

Diversity and toxigenicity of mycobiota in grain corn: a case study at pioneer grain corn plantations in Terengganu, Malaysia

ABSTRACT

Malaysia has begun to locally mass-cultivate grain corn to reduce import dependency for animal feed industries. Since the Malaysian tropical climate constantly exposes grain corn to fungal colonization and mycotoxin production by mycotoxigenic species, it is, therefore, important to investigate the presence of fungal species, especially the mycotoxigenic strains in the Malaysian grain corn agroecosystem. In the present work, corn kernel, tassel, plant debris, and soil were collected from two pioneer grain corn farms (Kampong Dadong, KD; Rhu Tapai, RT), and morphological and molecular identifications were conducted. A total of 131 fungal isolates from 30 fungal species were recovered. Both KD and RT yielded log 4.7–6.7 CFU/g total fungal loads. *Fusarium verticillioides* was predominant in both farms, followed by the phytopathogenic *Lasiodiplodia theobromae* and the mycotoxigenic *Aspergillus flavus*, *A. niger*, *F. incarnatum*, and *F. proliferatum*. Mycotoxin analyses by high-performance liquid chromatography revealed that among 30 mycotoxigenic isolates tested for aflatoxins, deoxynivalenol, fumonisins, HT-2, T-2, ochratoxins A, and zearalenone, approximately 25 of the isolates could produce at least one mycotoxin *in vitro*. The present work serves as a baseline for more comprehensive research to better predict and control fungal contamination and the subsequent mycotoxin accumulation in Malaysian grain corn agroecosystems.

Keyword: Grain corn; Aflatoxins; Fumonisins; Trichothecenes; Ochratoxin A; Zearalenone