

Marzipan Santas, elves and stollen: Real deal or cheap fakes?

November 30 2011

With the December holidays a peak season for indulging in marzipan, scientists are reporting development of a new test that can tell the difference between the real thing — a pricey but luscious paste made from ground almonds and sugar — and cheap fakes made from ground soy, peas and other ingredients. The report appears in *ACS' Journal of Agricultural and Food Chemistry*.

Ilka Haase and colleagues explain that marzipan is a popular treat in some countries, especially at Christmas and New Year's, when displays of marzipan sculpted into fruit, Santa and tree shapes pop up in stores. And cakes like marzipan stollen (a rich combo of raisins, nuts and cherries with a marzipan filling) are a holiday tradition. But the cost of almonds leads some unscrupulous manufacturers to use cheap substitutes like ground-up peach seeds, soybeans or peas. Current methods for detecting that trickery have drawbacks, allowing counterfeit marzipan to slip onto the market to unsuspecting consumers. To improve the detection of contaminants in marzipan, the researchers became food detectives and adapted a method called the polymerase chain reaction (PCR) — the same test famed for use in crime scene investigations.

They tested various marzipan concoctions with different amounts of apricot seeds, peach seeds, peas, beans, soy, lupine, chickpeas, cashews and pistachios. PCR enabled them to easily finger the doctored pastes. They could even detect small amounts — as little as 0.1% — of an almond substitute. The researchers say that the PCR method could serve as a perfect tool for the routine screening of marzipan pastes for small

amounts of contaminants.

More information: “Marzipan: Polymerase Chain Reaction-Driven Methods for Authenticity Control” J. Agric. Food Chem., 2011, 59 (22), pp 11910–11917. [DOI: 10.1021/jf202484a](https://doi.org/10.1021/jf202484a)

Abstract

According to German food guidelines, almonds are the only oilseed ingredient allowed for the production of marzipan. Persipan is a marzipan surrogate in which the almonds are replaced by apricot or peach kernels. Cross-contamination of marzipan products with persipan may occur if both products are produced using the same production line. Adulterations or dilutions, respectively, of marzipan with other plant-derived products, for example, lupine or pea, have also been found. Almond and apricot plants are closely related. Consequently, classical analytical methods for the identification/differentiation often fail or are not sensitive enough to quantify apricot concentrations below 1%. Polymerase chain reaction (PCR)-based methods have been shown to enable the differentiation of closely related plant species in the past. These methods are characterized by high specificity and low detection limits. Isolation methods were developed and evaluated especially with respect to the matrix marzipan in terms of yield, purity, integrity, and amplificability of the isolated DNA. For the reliable detection of apricot, peach, pea, bean, lupine, soy, cashew, pistachio, and chickpea, qualitative standard and duplex PCR methods were developed and established. The applicability of these methods was tested by cross-reaction studies and analysis of spiked raw pastes. Contaminations at the level of 0.1% could be detected.

Provided by American Chemical Society

Citation: Marzipan Santas, elves and stollen: Real deal or cheap fakes? (2011, November 30) retrieved 17 August 2024 from <https://phys.org/news/2011-11-marzipan-santas-elves-stollen-real.html>

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