

TROPANE ALKALOID-ASSOCIATED HEALTH RISKS IN PEOPLE ON GLUTEN-FREE DIET

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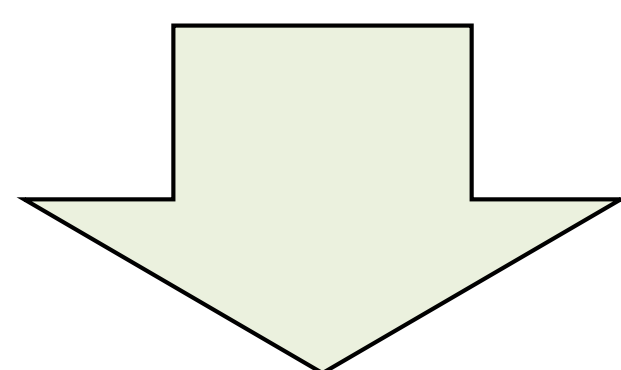
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INTRODUCTION & AIM

- **GLUTEN-FREE DIET**
– a nutritional therapy for people with a gluten intolerance/ceeliac disease
- **GLUTEN-FREE FOOD**
– produced from crops (corn, rice, buckwheat, and millet) which are **HIGHLY PRONE TO CONTAMINATION** with the seeds of plants producing **TROPANE ALKALOIDS**



The current study was undertaken to determine **THE HEALTH RISKS** associated with **ATROPINE AND SCOPOLAMINE**, the toxicologically most important tropane alkaloids.

METHOD

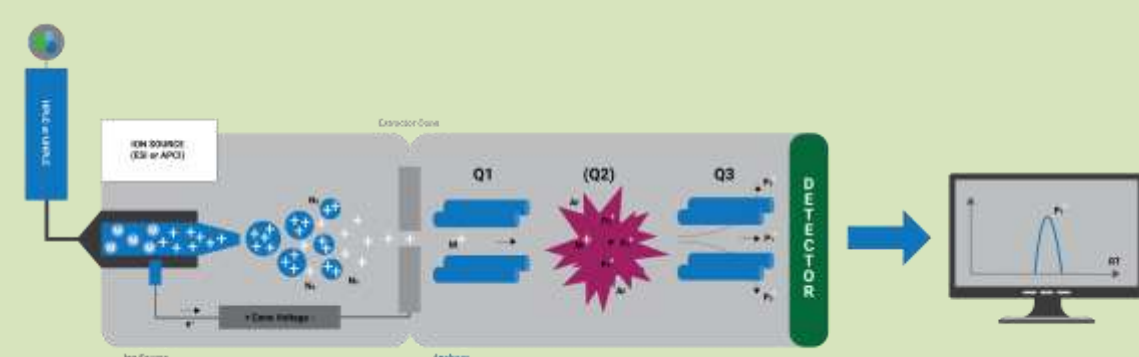
Sample collection

- 71 cereal foods labelled as “gluten-free”
- Serbian market



Quantification method

- LC-MS/MS



Consumer health risk assessment

- **Acute exposure:**
The upper-bound concentrations
National acute food consumption data
(EFSA Food consumption database)
- **Acute exposure compared with:**
 - the **group acute reference dose (ARfD)**
(16 ng/kg bw)
 - the **clinically significant minimal acute dose**
(1.54 µg/kg bw; calculation of the margin of exposure (MOE))

RESULTS & DISCUSSION

The **exposure** to the combination of atropine and scopolamine exceeded the group ARfD

- 2 flour samples
- 1 pasta sample



- 1 flour sample
- 1 pasta sample



- 1 pasta sample



High food consumption

- 2 flour samples
- 1 pasta sample

RISK OF ACUTE ADVERSE EFFECTS
in **ALL THE POPULATION GROUPS**

- bread samples
- biscuit samples

exceeding **50% of the group ARfD**
in the case of consumption by **toddlers (2+2) and children (1+1)**

- **Lowest MOE = 9:**
1 pasta sample
when consumed in **high amounts by toddlers**
- **Highest MOE = 22:**
mean food consumption
⇒ sufficiently protective

CONCLUSION

- Adverse acute health effects of tropane alkaloids cannot be ruled out even in the case of single-source dietary exposure, while aggregate exposure from multiple food sources consumed in the relevant time-frame increases concerns.