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The dichlorvos-ammonia method for visible detection of aflatoxigenic fungi from environments

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Aflatoxins are the most potent carcinogenic and toxic substances among mycotoxins and its contamination in food and feed crops has serious effects on the health of humans and animals. To monitor and to regulate the aflatoxin contamination in crops, the simple and precise detection method for aflatoxigenic fungi is necessary. We recently developed a visual detection method, the dichlorvos-ammonia (DV-AM) method, in which DV inhibits the esterase in aflatoxin biosynthesis causing the accumulation of anthraquinone precursors (versiconal hemiacetal acetate and versiconol acetate) of AFs in mycelia on the agar plate, followed by a change of the color of the colonies from light yellow to brilliant purple-red by the AM vapor treatment. This method enabled the direct isolation of aflatoxigenic fungi as well as non-aflatoxigenic fungi from environmental samples such as soils. However, when this method was applied to the soils containing many and various kinds of microorganisms, we found that they drastically inhibited the growth of fungi. Therefore, we further search for a semi-selection medium for aflatoxigenic fungi which is useful for the DV-AM method. We finally establish the medium and we succeeded in the detection of aflatoxigenic fungi from various soils in Japan. The DV-AM method using the semi-selection medium will be useful for clarification of the distribution as well as the dynamic movements of aflatoxigenic fungi in environments.

Biography

Kimiko Yabe has her expertise in biochemistry and molecular biology of toxic fungi. She has investigated the biosynthetic pathway of aflatoxins in collaboration with Dr. Hiromitsu Nakajima, Tottori University, Japan for more than 30 years. They have clarified most of all enzymatic reactions in aflatoxin biosynthesis by co-work with many great researchers inside and outside of Japan. Recently, she developed the DV-AM method, a simple method to detect aflatoxigenic fungi, in collaboration with Dr Masayo Kushiro, NARO, Japan. They have a dream that this method will be widely used and will be useful for people to develop an effective preventing method for aflatoxin contamination in crops all over the world.

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