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Potential of cactus seeds (*Opuntia ficus-indica*) as source of edible oil and antioxidants

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Opuntia ficus-indica is belonging to the family *Cactaceae* and grows in the arid and semi-arid zones in Africa, the Middle East and Asia. The plant is used to long lasting drought and low water availability. Therefore countries like Morocco are very interested in the cultivation of this plant as protection of the grounds against erosion, for the fight against desertification to slow down the rate of degradation of deforested soils and conservation of biodiversity. The edible part of the fruit contains a large number of very small seeds that were discarded as waste up to a few years ago. Nowadays expensive oil is produced from the seeds by cold pressing.

The aim of a 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)* is the comprehensive investigation of the agronomical and technological influences on the quality and safety of edible cactus seed oil along the value added chain.

In a first step cactus seeds from six different locations in Morocco were analysed regarding the content of oil, protein and carbohydrates. The oil was characterized with respect to the composition of fatty acids, tocopherols, phytosterols and triacylglycerols as well as the oxidative stability measured by the Rancimat test. In addition the amount of total phenolic compounds and the antioxidant activity of extracts obtained from the oil and the seeds were investigated.

Cactus seed oil is characterized by a low oil content of about 1% to 2% and a protein content varying between 6.7% and 9.2%. The fatty acid composition is dominated by linoleic acid (56.4% – 63.8%) and oleic acid (13.3% – 19.0%) as unsaturated fatty acids and palmitic acid (10.7% – 11.4%) as saturated fatty acid. Thus PLO, PLL, LLO and LLL are the main triacylglycerols of cactus seed oil. The tocopherol content of the seed oil ranged between 52.2 mg/100 g and 68.8 mg/100 g with γ-tocopherol as main constituent. The oil is rich in phytosterols with ß-sitosterol as main compound. Due to the high content of polyunsaturated linoleic acid cactus seed oil is susceptible against heat and oxygen in the Rancimat test.

Seeds and oil contain significant total amounts of phenolic compounds with an antioxidant activity. It is necessary to further characterize the phenolic compounds in the future.