

CHAPTER 1

Botanical brain healers: medicinal plants for Alzheimer's prevention and care

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Abstract

Present study explored a diverse range of medicinal plants traditionally used across cultures for their neuroprotective and cognitive-supportive potential. A comprehensive literature survey was conducted using databases such as PubMed, Scopus, Web of Science and NCBI with targeted ethnomedicinal and Alzheimer's-related keywords. Relevant books and articles were also screened. The compiled data highlighted 24 botanicals, including *Bacopa monnieri*, *Centella asiatica*, *Ginkgo biloba*, *Curcuma longa*, *Salvia officinalis* and *Huperzia serrata*, each valued for their traditional modes of preparation such as infusions, decoctions, powdered formulations and dietary consumption. While traditional usage does not constitute scientific evidence, the referenced studies suggest emerging scientific interest in their possible roles in supporting memory, reducing oxidative stress and promoting general cognitive wellness. Present overview provided a foundation for further research into botanical contributions to Alzheimer's prevention and complementary care.

Keywords: Cognitive-supportive, dietary consumption, neuroprotective, oxidative stress

Introduction

As conventional therapeutic options continue to offer only limited symptomatic relief, interest in complementary approaches particularly those rooted in traditional medicinal practices has grown substantially (Kamatham *et al.*, 2024; Safiri *et al.*, 2024). For centuries, cultures around the world have turned to botanical remedies to support brain health, enhance

memory and promote mental clarity (Borrego-Ruiz and Borrego, 2025; Kirubakaran, 2025). These plant-based therapies are rich in phytochemicals such as alkaloids, terpenoids, flavonoids and phenolic compounds, many of which are now recognized for their antioxidant, anti-inflammatory and neuroprotective potential (Kumar *et al.*, 2023; Hossain *et al.*, 2025). The title “Botanical brain healers: medicinal plants for Alzheimer’s prevention and care” reflect this growing scientific and cultural curiosity toward the cognitive-supportive role of medicinal plants. The botanical species enumerated in the present study represent a diverse range of traditional healing systems, including Ayurveda, Traditional Chinese Medicine, Western herbalism and indigenous plant-based practices. Plants such as *Bacopa monnieri*, *Centella asiatica* and *Convolvulus prostratus* have long been revered in South Asian traditions for enhancing memory and promoting mental calmness (Walker and Pellegrini, 2023; Ashok *et al.*, 2025), while species like *Ginkgo biloba*, *Melissa officinalis* and *Salvia officinalis* have been integrated into European herbal medicine for maintaining cognitive clarity (Kennedy and Scholey, 2006; Ge *et al.*, 2021). Many of these plants are consumed in simple and accessible forms like teas, decoctions, powders, fresh juices and dietary supplements, reflecting their deep cultural integration and ease of administration (Pandey *et al.*, 2013; Wang *et al.*, 2025). Their widespread historical use underscored the longstanding belief in the power of botanical agents to nourish the nervous system and support cognitive resilience (Ward and Pasinetti, 2016). Therefore, the present study provides a foundation for future investigations into the role of medicinal plants in promoting cognitive wellness and informing complementary strategies for Alzheimer’s prevention and care.

Methodology

A thorough review was conducted through a comprehensive survey of existing literature on the medicinal plants traditionally used by the local people or community. A range of databases including PubMed, Scopus, Web of Science, NCBI, etc., were searched using keywords such as “ethnomedicinal plants”, “herbal remedies”, “traditional practices”, “pharmacological potential”, “medicinal uses”, “mode of administration” and “natural healthcare practices”. Relevant books and articles were reviewed to gather information on the ethnomedicinal plants used against Alzheimer’s disease (Pagotto *et al.*, 2024; Kumar, 2025).

Results and discussion

Present study listed 24 medicinal plants traditionally used for cognitive support across different therapeutic systems (Table 1; Figures 1 & 2). The results showed that these plants span multiple families and utilized various plant parts such as roots, leaves, rhizomes, bark, flowers and seeds. Modes of use also vary widely, ranging from infusions (*Bacopa monnieri*, *Melissa officinalis*, etc.) and decoctions (*Galanthus nivalis*, *Polygala tenuifolia*, etc.), to dietary forms (*Bertholletia excelsa*, *Lepidium meyenii*, etc.) and powdered preparations (*Acorus calamus*, *Tinospora cordifolia*, etc.) (Figure 1). This diversity reflected not only the cultural richness of traditional healing practices but also indicated the potential for multiple bioactive pathways through which these botanicals may influence cognitive function, including antioxidant activity, anti-inflammatory mechanisms, neurotransmitter modulation and neuroprotective effects suggested in referenced studies (Mishra and Jain, 2025).

When considered collectively, the plants listed demonstrated an intriguing overlap between traditional usage patterns and emerging scientific interest. Botanicals like *Ginkgo biloba*, *Curcuma longa*, *Huperzia serrata* and *Centella asiatica* have gained global attention for their potential effects on memory, neuronal protection and oxidative stress reduction, aligning with their long-standing traditional applications (Moise *et al.*, 2024). Meanwhile, less widely studied species such as *Collinsonia canadensis*, *Clitoria ternatea* and *Commiphora wightii* highlighted opportunities for future research into underexplored phytochemicals with possible cognitive benefits. Although traditional modes of preparation provide important context, the discussion also emphasized that historical use alone does not validate clinical efficacy. Instead, these results serve as a foundational reference for directing more rigorous scientific inquiry bridging traditional knowledge with contemporary biomedical research to explore safe, evidence-informed botanical strategies for supporting cognitive wellness and complementing approaches to Alzheimer's prevention and care.

Table 1: List of medicinal plants traditionally used against Alzheimer's disease

Botanical name	Common name	Family	Mode of use	Sources
<i>Acorus calamus</i> L.	Sweet flag (E)	Acoraceae	The dried rhizome powder is often mixed with honey or processed in ghee and administered orally.	Esfandiari <i>et al.</i> , (2018)
<i>Angelica archangelica</i> L.	Wild celery (E)	Apiaceae	The dried root powder is typically consumed with warm water or honey.	Obulesu and Rao, (2011)
<i>Bacopa monnieri</i> (L.) Wettst.	Brahmi (H)	Plantaginaceae	The dried leaves are steeped in hot water to make an infusion for oral consumption.	Basheer <i>et al.</i> , (2022) (Figure 2)
<i>Bertholletia excelsa</i> Bonpl.	Brazil nut tree (E)	Lecythidaceae	The seed is consumed as a food or supplement.	Singhal <i>et al.</i> , (2012)
<i>Centella asiatica</i> (L.) Urb.	Indian pennywort (E)	Apiaceae	The fresh leaf juice is	Singhal <i>et al.</i> , (2012)

			consumed orally.	
<i>Clitoria ternatea</i> L.	Butterfly pea (E)	Fabaceae	A concentrated brew made by boiling the roots, and sometimes flowers, in water and consumed orally.	Chowdhury <i>et al.</i> , (2025)
<i>Collinsonia canadensis</i> L.	Horsebalm (E)	Lamiaceae	An infusion is made from the root, typically one cup is consumed orally.	Mahomoodally <i>et al.</i> , (2021)
<i>Commiphora wightii</i> (Arn.) Bhandari	Guggal (E)	Burseraceae	The dried and powdered guggal resin is consumed orally about ¼ teaspoon twice a day.	Singhal <i>et al.</i> , (2012)
<i>Convolvulus prostratus</i> Forssk.	Shankhpushpi (H)	Convolvulaceae	The whole plant, particularly the roots and aerial parts, is dried and ground into a powder. This powder is often mixed with warm milk or water and consumed orally.	Al-Keridis <i>et al.</i> , (2024)
<i>Coptis chinensis</i> Franch.	Chinese goldthread (E)	Ranunculaceae	The dried rhizome powder is consumed directly or mixed with water.	Xie <i>et al.</i> , (2023)

<i>Curcuma longa</i> L.	Turmeric (E)	Zingiberaceae	The powder or fresh grated root with hot milk or hot water to make tea for oral consumption.	Mishra and Palanivelu, (2008)
<i>Galanthus nivalis</i> L.	Snowdrop (E)	Amaryllidaceae	A decoction made from the bulbs is consumed orally.	Babashpour-Asl <i>et al.</i> , (2023)
<i>Ginkgo biloba</i> L.	Maidenhair tree (E)	Ginkgoaceae	The fresh or roasted seeds are consumed orally.	Pagotto <i>et al.</i> , (2024)
<i>Glycyrrhiza glabra</i> L.	Licorice (E)	Fabaceae	The rhizome and root decoctions are consumed orally.	Chakravarthi and Avadhani, (2013)
<i>Huperzia serrata</i> (Thunb.) Trevis.	Toothed clubmoss (E)	Lycopodiaceae	It is administered orally as herbal supplements.	Howes <i>et al.</i> , (2017)
<i>Lepidium meyenii</i> Walp.	Peruvian ginseng (E)	Brassicaceae	The dried roots are consumed as a nutritious food.	Guo <i>et al.</i> , (2016)
<i>Magnolia officinalis</i> Rehder & E.H.Wilson	Houpu magnolia (E)	Magnoliaceae	The dried bark is cut into pieces, boiled with water, often in combination with other herbs as part of complex	Li <i>et al.</i> , (2024)

			formulas is consumed orally.	
<i>Matricaria chamomilla</i> L.	Chamomile (E)	Asteraceae	The dried flowers are steeped in hot water to create a tea, consumed orally.	Alibabaei <i>et al.</i> , (2014)
<i>Melissa officinalis</i> L.	Lemon balm (E)	Lamiaceae	Traditional daily oral consumption for adults ranged from 1.5-4.5 grams of dried herb as an infusion three times a day.	Soodi <i>et al.</i> , (2014)
<i>Polygala tenuifolia</i> Willd.	Milkwort (E)	Polygalaceae	The dried root decoction is consumed orally.	Garg <i>et al.</i> , (2024)
<i>Salvia officinalis</i> L.	Sage (E)	Lamiaceae	The fresh or dried leaves are steeped in boiling water to make a tea, typically consumed up to three times daily.	Ghallab <i>et al.</i> , (2025)
<i>Salvia rosmarinus</i> Spenn.	Rosemary (E)	Lamiaceae	Tea is prepared by steeping fresh or dried leaves in hot water consumed orally and diluted rosemary oil is applied to the skin (forehead, neck or chest) and potentially enhance	Habtemariam, (2016)

			cognitive function.	
<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson	Giloy (E)	Menispermaceae	The dried stem is pulverized into a powder and administered orally, typically in a dosage of 1-3 grams per day.	Majhi <i>et al.</i> , (2024)
<i>Urtica dioica</i> L.	Stinging nettle (E)	Urticaceae	The fresh leaf juice is used as a tonic.	Singhal <i>et al.</i> , (2012)

(E: English; H: Hindi)

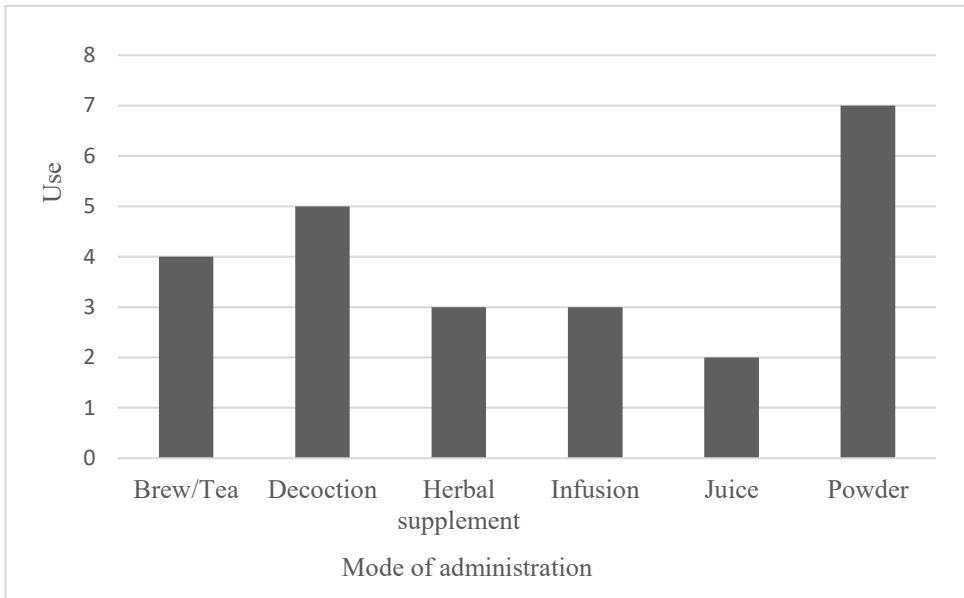


Figure 1: Medicinal plants used in different forms

Biotechnological approaches

The listed plants seek more scientific validation in the line of ethnopharmacology. Tissue culture techniques can enable the sustainable production of bioactive metabolites involved in neuroprotection. Genetic engineering and metabolic pathway manipulation further enhance the yield and stability of reported bioactive compounds. Advanced tools like CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)/Cas-based editing and transcriptomic profiling help identify genes involved in secondary metabolite biosynthesis linked to anti-Alzheimer's activity.

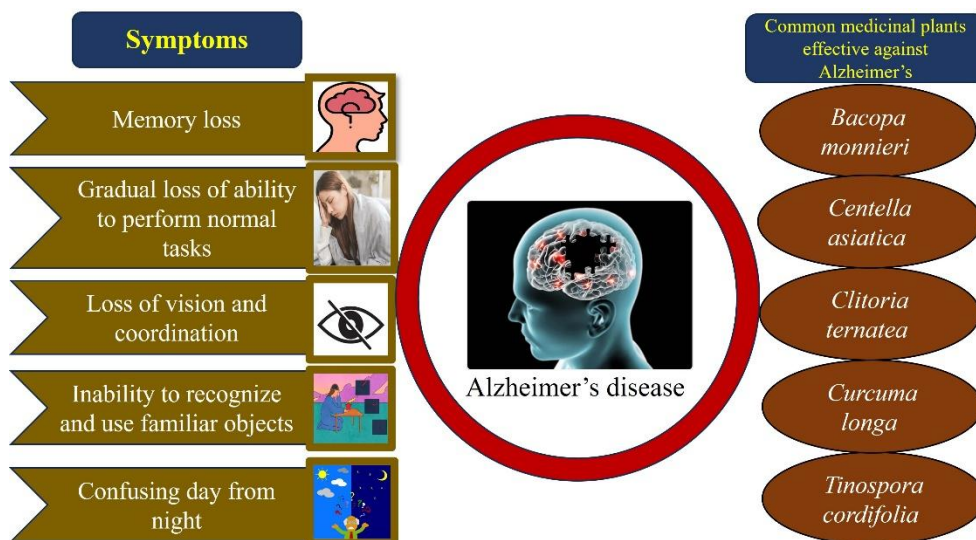


Figure 2: Some common medicinal plants effective against Alzheimer's disease

Conclusion

The present review demonstrates the rich diversity of botanicals traditionally used to support memory, cognitive clarity and overall brain health. While traditional practices provide meaningful insights, the conclusion underscored the importance of scientific validation to understand safety, dosage, mechanisms of action and potential therapeutic relevance. The referenced studies offer promising indications of antioxidant, anti-inflammatory and neuroprotective properties, but further clinical and pharmacological research is essential to determine their role in contemporary Alzheimer's prevention and complementary care.

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