

TROPANE ALKALOID CONTAMINATION OF GLUTEN-FREE CEREAL FOOD

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INTRODUCTION & AIM

- The low gluten content of crops like corn, rice, buckwheat, and millet makes them essential ingredients in **GLUTEN-FREE FOODS** – **NUTRITIONAL THERAPY FOR PEOPLE WITH A GLUTEN INTOLERANCE OR CELIAC DISEASE**

- CEREAL CROPS** susceptible to **CONTAMINATION** with **TROPANE ALKALOIDS** from the seeds of certain weeds growing in the same fields



TROPANE ALKALOIDS CONTAMINATION

The current study aimed to address the lack of data on the **PRESENCE** of the main tropane alkaloids, **ATROPINE** and **SCOPOLAMINE**, in **GLUTEN-FREE FOODS**.

METHOD

Sample collection

- 71 prepacked “gluten-free” cereal foods - Serbian market



The atropine and scopolamine content analysis

- LC-MS/MS

- Limit of quantification (each analyte): 0.4 µg/kg



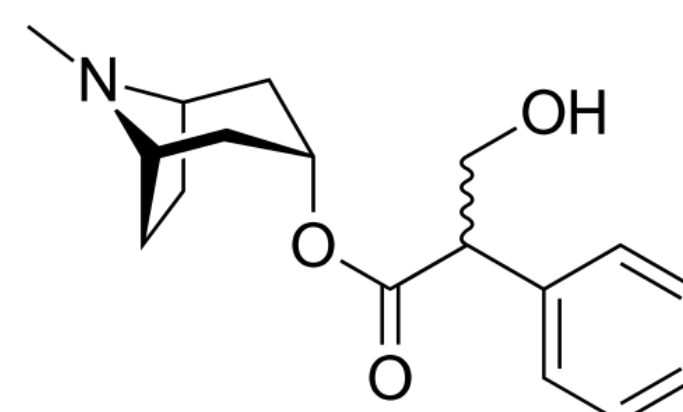
Regulatory compliance assessment

- max level - millet, sorghum, and maize products: 5 µg/kg
- max level - buckwheat: 10 µg/kg



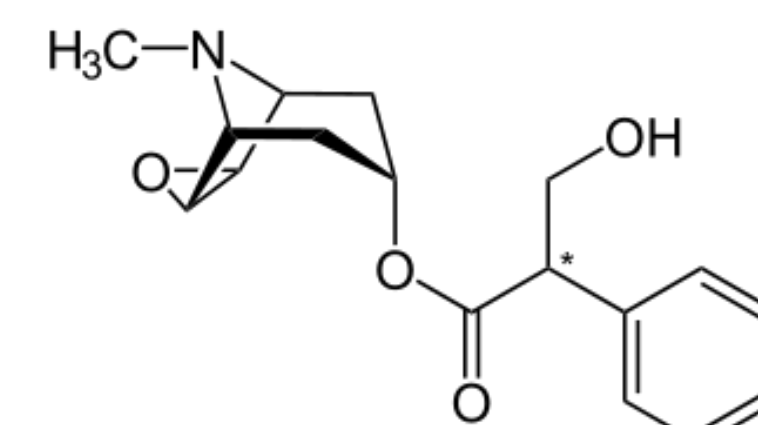
RESULTS & DISCUSSION

Atropine



- 42.3% of the samples
- max total concentration: 60.8 µg/kg (flour)

Scopolamine



- 32.2% of the samples
- max total concentration: 32.4 µg/kg (pasta)

Contamination frequency



66.7% > 53.3% > 41.7% > 35.0% > 25.0% > 0%

Regulatory compliance assessment

- 2 flour samples (16.7%) corn/corn, rice, and millet
- 1 pasta sample (8.3%) corn and rice



NON-COMPLIANCE

atropine / scopolamine (pasta sample): 2.4 ± 1.1
⇒ contamination with *Datura stramonium* seeds

CONCLUSION

The **NON-COMPLIANCE RATE** of **4.2%** in the **GLUTEN-FREE FOOD SAMPLES**, with **CONTAMINATION GREATLY EXCEEDING THE REGULATORY LIMIT**, is of public health importance.

Although processing of samples such as flour and pasta can modify the composition and concentration of tropane alkaloids in ready-to-eat food, solid information on the degree of degradability and toxicity of the products formed is still unavailable.