Identification of Mycotoxigenic Fungi from Grains in a Nigerian Region Using the Modern Polyphasic Methodology

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Mycotoxins are poisonous substances produced by fungi which contaminate agricultural commodities. Many foods and feeds can become contaminated with mycotoxins since they can form in commodities before harvest, during the time between harvesting and drying, and in storage. The food crops most often affected include maize, peanuts, sorghum, wheat, cocoa and tree nuts. Mycotoxins may also be carried over to animal products due to consumption of contaminated feed. Maize (*Zea mays)* and guinea corn (*Sorghum bicolor*) form a major staple of the study area and are high risk commodities for mycotoxigenic fungi and mycotoxin contamination. Multistage sampling technique was used to select the markets and store/warehouses used for this study; sample collection employed a simple random sampling method from different sampling points within designated areas. Identification of all fungal isolates was carried out using the modern polyphasic methodology for filamentous fungi identification. At the level of phenotypic approach, the mycotoxigenic fungi *Aspergillus*, *Fusarium*, and *Penicillium* were identified. These fungal isolates also produced the mycotoxins Aflatoxins B1 and B2, Fumonisin B1, Cyclopiazonic acid, Ochratoxin A and Ochratoxin alfa. Spectral analysis by MALDI-TOF MS identified the *Aspergillus* species as *A. flavus*, *A. aculeatus*, *A. niger* and *A. tamarii.* Work is currently on-going to complete fungal identification for all isolates down to species level using the genotypic approach. In view of the toxic effects of mycotoxin contamination, the isolation, identification and characterization of mycotoxigenic fungi from maize and guinea corn in the study area pose serious health risks for the human and animal population and also have implications for food safety and public health in Nigeria.

Key words: Mycotoxins, mycotoxigenic fungi, maize, guinea corn, modern polyphasic methodology, food safety, public health, Nigeria.