

## FOOD &amp; BEVERAGE

## Detect Pyrrolizidine Alkaloid Contamination in Food

*New reference materials from Phytolab now available through SigmaAldrich.com*

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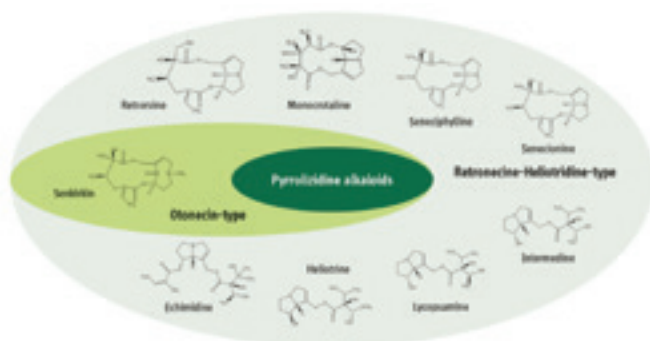
We recently added the portfolio of phytochemical reference materials from Phytolab to our global product offering. As one of the leading manufacturers internationally, Phytolab offers over 1,000 extensively documented herbal reference substances of all classes of natural compounds. The portfolio also includes 29 pyrrolizidine alkaloids and N-oxides.

Pyrrolizidine alkaloids are well known contaminants of various foodstuffs such as leaf lettuces, cereals or honey. Just recently pyrrolizidine alkaloids were also found in both herbal teas and common teas. Animal feedstuff can be affected as well. The source of the pyrrolizidine alkaloids are weeds from the families of the Asteraceae (genus Senecio, known as groundsel or ragwort), Boraginaceae and Fabaceae.

Honey can be contaminated with pyrrolizidine alkaloids if plants from these and other families are visited by the honey bees.

From a chemical point of view pyrrolizidine alkaloids are mono- or diesters of 1-hydroxymethyl pyrrolizidine (necine base) and aliphatic mono- or dicarboxylic acids (necic acids). Otonecine-type, platynecine-type, and the diastereomeric retronecine-type and heliotridine-type pyrrolizidine alkaloids are distinguished. A prerequisite for the toxicity is a 1,2-unsaturated necine structure that forms an ester with at least one branched C5-carboxylic acid. Pyrrolizidine alkaloids with these structural characteristics have been found to be genotoxic and carcinogenic in animal experiments. In larger quantities pyrrolizidine alkaloids can cause acute and chronic liver damage.

Structures of typical pyrrolizidine alkaloids from plants



For a reliable analysis of pyrrolizidine alkaloids, well characterized reference substances are essential. Because of great variances in response factors, e.g., in LC-MS analysis, the quantitative analysis of individual pyrrolizidine alkaloids is preferred over a non-selective sum method. Currently we offer 29 different pyrrolizidine alkaloids and their N-oxides, all of them supplied together with a comprehensive certificate of analysis. For a complete and up-to-date product list, please visit our website at [SigmaAldrich.com/phytolab](https://SigmaAldrich.com/phytolab)

#### Currently available phyproof® pyrrolizidine alkaloids and pyrrolizidine alkaloid N-oxides

| Cat. No. | Description            | Package Size |
|----------|------------------------|--------------|
| PHL89553 | Echimidine             | 10 mg        |
| PHL83432 | Erucifoline            | 5 mg         |
| PHL83433 | Erucifoline N-oxide    | 5 mg         |
| PHL83237 | Europine hydrochloride | 10 mg        |
| PHL83238 | Europine N-oxide       | 10 mg        |
| PHL80403 | Heliotrine             | 10 mg        |
| PHL83236 | Heliotrine N-oxide     | 10 mg        |
| PHL83234 | Indicine hydrochloride | 10 mg        |
| PHL83235 | Indicine N-oxide       | 10 mg        |
| PHL82424 | Intermedine            | 10 mg        |
| PHL83446 | Intermedine N-oxide    | 5 mg         |
| PHL83434 | Jacobine               | 5 mg         |
| PHL83435 | Jacobine N-oxide       | 5 mg         |
| PHL80412 | Lasiocarpine           | 10 mg        |
| PHL83220 | Lasiocarpine N-oxide   | 10 mg        |
| PHL89726 | Lycopsamine            | 10 mg        |
| PHL83447 | Lycopsamine N-oxide    | 5 mg         |
| PHL89251 | Monocrotaline          | 20 mg        |
| PHL82629 | Monocrotaline N-oxide  | 10 mg        |
| PHL89775 | Retrorsine             | 10 mg        |
| PHL82630 | Retrorsine N-oxide     | 10 mg        |
| PHL89789 | Senecionine            | 10 mg        |
| PHL82631 | Senecionine N-oxide    | 5 mg         |
| PHL89275 | Seneciphylline         | 10 mg        |
| PHL82632 | Seneciphylline N-oxide | 5 mg         |
| PHL83436 | Senecivernine          | 5 mg         |
| PHL83437 | Senecivernine N-oxide  | 5 mg         |
| PHL89274 | Senkirkin              | 10 mg        |
| PHL83438 | Trichodesmine          | 10 mg        |

For more information on our phytotoxin offer visit [SigmaAldrich.com/phytotoxins](https://SigmaAldrich.com/phytotoxins)