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**File: ■ Bacopa (*Bacopa monnieri*)**
**■ Stress**
**■ Mood**

**HC 081351-479**

**Date: August 30, 2013**

**RE: Bacopa Extract Shows Positive, but Minor, Acute Cognition, Mood, and Cortisol Effects**

Benson S, Downey LA, Stough C, Wetherell M, Zangara A, Scholey A. An acute, double-blind, placebo-controlled cross-over study of 320 mg and 640 mg doses of *Bacopa monnieri* (CDRI 08) on multitasking stress reactivity and mood. *Phytother Res*. 2013; [epub ahead of print]. doi: 10.1002/ptr.5029.

Bacopa (*Bacopa monnieri*) has been used for thousands of years to treat mental disorders. In the 21st century, it is most commonly used for cognitive enhancement. Preliminary in vivo studies have demonstrated anxiolytic, antidepressant, sedative, and adaptogenic properties. The purpose of this double-blind, placebo-controlled, crossover study was to evaluate 2 acute doses of bacopa for improving cognition, mood, anxiety, and stress.

Healthy men (n = 4) and women (n = 13), aged 18-44 years (mean age = 25.23), participated in this study conducted at Swinburne University, Melbourne, Victoria, Australia. Subjects were excluded for the following criteria: smoking; a history of psychiatric disorders or neurological diseases; having endocrine, gastrointestinal, or bleeding disorders; having chronic illness and infection; pregnancy or lactation; or taking over-the-counter (OTC) or prescription medications or herbal extracts. Subjects attended 1 practice visit to become familiar with the battery of tests, which included the multitasking framework (MTF) cognitive assessment (mental arithmetic, Stroop [reading colors written in a different color], letter search, and visual tracking) and mood measures (the Bond-Lader visual analog scale and the State-Trait Anxiety Inventory [STAI]). Then, they attended 3 test days, each separated by a 1-week washout period.

The crossover treatment sequence was computer-randomized to balance the order of treatment conditions across visits and participants. On each testing day, participants received either placebo, 320 mg of bacopa (KeenMind® [CDRI 08]; Flordis; St. Leonards, NSW, Australia), or 640 mg of bacopa. CDRI 08 is standardized to "no less than 55% total bacosides" and is a 25:1 extract prepared with 50% ethanol, made from the stems, leaves, and roots of a cultured variety of bacopa collected from West Bengal, India. The battery of MTF tests was taken on each test day at baseline, 1 hour postdose, and 2

hours postdose. Saliva was collected for cortisol testing and the mood tests were given both before and after the 1-hour and 2-hour MTF assessments.

There was no significant difference between treatments in the overall MTF score. When looking at the subscales, on the Stroop there were significant increases for all groups at certain timelines compared with their baselines. The letter search scores were significantly increased compared with baseline for the bacopa groups. For the letter search score, at 1 hour postdose the change from baseline with 320 mg of bacopa was significantly greater than the change from baseline for the placebo group ($P = 0.028$); the difference between 640 mg of bacopa and placebo at 2 hours postdose approached significance ($P = 0.074$). For subjective mood measures, at 2 hours postdose the change in the alertness score from baseline with 320 mg of bacopa was significantly greater than the change from baseline for the placebo group ($P = 0.001$); the difference between 640 mg of bacopa and placebo for this time approached significance ($P = 0.087$). The ratings for contentedness only approached significance for all times and doses. There was no significant effect on the calmness rating or STAI scores. At 1 hour and 2 hours postdose, pre-MTF cortisol levels were significantly decreased with the 640 mg dose compared with the 320 mg dose ($P = 0.017$ and $P = 0.002$, respectively), and with the 640 mg dose compared with placebo ($P = 0.18$ and $P = 0.22$, respectively). No significant post-MTF changes were observed.

The authors conclude that the positive effects suggest that bacopa has an effect at an earlier time point (1 hour) than previously studied. Also, 2 hours postdose is the time period when tasks related to reasoning and cognitive speed improved. Subjective ratings of mood and anxiety were not consistently improved. The authors state that the changes in cortisol provide a mechanism for stress reduction. This study is limited by its small population size. None of the findings are compelling because it was a placebo-controlled study, and yet the differences between bacopa and placebo were minimal. Perhaps if the study size had been larger, then more profound statistical differences would have been observed.

*—Heather S. Oliff, PhD*

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