp. DEF39 strain, selected previously for its biocontrol potential and the ability to decrease the accumulation of DON in wheat. The DEF39 sensitivity to ENB and DON, alone and in mixture, was assessed using both microplate and disk diffusion assays. ENB showed no negative effects on the bacterial growth even at the highest dose of 100 µg/ml. DON effects on DEF39 growth can be observed starting from the concentration of 2 µg/L in liquid culture, and 100 µg/L in solid culture. The DON-ENB co-exposure revealed similar results of DON alone, suggesting that it has the major toxic effect. For what concerns the influence of ENB on DEF39, using a biosensor-based microplate test to assess trichothecene pathway repression by *Streptomyces* secondary metabolites, we observed a modulation of DEF39 repression ability when it was exposed to ENB. Therefore, despite the lack of ENB toxicity on DEF39 growth, we hypothesize that ENB modulates the pathway of microbial secondary metabolites decreasing the DEF39 effect on DON suppression. This work suggests that the dynamics of interaction between microbiota and mycotoxins are tricky and need to be investigated also in the framework of development of effective biocontrol agents.