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# Review On Herbal Drugs in Alzheimer's Disease

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**Abstract:** *Alzheimer's is an irreversible and dynamic neurodegenerative aliment which associated with the age and characterized by serious loss of memory, personality changes, uncommon behaviour and decrease in intellectual capacity. Till now no countermeasure available for Alzheimer's, however symptomatic treatment may enhance memory and other issues related to this disease. Products from natural resources such as medicinal plants have been utilized for the treatment of various memory disorders like amnesia, dementia, Alzheimer's, Parkinson's since long time. Various studies depicted the utilization of therapeutic plants for treatment of Alzheimer's. In spite of that extract mode of their action is yet indistinct. Phytochemical investigations of various plant parts have demonstrated presence of numerous bioactive compounds, such as polyphenols, tannins, flavonoids, triterpenes, alkaloids and sterols. These compounds demonstrate an extensive variety of pharmacologicalactivities which includes anticholinesterase, anti-inflammatory, antiamyloidogenic, hypolipidemic, and antioxidant effects. This review provides the description of differentmedicinal plants against Alzheimer, s disease.*

**Keywords**: Alzheimer's disease, medicinal plants, herbs.

## Introduction

Alzheimer's disease (AD Causes Serious memory loss, especially in the elderly population over 70 years of age. It causes significant financial burden on the society, and an emotional burden on family members and caregivers of the AD. According to the Centre for Disease Control, AD affects approximately 5% of people 65to74 years of age and almost 50% of peopleolder than 85 years old .

Patient typically presents with loss of episodic memory that progressive dementia over the years. In the amnestic type of AD, imaging studies show atrophy of the medial temporal lobes of the brain in the early stages, then spreads to the lateral temporal , parietal and frontal lobes. . Microscopically, the affected area of the brain demonstrate the presence of neuritics plaques containing amyloid beta (AB) , Neurofibrillary Tangles ( NFTs), and AB accumulation in blood vessel walls of the cortex and leptomeninges.

## Medicinal plants against Alzheimer's disease:

Medicinal plants contain various phytocompounds which are Extractable and utilized as raw material for different scientific survey. Various secondary metabolites from plants are commercially essential and utilized in pharmaceutical industries. Recently, medicinal plants Have gained wide acceptance because of their fewer side effects Compared to the synthetic medicines and necessity to meet the Requirement of medicine for increasing human population.However, Steady supply of source material often becomes

difficult due to various
Factors like diverse geographical distribution, environmental changes, Cultural practices, labour cost, selection of superior plant stock and Over exploitation by pharmaceutical industries.7 Several investigations Reported that medicinal plants are utilized in the Alzheimer's disease Treatment which includes Ginkgo biloba, Withania Somnifera, Bacopa monnieri, Curcuma Longa, Shankhpushpi etc.

## 1. Withaniasomnifera:

Withania somnifera is largely utilized in Ayurveda as a nerve Tonic which supports the bodyto adapt stress. W. somnifera belongs To Solanaceae family, root of this plant is extensively utilized. It Possesses free radical scavenging activity, antioxidant activity, and enhances immune system.8 W. somnifera possesses a calming effect whereas other adaptogens tends tostimulate and thus shows positive effects in people with Alzheimer's disease.9 A recent studyof W. somnifera showed decreased level of stress and inability to concentrate and reversed forget fulness in a dose-dependent manner in and there is no adverse effects were found [10]. W.somnifera contains various phytocompounds which include which includes withanolides to Y, withasomidienone, withasomniferin A, dehydro withanolide R, withaferin A, withasomniferolsA to C, and withanone, phytosterols sitoindosides VII to X, beta-sitosterol, alkaloids, amino acids and high amounts of iron.11 Withanamides showed free radicals scavenge activity that generated during the Alzheimer's disease initiation and progression. It blocked the death of neuronal cell triggered by amyloid plaques.12 Molecular modelling investigations showed thatwithanamides A and C particularly bind to β-amyloid (Aβ 25-35) active motif and prevents theformation of fibril[.13] Aqueous extracts of W. somnifera showed the enhanced cholinergic activity by increasing the acetylcholine content and cholineacetyl transferase activity in rats, this shows the cognition-enhancing and memory-improving effects.14 In addition to pre- and post-synapses reconstruction in the neurons, methanol extracts of W. somnifera reversed the amyloid peptide-induced memory deficit in mice.[15 ]These in vivo effects of W. somnifera were continuing even after drug termination.

## 2. Curcuma Longa:

It is commonly called as turmeric used in Asia for thousands of years in Ayurveda, Siddha, Unani, traditional Chinese medicine. The world's largest producer, consumer and exporter of turmeric is India. It is perennial herbaceous plant. The turmeric powder contains 60-70% carbohydrates, 6-13% water, 6-8% proteins, 3-7% essential oils, 2-7% dietary fiber, 1-6% curcuminoids. It has been proven that curcumin usage is useful in the treatment of AD and dementia it also has the ability to decrease the formation of Amyloid plaques and delays degradation of neurons as these both are hallmark of AD the overall memory of AD patients is improved Curcuminoids are proven to have strong antioxidant action demonstrated by the inhibition of the formation and propagation of free radicals. It decreases the low-density lipoprotein oxidation and the free radicals that cause the deterioration of neurons, not only in AD but also in other neuron degenerative disorders such as Huntington's and Parkinson's disease. The levels of beta-Amyloid in AD mice that were given low dose of curcumin were decreased by around 40% in comparison to those that were not treated with curcumin. In addition, low doses of curcumin also caused a 43% decrease in the so-called "plaque burden" that these beta-Amyloid have on the brainsof AD mice. Surprisingly low doses of curcumin given over longer period were actually more effective than high doses in combating the neurodegenerative process of AD, at higher concentration, curcumin binds to Amyloid beta and block its self assembly [5]

## 3. Ginkgo Biloba:

It is commonly called as ginkgo the only species in the species ginkophyta this plant is native to china and south Japan; it has several uses in traditional medicines and as a sourceof food. Extracts of ginkgo leaves contain different types of phytochemicals they includephenolic acid, proanthocyanidins, flavonoid glycosides (Myricetin, kaempferol, isohamnetin, quercerin), Terpens, ginkolides, biobalides, ginkgo biflavones as well as alkylphenols. The flavonoid and Terpens in the extract significantly inhibit acetylcholinesterase activity in brain. Ginkolides are the chief chemical constituents it is a potent anti-oxidant with cholinergic and neuroprotective activities hence it protects against Aβ-Protein induced oxidative damage. It shows several molecular and cellular neuroprotective mechanisms including attenuation of apoptosis, inhibition of membrane lipid peroxidation, anti-inflammatory effects and direct inhibition of Amyloid beta aggregation.[7,8]

## 4. Bacopa Monnieri:

Bacopamonniera (Brahmi) in the Ayurveda system of Indian Herbal Medicine has been used for centuries. Traditionally, Ayurvedic medical system has been using it for anxiety relief, as atonic for the brain to enhance learning and memory development, and prevention of epilepsy.10 Aging leads to various degenerative changes in the body, and the quantity and quality of thesechanges depend on upon the anatomy and physiology of the tissue. The factors that contributeto these changes are oxidative damage to the DNA and hormonal deficiency. Normal stress response requires synchronized functioning of various hormones and neurotransmitters. Bacopa contains many alkaloids, such asbrahmine and herpestine, saponins, d-mannitol,hersaponin and monnierin that are responsible for the medicinal value. Other active constituents include betulic acid, stigmastarol, beta-sitosterol, numerous bacosides, and bacopasaponins.11 The bacosides enhance kinase activity, neuronal synthesis, and restore synaptic activity.12 These neuronal repair actions are valuable in AD management.[16]

## 5. Convolvulus pluricaulis (Shankhpushpi):

Convolvulus pluricaulis belongs to Convolvulaceae family and used as a memory enhancer. Astudy has shown that aqueous extract and ethyl acetate of Convolvulus pluricaulis increases memory functions and learning abilities. [9,] This plant has been reported to calm nerves by regulating stress hormones synthesis like cortisol and adrenaline in the body. Ethanolic extractof this plant also significantly improved learning abilities and memory retention in rats.Administration of Convolvulus pluricaulis increased acetylcholinesterase activity in hippocampal CA1 and CA3 regions associated with the memory function and learning abilities.

## Conclusion

Interests in the utilization of different herbal products increase day by day. As several studies show that utilization of synthetic drugs has side effects, so there is a need of alternative sourceof drugs which have low or negligible side effects. Medicinal plants contain wide range of bioactive compounds which is an alternative of synthetic drug for Alzheimer's disease treatment. Medicinal plants can boost life quality of patients with AD and memory deficits. This review provides the details about the role of medicinal plants against the Alzheimer's disease. However, mechanisms of action are still not clear. Future clinical trials involving larger sample sizes are require investigating role of different medicinal plants and the underlying mechanisms.

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