

# Proanthocyanins

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## Some Proanthocyanidins may provide antibacterial effect.

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Saskatoons contain about 6.5-11.68 mg of proanthocyanidins in each gram of dried fruit. Good weather in 2013 did nearly double the proanthocyanidin concentration of saskatoons.

Proanthocyanidins are condensed tannins widespread in the plant kingdom. In polymerization, proanthocyanidin molecules link through two types of linkages: A-type and B-type. Proanthocyanidin-A, which is rare, inhibits bacteria and virus adhesion to epithelial cells to reduce infections but do not reduce infectivity of pathogens (Cheng et al., 2005). Proanthocyanidin-B molecules are ubiquitous in nature (e.g. strawberry, blueberry, raspberry, blackberry, grape, apple, cherry, mango, banana, peach, apricot and so on) and may be important as antioxidants. Cranberries (32.72 mg/g dw) and blueberries (11.98 mg/g dw) carry high amounts of proanthocyanidins (Gu et al., 2004). Cranberry is the first fruit to report as having proanthocyanidin-A. One liter of pure cranberry juice (100%) contains 777.2 mg of proanthocyanidin-A (Feliciano et al., 2012). According to Gu et al. (2004), the other fruits containing proanthocyanidin-A are plums and avocados.

Up until now, the health benefits of proanthocyanidins have been studied using cranberries. One such example is discussed below. A clinical-study carried out at the British Columbia Children's Hospital, has shown the effect of cranberry proanthocyanidins on the prevention of urinary tract infections (UTI) of children (Afshar et al., 2012). This study recruited 40 children, of ages 5 to 18 years, who were suffering from urinary tract infections caused by E. coli (65% of cases), gram-negative bacilli (27% of cases), gram-positive cocci (8% of cases) and complex of more than one bacteria type (5% of cases). The test subjects were given a juice with 37% proanthocyanidins at 2.0 ml per kg of body weight for a period of one year. The total volume of juice consumed was recorded. The control group received the same volume of a placebo, a juice without proanthocyanidins and cranberry ingredients. The urine samples collected from subjects, once every three months, were tested for proanthocyanidins. When subjects showing signs of infections, urinalysis and cultures were carried out to confirm. Accordingly, proanthocyanidin containing juice consumption had reduced urinary tract infection by 65% in the experimental group.

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## How do we know?

Source: Gu, L., Kelm, M. A., Hammerstone, J. F., Becher, G., Holden, J., Haytowitz, D., Gebhardt, S., & Prior, R. L. (2004). Concentrations of proanthocyanidins in common foods and estimations of normal consumption. *The Journal of Nutrition*, 134(3), 613-617.

Source: Afshar, K., Stothers, L., Scott, H., & MacNeily, A. E. (2012). Cranberry juice for the prevention of pediatric urinary tract infection: A randomized controlled trial. *The Journal of Urology*, 188, 1584-1587.

