SEPARATION OF AFLATOXINS WITH CENTRIFUGAL PARTITION CHROMATOGRAPHY

GÁBOR ENDRE[1,2], ZSÓFIA HEGEDÜS[1], MÓNIKA VARGA[1], CSABA VÁGVÖLGYI[1], ANDRÁS SZEKERES[1]

[1]University of Szeged, Faculty of Science and Informatics, Department of Microbiology, Közép fasor 52. Szeged H-6726
[2]Doctoral School in Biology, Faculty of Science and Informatics, University of Szeged, Hungary
egabcy@gmail.com, andras.j.szekeres@gmail.com

Mycotoxins are the secondary metabolites produced by filamentous fungi. Within these metabolites, aflatoxins are playing an outstanding role, due to their high-level toxicity, which could cause remarkable problems in food and feed industry. Plenty of methods are available for monitoring or measuring these compounds from various matrices, which require relatively high amounts of pure aflatoxins as standard compounds for qualification and quantification. Aflatoxins could be obtained synthetically or via production of a microorganism. Related the purifications of this mycotoxin from the fermentation environment, the liquid-liquid chromatography could take a remarkable part. This technique is based on a distribution of components between two phases in a biphasic solvent system, and one of the implementation of this technique is called Centrifugal Partition Chromatography (CPC).

In this study, the aflatoxins were extracted from the culture of an *Aspergillus parasiticus* strain (SZMC 2473) using a three-step extraction procedure. The resulted crude extract was used to find the best ternary biphasic solvent system in order to achieve proper separation. All the constructed ternary systems are based on the best solvent method. The systems contained a solvent, which is best to dissolve the desired aflatoxins and two additional “bridge” solvents. One of these solvent is much polar and the other is less polar, compared to “bridge” one. Applying these solvents in different ratios to solve the crude extract, the valuable component and the impurities could be shifted from one phase into the other. With chloroform, acetone and acetic acid as best solvents, numerous ternary systems were tested. After the selection of the best one, the preparative separation of aflatoxins was carried out by using centrifugal partition chromatography. At the end of our work the purified aflatoxins were analysed by LC-HRMS to check their purity and identity.

Acknowledgements
This work was supported by the Hungarian Scientific Research Fund by grants NKFI K-115690 and this work was connected to the project GINOP-2.3.2-15-2016-00012. AS was supported through the New National Excellence Program of the Ministry of Human Capacities (ÚNKP-16-4).