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Preventive administration of *Opuntia ficus-indica* (L.) Mill. fruit juice reduces UV radiation damage in hairless rat

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Opuntia ficus indica (L.) Mill. is a native species of Central America. It is widespread also in the Mediterranean area, where is cultivated for various aims. In Sicily it is cultivated mainly for its sweet fruits, nutritionally interesting for their content of nutraceuticals.

For a long time, the authors studied biological activities of mucilage and pectin extracted from cladodes of *Opuntia ficus-indica*, cultivated in specialized areas in Sicily (1, 2).

Other papers of the same authors reported the fruit juice antioxidant, antiulcer and hepatoprotective activities in rat (3, 4).

In this work the authors investigate about the protective effect from UV radiation damage in hairless rats, by a preventive administration of prickly pear juice. Ten rats were treated with the fruit juice (3 ml by gavage) for 15 days. From 13th to 15th day, the whole dorsum was irradiated, for 20 min, by UVB radiation (294 nm). Another group of ten rats, treated in the same conditions, underwent UVA radiation (366 nm). Specimens were processed for histological examination. The observations were compared with control rats, treated with distilled water. The results demonstrate that the skin of treated rats shows a less thick epidermis, with a significant decrease of sunburn cells. Besides, in the derma there are less infiltrating cells, indicating a reduced inflammation.

These data suggest that juice pre-treatment offers some protection from both UV radiations. *Opuntia ficus-indica* fruit juice contains a group of antioxidant substances (flavonoids, betalains and vitamin C) that probably are responsible of the observed effects.

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Anti-proliferative effect of betalains from Sicilian cactus pear (*Opuntia ficus indica*, L. Mill.) on malignant HepG2, Huh-7, and HA22T human liver cell lines

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Epidemiological evidence has been provided that various age-related pathologies, including cardiovascular diseases, cancer, and neurodegenerative disorders have a minor incidence among people consuming vegetable-rich diets. Antioxidant food components have been considered essential to obtain long-term positive health outcomes. Betalains are redox-active pigments occurring in the Caryophyllales order of plants, among which the edible cactus pear and red beet. These bioactive phytochemicals can act as antioxidants in various biological models, including oxidation of membranes (1) and LDL (2), and modulators of redox-mediated cell pathways relevant to the inflammatory response (3). It has recently been documented that betanin can inhibit proliferation of a variety of human tumor cells, including breast, colon stomach, CNS, lung, and myeloid leukemia (4,5).

Human hepatocellular carcinoma is the third most common cause of cancer death. We studied the effect of the betalain pigments betanin and indicaxanthin isolated from fruits of Sicilian cactus pear on the proliferation of human liver cancer cells lines (HepG2, Huh-7 and HA22T). Both betalains showed a dose-dependent anti-proliferative effect (30 to 50%) in a low micromolar range (0.1 to 100 μ M), with the effect in Huh-7 and HA22T cells higher than in HepG2 cells. In all experiments indicaxanthin exhibited higher antiproliferative effect than betanin. Other studies aimed at investigating about the molecular mechanisms involved are in progress. Our data add further value to the nutritional characteristics of cactus pear fruits and encourage diets including this fruit to maintaining a healthy status.

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