Bacopa monnieri

(https://shop.tranceplants.net/products/bacopa-monnieri-brahmi-pure-extract-powder-20-bacosides)

TAXONOMIC CLASSIFICATION:[1]

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Lamiales

Family: Scrophuariaceae

Genus: *Bacopa*

Species: *monnieri*

Vernacular name: Brahmi

INTRODUCTION:

Bacopa monnieri, also known as Brahmi, water hyssop, thyme-leaved gratiola, and herb of grace, is a staple plant in traditional Ayurvedic medicine. It grows in wet, tropical environments, and its ability to thrive underwater makes it popular for aquarium use. *Bacopa monnieri* has been used by Ayurvedic medical practitioners for centuries for improving memory, reducing anxiety, and treating epilepsy. Research also proves that it may boost brain function and alleviate anxiety and stress, among other benefits. A class of powerful compounds called bacosides in *Bacopa monnieri* is believed to be responsible for these benefits.[2]

Bacopa monnieri interacts with the dopamine and serotonergic systems, but its main mechanism concerns promoting neuron communication. It does this by enhancing the rate at which the nervous system can communicate by increasing the growth of dendrites. It also acts an antioxidant. [3] Bacopa is commonly used for Alzheimer's disease, improving memory, anxiety, and attention deficit-

hyperactivity disorder (ADHD) etc.[7]

Brahmi is a small creeping herb with the numerous branches. It grows to a height of 2 -3 feet and its branches are 10 -35 cm

long and has oval shaped leaves that are 1-2 cm long and 3- 8 mm broad. Small-

tubular, five petaled flowers are white- purple in colour. The fruit is oval and sharp at apex. Brahmi is mostly found in marshy areas near streams and ponds throughout India especially in the North eastern regions at an elevations from sea level to altitudes of 4,400 feet.[1]

MAJOR CHEMICAL CONSTITUENTS:[4]

The main nootropic constituents of are triterpenoid saponins known as bacosides, with jujubogenin or pseudo-jujubogenin moieties as aglycone units. Novel saponins called bacopasides I–XII have also been identified more recently. The alkaloids brahmine, nicotine, and herpestine, along with d-mannitol, apigenin, hersaponin, monnierasides I–III, cucurbitacins and plantainoside B. . Also, Rastogi et al. found this bacoside profile—bacopaside I (5.37%), bacoside A3 (5.59%), bacopaside II (6.9%), bacopasaponin C isomer (7.08%), and bacopasaponin C (4.18%) in

Bacopa sample

PROPERTIES AND USES:[5][6]

- Antiepileptic activity
- Antioxidant activity
- Hepatoprotective activity
- Nerve tonic
- Anti-inflammatory
- Boosts brain function
- Helps to reduce ADHD(attention deficit hyperactivity disorder) symptoms
- Anti- cancer properties
- Lowers blood pressure
- Prevents stress and anxiety

(https://aquaticplants.co.nz/product/bacopa-monnieri/)

SIDE EFFECTS OF EXCESS CONSUMPTION:[5][6]

- Nausea
- Stomach cramps and diarrhea
- Muscle Fatigue
- Dry mouth
- GI irritation
- Flu-like symptoms

DOSAGE:

As mentioned in Ayurvedic Pharmacology, 0.125gm to 1gm of Brahmi leaf powder is safe for consumption [11]

RESEARCH:

1. A study was conducted to determine the effect of *B. monnieri* on attention, cognitive processing, working memory, and cholinergic and monoaminergic functions in healthy elderly people. Sixty healthy elderly subjects (mean age 62.62 years; SD 6.46), consisting of 23 males and 37 females, received either a standardized extract of B. monnieri (300 and 600 mg) or placebo once daily for 12 weeks. The cholinergic and monoaminergic systems functions were determined using AChE and MAO activities. Working memory was assessed using percent accuracy and reaction time of various memory tests as indices, whereas attention and cognitive processing were assessed using latencies and amplitude of N100 and P300 components of event-related potential. All assessments were performed before treatment, every four weeks throughout study period. The suppression of plasma AChE activity was observed among the groups. This suggested that *B. monnieri* can improve attention, cognitive processing, and working memory partly via the suppression of AChE activity.[9]

2. To examine the neuroprotective effects of Brahmi extract, protection against the beta-amyloid protein and glutamate-induced neurotoxicity in primary cortical cultured neurons was studied. Neuroprotective effects were determined by measuring neuronal cell viability following beta-amyloid and glutamate treatment with and without Brahmi extract. Mechanisms of neuroprotection were evaluated by monitoring cellular oxidative stress and acetylcholinesterase activity. Then results demonstrated that Brahmi extract protected neurons from beta-amyloid-induced cell death, but not glutamate-induced excitotoxicity. In addition, culture medium containing Brahmi extract appeared to promote cell survival compared to neuronal cells growing in regular culture medium.

Also, Brahmi-treated neurons expressed lower level of reactive oxygen species suggesting that Brahmi restrained intracellular oxidative stress which in turn prolonged the lifespan of the culture neurons. From this study, the mode of action of neuroprotective effects of Brahmi appeared to be the results of its antioxidant to suppress neuronal oxidative stress and the acetylcholinesterase inhibitory activities. Therefore, treating patients with Brahmi extract may be a great alternative for ameliorating neurodegenerative disorders associated with oxidative stress and Alzheimer's disease.[10]

PRECAUTION AND WARNING:[7]

- **Pregnancy and breast-feeding**: It is recommended to avoid Bacopa consumption during pregnancy
- **Slow heart rate (Bradycardia)**: Bacopa might slow down the heartbeat. This could be a problem for people who already have bradycardia
- **Gastrointestinal tract blockage**: Bacopa might cause congestion in the intestines causing problem in people who have a blockage in their intestines.
- **Ulcers**: Bacopa might increase secretions in the stomach and intestines thus worsening the ulcers.
- **Lung conditions**: Bacopa might increase fluid secretions in the lung. There is concern that this could worsen lung conditions such as asthma or emphysema.
- **Thyroid disorders**: Bacopa might increase levels of thyroid hormone. Bacopa should be used cautiously or avoided in a thyroid condition
- **Urinary tract obstruction**: Bacopa might increase secretions in the urinary tract. There is concern that this could worsen urinary obstruction.

INTERACTION WITH DRUGS:[8]

- **Anticholinergic drugs:** Bacopa might increase levels of certain chemicals in the body that work in the brain, heart, and elsewhere. These drying medications might decrease the effects of Bacopa, and Bacopa might decrease the effects of drying medications.
- Some of these drying medications include atropine, scopolamine, some medications used for allergies (antihistamines), and some medications used for depression (antidepressants)
- **Thyroid hormone Interaction :** Body naturally produces thyroid hormones. Bacopa might increase thyroid hormone the body produces. Taking Bacopa with thyroid hormone pills might cause Hyperthyroidism.
- **Various medications used for glaucoma, Alzheimer's disease, and other conditions (Cholinergic drugs):** Some of these medications used for glaucoma, Alzheimer's disease, and other conditions include pilocarpine (Pilocar and others), donepezil (Aricept), tacrine (Cognex), and others.

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