**The inhibitory effect of *Bacillus megaterium* on aflatoxin biosynthetic pathway gene expression in *Aspergillus flavus***

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**Abstract:** *Aspergillus flavus* is one of the major fungal moulds that colonize peanut in the field and during storage. The impacts to human and animal health and to economy in agriculture and commerce are significant since this mould produces the most potent natural toxins, aflatoxins, which are carcinogenic, mutagenic, immunosuppressive, and teratogenic. A strain of marine *Bacillus megaterium* isolated from the Yellow Sea of East China was evaluated for its inhibitory effect on aflatoxin formation through inhibiting aflatoxin pathway gene expression in *A. flavus* as demonstrated by genechip analysis. The results showed that aflatoxin accumulation in potato dextrose broth liquid medium and (spell out=MM ) liquid medium was almost totally (98%) inhibited by *B. megaterium*. The inhibitory efficiency on aflatoxin accumulation by *B. megaterium*, however, was shown slightly reduced (85%~87%) in two peanut varieties due to poor condition for optimum growth of *B. megaterium* on peanut plant compared with that in the liquid medium. The expression of most of the aflatoxin biosynthetic genes in the fungus was confirmed to be inhibited. Some of the gene targets (*aflF*, *aflT*, *aflS*, *aflJ*, *aflX*) for inhibition by *B. megaterium* were identified which can be used for controlling aflatoxin contamination in peanuts. The mechanism of inhibition is under investigation.

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