Review Article

Exploring the Antipsychotic Potential of Medicinal Plants

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Received: 05-05-2026; **Revised:** 24-07-2026; **Accepted:** 29-07-2026; **Published online:** 20-08-2026.

ABSTRACT

Psychotic disorders are severe neuropsychiatric conditions characterized by disturbances in thought processes, perception, emotional responses, and behavior. Schizophrenia, one of the most prevalent psychotic illnesses, imposes a substantial social and economic burden worldwide. Although conventional antipsychotic medications remain the primary therapeutic option, their long-term administration is frequently associated with adverse effects such as extrapyramidal symptoms, metabolic abnormalities, sedation, and reduced treatment adherence. Consequently, there is increasing interest in identifying safer and more effective alternatives derived from natural sources. Medicinal plants contain diverse bioactive constituents including flavonoids, alkaloids, terpenoids, phenolic compounds, and glycosides that possess antioxidant, anti-inflammatory, neuroprotective, and neurotransmitter-modulating properties. These mechanisms may contribute to the attenuation of psychotic symptoms and improvement of cognitive deficits. Experimental studies have demonstrated promising antipsychotic-like effects of several plant extracts through modulation of dopaminergic, serotonergic, glutamatergic, and GABAergic pathways. The present review summarizes the therapeutic potential of selected medicinal plants with reported antipsychotic activity, discusses their phytochemical composition and pharmacological mechanisms, and highlights commonly employed experimental models used for their evaluation. Furthermore, the review addresses current challenges and future directions for the development of plant-based antipsychotic therapies.

Keywords: Psychosis; Schizophrenia; Medicinal plants; Antipsychotic activity; Neuroprotection; Phytochemicals; Herbal medicine.

INTRODUCTION

Psychotic disorders represent a group of chronic mental illnesses that affect perception, cognition, emotional regulation, and social functioning. Among these disorders, schizophrenia is the most extensively studied and is recognized as a major cause of disability worldwide. Patients suffering from psychosis commonly experience hallucinations, delusions, disorganized speech, impaired judgment, and deficits in cognitive performance, all of which significantly compromise quality of life. The pathogenesis of psychotic disorders is highly complex and involves interactions between genetic susceptibility, environmental factors, oxidative stress, inflammatory responses, and disturbances in multiple neurotransmitter systems. Current pharmacotherapy primarily targets dopaminergic pathways and effectively controls positive symptoms such as hallucinations and delusions. However, existing medications often demonstrate limited efficacy against negative symptoms and cognitive impairment. In addition, prolonged treatment may lead to undesirable adverse reactions including weight gain, extrapyramidal disturbances, endocrine abnormalities, and metabolic complications. These limitations have stimulated scientific interest in alternative therapeutic approaches. Medicinal plants have occupied an important position in traditional systems of medicine for centuries and continue to serve as a valuable source of novel pharmacologically active molecules. Numerous phytochemicals have demonstrated neuroprotective and psychopharmacological properties capable of influencing neurotransmitter balance and reducing oxidative damage within the central nervous system.[1,2]

Recent advances in phytopharmacology have provided experimental evidence supporting the role of herbal medicines in psychiatric disorders. Several medicinal plants exhibit multitarget mechanisms involving antioxidant defense, inhibition of neuroinflammation, and modulation of dopamine, serotonin, glutamate, and GABA signaling pathways. Such properties suggest that plant-derived compounds may offer complementary or alternative strategies for managing psychotic disorders. Therefore, the present review aims to critically evaluate selected medicinal plants with reported antipsychotic potential and summarize their phytochemistry, pharmacological activities, mechanisms of action, and future prospects in neuropsychiatric research.[3]

PATHOPHYSIOLOGY OF PSYCHOTIC DISORDERS

The development of psychotic disorders is multifactorial and cannot be explained by a single mechanism. Current evidence suggests that psychosis results from the interaction of neurochemical abnormalities, oxidative stress, neuroinflammation, genetic predisposition, and environmental influences. [4]

1. Dopamine Dysregulation Theory

The dopamine hypothesis remains one of the most widely accepted explanations for schizophrenia. Excessive dopamine activity within the mesolimbic pathway is believed to contribute to positive symptoms such as hallucinations and delusions, whereas reduced dopamine transmission in the mesocortical pathway has been associated with cognitive dysfunction and negative symptoms. [5]

Hyperactivity of mesolimbic dopaminergic neurons may result in: [6]

- Hallucinations
- Delusions
- Agitation
- Disorganized behavior

In contrast, mesocortical dopamine deficiency may produce: [7]

- Social withdrawal
- Emotional flattening
- Reduced motivation
- Cognitive impairment

2. Serotonergic Dysfunction

Serotonin plays an important role in mood regulation, cognition, and sensory perception. Altered activity of 5-HT_2A receptors has been implicated in the pathogenesis of psychosis. This concept is supported by the effectiveness of atypical antipsychotic drugs that simultaneously block dopamine and serotonin receptors.[8]

3. Glutamatergic Hypothesis

Glutamate is the principal excitatory neurotransmitter in the central nervous system. Impaired NMDA receptor function may disrupt neuronal communication and contribute to the development of positive, negative, and cognitive symptoms. Agents such as ketamine and phencyclidine produce schizophrenia-like manifestations through NMDA receptor blockade, further supporting this hypothesis.[9]

4. GABAergic Dysfunction

Gamma-aminobutyric acid (GABA) serves as the major inhibitory neurotransmitter in the brain. Reduced GABAergic transmission may disturb neuronal homeostasis and contribute to behavioral abnormalities and impaired cognitive processing observed in psychotic disorders.[10]

5. Oxidative Stress and Neuroinflammation

Increasing evidence indicates that excessive production of reactive oxygen species and activation of inflammatory pathways play a crucial role in the progression of schizophrenia. Elevated levels of inflammatory cytokines and oxidative stress markers have been reported in patients with psychotic disorders. These pathological processes may lead to neuronal damage and neurotransmitter imbalance.[12,13]

6. Genetic and Environmental Factors

Psychosis is influenced by both hereditary and environmental components. Genetic susceptibility, prenatal infections, psychological stress, substance abuse, nutritional deficiencies, and exposure to environmental stressors may collectively increase the risk of developing schizophrenia and related disorders.[14]

EXPERIMENTAL APPROACHES FOR THE EVALUATION OF ANTIPSYCHOTIC ACTIVITY

The development of novel antipsychotic agents requires reliable experimental models capable of reproducing behavioral and neurochemical alterations observed in psychotic disorders. Since schizophrenia involves abnormalities in multiple neurotransmitter systems, no single animal model can completely mimic the disease. Therefore, various pharmacological and behavioral models are employed to assess the efficacy and safety of plant extracts and synthetic compounds.[15,16]

1. Amphetamine-Induced Stereotypy Model

The amphetamine-induced stereotypy model is widely used to investigate compounds acting on dopaminergic pathways. Amphetamine promotes dopamine release and inhibits dopamine reuptake, resulting in excessive dopaminergic stimulation within the mesolimbic system. Consequently, experimental animals exhibit stereotypic behaviors including repetitive sniffing, licking, biting, and increased locomotor activity. Pretreatment with antipsychotic agents reduces these abnormal behaviors, indicating antagonism or modulation of dopamine neurotransmission. Since hyperdopaminergia is strongly associated with positive symptoms of schizophrenia, this model is considered valuable for evaluating typical antipsychotic activity.[17,18]

Parameters Commonly Assessed

- Sniffing frequency
- Licking behavior
- Biting and gnawing responses
- Locomotor activity
- Stereotypy scores

2. Apomorphine-Induced Climbing Behaviour

Apomorphine acts as a dopamine receptor agonist and induces characteristic climbing behavior in mice through stimulation of D_2 receptors. The intensity and duration of climbing are directly related to dopaminergic activation. Compounds possessing antipsychotic properties suppress climbing behavior by antagonizing dopamine receptors or regulating dopaminergic transmission. Therefore, this model is particularly useful for screening dopamine receptor antagonists. [19]

Parameters Evaluated

- Number of climbing episodes
- Climbing duration
- Behavioural scores

3. Ketamine-Induced Psychosis Model[20,21]

The ketamine model has gained considerable attention because it reproduces both positive and negative symptoms of schizophrenia. Ketamine blocks NMDA receptors and disrupts glutamatergic neurotransmission, producing hyperactivity, social withdrawal, memory impairment, and cognitive dysfunction. Unlike dopamine-based models, ketamine-induced psychosis more closely resembles the multifactorial nature of schizophrenia and is frequently employed for evaluating atypical antipsychotic agents.

Parameters Evaluated

- Hyperlocomotion
- Social interaction
- Cognitive performance
- Oxidative stress biomarkers
- Anxiety-related behaviour

4. Conditioned Avoidance Response (CAR)[22]

The conditioned avoidance response model is considered one of the classical screening methods for antipsychotic drugs. Animals are trained to avoid an unpleasant stimulus after receiving a warning signal. Effective antipsychotic agents selectively inhibit conditioned responses without affecting escape responses. Suppression of avoidance behaviour is regarded as a reliable predictor of clinical antipsychotic efficacy.

Parameters Evaluated

- Avoidance response
- Escape responses
- Response latency

5. Catalepsy Test[23]

Although dopamine receptor blockade contributes to antipsychotic efficacy, excessive blockade within the nigrostriatal pathway may produce extrapyramidal side effects. Catalepsy testing is therefore performed to evaluate the safety profile of novel compounds. Animals exhibiting prolonged maintenance of an imposed posture are considered cataleptic. Reduced catalepsy suggests a lower probability of motor adverse effects.

Parameters Evaluated

- Cataleptic score
- Duration of immobility
- Posture correction time

6. Open Field Test[24]

The open field test provides information regarding spontaneous locomotor activity, emotional status, and exploratory behavior. Hyperactivity induced by psychotomimetic agents can be quantified using this method.

Parameters Evaluated

- Number of crossings
- Rearing activity
- Grooming behavior
- Immobility period

7. Elevated Plus Maze[25]

The elevated plus maze is primarily used to assess anxiety-related behavior. Since anxiety frequently accompanies psychotic disorders, this method provides supportive evidence regarding the anxiolytic potential of medicinal plants.

Parameters Evaluated

- Open arm entries
- Closed arm entries
- Time spent in open arms
- Time spent in closed arms

ADVANTAGES OF PLANT-DERIVED ANTIPSYCHOTIC AGENTS[26,27]

1. Multitarget Pharmacological Action- Plant constituents are capable of influencing multiple neurotransmitter systems simultaneously, thereby providing broader therapeutic effects.
2. Antioxidant and Neuroprotective Properties- Many medicinal plants reduce oxidative stress and protect neuronal structures from degeneration.
3. Anti-inflammatory Activity- Suppression of inflammatory mediators may help attenuate neuroinflammation associated with psychosis.
4. Reduced Incidence of Adverse Effects- Herbal medicines are generally associated with fewer extrapyramidal complications compared with conventional antipsychotics.
5. Economic Accessibility- Medicinal plants are comparatively inexpensive and readily available in developing countries.
6. Better Patient Acceptance- Traditional use and natural origin often improve patient compliance.
7. Potential for Combination Therapy- Herbal products may be employed as adjuncts to conventional medications to improve therapeutic outcomes.

LIMITATIONS AND CHALLENGES[28,29]

1. Insufficient Clinical Evidence- Most studies are restricted to experimental animals, while human clinical trials remain limited.
2. Lack of Standardization- Variations in geographical origin, harvesting conditions, and extraction procedures influence phytochemical composition.

3. Inadequate Toxicological Data- Long-term safety information for many medicinal plants is still unavailable.
4. Poor Bioavailability- Certain phytoconstituents exhibit low absorption and limited therapeutic concentrations.
5. Herb-Drug Interactions- Simultaneous administration with conventional medications may alter pharmacokinetic profiles.
6. Regulatory Limitations-Uniform guidelines for quality control and standardization are lacking.
7. Difficulty in Dose Optimization- Establishing therapeutic doses for herbal preparations remains challenging.

FUTURE PERSPECTIVES[30,31]

Future research should focus on:

1. Identification and isolation of active phytoconstituents responsible for antipsychotic activity.
2. Development of standardized herbal formulations with improved bioavailability.
3. Investigation of molecular mechanisms underlying neurotransmitter modulation.
4. Evaluation of synergistic interactions with existing antipsychotic drugs.
5. Comprehensive toxicity and pharmacokinetic studies.
6. Conducting multicenter randomized clinical trials.
7. Application of nanotechnology to enhance delivery and therapeutic efficacy.
8. Development of novel plant-derived drug candidates with fewer adverse effects.

Medicinal Plant:

1. *Moringa oleifera* Lam.[32,33,34]

Family - Moringaceae

Common Name- Drumstick Tree, Horseradish Tree

Botanical Overview

Moringa oleifera is a rapidly growing medicinal tree native to the Indian subcontinent and extensively cultivated in tropical and subtropical regions. The plant has attracted significant scientific interest because of its nutritional value and diverse pharmacological activities. Various parts of the plant, including leaves, seeds, flowers, roots, and bark, have been utilized traditionally for the management of inflammatory disorders, infections, metabolic diseases, and neurological conditions. In recent years, increasing evidence has suggested that Moringa oleifera possesses neuroprotective properties that may be beneficial in neuropsychiatric disorders characterized by oxidative stress and neuroinflammation.

Phytochemical Profile

The therapeutic effects of *Moringa oleifera* are attributed to the presence of numerous secondary metabolites, including: Quercetin, Kaempferol, Chlorogenic acid, Isothiocyanates, β-Carotene, Ascorbic acid, Phenolic acids, Flavonoids, Saponins, Tannins.

Among these constituents, flavonoids and phenolic compounds are considered major contributors to its antioxidant and neuroprotective activities.

Pharmacological Properties

Several experimental studies have demonstrated that Moringa oleifera exhibits:

Antioxidant activity, Anti-inflammatory activity, Antidiabetic activity, Anticancer activity, Hepatoprotective activity, Neuroprotective activity, Antidepressant activity, Cognitive-enhancing effects

These biological activities indicate that the plant exerts multitarget effects capable of influencing several pathological processes involved in central nervous system disorders.

Potential Role in Psychotic Disorders[35]

Accumulating evidence suggests that oxidative stress and inflammatory mediators contribute significantly to the progression of schizophrenia. Since Moringa oleifera contains potent antioxidant molecules, it may help reduce neuronal damage caused by excessive free radical production.

Furthermore, experimental investigations have shown improvements in memory performance and behavioral abnormalities following administration of Moringa extracts. Such findings suggest that the plant may have potential value as an adjunctive therapeutic agent for psychotic disorders.

2. *Aegle marmelos* (L.) Corrêa[36,37]

Family- Rutaceae

Common Name - Bael, Bengal Quince

Botanical Overview

Aegle marmelos is an important medicinal plant extensively used in Ayurveda and other traditional systems of medicine. The plant is indigenous to India and Southeast Asia and is considered sacred in Indian culture. Leaves, fruits, roots, and bark have been employed traditionally for the treatment of gastrointestinal disorders, diabetes, inflammatory conditions, and nervous system diseases.

Recent scientific investigations have highlighted its neuroprotective potential and antioxidant properties.

Phytochemical Profile

The plant contains numerous pharmacologically active constituents, including: Marmelosin, Aegeline,

Skimmianine, Coumarins, Alkaloids, Flavonoids, Phenolic compounds, Tannins, Essential oils

These compounds collectively contribute to the biological activities of the plant.

Pharmacological Properties

Aegle marmelos exhibits:

Antioxidant activity, Anti-inflammatory activity, Antimicrobial activity, Hepatoprotective activity, Antidiabetic activity, Gastroprotective activity, Neuroprotective activity, Anxiolytic effects

The antioxidant potential of the plant has been extensively investigated and may contribute to its beneficial effects on the nervous system.

Potential Role in Psychotic Disorders

Increasing evidence indicates that chronic oxidative stress contributes to neuronal dysfunction observed in schizophrenia. The phenolic compounds present in *Aegle marmelos* may help minimize oxidative injury and maintain neuronal homeostasis.

Experimental studies have reported anxiolytic and memory-enhancing effects, suggesting possible usefulness in psychiatric conditions characterized by cognitive impairment and emotional disturbances.

3. *Ocimum sanctum* Linn.[38,39]

Family- Lamiaceae

Common Name- Holy Basil, Tulsi

Botanical Overview

Ocimum sanctum Linn., commonly referred to as Tulsi, is an aromatic medicinal herb extensively used in Ayurvedic medicine. Native to the Indian subcontinent, the plant has been traditionally employed for the management of respiratory disorders, inflammatory diseases, stress-related conditions, and neurological ailments. Because of its adaptogenic and neuroprotective properties, Ocimum sanctum has received considerable attention in modern phytopharmacological research.

The plant is recognized as a "Rasayana" herb in Ayurveda due to its ability to promote overall health and enhance resistance against physiological stress.

Phytochemical Profile

The biological activities of *Ocimum sanctum* are attributed to the presence of numerous phytoconstituents, including: Eugenol, Ursolic acid, Rosmarinic acid, Apigenin, Linalool, Orientin, Vicenin, Flavonoids, Tannins, Phenolic compounds

These compounds collectively contribute to the antioxidant and neuroprotective properties of the plant.

Pharmacological Properties

Experimental investigations have demonstrated that *Ocimum sanctum* possesses:

Antioxidant activity, Anti-inflammatory activity, Adaptogenic activity, Anxiolytic activity, Antidepressant activity, Neuroprotective activity, Immunomodulatory activity, Cognitive-enhancing effects

The broad spectrum of pharmacological actions indicates that the plant may influence several pathological mechanisms associated with psychiatric disorders.

Potential Role in Psychotic Disorders

Stress, neuroinflammation, and oxidative damage are increasingly recognized as contributing factors in schizophrenia. The adaptogenic nature of Ocimum sanctum may help attenuate stress-induced neurochemical disturbances. In addition, the antioxidant capacity of the plant may protect neurons against oxidative injury and improve cognitive function.

Several preclinical studies have reported anxiolytic and antidepressant effects, suggesting its potential role as an adjunctive therapy in neuropsychiatric disorders.

4. *Curcuma longa* Linn.[40]

Family- Zingiberaceae

Common Name- Turmeric

Botanical Overview

Curcuma longa is a perennial rhizomatous herb extensively cultivated in India and several Asian countries. The rhizome is the principal medicinal part and has been used traditionally for centuries in the treatment of inflammatory disorders, liver diseases, skin ailments, and metabolic abnormalities.

In recent years, turmeric has attracted considerable scientific interest because of the remarkable biological activities of curcumin, its major bioactive constituent. Numerous studies have explored its role in neurodegenerative and psychiatric disorders.

Phytochemical Profile

Important phytochemicals present in *Curcuma longa* include: Curcumin, Demethoxycurcumin, Bisdemethoxycurcumin, Turmerone, Sesquiterpenes, Flavonoids, Phenolic compounds, Essential oils

Curcumin is considered the major component responsible for most of the pharmacological effects.

Pharmacological Properties

The plant exhibits multiple therapeutic activities, including:

Antioxidant activity, Anti-inflammatory activity, Neuroprotective activity, Antidepressant activity, Anticancer activity, Hepatoprotective activity, Cognitive-enhancing effects, Immunomodulatory activity

The multitarget nature of curcumin has contributed to its growing importance in neuropsychiatric research.

Potential Role in Psychotic Disorders

Neuroinflammation and oxidative stress are considered important pathological processes in schizophrenia. Curcumin possesses potent antioxidant and anti-inflammatory properties capable of protecting neuronal cells against oxidative damage.

Experimental evidence suggests that curcumin may improve cognitive deficits and behavioral abnormalities associated with psychiatric disorders. Additionally, its ability to influence neurotransmitter systems and neurotrophic factors makes it a promising candidate for adjunctive therapy.

5. *Ginkgo biloba* L.[41]

Family- Ginkgoaceae

Common Name- Maidenhair Tree

Botanical Overview

Ginkgo biloba is one of the oldest surviving tree species and is often referred to as a "living fossil." Native to China, the plant has been extensively utilized in traditional medicine for centuries to improve memory, circulation, and neurological health. Extracts prepared from its leaves are widely used in modern phytotherapy and have gained considerable scientific attention because of their potential benefits in neurodegenerative and psychiatric disorders. Standardized Ginkgo biloba extracts, particularly EGb 761, have been investigated for their effects on cognition, oxidative stress, and behavioral disturbances.

Phytochemical Profile

The therapeutic properties of *Ginkgo biloba* are attributed to several biologically active constituents, including: Ginkgolides A, B, and C, Bilobalide, Quercetin, Kaempferol, Isorhamnetin, Proanthocyanidins, Flavonoid glycosides, Terpene lactones

These compounds contribute to antioxidant, anti-inflammatory, and neuroprotective effects.

Pharmacological Properties

Experimental and clinical studies have demonstrated that *Ginkgo biloba* possesses:

Antioxidant activity, Neuroprotective effects, Memory-enhancing properties, Anti-inflammatory activity, Improvement of cerebral blood flow, Cognitive-enhancing activity, Antidepressant effects, Antiapoptotic activity

Because of these diverse actions, Ginkgo biloba has been investigated in Alzheimer's disease, dementia, anxiety disorders, and schizophrenia.

Potential Role in Psychotic Disorders

Cognitive dysfunction is one of the major challenges in schizophrenia management and is often inadequately controlled by conventional antipsychotic drugs. Several studies suggest that Ginkgo biloba may improve cognitive deficits and reduce oxidative stress associated with psychotic disorders. Adjunctive therapy with standardized Ginkgo biloba extracts has shown beneficial effects in reducing negative symptoms and improving overall clinical outcomes in some patients with schizophrenia.

6. *Valeriana officinalis* L.[42]

Family- Caprifoliaceae

Common Name- Valerian

Botanical Overview

Valeriana officinalis is a perennial herb native to Europe and Asia and is widely recognized for its sedative and anxiolytic properties. The roots and rhizomes constitute the medicinal parts of the plant and have traditionally been used for insomnia, nervous disorders, anxiety, and stress-related conditions.

Because sleep disturbances and anxiety frequently coexist with psychotic disorders, valerian has attracted interest as a supportive therapeutic agent.

Phytochemical Profile

The plant contains numerous active compounds, including:

Valerenic acid, Valepotriates, Sesquiterpenes, Alkaloids, Flavonoids, Lignans, Essential oils.

Valerenic acid is considered the major constituent responsible for central nervous system effects.

Pharmacological Properties

Studies have reported several biological activities of *Valeriana officinalis*, including:

Sedative activity, Anxiolytic effects, Anticonvulsant activity, Antidepressant activity, Neuroprotective effects, Muscle relaxant activity, Sleep-promoting properties

These pharmacological properties suggest potential utility in psychiatric conditions characterized by anxiety and sleep disturbances.

Potential Role in Psychotic Disorders

Sleep abnormalities and anxiety are common in patients with schizophrenia and may worsen disease progression. By improving sleep quality and reducing emotional stress, valerian may provide supportive benefits in psychotic disorders.

Although direct antipsychotic effects have not been clearly established, its calming properties may contribute to improved quality of life and treatment adherence.

7. *Passiflora incarnata* L.[43,44]

Family- Passifloraceae

Common Name- Passion Flower, Maypop

Botanical Overview

Passiflora incarnata is a perennial climbing vine indigenous to North and South America and has long been utilized in traditional medicine for the treatment of insomnia, anxiety,

epilepsy, and nervous disorders. The aerial parts of the plant, including leaves and flowers, are rich in bioactive compounds with central nervous system activity. Because emotional disturbances and sleep abnormalities are frequently associated with psychotic illnesses, Passiflora incarnata has emerged as a promising medicinal plant for neuropsychiatric research.

Phytochemical Profile[45]

Several phytoconstituents have been identified in *Passiflora incarnata*, including: Vitexin, Isovitexin, Apigenin, Orientin, Harman alkaloids, Flavonoids, Phenolic compounds, Glycosides, Saponins

Among these compounds, flavonoids are considered the principal contributors to its psychopharmacological effects.

Pharmacological Properties

Experimental studies have demonstrated a broad range of biological activities, including:

Anxiolytic activity, Sedative effects, Anticonvulsant activity, Antidepressant effects, Neuroprotective activity, Antioxidant activity, Anti-inflammatory properties

These activities suggest that Passiflora incarnata may provide supportive benefits in disorders involving excessive neuronal excitability and psychological stress.

Potential Role in Psychotic Disorders

Psychotic disorders are often accompanied by anxiety, agitation, insomnia, and emotional instability. The calming and sedative properties of Passiflora incarnata may help improve these associated symptoms. Furthermore, oxidative stress has been implicated in schizophrenia, and the antioxidant potential of the plant may contribute to neuronal protection.

Although evidence supporting direct antipsychotic effects remains limited, the plant may have value as an adjunctive therapy.

8. *Nardostachys jatamansi* DC.[46,47]

Family- Caprifoliaceae

Common Name- Jatamansi, Indian Spikenard

Botanical Overview

Nardostachys jatamansi is an aromatic perennial herb native to the Himalayan regions of India, Nepal, and Bhutan. The rhizomes of the plant have been extensively used in Ayurveda for the management of insomnia, epilepsy, anxiety, hysteria, and memory disorders.

In recent years, increasing attention has been directed toward its neuroprotective and antioxidant properties, making it an important candidate for neuropsychiatric research.

Phytochemical Profile

Major constituents present in *Nardostachys jatamansi* include: Jatamansone (Valeranone), Nardostachone, Sesquiterpenes, Alkaloids, Coumarins, Flavonoids, Lignans, Essential oils.

These compounds contribute to the pharmacological activities of the plant.

Pharmacological Properties[48]

Numerous investigations have reported:

Neuroprotective activity, Antioxidant effects, Antidepressant activity, Anxiolytic activity, Anticonvulsant activity, Memory-enhancing properties, Anti-inflammatory effects, Sedative activity

These actions indicate that the plant exerts multitarget effects on the central nervous system.

Potential Role in Psychotic Disorders

Oxidative stress and neuronal degeneration have been implicated in the pathophysiology of schizophrenia. The strong antioxidant properties of *Nardostachys jatamansi* may help reduce oxidative injury and improve neuronal survival.

Experimental studies have also demonstrated beneficial effects on learning and memory, suggesting possible utility in addressing cognitive deficits associated with psychotic disorders.

9. *Convolvulus pluricaulis* Choisy[49,50]

Family- Convolvulaceae

Common Name- Shankhpushpi

Botanical Overview

Convolvulus pluricaulis, commonly known as Shankhpushpi, is one of the most important Ayurvedic medicinal herbs used as a brain tonic. The plant has traditionally been prescribed for memory impairment, anxiety, insomnia, epilepsy, and mental fatigue.

Its reputation as a cognitive enhancer has stimulated scientific interest in its role in neurological and psychiatric disorders.

Phytochemical Profile

Important constituents identified in the plant include: Convolvine, Convolamine, Flavonoids, Alkaloids, Glycosides, Coumarins, Steroids, Phenolic compounds

These constituents contribute to its neuropharmacological properties.

Pharmacological Properties

Studies have reported:

Nootropic activity, Neuroprotective effects, Antioxidant activity, Antidepressant activity, Anxiolytic activity, Anticonvulsant effects, Memory-enhancing properties

The plant is considered one of the most promising Ayurvedic herbs for improving cognitive performance.

Potential Role in Psychotic Disorders

Cognitive impairment and oxidative stress represent important components of schizophrenia. The neuroprotective and antioxidant properties of *Convolvulus pluricaulis* may help attenuate these pathological changes.

Experimental studies suggest improvements in learning, memory, and behavioral performance, indicating possible usefulness in managing cognitive deficits associated with psychotic illnesses.

Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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