Anticholinergic poisoning after use of contaminated herbal tea

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Objective
To report poisonings from herbal tea containing marshmallow root (*Althaea officinalis*), inadvertently contaminated with an atropine-containing herb.

Case series
In January 2013 the Dutch National Poisons Information Center (DPIC) received an inquiry about a couple that fell ill within hours after ingesting herbal tea for the treatment of common cold symptoms. Both suffered from dry mucous membranes, nausea, blurred vision, hallucinations, tachycardia and urinary retention. They were admitted to a hospital with evident anticholinergic symptoms that resolved after 4 days.

The DPIC contacted the Netherlands Food and Consumer Product Safety Authority (NVWA) and learned that they had received a similar report about health effects concerning a comparable herbal tea. Within one week 6 patients were reported to the DPIC and the NVWA, 4 persons were admitted to a hospital, they all recovered within 1-5 days without sequelae.

Measures taken
The DPIC inquiries and the NVWA reports all involved products from one supplier and contained *Althaea officinalis*. The NVWA contacted the supplier. Within three days after the first case report the products were withdrawn from the market.1 Furthermore, the supplier issued a warning to the public via advertisements in several national newspapers. The DPIC posted a message via an EAPCCT mailing to warn other Poisons Centers. In this message, other European countries were asked to report back, if similar intoxications had occurred in their country. One case in France was traced in this way. The herbal preparation involved was purchased in Amsterdam, the Netherlands.

Source
Analysis of the products revealed a high atropine content (1-10 mg/g). The production chain was investigated, yielding the conclusion that contamination probably occurred during the harvest of *Althaea officinalis* in Bulgaria and the atropine source was deadly nightshade (*Atropa belladonna*). The contaminated batch was solely distributed in the Netherlands.

Conclusion
Contamination of herbal preparations with poisonous plants can lead to serious toxicity. The described incident occurred with a product from a renowned producer that practices quality control in the whole production process. Poisons centers can play an important role in recognizing dangerous consumer products. Cooperation with health care authorities is essential to facilitate swift intervention and prevent further harm to public health.

Medicinal use
Marshmallow leaf and root have great demulcent properties in common cold, and are used for dry cough, pain and swelling (inflammation) of the mucous membranes of the respiratory tract. They are also used for stomach ulcers, diarrhea, constipation, intestinal inflammation, and stones in the urinary and biliary tract. Plant parts, especially the roots, are soaked or boiled in water to produce a gummy, starch-like matter. About half of the dry weight of the roots consists of mucilage. These decoctions form a protective layer over the membranes, when the natural mucous has been abraded.

Constituents
The product ingredients are mainly mucilage (polysaccharides) and furthermore flavonoids (quercetin), kampherol, betaine, caffeic acid, chlorogenic acid, ferulic acid, p-coumaric acid, salicylic acid, scopoletin, sorbitol, vanillic acid, asparagine, tannins, lecithin, paraffin, pectin, B-vitamins, beta-carotene, vitamin C and traces of Ca, Fe, Mg, Mn, P, K, Se and Zn.

Marshmallow is a perennial plant, native to Europe and the western part of the United States. It thrives along riverbanks, in waste places and roadsides in wet, marshy areas.

"Fig. 1 Althaea officinalis (marshmallow root)."
"Fig. 2 Sample of the toxic tea, containing dried and crushed root parts."
"Fig. 3 Herbal preparations containing the toxic contaminant."