

Fungal Infection and Mycotoxin Contamination of Maize in the Humid Forest and the Western Highlands of Cameroon

Z. Ngoko,¹ W.F.O. Marasas,^{*,2} J.P. Rheeder,² G.S. Shephard,²
M.J. Wingfield³ and K.F. Cardwell⁴

Fungal incidence and mycotoxin contamination of farm-stored maize were assessed and compared in grain samples from three villages each in two agroecological zones over time. Maize samples were collected at 2 and 4 months after stocking from 72 farmers' stores in 1996 and 1997 in the Humid Forest (HF) and Western Highlands (WHL) of Cameroon. Mycological assays of these samples revealed several fungal species. *Nigrospora* spp. were the most prevalent fungi in HF (32%) and WHL (30%) in 1996, *Fusarium verticillioides* (22%) and *F. graminearum* (27%) were also isolated from these samples. In the WHL in 1996, no significant difference in fungal incidence was found among villages for samples collected 2 months after harvest, but at 4 months incidence was significantly higher ($P < 0.05$). In 1997 the levels of fungal contamination were lower than in 1996. The incidence of *Aspergillus* spp. was low in general, ranging from 0.0 to 5.9% infected kernels. Analysis with thin layer chromatography detected low levels of aflatoxins in a few samples. *F. verticillioides* mycotoxin fumonisin B₁ (300–26,000 ng/g) and *F. graminearum* metabolites deoxynivalenol (<100–1,300 ng/g) and zearalenone (<50–110 ng/g) were determined by means of polyclonal antibody competitive direct enzyme-linked immunosorbent assay. A significant correlation ($r=0.72$; $P=0.0001$) was found between the incidence of *F. graminearum* and the contamination with deoxynivalenol. Storage time (2 vs 4 months after stocking) had a significant positive effect ($r=0.39$; $P=0.013$) on the level of fumonisin B₁. This is the first report of the natural occurrence of these mycotoxins in maize in Cameroon.

KEY WORDS: Aflatoxin; deoxynivalenol; fumonisin; *Fusarium graminearum*; *Fusarium verticillioides*; *Zea mays*; zearalenone.

Received Dec. 11, 2000; received in final form April 25, 2001; <http://www.phytoparasitica.org> posting July 19, 2001.

¹Inst. de la Recherche Agricole pour le Developpement (IRAD) Bambui, Bamenda, Cameroon.

²PROMECA Unit, Medical Research Council, Tygerberg, South Africa 7505 [*Corresponding author, e-mail: wally.marasas@mrc.ac.za].

³Forestry and Agricultural Biotechnology Institute (FABI), Faculty of Biological and Agricultural Sciences, University of Pretoria, Pretoria, South Africa 0002.

⁴International Institute of Tropical Agriculture (IITA), Biological Control Center for Africa, Cotonou, Republic of Bénin.