

**Title** Molecular and immunological detection of *Fusarium* infection and fumonisin contamination in major food crops in southern India

**Author** S. Chandra Nayaka, A.C.Uday Shankar, S.R Niranjana and H.S.

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### Abstract

Fumonisin, are group of mycotoxins mainly produced by *Fusarium verticillioides* and *F. semitectum*, have adverse health effects on humans and livestock that ingest fumonisin-contaminated food products and feeds. Maize, sorghum and rice are excellent substrates for the growth of *Fusarium* sp., and fumonisin (FB) production. In order to understand the magnitude of *F. verticillioides* and *F. semitectum* infection and FB contamination, surveys were conducted in different agro-ecological zones of southern India, and 112 samples of maize, rice and sorghum were collected from different sources. These samples were analyzed for FB1 and FB2 contamination by HPLC and Competitive Direct ELISA. Analysis indicated that post-harvest was the favorable stage for infection by *F. verticillioides* and *F. semitectum* and FB production. More than 60 % of the maize kernels, 30% sorghum seed samples and 23% of rice seed samples tested were contaminated with FB, ranging from 3 to 927 µg/kg. A PCR for specific detection of toxigenic and non-toxigenic *F. verticillioides* was standardized. Specific primers VERT1, VERT2 and for toxigenic strains, VERTF1 and VERTF2 were designed based on IGS sequence. The primers specific to the toxigenic *F. verticillioides* were highly effective and amplified the expected 400 bp product. This study demonstrated the potential utility of PCR using specific primers for detection of *F. verticillioides* in major food crops.