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

HerbClip™

File: ■ Bacopa (*Bacopa monnieri*)
■ KeenMind®
■ Cognition

HC 101353-491

Date: February 28, 2014

RE: Clinical Review of the Cognitive Effects of Bacopa

Stough C, Scholey A, Cropley V, et al. Examining the cognitive effects of a special extract of *Bacopa monniera* [*sic*] (CDRI 08: KeenMind): A review of ten years of research at Swinburne University. *J Pharm Pharm Sci*. 2013;16(2):254-258.

The purpose of this review article was to summarize the clinical research evaluating bacopa (*Bacopa monnieri*) and more specifically KeenMind® (CDRI 08; Flordis; St. Leonards, NSW, Australia) for treating neurological disorders. KeenMind is an extract of bacopa that is standardized to contain 55% bacosides. Bacopa is used in traditional Ayurvedic medicine for treating memory decline, inflammation, pain, pyrexia (fever), epilepsy, and it is used as a sedative. The authors point out that other products cannot be expected to have the same efficacy as they have been grown and extracted under different conditions and will have their own unique chemical compositions.

Experimental evidence indicates that bacopa improves motor learning, acquisition, and retention; delays extinction of newly acquired behavior; has anti-inflammatory, anxiolytic, and antidepressant actions; dilates blood vessels; and has adaptogenic activity. The exact mechanism of action is unknown but possible contributing effects may include direct procholinergic action, antioxidant (flavonoid) capacity, metal chelation, anti-inflammatory effects, increased blood circulation, adaptogenic activity, and removal of beta-amyloid deposits.

The authors briefly summarize six studies conducted at their research facility. Three randomized, placebo-controlled studies evaluated healthy individuals who received 320 mg KeenMind for 90 days. A battery of cognitive testing revealed that KeenMind improved information processing speed and verbal learning, and decreased anxiety compared to placebo. One study showed that bacopa and the pharmaceutical modafinil produce a similar magnitude of cognitive improvement, but at different rates (modafinil was quicker). The acute cognitive-enhancing benefits of KeenMind were evaluated in two double-blind, placebo-controlled crossover studies where healthy subjects received 320 mg or 640 mg of KeenMind prior to conducting cognitive tasks. KeenMind improved divided attention compared with placebo, indicating that KeenMind can work acutely, as well as over a longer time frame.

The authors hypothesize that the mechanism of action for acute and chronic effects are different. Acute effects may include direct neurotransmitter changes, increase in blood flow, or increases in energy metabolism. The mechanisms associated with improvement in inflammation and antioxidant status, reduction in beta-amyloid and increases in metal chelation are likely to occur over longer time frames and be more suitable to improving cognitive function in abnormal brain states or in the ageing brain using chronic treatment.

The authors briefly summarize five studies that are underway. As the brain ages, cognitive and pathological changes occur. The authors are conducting a randomized, double-blind, placebo-controlled study of 310 subjects receiving 320 mg/day KeenMind or placebo for 12 months. The primary aim is to investigate the effects of KeenMind on cognitive performance. The secondary aims are to explore the time-course of cognitive enhancement and the potential cardiovascular and biochemical mechanisms of the cognitive enhancement. Another study will examine the effect of 320 mg/day KeenMind for 6 months on cognitive functioning in patients with Alzheimer's disease (additional study details not provided). Another study is evaluating the effect of KeenMind or placebo on 6-14-year-old boys who have a high level of hyperactivity or inattention (additional study details not provided). It is unclear when the studies that are underway will be concluded and results published.

The authors conclude that KeenMind is a safe and efficacious cognitive enhancer based on the 10 years of research conducted at their facility. Although the clinical evidence is strongest for bacopa's chronic cognitive-enhancing effects, recent studies suggest it also has acute effects. Future research should focus on the constituents responsible for the cognitive changes, and longer duration trials are needed to determine whether bacopa may offer protection against neurodegenerative disorders.

—Heather S. Oliff, PhD

Referenced article can be found at
http://ejournals.library.ualberta.ca/index.php/JPPS/article/view/19609/15279.