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Aggregate exposure to common fragrance compounds: Comparison of the contribution of essential oils and cosmetics using probabilistic methods and the example of limonene

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Abstract

The knowledge of aggregate exposure to different types of products is paramount in the risk assessment.

The aim of this study was to compare the relative contribution of essential oils compared to cosmetics on the daily dermal exposure to limonene, an ubiquitous fragrance compound that can be an allergen depending on its degree of oxidation.

Aggregate daily exposure to limonene was calculated among a panel of French volunteers using both essential oils and cosmetics, for 4 different specific zones, i.e. face and neck, chest, upper limbs and lower limbs. Calculations were made using a probabilistic Monte Carlo method and sensitivity analysis.

The main strength of this work was the inclusion of essential oils in addition to cosmetics in the model. For the first time, the generated data could be used to compare the contribution of these two products in dermal exposure. Essential oils appear to be significant contributors to exposure to limonene particularly for the face. This work is a first step that will permit to determine the exposure to other fragrance compounds with sensitizing potential.

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