P.O. Box 144345 Austin, TX 78714-4345 ▪ 512.926.4900 ▪ Fax: 512.926.2345 ▪ www.herbalgram.org

# HerbClip™



**File: ■ Coffee Berry (*Coffea* spp.)**
**■ Antioxidant Status**
**■ Anaerobic Performance**

**HC 050194-385**

**Date: September 30, 2009**

**RE: Supplementation with Coffee Berry Increases Antioxidant Capacity in Athletes**

Ostojic SM, Stojanovic, MD, Djordjevic B, Jourkesh M, Vasiljevic N. The effects of a 4-week coffee berry supplementation on antioxidant status, endurance, and anaerobic performance in college athletes. *Res Sports Med.* 2008;16:1-14.

Physical exercise increases oxygen consumption, which, in turn, increases the production of reactive oxygen species and free radicals. The increase in antioxidant capacity known to occur with endurance training may not be sufficient to neutralize this increase in free radical production. Thus, nutritional supplements rich in bioavailable antioxidants have become particularly popular in physically active persons over the past decade. However, the effects of antioxidant supplements on antioxidant status, cellular structure, and performance are not clearly understood. In physically active persons, antioxidant supplementation has been shown to have beneficial effects on performance and recovery (e.g., increased energy levels and a decreased risk of muscle injury) in some studies but to cause decreases in training efficiency and in cellular antioxidant adaptation in other studies. Therefore, the benefit of antioxidant supplementation in athletes is controversial. The objective of this study was to evaluate changes in total antioxidant capacity (TAC) and in aerobic and anaerobic performance in college athletes after supplementation with coffee (*Coffea* spp.) berry (CB).

Twenty healthy college athletes (14 men and 6 women) were recruited for this study, which was conducted at the University of Belgrade, Serbia. The subjects were randomly assigned to receive CB capsules (400 mg each twice daily) or placebo capsules (cellulose) for 28 days. Both the CB and placebo capsules were manufactured by Futureceuticals (Momence, Illinois). The subjects maintained their habitual "consumption habits" throughout the study period, but a week before baseline testing and for 4 weeks prior to experimental testing a standardized diet was employed. Between tests, similar resistance-training programs were monitored by a strength and conditioning coach. No prolonged exercise occurred for 48 hours before the experiments, performed by all on the

same day and in the same order. After completing a 15-minute warm-up consisting of sprints, the subjects completed a 60-second vertical jump test. Heart rate was measured before (baseline), during, and after the test. The highest heart rate was recorded as $HR_{max}$, and the decrease in heart rate in the first minute after the test was recorded as the heart rate recovery (HRR) index. Blood samples were collected at baseline and after the test for the measurement of glucose, total cholesterol, high-density and low-density lipoproteins, triglycerides, and TAC. Blood lactate concentrations were measured 5 minutes ($Lact_{max}$) and 10 minutes ($Lact_{rec}$) after the test. Maximal oxygen uptake was also measured during exercise. The subjects were instructed to report any adverse side effects experienced. P values >0.05 indicated significant differences.

No significant differences in baseline measures were observed between the CB and placebo groups. The mean (± SD) TAC was significantly greater in the CB group than in the placebo group after supplementation and was significantly greater after supplementation (1.66 ± 0.16 mmol/L) than at baseline (1.54 ± 0.13 mmol/L) in the CB group. The mean (± SD) HRR index was also significantly greater in the CB group than in the placebo group after supplementation and was significantly greater after supplementation (38 ± 4 beats/min) than at baseline (32 ± 9 beats/min) in the CB group. $Lact_{rec}$ decreased significantly in the CB group after supplementation (from 7.6 ± 4.2 to 5.5 ± 2.6 mmol/L) and was significantly lower in the CB group than in the placebo group after supplementation. Glucose, total cholesterol, high-density and low-density lipoproteins, triglycerides, $HR_{max}$, $Lact_{max}$, average anaerobic power, maximal oxygen uptake, and the index of anaerobic fatigue did not change significantly from baseline and were not significantly different between the CB and placebo groups after supplementation. None of the subjects reported any adverse side effects.

The results indicate that CB supplementation slightly but significantly increased TAC but had only "minimal effects" on the recovery parameters measured after exercise in college athletes. To the authors' knowledge, this study was the first to directly analyze the effects of CB supplementation on antioxidant status and exercise performance in athletes. Because no data are available in peer-reviewed journals to corroborate these data, the authors recommend that additional research be conducted to determine the possible underlying mechanisms for the observed effects. Possible variables to be studied include the changes in dosage and duration and the nature and intensity of training on anaerobic performance and endurance.

*—Brenda Milot, ELS*

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