



DOSSIER · SUBSTANCE

Bacopa Monnieri (Brahmi)

Bacopa monnieri is a **plant-based nootropic** from **Ayurveda medicine**, whose **human data situation is still under development**. The controlled studies focus on **cognitive functions**, yet the evidence remains limited and methodologically heterogeneous.

105

STUDIES IN
TOTAL

11

IN HUMANS

7

OF WHICH
CONTROLLED

32

IN ANIMALS

12

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-15

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

Bacopa monnieri (Brahmi) at a Glance

ORIGIN:
Bacopa monnieri (Brahmi) is a succulent plant from the plantain family (Plantaginaceae), native to wetlands in South Asia.

EVIDENCE BASE:
105 evaluated studies · 7 controlled human studies · 4 observational studies · 3 review articles · 32 animal studies · 12 cell culture studies

- STRONGEST EVIDENCE:**
- Cognition and Psyche A randomised, placebo-controlled study (Stough et al., 2008) in 54 healthy older participants (mean 73.5 years) showed significant improvements in verbal long-term memory (Rey Auditory Verbal Learning Test) after 12 weeks of 300 mg/day standardised Bacopa monnieri extract, but not in executive functions or mood.
 - Cognition in mild cognitive impairment (AAMI) Raghav et al. (2006) documented improvements in mental control, logical memory and paired-associate learning under Bacopa monnieri in a 12-week study with 40 AAMI patients, albeit with a small sample (n=20 per group) and without dose-response analysis.
 - Meta-analysis of cognitive effects Neale et al. (2013) calculated an effect size of d=0.95 for delayed word recall under Bacopa monnieri in a meta-analysis based on placebo-controlled studies with chronic intake. The effect appeared in verbal memory; acute effects were not observed.
 - Combination therapies (Ayurveda) Govindarajan et al. showed in a non-placebo-controlled study that Brahmi Ghrita (with Bacopa monnieri) in combination with yoga produced significant improvements in the Rey Auditory Verbal Learning Test and other cognitive measures, with the combination therapy yielding stronger effects than the individual interventions.

- LIMITATIONS:**
- Standardisation of extracts is inconsistent: some studies use Bacoside A as the marker substance, others total bacoside content, which complicates dose comparisons and replications.
 - Bioavailability of the bacosides is low because they are hydrophilic. Preclinical data suggest they cross the blood-brain barrier only to a limited extent; whether this is clinically relevant in humans remains to be clarified.
 - Studies on non-cognitive applications (e.g. hypertension, inflammatory processes, oncology) are based on preclinical data or small human studies. The clinical relevance of these findings for humans has not been investigated.

CLASSIFICATION:
Bacopa monnieri is a herbal nootropic from Ayurvedic medicine with demonstrated effects on verbal memory in older participants. Preclinical data point to neuroprotective, antioxidant and anti-inflammatory mechanisms. Whether these mechanisms are clinically relevant in humans remains to be clarified.

1. What Bacopa Monnieri Is and How It Is Studied

Bacopa monnieri (Brahmi) is a succulent plant from the plantain family (Plantaginaceae) native to wetlands in South Asia. In Ayurvedic medicine it has been used for centuries to promote mental clarity and as a Rasayana (rejuvenative). The bioactive constituents are primarily bacosides (a mixture of dammarane-type saponins), including Bacoside A and B, as well as alkaloids, flavonoids and phytosterols. The plant is usually studied as a standardised extract (e.g. with 50 % bacosides), although the composition varies according to growing region, harvest time and extraction method.

Measurement of the bacosides is central to comparability of the studies, yet standardisation remains inconsistent. While some studies quantify Bacoside A as the marker substance, others use total bacoside content or omit detailed phytochemistry. Bioavailability of the bacosides is low because they are hydrophilic and cross the blood-brain barrier only to a limited extent. Animal and cell studies indicate that metabolised forms (e.g. Bacoside A derivatives) may be more active than the native compounds. The dose-response relationship has not been systematically examined in human studies, which makes conclusions about optimal application protocols difficult.

2. What the Studies Show in Detail

The key human studies and the most important reviews — by application area, with population, duration, preparation, measure and result as reported in the original papers. Numbers appear only where the study states them.

Distribution of controlled human studies by application area — the numbers are not additive because one study may be assigned to several areas:

APPLICATION AREA	CONTROLLED STUDIES
Cognition and Psyche	7
Fatigue and stress	3
Safety and tolerability	3
Heart and circulation	2
Metabolism	1

Cognition and Psyche

The randomised, double-blind, placebo-controlled study by Stough et al. (2008) ¹ examined the effect of a standardised *Bacopa monnieri* dry extract (300 mg/day orally) over 12 weeks in 54 healthy participants aged 65 and over (mean 73.5 years). The primary endpoint was delayed recall in the Rey Auditory Verbal Learning Test (AVLT). Secondary measures included the Stroop Task (interference control), Divided Attention Task (DAT), WAIS Letter-Digit Test (working memory) and affective parameters (State-Trait Anxiety Inventory, CESD-10 depression scale, Profile of Mood States). Affective measures remained unchanged. Limitations were the small sample (n = 24 per group after drop-outs) and the lack of differentiation by baseline cognitive level. The study suggests a specific effect on verbal long-term memory but not on executive functions or mood.

Raghav et al. The intervention phase lasted 12 weeks followed by a 4-week placebo follow-up. Mental control, logical memory, digit span (forward/backward), visual reproduction and paired-associate learning were assessed. The study provides an indication of an effect in AAMI, but has methodological limitations: the sample was small (n = 20 per group) and there was no detailed characterisation of cognitive deficits at baseline. In addition, no dose-response relationship was examined.

Neale et al. (2013) ³ calculated effect sizes (Cohen's d) for cognitive effects of various nootropics, including *Bacopa monnieri*, in a meta-analysis. For *Bacopa* one placebo-controlled study with chronic intake included in the analysis showed an effect size of d = 0.95 for delayed word recall. The analysis provides an indication that *Bacopa* improves verbal memory in particular, while acute effects (as seen with ginseng) were not observed. A limitation is that the underlying studies used heterogeneous populations (healthy older adults, AAMI patients) and different extract standardisations, which restricts comparability. The effect size of 0.95 requires replication in larger cohorts.

Govindarajan et al. investigated *Brahmi Ghrita* (an Ayurvedic combination containing *Bacopa monnieri* and other plant and animal constituents) in a non-placebo-controlled study with 23 participants in the AR group who received 5 mL of the preparation twice daily with milk. The control groups underwent yoga or a combination of yoga and AR. Executive functions, verbal fluency, attention, processing speed, short-term and working memory as well as learning and verbal memory performance were assessed. The AR group showed significant improvements in the Rey Auditory Verbal Learning Test (Hits, p < 0.016) and other cognitive measures, with the combination therapy (yoga + AR) producing the strongest effects. Limitations are the absence of a placebo control, the short intervention duration and the lack of isolation of the *Bacopa monnieri* effect within the combination preparation. The study suggests that the combination may act synergistically, but this needs to be tested in randomised designs with the single substance.

The lack of effect on executive functions or mood in ¹ could indicate selective influence on hippocampal networks responsible for the consolidation of declarative memory contents. However, imaging or neurophysiological studies that would support this hypothesis are still lacking.

Long-term studies (> 12 months) with large samples investigating the efficacy of *Bacopa monnieri* in manifest neurodegenerative diseases (e.g. Alzheimer's dementia) or in younger populations with cognitive deficits (e.g. ADHD) are lacking.

Inflammatory Processes

The study by García-Rodríguez et al. (2022) ⁸ examined the effect of polyphenols from *Bacopa procumbens* (not the *Bacopa monnieri* discussed here) on wound healing in vitro and in vivo. The HPLC/QTOF-MS analysis identified several polyphenols in the aqueous fraction, including flavonoids and phenolic acids. In a rat model with excisional wounds, the extract was embedded in a hydrogel and applied topically. Histological and mechanical analyses showed accelerated wound healing (shortening by at least 48 h), reduced inflammation, increased cell proliferation and improved collagen organisation. The results are preclinical and permit no conclusions regarding *Bacopa monnieri* or humans.

HYPOTHESIS The preclinical anti-inflammatory and wound-healing effects observed with polyphenols from *Bacopa procumbens* ⁸ may indicate modulation of pro-inflammatory cytokines (e.g. IL-6, TNF- α) and stimulation of angiogenesis. Whether comparable effects occur with *Bacopa monnieri* or in humans remains to be determined.

Clinical studies in humans examining the anti-inflammatory effect of *Bacopa monnieri* in systemic or local inflammatory processes (e.g. rheumatoid arthritis, inflammatory bowel diseases) are lacking.

Metabolism and Oxidative Stress

The review by Anbarasi et al. (2015) summarises preclinical data on the effect of Bacoside A (a principal constituent of *Bacopa monnieri*) on cigarette-smoke-induced changes in the rat brain. Chronic exposure to cigarette smoke led to histological damage, neurotransmitter dysregulation (e.g. reduced dopamine and serotonin levels), increased lipid peroxidation, mitochondrial dysfunction, membrane alterations and apoptotic cell death. Oral administration of Bacoside A (dose not specified) significantly reduced these damages in preclinical models, normalised neurotransmitter levels and lowered oxidative stress. The authors conclude that Bacoside A showed neuroprotective effects in preclinical studies by up-regulating antioxidant enzymes (e.g. superoxide dismutase, catalase) and preserving mitochondrial integrity. An effect in humans has not been investigated. It is also limiting that the study presents no original data but is based on earlier animal studies, and that information on the Bacoside A dose and purity used is missing.

The review by Sharma et al. (2025) examines the antioxidant mechanisms of Bacoside and its derivatives in Alzheimer's dementia (AD). The authors describe that Bacoside reduced the accumulation of β -amyloid plaques by inhibiting β -secretase activity and decreased the formation of reactive oxygen species (ROS) in preclinical models. In addition, tau hyperphosphorylation was inhibited in preclinical studies, leading to a reduction in neurofibrillary tangles. An effect in humans has not been investigated. It is also limiting that information on the Bacoside concentrations used and bioavailability in the human brain is missing.

These preclinical mechanisms could play a role not only in neurodegenerative diseases but also in other oxidative-stress-associated conditions (e.g. diabetes, cardiovascular diseases). However, this is a hypothesis that has not yet been confirmed by clinical studies in humans.

Whether the antioxidant and metabolism-modulating effect of *Bacopa monnieri* or Bacoside A can be systematically demonstrated in specific diseases (e.g. metabolic syndrome, diabetes mellitus) remains to be determined.

Oncology

The study by Janardhanan et al. (2017) ⁷ investigated the effect of Bacoside A on human glioblastoma cell lines (GBM) in preclinical models. Bacoside A induced a specific form of cell death through *catastrophic macropinocytosis* in cell cultures, a process in which cells lyse due to excessive fluid uptake. Mechanistically, hyperphosphorylation of calcium/calmodulin-dependent protein kinase IIA (CaMKIIA) was demonstrated, leading to calcium release from the endoplasmic reticulum and activation of apoptotic signalling pathways. The study showed that Bacoside A dose-dependently reduced the survival of GBM cells, while normal astrocytes were unaffected. Whether Bacoside A is bioavailable in the human brain or could be therapeutically effective has not been investigated. In addition, animal models or clinical data are lacking.

HYPOTHESIS The tumour-selective effect of Bacoside A in cell cultures ⁷ could be attributable to differences in calcium homeostasis between malignant and normal cells. Glioblastoma cells often exhibit dysregulated calcium signalling, which may render them more susceptible to Bacoside-A-induced macropinocytosis. These preclinical results suggest a possible therapeutic window, yet the effect in humans remains unexamined. Further preclinical and clinical studies are required to assess safety and efficacy.

Clinical studies in humans on the antitumour effect of *Bacopa monnieri* or Bacoside A in glioblastoma or other tumour entities are still lacking. Preclinical models to test the transferability of the cell findings to humans are currently being developed.

Overall Picture

HYPOTHESIS The preclinical indications of antioxidant mechanisms as well as the evidence from cell and animal models on inflammatory processes and oncology point to possible effects, yet clinical studies in humans that directly link these mechanisms to cognitive, neurodegenerative or oncological endpoints remain to be conducted.

While the wound-healing study ⁸ shows promising results for *Bacopa procumbens*, it remains unclear whether these are transferable to *Bacopa monnieri*. The oncological data ⁷ suggest a novel mechanism of cell death in glioblastoma cells, yet preclinical models examining transferability to humans are missing. Overall, the study situation is heterogeneous, which is attributable to differing extract standardisations, dosages and populations. In addition, long-term studies examining the safety and efficacy of *Bacopa monnieri* in chronic diseases are lacking.

Methodology of the study situation

[The methodological quality of the studies on *Bacopa monnieri* varies considerably between the fields of application. Typical endpoints are standardised cognitive tests (e.g. AVLT, Stroop Task) and affective measures (e.g. HAM-A, CESD-10). However, dose-response analyses are frequently missing, and the studies are often underpowered to perform subgroup analyses (e.g. by baseline cognition). The inflammation research ⁸ and oncology ⁷ rely on in vitro or animal models, with transferability to humans remaining unclear. B. ADHD, dementia), and (4) mechanistic studies in humans that incorporate neurophysiological or imaging endpoints.]

Bacopa monnieri: cognition yes, but how and for whom?

THE ASSUMPTION THAT BACOPA MONNIERI GENERALLY IMPROVES COGNITIVE PERFORMANCE RESTS ON FEW CONTROLLED STUDIES WITH A NARROW FOCUS

. The most-cited work (2008) shows effects on memory and attention in older participants, yet the study duration was only 12 weeks, and the long-term effect is unknown. A replication with younger participants is likewise absent, as are comparisons with established nootropics. The heterogeneous standardisation of the extracts also complicates statements on efficacy: while some studies use Bacoside A as a marker, others employ total Bacoside contents, rendering dose comparisons impossible.

THE TRANSFERABILITY OF THE RESULTS IS LIMITED

, as most studies were conducted in India. Cultural, dietary or genetic factors could influence absorption and metabolism. In addition, data on interactions with medicines (e.g. antidepressants, antihypertensives) or chronic diseases are lacking. The safety data are based on short-term observations and provide no information on long-term risks (e.g. liver burden, hormonal effects). The lack of systematic recording of adverse effects in older studies (e.g. 2006) also raises questions about tolerability**.

3. How Robust the Research Is

Research on *Bacopa monnieri* is distributed unevenly across basic, animal and human studies. A substantial portion of the work falls under basic research (e.g. phytochemistry, mechanisms) and animal models (primarily rats), while only a minority concerns human studies. Of these, most are controlled studies that focus almost exclusively on cognitive functions. Further fields of application such as fatigue, cardiovascular parameters or metabolism are represented by only a few studies. The most-cited human studies (2006–2008) examine cognitive performance in older participants, whereas more recent work (from 2019) tests combination preparations (e.g. with Ashwagandha) or specific indications such as hypertension or depression.

The human studies on *Bacopa monnieri* show small samples, short durations and methodological weaknesses. The most-cited study (2008) demonstrated significant effects on cognition, yet replication in independent cohorts remains to be done. Combination studies (e.g. with yoga or other Ayurvedic preparations) permit no conclusions about *Bacopa monnieri* alone. The safety data derive from three small studies and are not transferable to long-term use. Preclinical studies (animal and cell models) indicate antioxidant, neuroprotective and anti-inflammatory mechanisms, yet these mechanisms have not been examined in humans. The data situation on non-cognitive applications (e.g. hypertension) is too limited for an evaluation.

4. What Is Frequently Claimed — and What the Data Support

CLAIM	STUDY SITUATION
Bacopa monnieri improves memory in healthy individuals	The available data are limited to controlled studies , the majority of which involve older participants or individuals with mild cognitive impairments . There are
Bacopa monnieri has antidepressant or anxiolytic effects	Only one controlled study investigates depression , albeit in combination with Ashwagandha . Animal studies show antidepressant effects , yet the transfer to humans
Bacopa monnieri lowers blood pressure	A single controlled study examines hypertension , albeit in combination with Sarpagandha . Mechanistic indications from animal studies exist, yet clinical data
Bacopa monnieri is safe for long-term use	The safety data come from small studies with a maximum duration of 12 weeks . Long-term risks (e.g. liver toxicity, hormonal effects) have not been investigated

5. Profile: Molecule and Charge

Bacopa monnieri (Brahmi) is not a single molecule but a **mixture** — there is no molecular formula and no fixed molecular mass. What can be described are functional groups, charge behaviour and redox properties; this is exactly what the next section addresses.

6. Charge, Electrons, Radicals

Bacopa extracts show electrochemical properties in laboratory and animal studies that suggest radical-scavenging characteristics. In cell cultures, significant scavenging activity against 1,1-diphenyl-2-picrylhydrazyl radicals (IC₅₀: 30 µg/ml) and hydroxyl radicals (IC₅₀: 25 µg/ml) was demonstrated ^{10 10}. Protection against SNP-induced toxicity in L132 cells occurred via free-radical-neutralising and anti-apoptotic mechanisms ¹¹. In addition, a decrease in myeloperoxidase activity and an increase in antioxidant capacity were observed, indicating modulation of redox balance ^{12 12}. Whether these effects result from direct electron transfer, cation exchange or charge stabilisation remains unclear. No direct measurements of electrochemical parameters have been performed in humans.

In animal models, the antioxidant effect of **Bacopa extracts** correlated with cognitive effects, such as improved memory performance. Reduction of free radicals and nitrative stressors (e.g. nitric oxide) was discussed as a possible mechanism. Whether these results are transferable to humans remains open. Electrochemical measurements such as charge distribution or cation-exchange capacity have not yet been carried out in humans. Further studies would be required to characterise the underlying molecular interactions.

7. Interactions with Other Substances

With which other substances on the platform this substance has been **jointly** investigated or discussed in human studies and reviews — combination, comparison or shared mechanism of action. The number refers to works in which both appear.

SUBSTANCE	SHARED WORKS	OF WHICH CONTROLLED IN HUMANS
Adaptogene	131	44
Turmeric and Curcumin	11	2
Stress, Cortisol and Inflammation	2	1

In Bacopa monnieri itself, effects on enzymes and transporters were examined in animal experiments. A standardised extract formulation reduced intestinal P-glycoprotein (Pgp) expression in rats without altering hepatic Pgp expression ¹⁴. In addition, the activity of cytochrome P450 3A (CYP3A) in liver and intestine was tested, with no significant changes in enzyme activity detected ^{14 14}. In combination with bromelain, bacoside A showed antioxidant effects in mice that mitigated dichlorvos-induced toxicity ^{13 16}. Clinical data on interactions with medicinal products or nutrients are lacking.

In animal models, *Bacopa monnieri* was combined with other substances without demonstrating synergistic effects. The combination with Mandookaparni showed no advantage over single administration in attenuating amnesic effects¹⁵. An interaction with piracetam as an active control substance was not observed¹⁵. At receptor level, scopolamine interacts as an antagonist of muscarinic acetylcholine receptors, yet whether *Bacopa monnieri* influences this binding is not established.

8. Overdosage, Tolerability, Limits

Data on adverse effects of *Bacopa monnieri* are available from controlled human studies. Other studies report good tolerability: serum creatinine values remained within the normal range^{4,5}, and liver function parameters showed no abnormalities⁵. In a 6-month study, adverse effects were documented without specific cases being named¹⁷. Another study systematically recorded side effects using scales such as the UKU without reporting specific toxicity⁵. In an observational study with significant cognitive improvements, no adverse events were recorded⁹. No animal or cell studies on toxicity or overdosage are available. A review refers to the need to pharmacologically mitigate passive smoke effects without directly naming *Bacopa monnieri*.

There are no direct data from human studies on upper limits or toxic doses of *Bacopa monnieri*. In animal experiments, doses of 10–160 mg/kg body weight of morphine (not *Bacopa*) were administered over 21 days, which cannot be transferred to *Bacopa*. Cell-culture studies examined neuromodulatory effects of *Bacopa* extracts without quantifying toxicity^{18,19}. An observational study mentions “unrelated toxicity” during long-term use of another active substance, indicating possible risks with prolonged therapy but not related to *Bacopa*⁷. A review describes neurotoxic effects of tau aggregates that are not associated with *Bacopa*. Contraindications are not established. Further studies on the dose–response relationship and long-term toxicity would be required.

9. The Most Robust Works

Ordered by strength of evidence, not by familiarity. The complete evaluation comprises considerably more works; the most robust ones are listed here.

Controlled Studies in Humans

- ¹ Effects of a standardised *Bacopa monnieri* extract on cognitive performance, anxiety, and depression in the elderly: a randomised, double-blind, placebo (2008)
- ² Randomised controlled trial of standardised *Bacopa monnieri* extract in age-associated memory impairment (2006)
- ³ Cognitive effects of two nutraceuticals Ginseng and *Bacopa* benchmarked against modafinil: a review and comparison of effect sizes (2013)
- Efficacy of Integrated Yoga and Ayurveda Rasayana on cognitive functions in elderly with mild cognitive impairment: Non-randomised three-arm clinical (2022)
- ⁴ Effect of Brahmi vati and Sarpagandha Ghana vati in management of essential hypertension - A randomised, double blind, clinical study (2019)
- Efficacy of Cognition Support Formula® on cognitive function in older adults with subjective cognitive impairment: a protocol for a 26-week, randomise (2019)
- ⁵ Efficacy of Brahmi vati and Aswagandharista in major depressive disorder: A randomised controlled trial (2024)

Observational Studies in Humans

- ⁶ The Molecular Links of Re-Emerging Therapy: A Review of Evidence of Brahmi (*Bacopa monnieri*) (2016)
- ⁷ Bacoside A Induces Tumor Cell Death in Human Glioblastoma Cell Lines through Catastrophic Macropinocytosis (2017)
- ⁸ Characterization of Polyphenolic Compounds from *Bacopa procumbens* and Their Effects on Wound-Healing Process (2022)
- ⁹ Changes in MoCA scores with sequential administration of Trikatu Cūrṇa and Brahmi Ghṛta in mild cognitive impairment: an exploratory single-arm clinic (2026)

10. Summary

Bacopa monnieri shows consistent, albeit moderate effects on verbal long-term memory in controlled human studies, particularly in older subjects and persons with mild cognitive impairment (AAMI). Placebo-controlled studies with 12-week intake of standardised extracts (300 mg/day) provide indications of improvements in tests such as the Rey Auditory Verbal Learning Test (AVLT). Executive functions, attention or affective parameters (e.g. mood, anxiety) remained unchanged in these studies. The meta-analysis by Neale et al. (2013) suggests a specific effect on verbal memory, however based on heterogeneous study populations and extract standardisations. Combination studies with other Ayurveda interventions (e.g. Yoga) suggest synergistic effects, but do not allow conclusions about *Bacopa monnieri* alone. **Hypothesis:** The selective effect on verbal memory could indicate a modulation of hippocampal networks responsible for the consolidation of declarative memory contents. Preclinical studies (animal and cell models) show neuroprotective, antioxidant and anti-inflammatory mechanisms, for example through upregulation of antioxidant enzymes (superoxide dismutase, catalase) or inhibition of β -secretase activity. **Hypothesis:** The anti-inflammatory effects of *Bacopa* polyphenols in preclinical models could indicate a modulation of pro-inflammatory cytokines (IL-6, TNF- α), yet an application in chronic wounds or inflammatory skin diseases is not investigated. **Hypothesis:** The tumour-selective effect of Bacoside A in glioblastoma cell lines (induced catastrophic macropinocytosis) could be based on differences in calcium homeostasis between malignant and normal cells, which could open a therapeutic window in oncology. These mechanisms are preclinical and not transferable to humans. The following research gaps would have to be systematically addressed: (1) Replication of the cognitive effects in larger, long-term studies (>12 months) with standardised extracts and clearly defined dose-response relationships, particularly in younger populations (e.g. ADHD) or manifest neurodegenerative diseases (e.g. Alzheimer's dementia). (2) Mechanistic studies in humans with imaging or neurophysiological endpoints (e.g. fMRI, EEG), to test the hypothesis of a hippocampal

modulation. (3) Clinical studies on non-cognitive applications, for example on the anti-inflammatory effect in systemic or local inflammatory processes (e.g. rheumatoid arthritis) or on the antioxidant effect in metabolic diseases (e.g. diabetes). (4) Preclinical and clinical studies on the oncological effect of Bacoside A, particularly on bioavailability in the brain and on safety in animal models. (5) Comparative studies with established nootropics or combination therapies, to clarify the positioning of Bacopa monnieri in the therapeutic spectrum.

11. What Remains Open

- **Standardisation:** Which **bacoside composition** is optimal for which **application**? The **phytochemistry of the extracts** varies strongly, yet **comparative studies** are lacking.
- **Mechanism:** How do **bacosides cross the blood-brain barrier**? **Cell and animal studies** suggest **metabolised forms**, yet **human studies** are lacking.
- **Target groups:** Are there **differences in effect** between **young and older subjects** or **persons with neurodegenerative diseases**? **Systematic comparisons** do not exist.

12. Further Paths

Topics, modes of action and chains in which this substance occurs — for all those who want to look beyond the substance.

- Interaction network

Frequently Asked Questions

Can Bacopa monnieri be used in dementia or Alzheimer's?

The **data situation is insufficient**. Although **animal and cell studies** show **neuroprotective and antioxidant effects**, **controlled human studies** are lacking. The **most frequently cited study** examined **older subjects with mild cognitive impairment**, not **dementia or Alzheimer's**. **Combination studies** (e.g. with yoga) do not permit **conclusions about Bacopa monnieri alone**. An **application in neurodegenerative diseases** is **not supported by clinical data**.

Are there interactions with medicines?

Systematic studies on interactions are lacking. **In-vitro data** suggest **possible interactions with cytochrome P450 enzymes**, which could influence **drug metabolism**. **Animal studies** show **blood-pressure-lowering effects**, which could lead to **additive actions with antihypertensives**. **Clinical data** do not exist, however, so **caution with combinations** is advised.

How long does it take for Bacopa monnieri to work?

The **controlled studies** show **effects on cognition after 8–12 weeks**. A **shorter duration of use** has **not been systematically investigated**. **Animal studies** suggest **faster effects**, yet the **transfer to humans** is **uncertain**. **Long-term data** are lacking, so **statements on the duration of use** are not possible.

Sources

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- 10 Among the fractions tested in vitro, EtOAc fraction possessed significant 1,1-diphenyl-2-picrylhydrazyl radical scavengi...
· 2008
- 11 By considering all these findings, we report that BME protects L132 cells against SNP-induced toxicity via its free radi...
· 2014
- 12 Healing effect was further substantiated by decreased free radicals and myeloperoxidase and enhanced antioxidants and co...
· 2013
- 13 Dichlorvos administration causes a significant reduction in the level of CAT, SOD, GPx and GSH ($p < 0.05$) which was rest...
· 2016
- 14 Evaluation of memory enhancing clinically available standardized extract of Bacopa monniera on P-glycoprotein and cytoch...
· 2013
- 15 The experiments included both active (piracetam) and inactive (vehicle) controls. Methods Adult, male, Sprague-Da...
· 2006
- 16 Bacoside A and bromelain occupy a tremendous antioxidant action in the mice kidneys and a combination of the same amelio...
· 2017
- 17 Adverse effects will be documented over the 6-month trial period. Discussion This is the first study to test the ...
· 2019
- 18 Neuromodulatory propensity of Bacopa monniera against scopolamine-induced cytotoxicity in PC12 cells via down-regulation...
· 2013

International Health Research

Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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