ABSTRACT

Maize grown under push-pull cropping system has been reported to contain lower concentrations of fumonisin and aflatoxin than maize monocrop. This study determined the inhibitory effect of desmodium root extracts on spore germination and radial growth of toxigenic Aspergillus flavus and Fusarium verticillioides. Aspergillus flavus and F. verticillioides were isolated from maize and soil and tested for ability to produce aflatoxin and fumonisin by inoculation on mycotoxin-free maize. Aflatoxin and fuminisin were detected and quantified by direct competitive ELISA. Desmodium roots were dried, ground to fine powder and extracted with methanol and dichloromethane and evaluated for anti-fungal activity by inhibition of spores of A. flavus and F. verticillioides potato dextrose agar (PDA) medium. Isolates of F. verticillioides produced up to 599,741 µg/kg fumonisin while isolates of A. flavus produced up to 199,184 µg/kg aflatoxin. Desmodium root extracts reduced germination of A. flavus spores and F. verticillioides by 9.6% and 43.8%, respectively and reduced their respective colony radial growth by 15% and 57%. The results suggested that desmodium roots contain chemical compounds that inhibit growth of A. flavus and F. verticillioides. This may explain the reduction in infection of maize with mycotoxin-producing fungi before harvest in push-pull cropping systems by reducing the pathogen inoculum in the soils. Determination of the active compounds in the root exudates is recommended.