Matrix of the Month

May 2018

Aflatoxins B/G in Dried Mango ~ Manual and Automated ~

Do you have a special matrix that we should test for mycotoxins? Please let us know and write an e-mail to: mycotoxins@LCTech.de

Sample Preparation

MYCOTOXINS

The Mango

The mango originates in India, where the mango tree grows in the tropical rainforest. Today, mango is cultivated in many countries of the world, e.g. in the USA, Mexico or Hawaii, but also in Central and South America and in the south of Spain. With its fine, exotic taste, the mango is very popular for snacking in between, because it contains a very high proportion of vitamins, minerals, and dietary fibres and therefore also contains very little fat and a lot of protein. In addition, the metabolism is accelerated by bitter substances and fruit acids and thus boosts the utilisation of food. In dried form, the mango is also very popular for refining mueslis. Nevertheless, the tasty, fruity mango strips have a high sugar content and should therefore only be enjoyed in moderation.

When importing food and feed, strict EU-wide legal regulations apply to the permissible content of mycotoxins. Among these, even mango does not always meet these quality requirements, as mould formation and undesirable high concentrations of mycotoxins can occur during the drying process. This is shown by regular border controls by the EU, where excessively high aflatoxin B/G values repeatedly lead to rejections.

Sample Clean-up Made Easy by Automation with FREESTYLE SPE

Robotic System FREESTYLE SPE

The FREESTYLE system takes on daily routine tasks in the laboratory, but also offers users a unique opportunity to combine specific working steps that were previously carried out individually.

And all this during day, night, and even at weekends.

Each already approved manual SPE method in the laboratory can automated in a quick and easy manner. The application fields are wide: from food and feed to environmental samples up to forensic applications and doping control samples.

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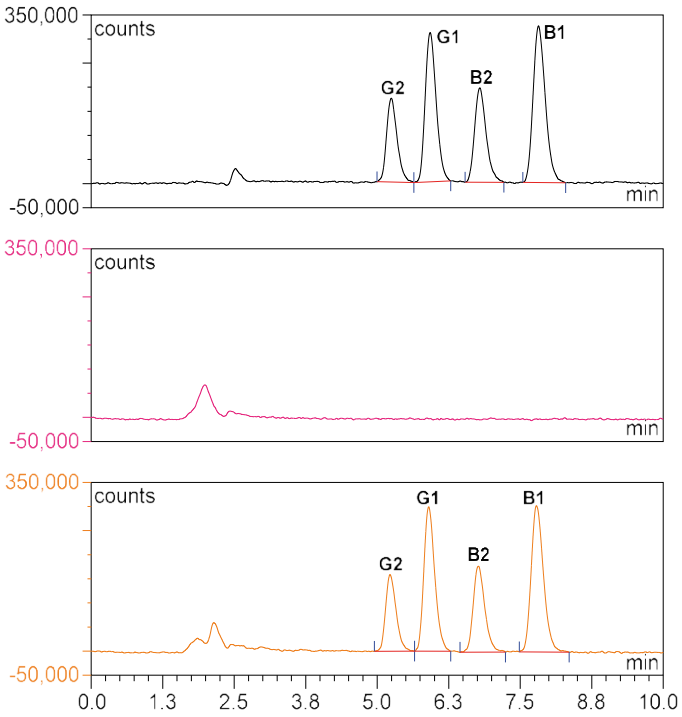
Manual Processing Protocol

Homogenise 10 g of dried mango and add 2 g of sodium chloride. Mix the matrix with 100 mL methanol/water (80/20 (v/v)). In order to remove fat an essential oils, add 50 mL of n-hexane during the extraction. Continue the extraction for at least 30 minutes to ensure high extraction efficiencies.

Filrate the raw extract and centrifuge the filtrate at 3000 g for 10 minutes. Use the n-hexane (lower phase) for further processing. Dilute 10.5 mL with 64.5 mL PBS. Afterwards, load 50 mL of sample (represents 0.7 g matrix) onto a AflaCLEAN column. Rinse the column with 2 x 5 mL deionised water.

Dry the column with a short flush of air and elute toxins with 2 mL with methanol. Keep in mind that the column bed is incubated with methanol for 5 minutes in order to ensure a fully denaturation of the antibodies and release of toxins.

Chromatogram



Black: *Standard 10 ppb (7 ng/ 2 mL)*
Red: *Dried mango not spiked*
Orange: *Dried mango spiked (10 ppb)*

AflaCLEAN, immunoaffinity column for Aflatoxins B/G

HPLC-Conditions
(Aflatoxin B/G)

Mycotoxin:	**Aflatoxin B/G**
HPLC:	isocratic
Column Oven:	36 °C
Separation Column:	RP C-18 (P/N 10522)
Flow Rate:	1.2 mL/min
Eluent:	HPLC-water/methanol/ acetonitrile (60/30/15 (v/v/v))
Fluorescence Detection:	Derivatization with UVE photochemical reactor
Excitation Wavelength:	365 nm
Emission Wavelength:	460 nm

Recovery Rates
Content of Aflatoxin B/G in dried Mango

Mycotoxin	**B1**	**B2**	**G1**	**G2**
Standard*	100	100	100	100
Recovery Rate Dried mango, 10 ppt**	91	95	95	89

**Standard is set = 100 %, **Corrected with non-spiked sample /
The results comply with the performance specifications of EC 401/2006 (Section 4.3.1)**

These LCTech products were used:

AflaCLEAN,
Immunoaffinity Column for Aflatoxin B/G
P/N 10514 / 11721

HPLC Separation Column RP C-18
P/N 10522

FREESTYLE SPE, Robotic System
for Automated Sample Clean-up
P/N 12663 / 12668

UVE Photochemical Reactor
P/N 10519