The fact that Fusaria are one of the most versatile mycotoxin producers is caused both by the wide range of species and the abilities of simultaneous biosynthesis of muliple metabolites from different metabolic pathways. The coincidence of trichothecenes and zearalenone produced by *Fusarium graminearum* and *F. culmorum*, as well as fumonisins, enniatins, beuvericin and moniliformin by *F. proliferatum* and *F. verticillioides*. The versatility of the Fusaria is frequently reflected by contamination of food and feed products with multiple mycotoxins.

1.) Enniatins (ENs) produced by *Fusarium* species are group of mycotoxins with antimicrobial, insecticidal and phytotoxic activities. PCR based assays were applied for detecting enniatin-producing strains of *F. avenaceum* (21), *F. poae* (78) and *F. sporotrichioides* (40) isolated from wheat seeds originated of 30 geographic localities of Hungary. All *F. sporotrichioides* strains and except two of all *F. poae* strains gave positive signal to *esysp1* and *esysp2 primers* as well as all *F. avenaceum* isolates were positive to *esya1* and *esya2 primers* indicating the ability to produce ENs. This is a first report of the enniatin producing ability of *Fusarium* species associated to wheat in Hungary (**Koncz et al.,2009**).

2.) The fumonisin analogs that have been characterized since 1988 can be classified into four main groups, identified as the fumonisin series A, B, C and P. The fumonisin B (FB) analogs, comprising toxicologically important FB1, FB2, FB3 are most abundant naturally occurring fumonisins, with FB1 predominant, and are usually found at the highest levels. FB1 typically accounts for 70-80% of the total fumonisin produced. The lesser known fumonisin analogous are difficult to detect with most analytical techniques due to the necessary derivatization process, but they can be analyzed by liquid chromatography mass spectrometry with electrospray ionization time-of-flight (LC/ESI-TOFMS) and ion trap mass spectrometry (RP-HPLC/ESI-ITMS). ESI-ITMS has gained general acceptance in fumonisin analysis. The experimental data reported in the previously published paper (**Bartók et al., 2006**) repeatedly reveal that RP-HPLC/ESI-IT-MS is suitable for the identification of unknown compounds present at low concentration and for suggesting their structures. To decrease the possibility of the formation of artifacts, the fumonisins were analysed RP-HPLC/ESI-TOFMS and RP-HPLC/ESI-ITMS immediately after the extraction of the culture material, without any further sample clean-up. The FB1 toxin and 28 of its isomers were detected by ITMS after separation with RP-HPLC. The total amount of the 28 FB1 isomers was 2.803% of the quantity of FB1 that is important from the aspect of food and feed safety (**Bartók et al., 2010a**). Six new higher molecular weight fumonisins (three pairs of isomers) extracted from a *F. verticillioides*-infected solid rice culture. We denoted the new compounds as esterified FB1 (EFB1) toxins, with the suggested names EFB1PA, iso-EFB1PA, EFB1LA, iso-EFB1LA, EFB1OA and iso-EFB1OA. The total amount of these new compounds comprised 0.1% of the FB1 concentration, which may be rated as significant when it is considered that these new compounds are significantly more apolar than earlier-described fumonisins, and their uptake into and toxicity elicied in the various tissues of living organisms may therefore also be significantly different from those of other fumonisins (**Bartók et al., 2010b**). Several new fumonisin B5 mycotoxin isomers (iso-FB5) present in a rice culture infected with *F. verticillioides* were separated on a RP-HPLC column recommended for the separation of structural isomers, and subsequently detected by time-of-flight and ion trap mass spectrometry. The total amount of FB5 toxin and its isomers was 0.9% of the quantity of the main compound (FB1 toxin), which is a noteworthy quantity considering their potential toxicity (**Bartók et al., 2012**). The fumonisin B1,2,3,4 toxin producing capacities of 60 strains of *F. verticillioides* isolated in the main maize-cultivating areas of Hungary were screened on rice grains *in vitro*. The amounts of FB1, FB2, FB3 and FB4 in the extracts of the culture material were determined by RP-HPLC/ESI-ITMS without any sample clean-up. All *F.*

verticillioides strains produced all analogues (FB1-4) of fumonisin B series. The strains did not differ significantly in their cultural characteristics, though the analytical results allowed the distiction of three idiosyncratic FB1-4-producing chemotypes with characteristic proportions of the fumonisin B analogues. The dominant chemotype produced them in the sequence FB1>FB2>FB3>FB4, with large amounts of FB1 and FB2. A second chemotype produced a higher amount of FB3 than of FB2, while the third chemotype produced large amounts of FB2 and FB4. No differences in FB1-4 producing capacity were observed between strains isolated from various locations or different sources (**Szécsi et al., 2010**). To produce large amounts of pure FB1, a novel purifying method was developed by using centrifugal partition chromatography, which is a prominent member of the liquid chromatographic techniques. This method produced approximately 120 mg of FB1 toxin with a purity of more than 98% from 200 g of rice culture (**Szekeres et al., 2013**).

3.) airborne propagules of *Fusarium* spp. were collected on a Fusarium-selective medium with Andersen sampler in a maize field. *Fusarium* isolates were identified based on morphological characters and using PCR analysis with species-specific primers. The PCR assays confirmed morphological identification of *F. proliferatum, F. subglutinans* and *F. verticillioides*. High concentrations were found during the maize harvest, loading and maize shelling. Our results showed that the monitoring of *F. verticillioides* should be performed at a single sampling height. The VERTF1/2 set of primers were used to discriminate potential fumonisin producing strain of *F. verticillioides*, and all *F. verticillioides* strains scored positive for above mentioned set of primers. This is the first study where specific primers were used for the confirmation of morphological determination of above-mentioned *Fusarium* species, and selection of fumonisin-producing airborne isolatews of *F. verticillioides* in Hungary (**Szécsi et al. 2011; Magyar et al., 2012**).

4.) An ability to switch between a yeast-like form and a filamentous form was found among fumonisin-producing *F. verticillioides* strains. These strains form yeast-like colonies on Sabouraud's agar plates, containing 9% NaCl at 37 C in the dark. *F. verticillioides* strains on blood agar plates produce green haemolytic reaction as a results of haemoglobin degradation. The possible role of these morphological forms in infectious diseases of humans and animals is discussed (**Szécsi and Magyar, 2011**).

5.) A study was carried out on the distribution and diversity of *Fusarium* species associated with non-agricultural grasses, maize, sorghum and millet in Hungary. A total of 106 plants belonging to 43 different grass species were collected in different locations in Hungary, and 11 different *Fusarium* species were isolated from the stem of 62.3% of the plant samples. The most common species were *F. compactum* (19.1%), *F. equseti* (16.2%) and *F. graminearum* (14.7%). This is the first report on the divesity of endophytic Fusaria associated with grasses in Hungary (**Szécsi et al., 2013).**