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Characterisation of volatile, aroma active compounds of cold-pressed cactus seed oil

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Cactus seed oil derives from the seeds of *Opuntia ficus-indica*, a robust plant belonging to the family Cactaceae, growing in arid and semi-arid zones in Africa, the Middle East and Asia with long lasting drought and low water availability. This plant can cope with the increasing problems of climate change with less and less rainfall and on the other hand it can help to ensure the nutrition situation of and generate an income for the population.

Cactus seed oil is mainly used in cosmetics due to the high price and the time-consuming and laborious process of production resulting from the small kernels located on the fruits. On the other side the oil is also suitable for human consumption with a fatty acid composition similar to sunflower oil and γ -tocopherol as main antioxidant compound. As a cold-pressed oil not only the fatty acid composition of the oil is important but also the sensory quality which is defined by the interaction of the volatile, aroma-active compounds.

The aim of the present work performed within the research project “*Quality and safety of Moroccan virgin cactus seed oil (*Opuntia ficus-indica*) from the plant to the bottle*” financed within the *Programme Maroc-Allemand de Recherche Scientifique (PMARS)* was to characterize for the first time the profile of volatile aroma active compounds from cactus seed oil obtained from different geographical origins or different processing. Seeds from six different locations in Morocco, Houceima, Bejaad, Rhamna, Sidi Ifni, Ait Baha and Tiznit, as well as seeds from Sidi Ifni roasted at $110^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 10 to 40 min were used for the investigation.

Seeds were pressed by a screw press and the resulting oil was filtered by a paper filter. The volatile compounds from the oil, the press cake and the crushed seeds were separated from the material by dynamic head-space analysis combined with a gas chromatograph. Detection of the compounds was performed by mass spectrometry. In addition the volatile compounds were identified as aroma active by smelling with the human nose at a sniffing port after separation of the compounds with a gas chromatograph. Oils from different regions were analyzed and compared in order to find out about an influence of the growing area of the seeds on the aroma profile. Moreover, the compounds which are characteristic for cactus seed oils from roasted seeds were identified.