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The healing power of nature: Exploring plants that combat memory loss diseases

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Abstract

Memory loss diseases such as Alzheimer's and dementia are becoming increasingly common in our aging population. While there is no cure for these conditions, research has shown that there are plants and natural remedies that may help to slow the progression of memory loss. Many of these plants have been used for centuries in traditional medicine and are now being studied for their potential benefits in treating cognitive decline. In this paper, we'll explore some of the plants that have shown promise in combating memory loss and their healing properties. From herbs and spices to fruits and vegetables, we'll delve into the natural world and discover the compounds that make these plants so beneficial. So, if you or a loved one is struggling with memory loss, read on to discover the healing power of nature and the plants that can help combat these diseases.

Keywords: Memory loss, Alzheimer's, dementia, traditional medicine & plants

1. Introduction

In today's fast-paced world, memory loss diseases have become a growing concern for individuals and their loved ones. As we age, the risk of developing conditions such as Alzheimer's disease, dementia, and other forms of cognitive decline increases. These diseases not only impact the individuals experiencing them but also have a profound effect on their families and caregivers.

Memory loss diseases can cause a range of symptoms, including memory lapses, confusion and difficulty in problem-solving and even personality changes. The impact on quality of life can be significant, making it crucial to explore potential remedies and therapeutic approaches to combat these debilitating conditions. One area of interest that has gained significant attention is the healing power of nature, specifically the use of plants to alleviate the symptoms of memory loss diseases^[1]. Nature has long been known for its therapeutic properties, offering solace, relaxation, and rejuvenation^[2]. In recent years, researchers and scientists have turned their attention to the potential benefits that certain plants and natural compounds can provide in the realm of memory loss^[3].

This paper we delve into the fascinating world of plants that have shown promising effects in combating memory loss diseases. From ancient herbal remedies to modern scientific discoveries, we will explore the potential of nature's healing power in improving cognitive function and enhancing the quality of life for those affected by these conditions. Join us on this journey as we uncover the wonders of nature's pharmacy and the potential it holds for memory loss diseases.

2. The connection between nature and mental health

There is an undeniable connection between nature and mental health. Countless studies have shown that spending time in nature can have a positive impact on our overall well-being, including our mental and emotional state. In today's fast-paced and technology-driven world, it has become more important than ever to reconnect with nature to find solace and healing. When it comes to memory loss diseases, such as Alzheimer's and dementia, nature has proven to be a powerful ally. Research has shown that exposure to natural environments, such as gardens, parks, or even just a walk in the woods, can have a profound impact on cognitive function and memory retention. One theory behind this connection is the concept of "biophilia," which suggests that humans have an innate desire to connect with nature. Being surrounded by natural elements, such as plants, trees, and fresh air, can help reduce stress, improve concentration, and boost overall cognitive function^[4].

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Incorporating nature into our daily lives can be as simple as having indoor plants in our homes or offices, creating a green space in our backyard, or taking regular walks in a nearby park. The sights, smells, and sounds of nature can have a calming effect on our minds, promoting relaxation and reducing anxiety. As we delve deeper into exploring the healing power of nature and its impact on memory loss diseases, it becomes evident that reconnecting with the natural world can be a valuable and effective approach. By embracing the wonders of plants and immersing ourselves in the beauty of nature, we can tap into its healing potential and potentially improve the quality of life for those affected by memory loss diseases.

3. Exploring plants with potential healing properties

Nature has always been a source of healing and solace for humanity, offering an array of plant species with potential medicinal properties [5]. When it comes to combating memory loss diseases, certain plants have shown remarkable promise. Let's dive into the world of botanical wonders and explore some of the plants that could hold the key to mitigating these debilitating conditions. Nature's pharmacy is abundant, and it is our responsibility to delve deeper into its secrets and unlock the potential of these botanical treasures.

Some plants related to memory enhancement are as follows:

1) *Ginkgo biloba*: Enhancing memory and cognitive function

Ginkgo biloba, derived from one of the oldest tree species on Earth, has long been revered for its potential to enhance memory and cognitive function. This remarkable plant has captured the attention of researchers and health enthusiasts alike, as its medicinal properties have been studied extensively. Known for its distinctive fan-shaped leaves, *Ginkgo biloba* contains powerful antioxidants and anti-inflammatory compounds that can benefit brain health [6]. These compounds work together to protect nerve cells from damage caused by harmful free radicals, which are known to contribute to memory loss diseases such as Alzheimer's and dementia [7].

Studies have shown that *Ginkgo biloba* can improve cognitive function by increasing blood flow to the brain. By enhancing circulation, more oxygen and nutrients can reach the brain, supporting its optimal functioning. This improved blood flow has been linked to enhanced memory, concentration, and overall mental clarity. Furthermore, *Ginkgo biloba* has been found to inhibit the formation of beta-amyloid plaques, which are characteristic of Alzheimer's disease [8]. These plaques can disrupt communication between brain cells, leading to memory impairment and cognitive decline. By reducing the formation of these plaques, *Ginkgo biloba* has the potential to slow down the progression of memory loss diseases [9].

While *Ginkgo biloba* is generally considered safe for consumption, it is always advisable to consult with a healthcare professional before adding any new supplements to your routine, especially if you have pre-existing health conditions or are taking other medications. Incorporating *Ginkgo biloba* into your daily regimen, whether in the form of capsules, extracts, or teas, may offer a natural and holistic approach to combating memory loss diseases. However, it is important to remember that it is not a miracle cure and should be used in conjunction with other lifestyle factors that promote brain health, such as a balanced diet, regular exercise, and mental stimulation.

2) Rosemary: Aromatic herb with memory-boosting

effects

Rosemary, a fragrant and versatile herb, has been recognized for its memory-boosting effects for centuries and its botanical name is *Salvia rosmarinus* syn *Rosemarinus officinalis*. This remarkable plant not only adds a delightful aroma to dishes but also holds incredible healing potential for memory loss diseases. Known for its rich history in traditional medicine, rosemary contains compounds that have been shown to enhance cognitive function and improve memory [10]. One such compound is rosmarinic acid, which acts as an antioxidant and anti-inflammatory agent in the brain. These properties help protect brain cells from damage caused by free radicals and reduce inflammation that can contribute to memory decline [11].

The scent of rosemary alone has been found to have a positive impact on memory and concentration. In a study conducted by the University of Northumbria, participants exposed to the aroma of rosemary essential oil showed improved cognitive performance compared to those in a control group. Furthermore, research suggests that rosemary may inhibit the breakdown of acetylcholine, a neurotransmitter vital for memory and learning [12]. By preserving acetylcholine levels in the brain, rosemary may help combat memory loss diseases such as Alzheimer's and dementia [13]. Incorporating rosemary into your daily routine is simple and enjoyable. Whether used fresh or dried, this aromatic herb can be added to a variety of dishes, such as roasted vegetables, soups, marinades, and herbal teas. It not only adds a burst of flavour but also offers potential cognitive benefits. It's important to note that while rosemary shows promising effects in improving memory, it should not be considered a sole treatment for memory loss diseases. Consultation with a healthcare professional is essential for a comprehensive approach to managing such conditions.

3) Turmeric: A spice with potential anti-Alzheimer's properties

Turmeric, a vibrant yellow spice commonly used in Indian cuisine, has gained attention in recent years for its potential health benefits and its botanical name is *Curcuma longa* and *Curcuma aromatica*. Among its many touted properties, what makes turmeric truly fascinating is its potential to combat memory loss diseases, particularly Alzheimer's.

Curcumin, the active compound found in turmeric, has been the subject of numerous scientific studies exploring its potential therapeutic effects [14]. Researchers have discovered that curcumin possesses powerful antioxidant and anti-inflammatory properties, which are believed to contribute to its neuroprotective effects [15]. In Alzheimer's disease, the accumulation of plaques made up of beta-amyloid proteins is a hallmark characteristic. These plaques lead to the destruction of brain cells and contribute to memory loss and cognitive decline [16]. Studies have shown that curcumin has the ability to cross the blood-brain barrier, allowing it to directly interact with beta-amyloid plaques [17 & 18]. It has been found to inhibit the formation of these plaques and promote their clearance, potentially slowing down the progression of the disease.

Furthermore, curcumin has been shown to reduce inflammation in the brain, which is another key factor in Alzheimer's disease. Chronic inflammation can contribute to the progression of neurodegenerative diseases and exacerbate cognitive decline. By modulating various inflammatory pathways, curcumin may help alleviate inflammation and protect brain cells from damage [19]. While more research is

needed to fully understand the mechanisms and dosage requirements for turmeric's therapeutic effects, incorporating this spice into your diet may provide potential benefits for brain health. Adding turmeric to your meals, drinking turmeric tea, or taking curcumin supplements are all ways to introduce this powerful spice into your daily routine [20]. However, it's important to note that the bioavailability of curcumin is relatively low, meaning that the body has difficulty absorbing and utilizing it effectively. To enhance its absorption, it's recommended to consume turmeric with black pepper, which contains piperine that enhances curcumin's bioavailability.

4) Sage: Traditional herb for memory enhancement

When it comes to combating memory loss diseases, nature has provided us with an array of remarkable plants, and one such plant is sage. Sage, scientifically known as *Salvia officinalis*, has been used for centuries as a traditional herb for memory enhancement [21]. Native to the Mediterranean region, sage is renowned for its aromatic leaves that possess a distinct earthy and slightly peppery flavour. However, its benefits go far beyond its culinary uses. Sage contains compounds that have been found to improve cognitive function and memory. One of the key components of sage is rosmarinic acid, which acts as an antioxidant and anti-inflammatory agent in the brain [22 & 23]. These properties help protect brain cells from oxidative stress and inflammation, which are often associated with memory decline. Research studies have shown promising results regarding sage's ability to enhance memory and cognitive performance [24]. In a study published in the Journal of Traditional and Complementary medicine, participants who consumed sage extract demonstrated improved memory recall and attention compared to those who were given a placebo [25].

Moreover, sage has also been found to inhibit the breakdown of acetylcholine, a neurotransmitter essential for memory and learning. By preserving acetylcholine levels in the brain, sage aids in maintaining optimal cognitive function. Incorporating sage into your daily routine can be done in various ways. You can enjoy it as a flavourful addition to your meals, such as in sauces, stuffing, or as a seasoning for roasted vegetables. Additionally, sage tea is a popular herbal remedy that can be brewed by steeping fresh or dried sage leaves in hot water [26].

While sage is generally safe for consumption, it is important to consult with a healthcare professional, especially if you have any pre-existing medical conditions or are taking medications that may interact with sage.

5) Ginseng: Adaptogenic herb to combat cognitive decline

Ginseng commonly refers to *Panax quinquefolius* L. (American ginseng) or *Panax ginseng* C.A. Meyer (Korean ginseng). When it comes to combating memory loss diseases, nature has provided us with a powerful ally – ginseng. This adaptogenic herb has been used for centuries in traditional medicine for its numerous health benefits, including its positive impact on cognitive function. Ginseng is known for its ability to enhance brain health and improve memory. It contains compounds called ginsenosides, which have been found to have neuroprotective properties [27]. These ginsenosides help to protect brain cells from damage caused by oxidative stress and inflammation, two factors that contribute to cognitive decline [28 & 29].

Studies have shown that ginseng can improve cognitive performance, attention, and memory in individuals with mild

cognitive impairment or early-stage Alzheimer's disease. It has also been found to enhance mental performance and reduce mental fatigue in healthy individuals. One of the ways ginseng exerts its beneficial effects is by increasing the production of acetylcholine, a neurotransmitter that plays a crucial role in learning and memory. By boosting acetylcholine levels, ginseng helps to improve communication between brain cells, facilitating better cognitive function [30].

Moreover, ginseng has adaptogenic properties, meaning it helps the body adapt to stress and maintain overall balance. Chronic stress is known to contribute to cognitive decline, and by reducing stress levels, ginseng indirectly supports brain health. To incorporate ginseng into your routine, you can consume it in various forms, such as capsules, powders, or as a tea. It's important to note that ginseng may interact with certain medications, so it's advisable to consult with a healthcare professional before starting any new supplement regimen.

6) Brahmi: A Ayurvedic medicinal plant for memory boosting

Brahmi, also known as *Bacopa monnieri*, is a popular herb in Ayurvedic medicine known for its potential memory-boosting properties. It has been used for centuries in traditional medicine to enhance cognitive function and improve memory^{31&32}. Brahmi contains several active compounds that contribute to its memory-enhancing effects. The herb is rich in bacosides, which are believed to promote the growth and repair of nerve cells in the brain. These bacosides also have antioxidant properties, which help protect the brain from oxidative stress and damage [33, 34 & 35].

Research on Brahmi has shown promising results in improving memory and cognitive function. It is believed that Brahmi works by increasing the production of certain neurotransmitters in the brain, such as acetylcholine, which is involved in memory and learning processes³⁶. In addition to its memory-boosting effects, Brahmi has also been studied for its potential benefits in reducing anxiety and stress. It is thought to modulate the stress response by regulating cortisol levels in the body, thus promoting a sense of calm and relaxation [37 & 38].

Brahmi is a memory booster plant that has been used in traditional medicine for centuries. It is believed to enhance cognitive function and improve memory through various mechanisms, including the promotion of nerve cell growth, antioxidant activity, and modulation of neurotransmitters.

7) Sankhpuspi: A Natural Brain Memory Booster Plant

In today's fast-paced world, maintaining a sharp memory and cognitive function is crucial for success. With an increasing number of people seeking ways to enhance their brain power, natural remedies have gained popularity. One such remedy is Sankhpuspi, a plant known for its memory-boosting properties. Sankhpuspi, scientifically known as *Convolvulus pluricaulis*, is a perennial herb that is native to India. It has been used in traditional Ayurvedic medicine for centuries to improve memory and cognitive function. The name "Sankhpuspi" is derived from the Sanskrit words "sankh" meaning conch and "puspi" meaning flower, referring to the shape of its small, conch-like flowers.

The plant is commonly found in the Himalayan region and is known for its small, pink or white flowers. However, it is not just the flowers that hold the key to its memory-boosting properties. The whole plant, including its stems and leaves, is used for medicinal purposes^{39, 40, &41}. These parts are dried

and used to prepare herbal formulations such as powders, capsules, and tonics. Sankhpuspi is believed to work by enhancing the function of neurotransmitters in the brain, thereby improving memory, concentration, and overall cognitive abilities. It is also known to have antioxidant properties, which protect the brain cells from damage caused by free radicals. Additionally, it is thought to have an anti-anxiety effect, promoting calm and focused state of mind. Numerous scientific studies have been conducted to investigate the memory-enhancing effects of Sankhpuspi^{42, 43, [44 & 45]}. These studies have shown promising results, indicating that the plant can indeed improve memory and cognitive performance. However, more research is still needed to fully understand its mechanism of action and potential side effects.

8) Jatamansi: The Brain Memory Booster Plant

In today's fast-paced and demanding world, maintaining a sharp and focused mind is essential for success. As we age, our cognitive abilities naturally decline, leading to memory loss, difficulty concentrating, and decreased mental clarity. While there are various methods and supplements available to enhance brain function, one natural remedy that has gained prominence is the herb Jatamansi. Jatamansi, scientifically known as *Nardostachys jatamansi*, is a perennial herb native to the Himalayan region. It has been used for centuries in traditional Ayurvedic medicine for its numerous health benefits, particularly its ability to boost brain health and improve memory. One of the key reasons Jatamansi is considered a brain memory booster is its potent antioxidant properties^{46,47,48&49}. Oxidative stress caused by free radicals can damage brain cells and contribute to cognitive decline. Jatamansi contains bioactive compounds such as sesquiterpenoid and coumarins, which act as powerful antioxidants, protecting the brain from oxidative damage and reducing inflammation^{50&51}. Furthermore, Jatamansi has been found to have a calming effect on the nervous system. Stress and anxiety can adversely affect cognitive function, leading to memory problems and difficulty focusing. Jatamansi acts as an adaptogen, helping the body and mind adapt to stress and promoting a sense of calmness and relaxation. By reducing stress levels, Jatamansi indirectly supports better memory and cognitive function⁵². Several scientific studies have also shown promising results regarding Jatamansi's memory-enhancing effects^{53&54}.

9) Vacha is a Brain Memory Booster Plant

Vacha, also known as *Acorus calamus*, is a perennial herbaceous plant that has been used for centuries in traditional medicine systems like Ayurveda⁵⁵. It is known for its remarkable ability to enhance brain function and improve memory. The plant is native to India and is commonly found in wetlands and marshy areas. It has long, sword-shaped leaves and aromatic rhizomes. The rhizomes of Vacha are particularly valued for their medicinal properties. Vacha has been used as a brain tonic in Ayurvedic medicine for its ability to improve cognitive function, enhance memory, and increase concentration^{56&57}. It is believed to stimulate the brain, improve blood circulation, and nourish the nervous system. The active compounds present in Vacha, such as acorin and beta-asarone, are thought to be responsible for its memory-enhancing effects. These compounds are believed to increase the levels of neurotransmitters like acetylcholine in the brain, which play a crucial role in memory and learning^{58&59}.

Research studies have shown promising results regarding the

memory-boosting properties of Vacha. In addition to its memory-boosting effects, Vacha is also known for its neuroprotective properties^[60]. It has been shown to protect the brain against oxidative stress and reduce the risk of neurodegenerative diseases like Alzheimer's and Parkinson's^[61, 62, 63 & 64].

Vacha can be consumed in various forms, including as a powder, capsule, or infusion. It is typically taken in small doses under the guidance of a qualified healthcare professional. It is important to note that Vacha should be used with caution and avoided by pregnant or breastfeeding women.

10) Kushmanda: A Brain Memory Booster Plant

In today's fast-paced world, maintaining good cognitive health and memory function is essential. Many people turn to various supplements and strategies to enhance their brainpower and improve their memory. However, one natural and lesser-known solution that has gained attention is Kushmanda, a brain memory booster plant^[65]. Kushmanda, also known as *Benincasa hispida* or winter melon, is a tropical vine that belongs to the Cucurbitaceae family. It is widely grown in India, China, and other Southeast Asian countries. While it is commonly used as a vegetable in cooking, its medicinal properties have been recognized for centuries^[66, 67 & 68]. The brain-boosting benefits of Kushmanda are primarily attributed to its rich nutrient profile. It is a good source of vitamins, minerals, and antioxidants, which play a vital role in maintaining brain health. The plant contains significant amounts of vitamin C, vitamin B complex, calcium, iron, and phosphorus, which are all crucial for optimal brain function.

One of the key components found in Kushmanda is flavonoids. Flavonoids are plant compounds known for their antioxidant and anti-inflammatory properties. These compounds help protect the brain from oxidative stress and inflammation, which can lead to cognitive decline and memory problems. By reducing inflammation and protecting brain cells from damage, Kushmanda may support better memory retention and recall.

Furthermore, Kushmanda is believed to have adaptogenic properties, meaning it helps the body adapt to stressors and promotes overall well-being. Chronic stress is known to negatively impact memory and cognitive function. By reducing stress levels, Kushmanda may indirectly enhance memory and cognitive performance. In traditional Ayurvedic medicine, Kushmanda has been used to treat various neurological disorders, including memory loss and cognitive impairment^[69]. It is believed to stimulate brain activity, improve concentration, and enhance memory.

4. How to incorporate these plants into your daily routine

Incorporating plants that combat memory loss diseases into your daily routine can be a simple and effective way to harness the healing power of nature. Whether you or a loved one are struggling with memory-related issues or simply want to support brain health, these plants can provide a natural and holistic approach.

One way to incorporate these plants is through herbal teas. Many memory-enhancing herbs, such as *Ginkgo biloba* and rosemary, can be brewed into a delicious and soothing tea. Start your day with a cup of *Ginkgo biloba* tea, which has been shown to improve cognitive function and enhance memory. For an afternoon pick-me-up, opt for rosemary tea, which is known for its ability to boost brain performance and

improve focus.

Another way to include these plants in your routine is through aromatherapy. Essential oils derived from plants like lavender and sage can be diffused or used in massage oils to promote relaxation, reduce stress, and improve memory. Inhaling these fragrances can have a direct impact on the brain, triggering positive responses and stimulating cognitive function.

Gardening is a wonderful way to incorporate these memory-enhancing plants into your daily life. Create a small herb garden or dedicate a corner of your yard to grow plants like sage, thyme, and lemon balm. Engaging in gardening activities not only provides a sense of fulfilment but also allows you to reap the benefits of fresh herbs that can be used in cooking or added to homemade remedies. Lastly, consider incorporating these memory-boosting plants into your culinary creations. Herbs like turmeric, known for its anti-inflammatory properties and positive impact on brain health can be added to various dishes and beverages. Try sprinkling turmeric powder into your morning smoothie or incorporating it into your favourite curry recipe for a flavourful way to support memory function.

Remember, incorporating these plants into your daily routine is not a quick fix but rather a long-term commitment to promoting brain health. Experiment with different methods and find what works best for you. By harnessing the healing power of nature, you can take proactive steps towards maintaining cognitive function and combating memory loss diseases.

5. Conclusion

The healing power of nature cannot be understated when it comes to combating memory loss diseases. Throughout this article, we have explored various plants and their remarkable properties that have shown potential in improving memory health. From the vibrant and aromatic rosemary, known for its ability to enhance cognitive function, to the ancient and revered *Ginkgo biloba*, and Turmeric, Sage, Ginseng, Brahmi, Sankhpuspi, Jatamansi, Vacha, Kushmanda with its long-standing reputation for supporting memory and brain health, nature provides us with an abundance of resources to tap into. Incorporating these plants into our daily lives, whether through herbal teas, essential oils, or dietary supplements, can be a simple yet powerful way to support our memory health. Memory loss diseases are complex and require comprehensive care. While these plants hold tremendous potential, it is crucial to consult with healthcare professionals before incorporating them into any treatment plan. Furthermore, it's important to recognize that natural remedies should not replace conventional medical treatments but rather complement them as part of a holistic approach to health.

6. References

1. Valiathan MS. Healing plants. *Current Science* 1998;75(11):1122-7.
2. Dhiman AK. *Sacred Plants and Their Medicinal Uses*. New Delhi: Daya Publishing House; c2003.
3. Joshi SG. *Medicinal Plants*. Oxford and IBH Publishing; c2000.
4. Dwivedi T, Kanta C, Singh LR, Prakash I. A list of some important medicinal plants with their medicinal uses from Himalayan state Uttarakhand, India. *Journal of Medicinal Plants*. 2019;7(2):106-116.
5. Prajapati ND, Purohit SS, Sharma AK, Kumar T. *Medicinal Plants*. 3rd ed. India: Agrobios Published Company; c2003. p. 353.
6. Field BH, Vadnal R. *Ginkgo biloba* and memory: an overview. *Nutritional Neuroscience* 1998;1(4):255-67.
7. Tomova T, Doncheva N, Mihaylova A, Kostadinov I, Peychev L, Argirova M. An experimental study on phytochemical composition and memory enhancing effect of *Ginkgo biloba* seed extract. *Folia Medica* 2021;63(2):203-12.
8. Moulton PL, Boyko LN, Fitzpatrick JL, Petros TV. The effect of *Ginkgo biloba* on memory in healthy male volunteers. *Physiology & Behavior*. 2001;73(4):659-65.
9. Howes MJR, Houghton PJ. Plants used in Chinese and Indian traditional medicine for improvement of memory and cognitive function. *Pharmacology Biochemistry and Behavior*. 2003;75(3):513-27.
10. Rahbardar MG, Hosseinzadeh H. Therapeutic effects of rosemary (*Rosmarinus officinalis* L.) and its active constituents on nervous system disorders. *Iranian Journal of Basic Medical Sciences* 2020;23(9):1100.
11. Ahmed HM, Babakir-Mina M. Investigation of rosemary herbal extracts (*Rosmarinus officinalis*) and their potential effects on immunity. *Phytotherapy Research* 2020;34(8):1829-37.
12. Nematollahi P, Mehrabani M, Karami-Mohajeri S, Dabaghzadeh F. Effects of *Rosmarinus officinalis* L. on memory performance, anxiety, depression, and sleep quality in university students: A randomized clinical trial. *Complementary Therapies in Clinical Practice* 2018;30:24-8.
13. Duke JA. The garden pharmacy: Rosemary, the herb of remembrance for Alzheimer's disease. *Alternative & Complementary Therapies* 2007;13(6):287-90.
14. Nasri H, Sahinfard N, Rafieian M, Rafieian S, Shirzad M, Rafieian-Kopaei M. Turmeric: A spice with multifunctional medicinal properties. *Journal of HerbMed Pharmacology* 2014;3(1):5-8.
15. Akram M, Nawaz A. Effects of medicinal plants on Alzheimer's disease and memory deficits. *Neural Regeneration Research* 2017;12(4):660.
16. Rao RV, Descamps O, John V, Bredesen DE. Ayurvedic medicinal plants for Alzheimer's disease: A review. *Alzheimer's Research & Therapy*. 2012;4:1-9.
17. Ahmed T, Gilani AH. Therapeutic potential of turmeric in Alzheimer's disease: curcumin or curcuminoids?. *Phytotherapy Research*. 2014;28(4):517-25.
18. Abd El-Hack ME, El-Saadony MT, Swelum AA, Arif M, Abo Ghanima MM, Shukry M, El-Tarabily KA. Curcumin, the active substance of turmeric: its effects on health and ways to improve its bioavailability. *Journal of the Science of Food and Agriculture*. 2021;101(14):5747-62.
19. Mishra S, Palanivelu K. The effect of curcumin (turmeric) on Alzheimer's disease: an overview. *Annals of Indian Academy of Neurology*. 2008;11(1):13.
20. Agarwal N, Pareek R, Sharma V, Tripathi S, Singh R, Kumar K. A comparative study of herbal memory enhancers. *Asian Journal of Pharmaceutical Research and Development*. 2022;10(6):146-52.
21. Scholey AB, Tildesley NT, Ballard CG, Wesnes KA, Tasker A, Perry EK, Kennedy DO. An extract of *Salvia* (sage) with anti cholinesterase properties improves memory and attention in healthy older volunteers. *Psychopharmacology*. 2008;198:127-39.
22. Jivad N, Rabiei Z. A review study on medicinal plants used in the treatment of learning and memory impairments. *Asian Pacific Journal of Tropical*

- Biomedicine. 2014;4(10):780-9.
23. Eidi M, Eidi A, Bahar M. Effects of *Salvia officinalis* L. (sage) leaves on memory retention and its interaction with the cholinergic system in rats. *Nutrition*. 2006;22(3):321-6.
 24. Smach MA, Hafsa J, Charfeddine B, Dridi H, Limem K. Effects of sage extract on memory performance in mice and acetylcholinesterase activity. *Annales Pharmaceutiques Françaises*. 2015;73(4):281-8.
 25. Ghorbani A, Esmailizadeh M. Pharmacological properties of *Salvia officinalis* and its components. *Journal of Traditional and Complementary Medicine*. 2017;7(4):433-40.
 26. Tomac I, Budić L, Bobovec J, Jakobek L, Matić P. Determination of sage tea polyphenols and their antioxidant effects using an electrochemical DNA-based biosensor. *Beverages*. 2023;9(3):76.
 27. Petkov VD, Mosharraf AH. Effects of standardized ginseng extract on learning, memory and physical capabilities. *The American Journal of Chinese Medicine*. 1987;15:19-29.
 28. Wang Y, Jiang R, Li G, Chen Y, Luo H, Gao Y, Gao Q. Structural and enhanced memory activity studies of extracts from *Panax ginseng* root. *Food Chemistry*. 2010;119(3):969-73.
 29. Dong L, Wang Y, Lv J, Zhang H, Jiang N, Lu C, Liu X. Memory enhancement of fresh ginseng on deficits induced by chronic restraint stress in mice. *Nutritional Neuroscience*. 2019;22(4):235-42.
 30. Smith I, Williamson EM, Putnam S, Farrimond J, Whalley BJ. Effects and mechanisms of ginseng and ginsenosides on cognition. *Nutrition Reviews*. 2014;72(5):319-33.
 31. Thorat BS, Bagkar TA, Patil RR. *Brahmi* the memory booster medicinal herb. *Journal of Medicinal Plants*. 2018;6(1):185-7.
 32. Deo YK, Reddy KRC. Critical review on pharmacological properties of *Brahmi*. *International Journal of Ayurvedic Medicine*. 2013;4(2):92-9.
 33. Dubey T, Chinnathambi S. *Brahmi* (*Bacopa monnieri*): an ayurvedic herb against the Alzheimer's disease. *Archives of Biochemistry and Biophysics*. 2019;676:108153.
 34. Yadav KD, Reddy KRC, Kumar V. Encouraging effect of *Brahmi Ghrita* in amnesia. *International Journal of Green Pharmacy (IJGP)*, 2013, 7(2).
 35. Vollala VR, Upadhyaya S, Nayak S. Effect of *Bacopa monniera* Linn. (*Brahmi*) extract on learning and memory in rats: a behavioral study. *Journal of Veterinary Behavior*. 2010;5(2):69-74.
 36. Chaudhari KS, Tiwari NR, Tiwari RR, Sharma RS. Neurocognitive effect of nootropic drug *Brahmi* (*Bacopa monnieri*) in Alzheimer's disease. *Annals of Neurosciences*. 2017;24(2):111-22.
 37. Ghibhela B, Mishra A, Sharma D. Chapter-3 *Brahmi*: A memory booster medicinal herb and its benefits. *Journal of Medicinal Plants*. 2022;6(3):43.
 38. Debjit B, Pankaj T, Tripathi KK, Kumar KPS. Traditional Indian memory enhancer herbs and their medicinal importance. *Annals of Biological Research*. 2010;1(1):41-6.
 39. Sharma R, Singla RK, Banerjee S, Sinha B, Shen B, Sharma R. Role of *Shankhpushpi* (*Convolvulus pluricaulis*) in neurological disorders: An umbrella review covering evidence from ethnopharmacology to clinical studies. *Neurochemistry International*. 2023;170:105054.
 40. Alugolu AK, Bhirud PR. A review on *Shankhpushpi* (*Convolvulus pluricaulis* Choisy): an ayurvedic medicine for brain and mind. *Journal of Pharmaceutical Sciences and Research*. 2010;2(12):717-27.
 41. Kaur N, Kaur S, Kaur N. *Shankhpushpi* (*Convolvulus pluricaulis* Choisy) in therapeutics with special reference to neurological disorders: a review. *Journal of Pharmacognosy and Phytochemistry*. 2017;6(5):1717-23.
 42. Patwardhan K. *Shankhpushpi* (*Convolvulus pluricaulis*): An overview on a traditional nootropic herb. *Journal of Herbal Medicine*. 2021;25:100392.
 43. Gokhale AB, Damre AS, Kulkarni KR, Saraf MN. Preliminary evaluation of anti-inflammatory and anti-arthritic activity of *Sida rhombifolia* leaves. *Fitoterapia*. 2002;73(7-8):655-7.
 44. Tandon N, Yadav SS. *Shankhpushpi* (*Convolvulus pluricaulis*): Ethnobotanical and scientific review. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2018;7(8):815-25.
 45. Kumar S, Pandey AK. Traditional uses, phytochemistry and pharmacological properties of *Medhya rasayana* plants. *Chinese Journal of Integrative Medicine*. 2015;21(7):563-8.
 46. Singh G. A short review on *Shankhpushpi* (*Convolvulus pluricaulis* Choisy): a medicinal plant used in ayurveda. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2021;10(5):862-70.
 47. Mishra SB, Tiwari A, Shrivastava A. Pharmacological properties of *Shankhpushpi* (*Convolvulus pluricaulis* Choisy): A review. *Journal of Pharmacognosy and Phytochemistry*, 2015, 3(4).
 48. Chatterjee S, Katiyar P, Singh DK. *Shankhpushpi* (*Convolvulus pluricaulis*): the ayurvedic and traditional nootropic herb. *Journal of Ayurveda and Integrative Medicine*. 2019;10(1):39-45.
 49. Kaur S. *Shankhpushpi* (*Convolvulus pluricaulis*): Traditional use, phytochemistry and pharmacology. *Phytomedicine*. 2018;43:50-60.
 50. Singh R, Verma P, Gaurav K, Kumar M, Amjad M, Jain A. A review on *Shankhpushpi* (*Convolvulus pluricaulis*): a boon to nervous system. *Journal of Chemical and Pharmaceutical Research*. 2016;8(4):436-40.
 51. Nakoti SS, Juyal D, Josh AK. A review on pharmacognostic and phytochemical study of a plant *Nardostachys jatamansi*. *The Pharma Innovation*. 2017;6(7, Part G):936.
 52. Rahman H, Muralidharan P. *Nardostachys jatamansi* DC protects from the loss of memory and cognition deficits in sleep deprived Alzheimer's disease (AD) mice model. *International Journal of Pharmaceutical Sciences Review and Research*. 2010;5(3):160-167.
 53. Nithya S, Muthuraman MS. An overview on the biological perspectives of *Nardostachys jatamansi*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2016;8(2):31-36.
 54. Saraf M. Memory—mechanisms, tools and aids. *Annals of Neurosciences*. 2010;16(3):119-122.
 55. Kumar R, Sharma S, Sharma S. A review on *Vacha*: an effective medicinal plant. *World Journal of Pharmaceutical Research*. 2020;9(6):842-9.
 56. Sharma V, Sharma R, Gautam DS, Kuca K, Nepovimova E, Martins N. Role of *Vacha* (*Acorus calamus* Linn.) in neurological and metabolic disorders: evidence from

- ethnopharmacology, phytochemistry, pharmacology and clinical study. *Journal of Clinical Medicine*. 2020;9(4):1176.
57. Katekar VA, Deshmukh S. A review: Ethanopharmacological review of native traditional medicinal plants as a memory booster. *GSC Biological and Pharmaceutical Sciences*. 2023;25(1):231-244.
 58. Masram P, Rajput DS. A brief review of pre-clinical and clinical researches on *Vacha (Acorus calamus Linn.)*. *Journal of Indian System of Medicine*. 2014;2(3):143-147.
 59. Ranade A, Surana M, Dhokne SV, Gaidhani S, Pawar SD. Ayurvedic ideology on *rasapanchak*-based cognitive drug intervention. In: *Medicinal Herbs and Fungi: Neurotoxicity vs. Neuroprotection*; c2021. p. 445-467.
 60. Ojha SK, Rai A, Singh PK, Tewari SK. Memory enhancements through plants mentioned in ayurveda: a review. *Journal of Research and Education in Indian Medicine*. 2013;19(3-4):73-81.
 61. Masram P, Rajput DS. A brief review of pre-clinical and clinical researches on *Vacha (Acorus calamus Linn.)*. *Journal of Indian System of Medicine*. 2014;2(3):143-147.
 62. Pawar MS, Kunal G, Yogita K, Asmita W. Assessment of nootropic activity of *Vachadi ghrita*, a medicated ghee formulation using animal models; c2015.
 63. Rajini PS, Muralidhara M. Therapeutic efficacy of ayurvedic polyherbal formulations (PHF): interactive mechanisms and broad-spectrum activities against neurological disorders. In: *Ayurvedic Herbal Preparations in Neurological Disorders*. Academic Press; c2023. p. 89-111.
 64. Rout OP, Acharya R, Gupta R, Inchulkar SR, Karbhal KS, Sahoo R. Management of psychosomatic disorders through Ayurvedic drugs-A critical review. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2013;2(6):6507-37.
 65. Kulkarni R, Shetty SK, Rajarajeshwari NM, Rao PN, Nayan J. *Rasayana* herbs of ayurveda to treat age related cognitive decline: an update. *Pharmacognosy Journal* 2016, 8(5).
 66. Sharma C, Singh AP, Singh AP. Memory potential herb: a review. *World Journal of Current Medical and Pharmaceutical Research*; c2021. p. 68-73.
 67. Suresh V. A Pharmaco-clinical evaluation of *Kushmanda [Benincasa hispida (Thunb) Cogn.]* with respect to its *Mootrala* property [Doctoral dissertation]. Rajiv Gandhi University of Health Sciences (India); c2020.
 68. Balkrishna A, Misra LN. Ayurvedic plants in brain disorders: the herbal hope. *Journal of Traditional Medicine & Clinical Naturopathy*, 2017, 6(2).
 69. Sharma Y, Fagan J, Schaefer J. Ethnobotany, phytochemistry, cultivation and medicinal properties of garden sage (*Salvia officinalis L.*). *Journal of Pharmacognosy and Phytochemistry*. 2019;8(3):3139-3148.