

New methods to trace fragrance allergens

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A recent doctoral thesis from the University of Gothenburg presents new methods to trace allergenic fragrance compounds in consumer products, such as perfumes.

Since [cosmetics](#) and hygiene products generally are exposed to air when used, it is important to use air-exposed fragrance compounds when testing a patient for allergic reactions, and not only the pure fragrance compounds.

'I have developed methods for chemical analysis that for the first time make it possible to identify fragrance compounds that have been exposed to air and thus become potent allergens in small amounts and that people may come in contact with in [consumer products](#),' says Johanna Rudbäck at the Department of Chemistry and Molecular Biology, University of Gothenburg.

Fragrance compounds are among the most allergenic substances in our environment and are almost always used in cosmetics and hygiene products.

Rudbäck studied two essential oils containing some of the most common fragrance compounds, sweet orange oil and petitgrain oil. The researchers have previously shown that exposing some common fragrance compounds to air leads to the formation of potent allergens, hydroperoxides in particular.

'My analyses show that hydroperoxides from the fragrance compounds

were present already before the bottles were opened, and the levels increased when the oils were exposed to air. The study shows that the oils didn't have any natural protection against the formation of allergenic compounds,' says Rudbäck.

To learn more about what happens when exposing fragrance compounds to air, Rudbäck studied two additional commonly used fragrance compounds, alpha-terpinene and citronellol. Alpha-Terpinene is found in for example tea tree oil and citronellol, from geranium, is one of the six most common fragrance compounds in cosmetics and [hygiene products](#). 'The allergenic effect of both compounds increased tenfold after air exposure compared to the pure fragrance compounds,' says Rudbäck.

The hydroperoxides from the fragrance compounds are generally difficult to identify and quantify. They are unstable and lack UV absorbance, and are very similar and come in several different forms. In addition, they are found in low concentrations in complex mixtures. The new methods involve separation of the hydroperoxides using either liquid or gas chromatography and detection using mass spectrometry.

'According to EU regulations, cosmetics must be specially labelled when containing fragrance allergens in concentrations exceeding 0.001% in stay-on products such as lotions and 0.01% in rinse-off products such as shampoos,' says Rudbäck.

More information: hdl.handle.net/2077/32865

Provided by University of Gothenburg

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