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**FILE: ■ Hibiscus (*Hibiscus sabdariffa*)**  
**■ Cholesterol**  
**■ antihyperlipidemic**

**HC 050672-337**

**Date: September 28, 2007**

**RE: Hibiscus Tea May Have Cholesterol-lowering Effects**

Lin TL, Lin HH, Chen CC, Lin MC, Chou MC, Wang CJ. *Hibiscus sabdariffa* extract reduces serum cholesterol in men and women. *Nutr Res.* 2007; 27: 140-145.

Hibiscus (*Hibiscus sabdariffa*) tea and soft drinks are popular in Taiwan, where hibiscus is also a valued medicinal herb. The popular Mexican soda Jamaica is flavored with hibiscus. Hibiscus flowers contain constituents known to have cardioprotective effects, including anthocyanins, flavonoids, and polyphenols. Previous *in vivo* studies by this group have shown that hibiscus extract lowers cholesterol levels in rats and rabbits.<sup>1,2</sup> In addition, a previous *in vitro* study by this group has shown that hibiscus extract inhibits low density lipoprotein (LDL) oxidation.<sup>1</sup> The purpose of this clinical trial was to assess the effect of hibiscus extract capsules on serum cholesterol levels in subjects with high cholesterol levels (<175 mg/dL).

The hibiscus extract capsules contained 500 mg of a hot aqueous extract prepared by macerating 150 g of hibiscus flowers in 6 L of hot water for 2 hours and then drying and filtering the resulting extract. The hibiscus extract contained 2.5% anthocyanins, 1.7% polyphenols, and 1.43% flavonoids. Therefore, each 500 mg capsule contained 20.1 ± 3.0 mg anthocyanins, 10.0 ± 2.5 mg flavonoids, and 14.0 ± 2.8 mg polyphenols. A total of 42 subjects were randomized to 3 groups for the study, conducted at Chung Shan Medical University Hospital in Taichung, Taiwan. The randomization method used was not described in the paper. The study was divided into 2 study periods lasting 2 weeks for a total duration of 4 weeks. The study was designed as a randomized crossover, with each subject acting as his or her own control. This was done by comparing cholesterol levels at week 2 and week 4 with each subject's baseline levels. Group 1 received 1 capsule of extract 3 times daily (1,500 mg/day), group 2 received 2 capsules 3 times daily (3,000 mg/day), and group 3 received 3 capsules 3 times daily (4,500 mg/day). All subjects took the capsules at mealtimes to mimic usage of cholesterol medications. The subjects maintained food diaries to track their use of the capsules.

Overall, subjects in group 2 (2 capsules 3 times daily) responded best to the hibiscus extract treatment. Groups 1 and 2, but not group 3, experienced a significant reduction in serum cholesterol levels at week 4, compared with baseline levels ( $P < 0.05$  for groups 1 and 2). In addition, group 2 experienced a significant reduction in serum cholesterol levels at week 2, compared with baseline levels ( $P < 0.05$ ). At week 2, 6 out of the 14 subjects (42.9%) responded to the hibiscus extract in groups 1 and 3; and 9 out of the 14 subjects (64.3%) responded to the treatment in group 2. By week 4, group 2 had the most responders with 10 out of the 14 subjects (71.4%) experiencing reductions in serum cholesterol levels. In group 1, 7 out of 14 subjects (50.0%) were responders, and 6 out of the 14 (42.9%) subjects in group 3 were responders at week 4. Despite receiving a higher dosage, the responders in group 3 had the smallest response to the hibiscus extract with an average 8.3% reduction in serum cholesterol levels at week 4 ( $-17.7 \pm 8.1$  mg/dL,  $P < 0.05$ ). Group 1 responders experienced an average 14.4% reduction in serum cholesterol levels at week 4, compared with baseline levels ( $-29.3 \pm 34.0$  mg/dL,  $P < 0.01$ ). Group 2 responders experienced an average serum cholesterol level reduction of 12.0% at week 4 ( $-26.7 \pm 36.6$  mg/dL,  $P < 0.01$ ).

The results indicate that hibiscus flower extracts can reduce serum cholesterol levels in hypercholesterolemic adults. The authors conclude that 1,000 mg of hibiscus extract taken 3 times daily may be the optimal dose. A month of continuous treatment may be required before a significant reduction in serum cholesterol levels occurs. Future studies using a randomized placebo control design will be useful in confirming the results of this study. In addition, although the anti-hyperlipidemic effects are presumed to be due to the anti-oxidant effects the exact mechanism for the observed effects needs further investigation. .

—Marissa Oppel, MS

#### References

- 1.Chen CC, Chou FP, Ho YC, et al. Inhibitory effects of *Hibiscus sabdariffa* L. extract on low-density lipoprotein oxidation and anti-hyperlipidemia in fructose-fed and cholesterol-fed rats. *J Sci Food Agric*. 2004; 84:1989-1996.
- 2.Chen CC, Hsu JD, Wang SF, et al. *Hibiscus sabdariffa* extract inhibits the development of atherosclerosis in cholesterol-fed rabbits. *J Agric Food Chem*. Aug 27, 2003; 51(18):5472-5477.

The American Botanical Council has chosen not to include the original article.

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