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The production of mycotoxins as an adaptation to the post-harvest environment

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The production of mycotoxins as an adaptation to the post-harvest environment

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Mycotoxins are toxic secondary metabolites produced by various food-relevant filamentous fungi. It is a well-known fact, that the biosynthesis of mycotoxins is not essential for the growth of the fungus. The biological reasons for the synthesis of most mycotoxins are not completely clear. Generally, fungal strains or mutants, which cannot produce mycotoxins, can grow equally well on laboratory media, e. g. under conditions which do not impose stress on the fungus. However, the colonization of plant-type products certainly poses stress to the fungus. Moreover, environmental conditions, for example during post-harvest storage, have a profound influence on the biosynthesis of mycotoxins. There are several hints that the production of mycotoxins is increased under conditions of external stress, which is mediated by certain signal transduction pathways. This situation suggests that the increased production of mycotoxins seems to support the adaptation to these kinds of environments. This view is further supported by the fact that changes of the environment may lead to changes in the secondary metabolite profile. Furthermore, it has been shown that certain mycotoxins can act as pathogenicity factors to support colonization and growth on post-harvest fruits and vegetables. In fact, there are several hints that colonization and growth on plant-type products in the post-harvest environment is supported by an increased mycotoxin biosynthesis, suggesting that mycotoxins are adaptation factors for this respective situation.

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