

## Right Track™ Product Science – Cranberry Reviews & Abstracts

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### **Right Track™ - Cranberry Concentrate**

Right Track™ contains 400 mg of cranberry concentrate, rich in total organic acids and proanthocyanidins, a potent antioxidant. A growing body of research indicates that cranberry intake as juice or supplements can help prevent chronic urinary tract infections (UTI), especially in women who are most prone to chronic UTI.

#### Key Reviews & Abstracts (Research Summaries):

(1)

#### **Cochrane Review Shows Preventive Effects of Cranberry against Urinary Tract Infections** *HerbalGram*. 2008;78:28-29 American Botanical Council

Reviewed by Jepson RG, Craig JC. **Cranberries for preventing urinary tract infections (Review)**. *Cochrane Database of Systematic Reviews*. 2008;DOI:10.1002/14651858. CD001321.pub.4.

Urinary tract infections (UTIs) are diagnosed when a threshold of bacteria in the urine is exceeded (generally greater than 100,000 cells/mL). UTIs consist of cystitis (bacteria in the bladder), urethral syndrome, and pyelonephritis (infection of the kidney). Symptoms associated with UTIs include pain during urination, cloudy urine, blood in the urine, back pain, and fever. Infants, pregnant women, the elderly, patients with spinal cord injuries, and immuno-compromised patients are at increased risk of UTIs. Although UTIs occur in both males and females, they are 50 times more common in females than in males, likely because females have a shorter urethra, which allows easier passage of bacteria into the bladder.

Generally, UTIs are easily treated with antibiotics. Cranberries (*Vaccinium macrocarpum*, Ericaceae) have been used widely for many years, usually in the form of cranberry juice, to prevent and treat UTIs. The preventive mechanism has not been definitively established; however, the functioning theory is that constituents of cranberries (fructose and proanthocyanidins) prevent bacteria (particularly *Esch-erichia coli*) from sticking to the uroepithelial cells that line the wall of the bladder. The objective of this review was to evaluate the effectiveness of cranberries in preventing UTIs in high-risk populations.

The following two hypotheses were tested: (1) cranberry juice and other cranberry-

containing products are more effective than placebo or no treatment in preventing UTIs in susceptible populations, and (2) cranberry juice and other cranberry-containing products are more effective than other treatments in preventing UTIs in susceptible populations. A literature review of several databases (MEDLINE, EMBASE, and the Cochrane Central Register of Controlled Trials) and the Internet was conducted. The purpose was to identify randomized clinical trials (RCTs) of studies that evaluated the effectiveness of cranberry products in preventing UTIs relative to placebo, no treatment, or other treatment. Studies of the treatment of asymptomatic or symptomatic UTIs and of UTIs not caused by bacterial infection were excluded. The primary outcome measure was the number of UTIs in each study group confirmed by a catheter or mid-stream specimen of urine or a "clean-catch" specimen. Secondary outcome measures were compliance with therapy and adverse side effects. The 2 authors of this review independently assessed the studies identified to determine eligibility for this review, and they independently extracted pertinent information (methods, participants, study design, interventions, and outcomes) from those studies that were deemed eligible. The quality of the studies was assessed on the basis of the Cochrane criteria.

Ten studies (n = 1049 subjects) were included in the review: 5 cross-over studies and 5 parallel-group studies. Detailed tabular material is provided in this review for each of the 10 studies. In seven of the studies, cranberry or cranberry-lingonberry juice was compared with water, juice, or placebo. In the remaining studies, cranberry tablets were compared with placebo. Five of the studies were conducted in the United States, two in Canada, one in the Netherlands, one in Finland, and one in Scotland. Details of the studies follow:

- 1 study lasted 1 month (30 mL cranberry juice/day)
- 1 study lasted 9 weeks (400 mg cranberry in capsule form)
- 2 studies lasted 3 months (400 mg cranberry in capsule form or 300 mL cranberry juice/day)
- 5 studies lasted 6 months (300 mL cranberry juice/day, 50 mL cranberry-lingonberry juice 5 days/week, 2 g cranberry juice concentrate, or 15 mL cranberry juice/kg/day)
- 1 study lasted 12 months (250 mL cranberry juice 3 times/day or one concentrated juice tablet 2 times/day).

The methodologic quality of all the trials was satisfactory. Four of the studies were included in a meta-analysis, and all of these studies showed that cranberry consumption significantly reduced the incidence of UTIs at 12 months (relative risk: 0.66; 95% CI: 0.47 to 0.92) compared with placebo or control. Only one of the 6 studies not included in the meta-analysis showed a significant effect of cranberry consumption on reducing the incidence of UTIs. Side effects (bad taste being the most common) were common in most of the studies, and the dropout rate

was high in many of the studies. The authors of this review conclude that "evidence from four RCTs indicates that cranberry products can be effective in reducing UTIs. However, it may only be effective in certain sub-populations." Some evidence indicates that cranberry juice may be effective in women with symptomatic UTIs, but the evidence is inconclusive for the elderly. Moreover, the evidence is unclear as to the amount and concentration of cranberry that needs to be consumed and the duration of consumption for the intervention to be effective. A major challenge in comparison of these types of studies are the lack of measurements of the total proanthocyanidins (PAC) in the clinical materials used in each study, as these components are the presumed clinically active ingredients. Additional "properly designed studies" with PAC-standardized materials are needed to clarify these uncertainties.

—Brenda Milot, ELS

(2)

HERBAL CLIPS/ABC REVIEW\*:

### **Preventing Urinary Tract Infections with Cranberry Extract**

Bailey D, Dalton C, Daugherty FJ, Tempesta MS. **Can a concentrated cranberry extract prevent recurrent urinary tract infections in women? A pilot study.** *Phytomed.* 2007;14:237-241.

Common in women, the elderly, and infants, urinary tract infections (UTIs) are defined as the "presence of a certain threshold number of bacteria in the urine (usually greater than 100,000 per mL)." One in four women who have a UTI will have a recurrence. Cranberry (*Vaccinium macrocarpon*) products are often used to prevent UTIs. The authors report on a study to test the effects of concentrated cranberry extract on women with recurrent UTIs.

Most UTIs are caused by one type of bacterium -- *Escherichia coli*. The *E. coli* strains that cause UTIs have proteinaceous macromolecules (fimbriae) that facilitate the adhesion of bacteria to uroepithelial cells in the urinary tract. In vitro and ex vivo studies indicate that cranberry products prevent adhesion of bacteria to the cell walls of the urinary tract, thus preventing UTIs.<sup>1,2</sup> Further, biochemical studies have revealed that in addition to causing the fimbriae on the surface of the bacteria to become compressed, reducing their adhesion, the proanthocyanidins in cranberry may change the shape of the bacteria from rods to spheres and cause chemical changes in their surface membranes.<sup>3</sup>

The authors conducted an open-label pilot study for 4 months at Helios Integrated Medicine, PC in Boulder, Colorado. Twelve women aged between 25 and 70 years with a history of 6 UTIs in the past year took 1 cranberry capsule twice daily for 12

weeks. Each capsule contained 200 mg cranberry extract standardized to 30% total phenols (much higher than dried cranberries and dried juices), produced by Phenolics, LLC (El Granada, CA), by selective extraction of the berries. The total cranberry proanthocyanidin intake during the study was approx. 100 mg per day.

All of the women completed a medical history questionnaire at the beginning of the study and were asked to update it with any changes. The women had urinalysis within 24 hours before starting on the cranberry extract and monthly afterward for 4 months.

None of the women developed a UTI during the study, based on symptoms or laboratory results.

After 2 years, a follow-up was done, and the same medical history questionnaire was reviewed with each woman. At that time, eight of the women reported no changes in their health since the study began. They all continued to take various cranberry supplements prepared by different manufacturers in doses ranging from 150 to 300 mg per day, and they continued to be free from UTIs. Four women stopped taking cranberry supplements for various unrelated medical reasons. Of those, one remained free of UTIs and two developed symptoms, which resolved after resuming the supplementation. The fourth developed a UTI confirmed by urinalysis and was treated with antibiotics. She then resumed the cranberry supplements and did not have any further symptoms.

This study adds evidence to three previous studies cited by the authors that indicate the effectiveness of cranberry products in preventing UTIs in women. These study results are unique, however, in that none of the women had a recurrent infection during the study period. Also, this study used a unique cranberry product standardized to 30% phenolics.

The authors suggest that more studies are needed to determine an optimal dose and to compare this product with cranberry juice and other cranberry products containing lower concentrations of proanthocyanidins. Patients who ingest cranberry concentrate products should be cautioned about the risk for nephrolithiasis (kidney stones): urinary oxalate level in 5 volunteers were found to increase by an average 43.4% while receiving cranberry concentrate tablets.<sup>4</sup>

-Shari Henson

References:

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3) Camesano TA. In: Proceedings of 232nd ASC Meeting, San Francisco, Calif.; September 11, 2006.

4) Terris MK, Issa MM, Tacker JR.

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