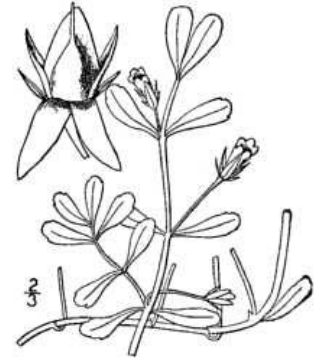


## A. Micronutrients – Herb

1. Bacopa monniera (L.) Pennell also Herpestis monniera (L.) Kunth
2. Common names: Brahmi, Herb-of-Grace and Water Hyssop.
3. Family: Scrophulariaceae
4. Entire plant is used medicinally; modern preparations are extracts of the stem and leaves(<http://www.deliciouslivingmag.com> 2005).
5. Common uses - some dating back centuries as a traditional Ayurvedic medicine:
  - a. Alzheimer's disease
  - b. Anxiety
  - c. Age-related cognitive decline (ARCD)
  - d. Epilepsy
  - e. Diuretic
  - f. ADD
  - g. Tonic for nervous system and heart
  - h. Insanity
  - i. Cognitive functions
  - j. Respiratory functions, bronchitis, asthma
  - k. Irritable bowel syndrome



USDA/Britton, N.L., and A.  
Brown. 1913. *Illustrated  
flora of the northern states  
and Canada*. Vol. 3: 192.



grams/day (Ayurvedic approach). Human research uses 300-450 mg per day of an extract standardized to contain 55% bacosides (Thorne Research 2004 ; <http://niam.com> 2005). Usage recommended as follows:

- a. infusion-two cups/day
- b. alcoholic extract-30 drops by mouth twice a day
- c. powder-two grams twice a day with warm water.
- d. Brewed in a tea is always best(Tillotson 2001)
- e. Commonly available in pill form - 250mg
  - i. 1 to 2, 2X daily
  - ii. 500 – 1000mgs total
- f. (Thorne Research 2004 ; <http://niam.com> 2005).

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## B. Vitamin B12 Cobalamin

### a. Intro

- i. Isolated in 1948 as the nutritional factor in liver that prevented pernicious anemia
- ii. Vitamin B<sub>12</sub>, a complex vitamin, is also called cobalamin because it contains the metal cobalt.
- iii. Primary functions are in the formation of red blood cells, the maintenance of a healthy nervous system and to help make DNA.

- iv. Chosen because of direct relationship with Multiple Sclerosis (MS) which I have.
- b. Use in the body
- i. Can be stored in liver, kidney and body tissues for 3-5 years.
  - ii. Complex absorption process taking about 3 hours:  
"Vitamin B<sub>12</sub> is bound to the protein in food. Hydrochloric acid in the stomach releases B<sub>12</sub> from proteins in foods during digestion. Once released, vitamin B<sub>12</sub> combines with a substance called gastric intrinsic factor (IF). This complex can then be absorbed by the intestinal tract."(Office of Dietary Supplements 2000)
- c. Beneficial effects (Murray 1996)
- i. Methyl donor – bringing carbon and hydrogen to other molecules
  - ii. Homocysteine metabolism
  - iii. Energy metabolism
  - iv. Immune function
  - v. Nerve function including synthesis of the insulating sheath around neurons
- d. Food/herbal sources
- i. Found only in animal foods including fish, meat, poultry, eggs, milk, and milk products such as organ meats, clams, and cheese.
  - ii. Vitamin B12-fortified foods such as yeast extracts, Vecon vegetable stock, veggieburger mixes, textured vegetable protein, soya milks, vegetable and sunflower margarines, and breakfast cereals.

- iii. Seaweeds and Algae show levels of B12 though the human-digestibility (effectiveness) of these sources is not reliable.(Pitchford 2002)
- e. Nutrient co-factors – Enzyme cofactor involved in the metabolism of proteins, fats, and carbohydrates and needed to produce succinyl CoA, an intermediary in the Krebs cycle that generates ATP for cellular energy (<http://www.lef.org/> 2005). EFA cofactor important for regenerating myelin sheath(Perlmutter 2002).
- f. Deficiency/excess symptoms (Herbert V 1996; Roehl 1996; Office of Dietary Supplements 2000)
  - i. Deficiency due often to inability to absorb B<sub>12</sub> from food and in strict vegetarians who do not consume any animal foods
  - ii. Signs of deficiency include anemia, fatigue, weakness, constipation, loss of appetite, weight loss, difficulty in maintaining balance, depression, confusion, dementia, poor memory, and soreness of the mouth or tongue
  - iii. can lead to neurological changes such as numbness and tingling in the hands and feet
  - iv. Signs of vitamin B<sub>12</sub> deficiency in infancy include failure to thrive, movement disorders, delayed development, and megaloblastic anemia
  - v. B12 levels often lower in persons aged 65+
- g. RDA/ODA
  - i. Under 6 mos - .3mg; 6-12 mos - .6mg; 1-3 yrs – 1mg; 4-6 yrs – 1.1mg; 7-10 yrs – 1.4mg; males 11-14 yrs – 1.7mg; males 15+ yrs – 2.0mg; females 11-14 yrs –

1.5mg; females 15+ yrs – 1.6mg; pregnant females –  
2.2mg; lactating females – 2.1mg.(Murray 1996)

- h. Therapeutic use and dosage (Office of Dietary Supplements 2000; <http://www.lef.org/> 2005)
  - i. The RDA is the minimum
  - ii. Diet can easily provide enough B12 but mal-absorption will render it useless
  - iii. Supplement may be needed if strict vegetarian, over 65yrs., or if pernicious anemia or gastrointestinal disorders exist
- i. Toxicity – none known(Roehl 1996)
- j. Preferred supplemental form – Methylcobalamin in tablet form (active upon absorption).
- k. Identify a health condition related to B12 imbalance and give recommendations for food and nutrient support
  - i. Multiple Sclerosis – confirm client is consuming and absorbing necessary Vitamin B12 for maintenance by reviewing diet. Adjust diet, adding B12 foods. Since most of these meats and cheeses are heat-producing foods, adjust diet accordingly. Review health and diet in 2-3 weeks. Assess if supplement is necessary. Supplement needed 30-45 days minimum to show effect. On occasion, treatment with high-dose injectables may be prescribed at 1cc injected IM daily for 5 days then 2x/week.(Perlmutter 2002)

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