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Aflatoxin Producers from Soil of Maize Producing Regions in Nigeria

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Abstract

Aflatoxins are toxic fungal metabolites produced by several members of *Aspergillus* section Flavi. Aflatoxin producing fungi disperse from the soil to infest maize crops on which they frequently cause aflatoxin contamination both in the field and in storage. Several aflatoxin producing species are known to occur in West Africa, but the frequencies and distributions of these strains in the major maize producing regions of Nigeria were previously unknown. Over 1,000 fungal isolates of *Aspergillus* section Flavi were collected from the soil by dilution plating of 51 soil samples from Nigerian maize fields onto a modified Rose Bengal agar. Section Flavi averaged 1159 colony forming units (CFU) per g soil and ranged from 2 to 16,660 CFU g⁻¹. The L morphotype of *A. flavus* occurred in all samples, whereas the S morphotype occurred in only 19 samples, but was present in every district, ranging from 0 to 45% of the fungi isolated. The highest S strain incidence was found in the Lafia district, and the lowest incidence was in the districts of Ogbomosho and Ado-Ekiti. Soil pH of the sampled soils ranged from 5.1 to 8.7 pH. Isolates varied widely in ability to produce both aflatoxins and sclerotia. Both the shape and size of sclerotia varied with some *A. flavus* strains tending to produce sclerotia embedded in the substrate. The importance of sclerotia embedded in substrates to the potential toxicity of *A. flavus* strains on crops should be considered. The distribution of aflatoxin-producing species in soils will be contrasted with the frequencies on crops grown in the sampled fields.

Keywords: Aflatoxin, *Aspergillus flavus*, sclerotia, soil