

Boost Your Brain Power with Ginkgo Biloba

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STORY AT-A-GLANCE

- › Ginkgo biloba, an ancient herb, has been studied for its cognitive benefits, particularly in relation to Alzheimer's disease and dementia
- › Bioactive compounds in ginkgo, including flavonoids and terpenic lactones, contribute to its neuroprotective, anti-inflammatory and antioxidant properties
- › According to studies, ginkgo helps improve memory, attention, mental processing speed and executive function by enhancing brain circulation and protecting against oxidative stress
- › Recent studies suggest ginkgo improves cognitive recovery after stroke and positively influences gut microbiome composition
- › While generally safe, ginkgo supplements must be used cautiously due to certain side effects and interactions, especially for those with bleeding risks or pregnant women

Ginkgo biloba has been called "the tree that time forgot"¹ because of its long-standing presence in our world, yet the benefits that this timeless plant offers are never forgotten or set aside. For centuries, ginkgo has been widely appreciated for its use against various ailments, such as stomach pain, asthma and tuberculosis, particularly in traditional Chinese medicine (TCM).²

But did you know that one of the most celebrated benefits of this 2,000-year-old tree is its ability to help support cognitive function? Research has highlighted ginkgo's ability to

boost brain power and, more recently, it's been studied for its protective effects against Alzheimer's disease.

Ginkgo Biloba Is a Helpful Ally Against Alzheimer's Disease

Ginkgo biloba's brain-boosting properties have been valued for a long time, and according to the U.S. National Center for Complementary and Integrative Health (NCCIH), during ancient times, members of the Chinese royal court even consumed ginkgo nuts to counter senility.³ Today, research notes that it's one of the herbal remedies available to help alleviate symptoms associated with neurodegenerative diseases like Alzheimer's.

A recent systematic review published in the journal *Antioxidants*⁴ evaluated ginkgo's efficacy in treating Alzheimer's and dementia. According to the researchers:

*"Ginkgo biloba (GB), an herb with historical use in traditional medicine, contains bioactive compounds such as terpenoids (Ginkgolides A, B and C), polyphenols, organic acids and flavonoids (quercetin, kaempferol and isorhamnetin). These compounds are associated with anti-inflammatory, antioxidant and neuroprotective properties, making them valuable for cognitive health."*⁵

The research looked at 15 clinical trials that used ginkgo biloba extract versus a placebo to treat these neurodegenerative diseases. They found that in 11 of these trials, administering the herbal extract "improved cognitive function, neuropsychiatric symptoms, and functional abilities in both types of dementia."

Bioactive Compounds Contribute to Ginkgo's Brain-Boosting Effects

The review highlighted bioactive compounds that are responsible for ginkgo's benefits, such as flavonoids and terpenic lactones, which "enhance brain circulation by reducing peroxide levels in cerebellar neurons and protecting cortical neurons from injuries caused by iron."⁶

Also present are ginkgolides, which are terpenoids with anti-inflammatory, antioxidant and neuroprotective properties (to name a few); the study notes that they have "intriguing effects" against cardiovascular and cerebrovascular diseases.⁷ According to the researchers:

"[Ginkgolide A's] mechanism of action involves inhibiting a biomarker of oxidative stress, 8-hydroxy-2'-deoxyguanosine (8-OHdG), which is abundant in the brain following inflammation caused by, say, trauma.

*GB's effects on oxidative stress and neuronal protection are linked to a reduction in ROS formation and action, such as inhibiting NADPH oxidase activation, downregulating the Mitogen-Activated Protein Kinases (MAPK) and activator protein-1 (AP-1) complex, inactivating Signal Transducer and Activator of Transcription 5 (STAT5), and several other molecules."*⁸

Meanwhile, kaempferol, a flavanol that's also found in other foods like apples, broccoli and strawberries, has been found to increase the expression of brain-derived neurotrophic factor (BDNF) and protects against the toxic effects of 3-nitropropionic acid, a neurotoxic compound, on brain cells.⁹

Ginkgo Biloba's Mechanisms of Action

But how exactly does ginkgo exert protective effects on your cognitive function? A separate scientific review, published in 2023 in the *Neuropsychiatric Disease and Treatment* journal,¹⁰ explored the mechanisms of action of this herb and how it helps people with mild neurocognitive impairment.

The researchers analyzed nine clinical trials involving 946 patients, and found that ginkgo biloba extract exerted beneficial cognitive effects, such as:^{11,12}

- Improving short- and long-term memory
- Helping retain attention and sharpen focus
- Boosting mental processing speed

- Enhancing executive function, which includes planning, decision-making and flexible thinking

The scientific review mentions how ginkgo interacts with the body to impart these benefits. For one, it has "vaso-regulatory, vaso-protective and blood flow-enhancing properties," which means it improves blood circulation to the brain, ensuring you get enough nutrients and oxygen for optimal function.¹³

In animal studies, ginkgo biloba has been found to inhibit the formation of harmful proteins, which clump together and cause damage. It also improves neurogenesis and synaptogenesis, boosting brain cell growth as well as enhancing the connections between these cells.¹⁴

Ginkgo also has antioxidant activities that protect against free radicals that trigger oxidative stress. It also protects your mitochondrial health. The mitochondria are the powerhouses of your cells, and having mitochondrial dysfunction hinders your cellular energy production, which is the root cause of most diseases.¹⁵

Ginkgo Biloba Helps Improve Cognitive Function After a Stroke

In the U.S., stroke is one of the most common reasons for mortality; 1 in 6 deaths from cardiovascular disease are caused by a stroke.¹⁶ Those who survive often deal with cognitive impairment, which could progress to dementia within five years.¹⁷

Hence, it's good to know that herbal remedies like ginkgo show promise in improving cognitive recovery, especially when used in the early days after a stroke. A 2023 study¹⁸ conducted by researchers from the Beijing Tiantan Hospital of the Capital Medical University in Beijing found that ischemic stroke patients who were given ginkgo injections daily were able to recover better.

The researchers divided 3,163 mild to moderate stroke patients into two groups. One group received daily injections of ginkgo diterpene lactone meglumine (GDLM), while the other received only a placebo.

While both groups initially had average cognitive scores, by day 14, those who received GDLM exhibited greater signs of improvement. On average, the ginkgo group's cognitive scores were 3.93 points higher; the placebo group had an average of 3.62 points. By day 90, those in the ginkgo group had an average of 5.51 points improvement, while the placebo group had 5.04 points average improvement.¹⁹

Anxin Wang, Ph.D., an associate professor at the Beijing Tiantan Hospital and one of the study authors, said:

"If our positive results are confirmed in other trials, GDLM injections may someday be used to improve cognitive function for patients after ischemic stroke."²⁰

Animal Studies Suggest Ginkgo Improves Behavior by Altering Gut Composition

The intricate connection between gut and brain health has long been established, and there's research proving that the state of your gut influences your mood and behavior. I recently [published an article](#) about the link between gut health, eating disorders and depression. According to a 2024 study published in BMC Psychiatry,²¹ certain gut bacteria strains were linked to inflammation and depression.

This shows another path by which ginkgo influences your mental health. According to a 2023 animal study conducted by Chinese researchers,²² ginkgo biloba extract (EGb) helps improve mood and memory among animals with Alzheimer's-like symptoms by altering their gut microbiome.

The test subjects were given the extract daily through intragastric administration (straight to the stomach) and were observed for two months. The researchers found that the extract helped increase good gut bacteria in the mice's gut, which then contributed to better results when they were subjected to a spatial memory test. According to the researchers:²³

"[A]ll four kinds of probiotics, Bifidobacterium, Limosilactobacillus, Adlercreutzia and Akkermansia, were positively correlated with the results of the water maze test, suggesting that the relative abundance of intestinal probiotics in APP/PS1 mice was significantly increased after EGb treatment, which further affected their learning and memory behavior, and there was a correlation between intestinal probiotics and cognitive dysfunction.

In addition, fecal bacteria transplantation experiments have confirmed that probiotics can improve the cognitive function of AD model mice."

In particular, Bifidobacterium and Limosilactobacillus were associated with reduced inflammation and improved brain function. The researchers also noted other positive effects on gut microbiome, such as protecting the gut barrier (which keeps out harmful substances from entering your bloodstream), protecting the blood-brain barrier and improving blood flow to the brain.

The study also noted that ginkgo influences other metabolic processes, particularly tryptophan metabolism and steroid hormone biosynthesis, which also positively affected cognition and behavior.

"EGb improves the pathology of AD [Alzheimer's disease] by increasing the production of intestinal probiotics and promoting the levels of related metabolites in AD mice," the researchers conclude.²⁴

Are There Risks and Cautions When Taking Ginkgo?

Ginkgo is available in a variety of forms, including extracts, teas, capsules and tablets. Don't use raw seeds and unprocessed ginkgo leaves, however — they contain toxic compounds called 4'-methoxypyridoxine (MPN) and cyanogenic glycosides, which can cause adverse effects like nausea, vomiting, diarrhea and abdominal pain.²⁵

The NCCIH says that ginkgo is safe when taken orally in moderate amounts. However, some people could experience side effects like headaches, dizziness, and allergic skin

reactions. Those with a bleeding risk are also advised to be careful when taking ginkgo supplements, as it could increase their chances of bleeding.²⁶

Pregnant women are also advised against taking ginkgo as it could lead to premature labor or extra bleeding, if used before giving birth. There's also little data on ginkgo's effects during breastfeeding, so nursing moms must be cautious when taking this supplement.

Take B Vitamins Along with Ginkgo Biloba

As mentioned above, ginkgo contains the toxin 4'-O-methylpyridoxine, which acts as an "antivitamin," particularly against B vitamins. While most supplements would likely eliminate this toxin, or have harmless amounts, it is a good precaution to increase your B vitamin intake when you use ginkgo supplements, especially if your goal is to help support cognitive function.

B vitamins play a vital role in your brain health, and particularly in warding off Alzheimer's. A 2022 review published in *Biomolecules* journal²⁷ found that vitamin B12 affects the biochemical pathways involved in Alzheimer's disease. According to the study authors:

"[S]upplementation of vitamin B12 exerts positive effects with respect to AD pathology, both in transgenic AD models and in wildtype animals.

*In line with this, cell culture and ex vivo studies provided further evidence for the protective effects of vitamin B12. These are linked to amyloid formation and fibrillization, epigenetic modifications, tau fibrillization, synaptogenesis of neuronal membranes, oxidative stress and cholesterol synthesis."*²⁸

In a more recent study, published in 2024,²⁹ researchers looked at the effects of supplementation in combatting Alzheimer's disease, highlighting B vitamins as one of the vitamin groups with a significant role in preventing brain deterioration.

"Supplementation with B vitamins (folic acid 0.8 mg, vitamin B6 20 mg, vitamin B12 0.5 mg) can decelerate the shrinkage of particular brain regions that play a [significant] role in the progression of AD and are linked to a deterioration in cognitive function.

B vitamins reduce the levels of homocysteine, which in turn results in a reduction in gray matter atrophy, therefore slowing down the decline in cognitive function," the authors concluded.³⁰

Lastly, remember that no matter how compelling the research is on ginkgo biloba's benefits for brain health, no one supplement can prevent or reverse cognitive decline. Don't look for a "quick fix" to help protect against age-related illnesses.

Instead, evaluate your lifestyle choices and dietary habits to ensure you are implementing healthy strategies that address or prevent dementia and Alzheimer's. For more information, I recommend reading my article, "[14 Modifiable Risk Factors That Can Help Prevent Dementia.](#)"

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