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Actors' Post-Harvest Maize Handling Practices and Allied Mycoflora Epidemiology in Southwestern Ethiopia: Potential for Mycotoxin Producing Fungi Management

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Abstract

Maize plays a key role in household food security in Ethiopia, but its benefit has been negated with high post-harvest losses. This study was thus initiated to assess post-harvest practices and associated fungi pathogen epidemiology along the maize supply chain in southwestern Ethiopia. The study was conducted in five purposively selected districts and a three-stage sampling procedure was employed for the selection of the target groups. In total, 342 participants from different actor groups were selected and interviewed using semi-structured questionaire. Maize samples were collected every month from 63 randomly selected actors for mycological analysis until six months of storage were reached. Survey results showed 10 post-harvest activities practised by actors. Post-harvest loss estimated to 31 % and loss during storage was identified as a critical point. Comparing all biological agents, loss due to fungal pathogens in the store ranked on top. Moisture content at loading stage could not increase the shelf life of the commodity. Germination test showed a significant ($p < 0.01$) decrease as storage duration increased. But, mould incidences on cobs and kernels significantly ($p < 0.05$) increased as storage duration increased. In total, seven fungal genera were isolated, characterised and identified, of which *Fusarium*, *Penicillium* and *Aspergillus* spp. were the predominant once. *Penicillium* and *Aspergillus* spp. showed a positive increment which requires a priority in attention for the control of those well-known mycotoxin producing fungi. However, *Fusarium spp.*, decline as storage duration increases. Most of the post-harvest practices are not effective in reducing post-harvest losses. Especially, farmers' traditional storage structures can be influenced by external climatic conditions and are liable for the development of mould during the rainy season. This research, therefore, highlights the need to design/develop or modify existing storage technologies that reduce post-harvest loss due to fungal pathogens. Furthermore, post-harvest drying to obtain optimum moisture content is also crucial to reduce losses.

Keywords: Mould, post-harvest loss, post-harvest management, storage fungi, stored maize

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