

Overview

Date of Issue/Version	February 2022 / Version 01
Capability	Determination of pyrrolizidine alkaloids in food by LC-MS/MS
Author of Method	Jörg Konetzki, R&D Institut Kirchhoff Berlin
Testing Lab	Institut Kirchhoff Berlin a Mérieux NutriSciences Company
Test Code (When applicable)	IKB 00.14.36.LC : 2021-12
Catalogue Price (*)	163 €
Transfer Price (*)	131 €
Testing Lab	MÉRIEUX NUTRISCIENCES – Institut Kirchhoff Berlin-Oudenarder Straße 16 13347 Berlin
Background	<p>Pyrrolizidine Alkaloids (PAs) are secondary metabolites which are synthesized by a multitude of worldwide occurring plants as a defense mechanism against insects. More than 600 molecules are currently known.</p> <p>Especially plants of the families Boraginaceae, Asteraceae and Fabaceae contain PAs. Due to their harmful potential, especially 1,2-unsaturated PAs are undesirable in food. Those PAs may act as genotoxic carcinogens.</p> <p>Based on the available data, the Federal Institute for Risk Assessment (BfR) already stated that overall consumer exposure to genotoxic and carcinogenic Pyrrolizidine Alkaloids from various types of foods is to be kept as low as possible (http://www.bfr.bund.de/en/pyrrolizidine_alkaloids_pa_-192924.html).</p> <p>From July 2022 on new limits for PA contents in tea, herbal tea, food supplements containing herbal ingredients, pollen, herbs and cumin seeds will apply. The maximum levels refer to the sum of 21 PAs and N-oxides and 14 additional isomers (21+14).</p> <p>Mérieux NutriSciences has developed a LC-MS/MS-based method which covers all the PAs the new maximum levels refer to. Due to analysis on a highly-sensitive mass spectrometer and a simplified sample preparation the method allows sensitive, reliable and fast PA analyses.</p>
Matrices (*)	Herbs / herbal teas / spices
Method Description	The homogenized samples are extracted three times by diluted acid in an ultrasonic bath. After appropriate dilution the extract is analyzed by LC-MS/MS.
Current Lab Capacity	70 samples / week
	Always check matrices and prices with your Customer Care (CC) representative.
(*) Special Notes	<p>Due to complexity and variability a sample might require a:</p> <ul style="list-style-type: none"> - Short validation - Revision of the limits <p>to be always confirmed by the corresponding CC</p>
Special Notes	-
Corporate contacts	thomas.behnke@mxns.com ; christin.hackethal@mxns.com

Technical

Sample Quantity	100 - 500 g (depending on matrix and homogeneity)
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Sampling Procedure	Please collect representative samples and homogenize thoroughly using an ultracentrifugal mill if an aliquot needs to be taken. PAs are sensitive to heat. Avoid heating during milling.
Standard TAT (Rush TAT if present)	7 working days Rush: 3 working days (for max. 6 previously announced samples)
Limit of Quantification/ Detection	5 µg/kg / 2 µg/kg
Instrument	LC-MS/MS
Method Reference	-

Corporate Contacts Germany

LABORATORY	thomas.behnke@mxns.com
CUSTOMER CARE	christin.hackethal@mxns.com

List of Analytes as determined (compliant to Reg.(EC) 1881/2006 as amended)

Pyrrolizidine Alkaloids	Matrices CAS number	Coffee and Tea (Herbal Tea), Spices	
		LoD (µg/Kg)	LoQ (µg/Kg)
Echimidine and Heliosupine Sum	520-68-3 32728-78-2	2	5
Echimidine-N-oxide	41093-89-4	2	5
Echinatine	480-83-1	2	5
Echinatine N-oxide	20267-93-0	2	5
Europine	570-19-4	2	5
Europine-N-oxide	65582-53-8	2	5
Heliosupine N-oxide	31701-88-9	2	5
Heliotrine	303-33-3	2	5
Heliotrine-N-oxide	6209-65-0	2	5
Indicine and Lycopsamine Sum	1195140-94-3 / 10285-07-1	2	5
Indicine-N-oxide and Intermedine-N-oxide SUM	41708-76-3 95462-14-9	2	5

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Integerrimine, Senecivernine and Senecionine SUM	480-79-5 72755-25-0 130-01-8	2	5
Integerrimine N-oxide and Senecionine-N-oxide SUM	85955-28-8 13268-67-2	2	5
Intermedine	10285-06-0	2	5
Lasiocarpine	303-34-4	2	5
Lasiocarpine-N-oxide	127-30-0	2	5
Lycopsamine-N-oxide	95462-15-0	2	5
Retrorsine and Usaramine SUM	480-54-6 15503-87-4	2	5
Retrorsine-N-oxide and Usaramine-N-oxide SUM	15503-86-3 / 117020-54-9	2	5
Rinderine	6029-84-1	2	5
Rinderine N-oxide	137821-16-0	2	5
Seneciphylline and Spartioidine SUM	480-81-9 / 520-59-2	2	5
Seneciphylline-N-oxide and Spartioidine-N-oxide SUM	38710-26-8 n.a.	2	5
Senecivernine-N-oxide	101687-28-9	2	5
Senkirkine	2318-18-5	2	5

Additional pyrrolizidine alkaloids can be analyzed on demand.