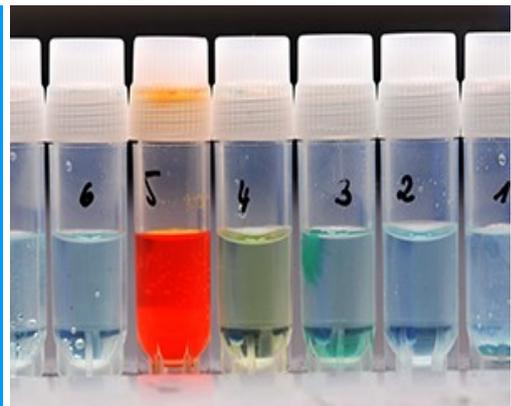


Pyrrolizidine Alkaloids (PAs)

Achieving Marketing Security in a Timely Manner



Effects of pyrrolizidine alkaloids

Pyrrolizidine alkaloids (PAs) are secondary phytochemicals that are synthesized by many plants for self-defense against pests. There are more than 500 different PAs in several thousands of plant species. These mainly pertain to the genera of compositae, boraginaceae and legumes. The breakdown products of the PAs may be damaging to health and have toxic effects on the liver, as well as being carcinogenic. Consequently, they are not permitted for use in food and animal feed and their content should be reduced to as low a level as is possible.

Contamination problem caused by weeds

Even plants that synthesize no PAs such as various herbal teas or wheat, for example, are partly affected by impurities. These contaminations are caused, among other things, by weeds. These weeds find their way into the respective batches during plant harvest.

PA contamination in discussion

Manufacturers of drugs, extracts, herbal supplements and distributors of herbal and homeopathic medicines of plant origin are recommended to check their products for dangerous plant substances. The German Federal Institute for Risk Assessment (BfR) recommends that the daily consumption of PAs should not exceed 0.007 µg PA/kg body weight. Standardized tests or limit values, however, do not yet exist.

Content determination by LC-MS/MS

BioTeSys established the analytical methods for PA determination in plant material published by the German

BfR (BfR-PA-Tee-2.0/2014). The analytes are analyzed using SPE & LC-MS/MS. The independent contract laboratory, BioTeSys, thus offers its customers the test methods most suited to providing marketing security in the case of adequate results. The current main focus is particularly on the following pyrrolizidine alkaloids and their N-oxides:

Pyrrolizidine alkaloid	corresponding N-oxide
Echimidine	Echimidine N-oxide
Erucifoline	Erucifoline N-oxide
Europine	Europine N-oxide
Heliotrine	Heliotrine N-oxide
Intermedine/ Indicine	Intermedine N-oxide/ Indicine N-oxide
Jacobine	Jacobine N-oxide
Lasiocarpine	Lasiocarpine N-oxide
Lycopsamine	Lycopsamine N-oxide
Monocrotaline	Monocrotaline N-oxide
Retrorsine	Retrorsine N-oxide
Senecionine	Senecionine N-oxide
Seneciophylline	Seneciophylline N-oxide
Senecivernine	Senecivernine N-oxide
Senkirkine	
Trichodesmine	

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