Anti-inflammatory effects of Indicaxanthin from Cactus Pear Fruit *(Opuntia Ficus Indica L, Mill.)* in carrageenin-induced acute inflammation in rats.

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Age-related inflammation-based disorders such as cancer and cardiovascular disease are widely acknowledged to have a lower incidence among populations whose dietary habits include a large proportion of vegetal food, this providing various non-nutrient secondary metabolites (phytochemicals) with purported beneficial activities (Virgili F. et al., 2008; Halliwell B. et al., 2005). Nutritional research has recently shifted from alleviating nutrient deficiencies to chronic disease prevention. In this study activity of indicaxanthin, a bioavailable phytochemical of the betalain class, from the edible fruit of Opuntia Ficus Indica (L Mill.), has been investigated in carrageenin-induced pleurisy, a rat model of acute inflammation. Indicaxanthin (0.5, 1, 2 μmol/Kg), orally given to rats before the injection of 0.2 ml of λ-carrageenin, time- and dose-dependently reduced the exudate volume (up to 70%) and the number of leukocytes recruited in the pleural cavity (up to 95%), at 24 h. When compared with indomethacin, indicaxanthin was as effective as the drug to reduce the exudate volume and recruited leukocytes. These anti-inflammatory effects were accompanied by an inhibited release of inflammatory mediators (PGE2, NO, IL-1β, TNF-α), and decrease of IL-1β, TNF-α, iNOS, and COX-2 mRNA, as well as iNOS, and COX-2 protein expression, in the recruited leukocytes. Indicaxanthin inhibited time- and dose- dependently the activation of NF-kB, a redox-dependent key transcription factor with a key role in directing the whole inflammatory cascade. A pharmacokinetic study provided evidence that all the observed effects were relevant to a maximum 0.2 μM indicaxanthin blood concentration, which is much less than the concentration (7 μM) reached in humans after ingestion of a reasonable amount of betalainic food (4 cactus pear fruits). In conclusion, this is the first study in vivo showing that the dietary pigment indicaxanthin has the potential to improve health, possibly by preventing inflammation-based disorders.

Virgili F. et al. (2008) *Free Radic Biol Med.* 45: 1205-16.
Halliwell B. et al. (2005) *Am J Clin Nutr.* 81: 268S-76S.