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**File: ■ Coffee (*Coffea arabica*)
■ Grape (*Vitis vinifera*) Seed Extract
■ Cognition
■ Brain-derived Neurotrophic Factor (BDNF)**

HC 021324-473

Date: May 31, 2013

RE: Levels of a Brain Protein Involved in Cognition Increased with Whole Coffee Fruit Concentrate Powder Supplementation

Reyes-Izquierdo T, Nemzer B, Shu C, et al. Modulatory effect of coffee fruit extract on plasma levels of brain-derived neurotrophic factor in healthy subjects. *Br J Nutr.* January 14, 2013;1-6. [epub ahead of print]. doi: 10.1017/S0007114512005338.

Brain-derived neurotrophic factor (BDNF) is a secreted protein that is involved in the development, maintenance, and function of the central nervous system, where it plays an important role in learning, memory, and behavior. It is also found in the tissues of a number of systems, including the cardiovascular, immune, reproductive, and endocrine systems. It has been shown that polyphenol-rich natural products also containing caffeine can increase plasma levels of BDNF. This controlled, pilot, acute study tested the effects of 4 such products – caffeine from green coffee (*Coffea arabica*), green coffee bean extract, whole coffee fruit concentrate powder (WCFC), and grape (*Vitis vinifera*) seed extract (containing high levels of polyphenols, but no caffeine) – in healthy subjects.

Twenty-five healthy, non-smoking subjects who were 18-55 years of age and who were not taking any drugs or supplements were randomly allocated to 1 of the 5 treatments (n=5 for each) following a 12-hour fast: green coffee caffeine (N677; 72.8% caffeine); green coffee bean extract (N625; 2% caffeine); WCFC (0.7% caffeine); grape seed extract (N31; 0% caffeine); or placebo (silica dioxide; 0% caffeine). No intake amounts were provided. Funding was provided by FutureCeuticals, Inc. (Momence, Illinois), the assumed manufacturers. The subjects received no other food or drink during the course of the study. Blood was collected at baseline and 30, 60, 90, and 120 minutes after treatment intake.

WCFC significantly increased BDNF compared to placebo (P=0.001), as well as compared to its own baseline, by 137%. None of the other treatments increased BDNF significantly.

The placebo decreased BDNF by 34%, which has not previously been reported. Therefore, the authors repeated the acute intake of WCFC in 15 new subjects who also fit the inclusion/exclusion criteria. The subjects received either 50 mg of chlorogenic acid, 100 mg of WCFC, or placebo (n=5 for each). BDNF increased significantly in the WCFC group ($P<0.05$), but not in the other 2 groups.

The authors suggest that the results of this study show that BDNF levels are not influenced by either caffeine or polyphenols, as has been shown in the past, but rather, by procyanidins or the unique coffee profile of WCFC.

—*Risa Schulman, PhD*

Peer Reviewer Comments:

An expert peer reviewer of this HerbClip has written the following about this study: The statistical power of the study is in question, given that 40 subjects would be required to reach a power calculation of 80%. The reviewer also noted one dose means very little; repetitive use could have provided further information. Again, such multiple dosing presumable could be done in a larger, follow-up trial.

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

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