

# Bacopa SAP

Science-based cognitive-health support

*Bacopa monnieri*, commonly known as Indian pennywort and water hyssop, is well-known for its therapeutic effects, including its role in promoting memory and intellect and its efficacy in treating psychiatric disorders like hallucinations, schizophrenia, obsessive-compulsive disorder, and psychosis. Triterpenoid saponins present in bacopa, called bacosides, are primarily responsible for their efficacy in enhancing neuronal transmission by restoring synaptic activity. NFH **Bacopa SAP** provides high-quality *Bacopa monnieri* extract standardized to 45% bacosides that can help foster memory, promote cognitive health, and improve mood disorders.

## ACTIVE INGREDIENT

Each vegetable capsule contains:

Bacopa (*Bacopa monnieri*) 25:1  
whole herb top extract (45% bacosides) ..... 300 mg

**NON-MEDICINAL INGREDIENTS:** Microcrystalline cellulose, vegetable magnesium stearate, and silicon dioxide in a non-GMO vegetable capsule composed of vegetable carbohydrate gum and purified water.

**This product is non-GMO and vegan-friendly.**

**Contains no:** Gluten, soy, wheat, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

**Bacopa SAP** contains 60 capsules per bottle.

## DIRECTIONS FOR USE

Take 1 capsule daily or as directed by your healthcare practitioner.

## INDICATIONS

**Bacopa SAP** can help:

- Improve memory
- Promote cognitive function
- Foster mental health
- Support cardiovascular health

## CAUTIONS AND WARNINGS

Consult a healthcare practitioner prior to use if you are pregnant or breastfeeding.

## KNOWN ADVERSE REACTIONS

May cause digestive problems.

## PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for each **Bacopa SAP** lot number have been tested by an ISO 17025-accredited third-party laboratory for identity, potency, and purity.



Scientific Advisory Panel (SAP):  
adding nutraceutical research  
to achieve optimum health



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*Bacopa monnieri*, commonly known as Indian pennywort and water hyssop, is native to India, Bangladesh, and a few parts of southern Asia.<sup>[1]</sup> Bacopa, or brahmi, is known for its therapeutic effects, including its efficacy in promoting memory and intellect and in treating psychiatric disorders like hallucinations, schizophrenia, obsessive-compulsive disorder, and psychosis.<sup>[2]</sup> The mechanism of action of bacopa is explained by its antioxidant neuroprotection potential through the reduction of metal ions, free-radical scavenging, and inhibiting lipid peroxidation. It also reduces  $\beta$ -amyloid synthesis, increases cerebral blood flow, and modulates neurotransmitters.<sup>[3]</sup> Triterpenoid saponins present in bacopa, called bacosides, are primarily responsible for its efficacy in enhancing neuronal transmission by restoring synaptic activity.<sup>[4]</sup> The other saponins include bacoside A3, bacoside II, bacosaponin C isomer, bacosaponin C, and bacoside I.<sup>[5]</sup> A study evaluated nine different extraction techniques and concluded that methanolic extract of soaked bacopa plant material yielded the highest amount of saponins.<sup>[5]</sup>

## COGNITIVE BENEFITS

A prime reason for defective cognition is the oxidative damage of brain cells by reactive oxygen species. A study on diabetic rats showed that oral administration of bacopa extract (50, 125, and 250 mg/kg body weight) helped significantly reverse the peroxidative damage with its excellent antioxidant potential.<sup>[6]</sup> A similar study on prepubertal mice showed that the herb could help in minimizing malondialdehyde levels, reactive-species generation, hydroperoxide levels, and protein carbonyls; thereby, a substantial drop in acetylcholinesterase activity was observed in all brain regions.<sup>[7]</sup> A meta-analysis of nine randomized, placebo-controlled, clinical studies showed that supplementation of 300 to 600 mg/d of *Bacopa monnieri* extract helped significantly enhance cognition, leading to a substantial enhancement in speed of attention.<sup>[8]</sup> Likewise, a systematic review of bacopa supplements showed that it helped enhance cognitive abilities such as memory-free recall after receiving 300 to 450 mg/d of supplement.<sup>[9]</sup>

## ANXIETY RELIEF

Several animal and human trials have shown that bacopa has proven anxiolytic, antidepressant, and memory-enhancing efficacy.<sup>[10]</sup> In a study on Wistar rats that had ethanol-induced anxiolysis and withdrawal anxiety, the rats were supplemented with 50, 100, 200, and 400 mg/kg of tween-80-extracted bacopa. All of the doses showed substantial anxiolytic effects.<sup>[11]</sup> A clinical intervention studied the effect of 300 mg of *Bacopa monnieri* extract: It revealed that the extract helped improve the Rey Auditory Verbal Learning Test score and helped in a substantial decrease in heart rate and anxiety score.<sup>[12]</sup> Also, in two other trials of KeenMind and BacMind, the extract showed significant improvement in the retention of information and betterment of anxiety scores, respectively.<sup>[13, 14]</sup>

## ALZHEIMER'S DISEASE

Elevation of lipid peroxidation in the patient's brain has been shown to be the key driver of Alzheimer's disease pathophysiology.<sup>[15]</sup> As mentioned above, bacopa has exceptional antioxidant potential; thus, it is predicted to be a promising treatment option for the disease.<sup>[6, 15]</sup> Male Wistar rats administered with bacopa had reduced cholinergic neuron densities and improved Morris water-maze test's escape-latency time.<sup>[15]</sup> A type of peptide called A $\beta$  is known to play a prominent role in the Alzheimer's disease progression. When incubated with bacoside A, A $\beta$ 42 significantly reduces, inhibiting its interaction with the membrane.<sup>[16]</sup> Research on delivering bacopa nanoparticles in liposomes, polymeric micelles, and polymersomes to specific target areas, including the brain, is in the pipeline.<sup>[17]</sup> A phase II clinical study used 300 mg of bacopa extract: It showed that it led to a significant change in the total postgraduate institute (PGI) memory scale compared to Donepezil-treated individuals.<sup>[18]</sup> Similarly, an open-label study found that the extract significantly improved orientation of time, place attention, and language components in reading, writing, and comprehension, and substantially decreased irritability and insomnia.<sup>[19]</sup>

## SEIZURE MANAGEMENT

Seizures become pronounced when disruption in *gamma*-aminobutyric acid (GABA) balance occurs. GABA is the primary inhibitory neurotransmitter in the cerebral cortex, and it sets the inhibitory quality to balance neuronal excitation.<sup>[20]</sup> A study on epileptic rats showed bacopa extract and bacoside A helped in reversing epilepsy-associated symptoms, and it correlated with the decrease in the GABA receptors.<sup>[21]</sup> A similar animal-based study showed that bacopa extract helped increase acetylcholine levels, reversing the seizure.<sup>[22]</sup>

## MENTAL HEALTH SUPPORT

In Parkinson's disease-affected rats, bacopa exhibited promising antioxidant activity and helped reduce inflammation in various parts of the brain.<sup>[23]</sup> Another preclinical study showed that bacopa extract has a neuroprotective potential, and it prevented MPTP-induced (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) degeneration of the nigrostriatal dopaminergic neurons.<sup>[24]</sup> A clinical intervention showed that 225 to 450 mg of bacopa extract can significantly improve emotional function and substantially enhance quality-of-life and motor outcomes.<sup>[25]</sup> Improvement in motor speed was seen in another randomized clinical trial; this study also suggested an increase in serum calcium levels after receiving bacopa

supplementation.<sup>[26]</sup> Likewise, human intervention, including 450 mg of bacopa extract, improved the digit-span backward test, list-learning delayed-recall test, and paired-associates dissimilar delayed-recall test, and showed a substantial enhancement in attention and verbal memory.<sup>[27]</sup> A randomized clinical study reported decreased pain-related symptoms and improved emotional wellbeing and general health, with 100 participants receiving 300 mg/d of bacopa for 28 days.<sup>[28]</sup> Similarly, in a study on 42 individuals affected by anhedonia, bacopa significantly improved the Snaith-Hamilton Pleasure Scale score and substantially enhanced the Hamilton depression rating scale.<sup>[29]</sup>

## VASCULAR FUNCTION

A study on rabbits and guinea pigs showed the remarkable spasmolytic effect of the bacopa extract on smooth muscles, primarily attributed to its powerful ability to inhibit calcium influx through both voltage- and receptor-operated calcium channels.<sup>[30]</sup> The vasodilation effect of bacopa's chemical components, such as flavonoids (luteolin and apigenin), bacoside I, and the saponin mixture (bacoside A), was studied: The results revealed that flavonoids had twice as much vasodilating potential as saponins in the bacopa extract.<sup>[31]</sup> A clinical study on patients aged over 65 years exhibited a marginal improvement in microvascular blood and a substantial decrease in memory recall after receiving 194 mg/d of *Bacopa monnieri* extract for 12 weeks.<sup>[32]</sup> In a study of the effect of bacopa extract on rat cerebral cortex using laser, Doppler showed that it enhanced the cerebral blood flow.<sup>[33]</sup>

## HYPOTHYROIDISM

A study on the effect of bacopa on thyroid function analyzed the thyroid hormone levels in plasma; lipid profile; and enzymes such as catalase, superoxide dismutase, and reduced glutathione. The results exhibited a significant increase in T3 and T4 levels and a corresponding drop in the TSH level.<sup>[34]</sup> A study on male rats has shown that bacopa can stimulate the thyroid gland and increase the concentration of T4 hormone by a noteworthy 41%. This is achieved without causing any adverse effects on the liver, such as lipid peroxidation (LPO). These findings suggest that *B. monnieri* could be used as a safe and effective thyroid-stimulating drug.<sup>[35]</sup> Likewise, a preclinical study on the effect of aluminum on thyroid gland function showed that the administration of 40 mg/kg body weight of bacopa can help nullify the ill-effects of the metal.<sup>[36]</sup>

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## INDICATION SPECIFIC DOSAGE SUMMARY BASED ON HUMAN CLINICAL RESEARCH#

#Please note these suggestions are guidelines based on the clinical studies. Evidence for efficacy and safety have been qualitatively (study quality in terms of study design, sample size, appropriate methods of analysis, use of appropriate placebo/control, bias, etc.) assessed and have been rated using a 5-star ★ rating classification.

| Indication                           | Suggested dosage    | Supporting evidence and study outcome  | Study design   | Outcome measures  | Safety   | Evidence quality rating |
|--------------------------------------|---------------------|--|--|---|--|-------------------------|
| <b>Mental Health</b>                 |                     |  |  |   |  |                         |
| Cognition <sup>1,2,3,4,5</sup>       | 1 to 2 capsules/day | Significant improvement in the cognitive performances postdosage including serial 3s and 7s subtraction.   | Randomized, double-blind, placebo-controlled, crossover study.<br><i>n</i> = 24; 320 mg or 640 mg of <i>Bacopa monnieri</i> extract for 2 hours.               | Cognitive Demand Battery, stress and mental fatigue, visual analogue scale, Rapid Visual Information Processing task, blood pressure  | No severe adverse effects were reported  | ★★★★                    |
|                                      | 1 to 2 capsules/day | Significant enhancement of cognition, additionally a substantial enhancement in speed of attention postdosage.   | 9 randomized, placebo-controlled studies.<br><i>n</i> = 518; 300 to 600 mg/d of <i>Bacopa monnieri</i> extract for 12 to 24 weeks.                             | Memory function, attention  | No severe adverse effects were reported (gastrointestinal problems like stool frequency, nausea, abdominal cramps)                             | ★★★★★                   |
|                                      | 1 to 2 capsules/day | Significant improvement in the cognitive abilities such as memory free recall after receiving the supplement.  | 6 randomized, parallel group, double-blind, and placebo-controlled studies.<br><i>n</i> = 454; 300 to 450 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks. | Reasoning, language behaviour, memory, visual perception, auditory perception, mental speed   | No severe adverse effects were reported  | ★★★★★                   |
|                                      | 1 capsule/day       | Significant improvement in spatial working memory accuracy; also a substantial decline in the false positives in Rapid Visual Information Processing Task in the supplemented group.                 | Randomized, double-blind, placebo-controlled, independent group design study.<br><i>n</i> = 62; 300 mg/d of <i>Bacopa monnieri</i> extract for 90 days.        | Cognitive Drug Research cognitive assessment system, Rapid Visual Information Processing Task   | No severe adverse effects were reported  | ★★★★                    |
|                                      | 1 capsule/day       | Significant improvement in verbal learning, memory acquisition, and delayed recall; also a substantial improvement the Rey-Osterrieth Complex Figure Test and Memory Complaint Questionnaire scores. | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 98; 300 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks.                                 | Audioverbal and visual memory performance, the Rey-Osterrieth Complex Figure Test, the Reitan Trail Making Test, the Memory Complaint Questionnaire                               | No severe adverse effects were reported (gastrointestinal problems)  | ★★★★                    |
| Anxiety <sup>6,7,8,9</sup>           | 1 capsule/day       | Significant improvement in visual information processing speed, and a substantial improvement in anxiety.  | Randomized, double-blind, placebo-controlled, independent group design study.<br><i>n</i> = 46; 300 mg/d of <i>Bacopa monnieri</i> extract for 90 days.        | Neuropsychological test battery, learning rate, memory consolidation, Rey Auditory Verbal Learning test   | No severe adverse effects were reported (nausea, dry mouth, fatigue)   | ★★★★                    |
|                                      | 1 capsule/day       | Significant improvement in the Rey Auditory Verbal Learning Test score; also a substantial decrease in heart rate and anxiety score after supplementation.   | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 54; 300 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks.                                 | Rey Auditory Verbal Learning test, State-Trait Anxiety Inventory, Center for Epidemiologic Studies Depression scale (CESD)-10 depression scale, the Profile of Mood States        | No severe adverse effects were reported (gastrointestinal problems)  | ★★★★                    |
|                                      | 1 to 2 capsules/day | Significant improvement in the retention of information, suggesting the antioxidant potential of the supplement within the hippocampus.  | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 76; 300 to 450 mg/d of <i>Bacopa monnieri</i> extract for three months.                      | Memory performance; visual span task; speeded coding task; delayed recall; Depression, Anxiety and Stress Scale   | No severe adverse effects were reported (gastrointestinal problems)  | ★★★★                    |
|                                      | 2 capsules/day      | Although no significant improvement in cognition, there was a significant improvement corresponding to the anxiety scores.   | Randomized, double-blind, placebo-controlled parallel-design study.<br><i>n</i> = 72; 450 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks.                 | Verbal learning and memory, inspection time, attention, interference, state, and trait anxiety scores   | No severe adverse effects were reported  | ★★★★                    |
| Alzheimer's disease <sup>10,11</sup> | 1 capsule/day       | A significant difference in the change in total postgraduate institute (PGI) memory scale in the <i>Bacopa monnieri</i> extract-treated patients when compared to Donepezil-treated individuals.     | Randomized, double-blind, parallel-group, phase-2 single-centre study.<br><i>n</i> = 48; 300 mg/d of <i>Bacopa monnieri</i> extract for 52 weeks.              | Memory Scale, Mini-Mental State Examination, Wechsler Memory Scale, Alzheimer's disease assessment scale-cognitive subscale (ADAS-Cog), postgraduate institute (PGI) memory scale | No severe adverse effects were reported (nausea, diarrhea, asthenia, arthralgia, headache, dizziness, anxiety, restlessness, insomnia, crying) | ★★                      |



|                                   |                     |  |  |   |   |      |
|-----------------------------------|---------------------|--|--|---|---|------|
|                                   | 2 capsules/day      | Significant improvement in orientation of time, place, attention, and language component in terms of reading, writing, and comprehension; also a substantial decrease in irritability and insomnia.      | Open label, prospective, uncontrolled, nonrandomized study.<br><i>n</i> = 39; 600 mg/d of <i>Bacopa monnieri</i> extract for six months.                           | Mini Mental State Examination Scale   | No severe adverse effects were reported | ★★   |
| Parkinson's disease <sup>12</sup> | 1 to 2 capsules/day | Significant improvement in the emotional function after receiving the supplementation; also a substantial enhancement in the quality of life and motor outcomes.   | Nonrandomized, primary, interventional, controlled, parallel, double-blind study.<br><i>n</i> = 20; 225 or 450 mg/d of <i>Bacopa monnieri</i> extract for 90 days. | Parkinson's Disease Quality-of-Life (PDQL) questionnaire, the Hoehn and Yahr (HY) Disability Stages Scale (Degree of Disability Scale), Unified Parkinson's Disease Rating Scale                | No severe adverse effects were reported | ★★★★ |
| Motor speed <sup>13</sup>         | 1 capsule/day       | Significant improvement in cognitive functions after supplementation; also a substantial increase in serum calcium levels.   | Randomized, double-blind, placebo-controlled, noncrossover, parallel study.<br><i>n</i> = 60; 300 mg/d of <i>Bacopa monnieri</i> extract for six weeks.            | Digit Span Memory Task, Paired Associate Task, Logical Memory Test (Story Recall), Memory Span for Nonsense Syllables, Finger Tapping Test, Choice Discrimination Test                          | No severe adverse effects were reported | ★★★★ |
| Working memory <sup>14</sup>      | 1 to 2 capsules/day | Significant improvement in digit-span backward test, list-learning delayed-recall test, paired-associates dissimilar delayed-recall test; also a substantial enhancement in attention and verbal memory. | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 65; 450 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks.                                     | Attention tests, memory verbal, speed of information processing, neuropsychological tests   | No severe adverse effects were reported | ★★★★ |
| Emotional wellbeing <sup>15</sup> | 1 capsule/day       | Significant improvement in emotional wellbeing and general health; also a substantial enhancement in pain-related symptoms. A decrease in immunoglobulin A and $\alpha$ -amylase was also noticed.       | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 100; 300 mg/d of <i>Bacopa monnieri</i> extract for 28 days.                                     | Bergen Insomnia Scale (primary outcome measure); Functional Outcomes of Sleep Questionnaire; Pittsburgh Sleep Diary; Short Form-36 Health Survey; and the Depression, Anxiety, and Stress Scale | No severe adverse effects were reported | ★★   |
| Anhedonia <sup>16</sup>           | 2 capsules/day      | Significant improvement in the Snaith-Hamilton Pleasure Scale score; also a substantial enhancement in the Hamilton depression rating scale.   | Randomized, controlled study.<br><i>n</i> = 42; 600 mg/d of <i>Bacopa monnieri</i> extract for four weeks.   | Snaith-Hamilton Pleasure Scale score, Hamilton depression rating scale  | No severe adverse effects were reported | ★★   |

## Cardiovascular Health

|                                 |               |   |   |   |   |      |
|---------------------------------|---------------|---|---|---|---|------|
| Vascular function <sup>17</sup> | 1 capsule/day | A marginal improvement was noticed in microvascular blood; also a substantial decrease in memory recall in patients aged over 65 years. | Randomized, double-blind, placebo-controlled study.<br><i>n</i> = 100; 194 mg/d of <i>Bacopa monnieri</i> extract for 12 weeks. | Battery of memory functions, carotid blood velocity, postischemic microvascular blood | No severe adverse effects were reported | ★★★★ |
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