Biocontrol of aflatoxin contamination by marine bacteria and terrestrial bacteria

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Aflatoxin contaminations in foods and feeds are problem worldwide. Many strategies have been tried for control of aflatoxin production during pre- and post-harvest. We have conducted biocontrol of aflatoxin contamination by deep-sea and coastal bacteria from the south Atlantic sea water and sediments and the Yellow sea sediments, and terrestrial bacteria from groundnut geocarphosphere, husks and kernels in China. Firstly, more than 300 strains of terrestrial bacteria and 100 strains of marine bacteria belonging to different species have been deposited in our research institute, which showed significant inhibition activity against the mycelial growth as well as the norsolorinic acid accumulation, the first stable precursors in the aflatoxin biosynthesis pathway. Secondly, one marine Nocardiopsis prasina could produce at least three kinds of known antifungal compounds from its ethyl acetate and chloroform extracts and other unidentified substances. The crude ethyl acetate extracts at 160ppm could inhibit the norsolorinic acid accumulation in artificial inoculated groundnut kernels and rice by 93.90% and 99.47% respectively, whereas for the chemical preservative of sodium diacetate they were 76.66% and 87.31% respectively. Thirdly, one geocarphosphere Bacillus amyloliquefaciens could not only inhibit norsolorinic acid accumulation but also produce plant hormones. A kind of bio fertilizer fermented by this strain with kelp residual wastes could significantly promote groundnut yield and inhibit infection of Aspergillus parasiticus on kernels in pot cultivation.

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