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MEDICINAL PLANTS AS POTENTIAL ANTIDEPRESSANTS: A COMPREHENSIVE REVIEW OF EXPERIMENTAL EVIDENCE

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ABSTRACT

Depression is a common and serious mental disorder marked by persistent low mood, lack of interest or pleasure, reduced energy, and impaired concentration. The pathophysiology of depression is mainly associated with increased activity of monoamine oxidase-A (MAO-A) and reduced levels of neurotransmitters such as noradrenaline (NA) and serotonin (5-HT). Clinical manifestations include loss of pleasure, feelings of worthlessness or excessive guilt, disturbed sleep, reduced appetite and libido, fatigue, and recurrent thoughts of death or suicide. Although several synthetic antidepressant drugs are available for the management of depression, their therapeutic effectiveness is often limited by adverse effects and poor patient compliance. Consequently, there has been a growing interest in traditional systems of medicine such as Ayurveda, Siddha, and Unani, which emphasize the use of natural remedies. Medicinal plants have gained significant attention due to their potential antidepressant activity and better safety profile. Numerous experimental and clinical studies have been reported on plant-based antidepressants; however, the available data remain insufficient to establish definitive therapeutic outcomes. Therefore, the present review aims to compile and critically analyze existing research on medicinal plants with antidepressant potential, highlighting the need for further scientific validation.

KEYWORDS: Depression; Antidepressant activity; Medicinal plants; Forced swimming test; Tail suspension test; Open field test.

Abbreviations: HBT: Hole Board Test; FST: Force Swimming, Test; TST: Tail Suspension Test; OFT: Open Field Test; EPMT: Elevated Plus Maze Test; MACT: Muscle Coordination Activity Test; THB: Triple Horizontal Bars.

INTRODUCTION

Depression is a chronic and debilitating mental disorder that affects an individual's mood, thought processes, physical health, and behavior. It is characterized by a persistent feeling of sadness, loss of interest or pleasure, reduced energy levels, and impaired concentration. Both biological and emotional factors contribute significantly to the development and progression of depressive disorders. Biological manifestations include psychomotor retardation, decreased appetite, and slowed thought processes, while emotional symptoms commonly involve apathy, pessimism, feelings of guilt, low self-esteem, indecisiveness, and lack of motivation.[1]

According to the World Health Organization, nearly 450 million people worldwide suffer from mental or behavioral disorders, making depression a major public health concern.[2,3] Mental illnesses account for approximately 12.3% of the global disease burden, a figure projected to rise to nearly 15% by 2020, indicating a rapidly growing health challenge.[4] Clinical and experimental studies suggest that major depressive disorder is associated with alterations in brain function and dysregulation of monoamine neurotransmitters, particularly norepinephrine, serotonin, and dopamine.[5]

Epidemiological data predict that depression will become the second leading cause of morbidity worldwide, following cardiovascular diseases, thereby imposing a substantial socioeconomic burden on society.[6] Depression is broadly classified into two major types: unipolar depression and bipolar depression. Unipolar depression accounts for approximately 75% of cases and is characterized by persistent depressive episodes without manic phases. This form is often non-familial and is frequently associated with stressful or traumatic life events, accompanied by anxiety and agitation. In contrast, bipolar depression, which constitutes about 25% of cases, is typically endogenous in nature, exhibits a genetic predisposition, and is marked by alternating episodes of depression and mania. It usually manifests during early adulthood and progresses in cyclical phases over weeks or months.[7]

Although several synthetic antidepressant drugs are currently available for the management of depression, their clinical use is often limited due to undesirable side effects and drug-drug interactions. Common adverse effects include dry mouth, fatigue, gastrointestinal disturbances, respiratory complications, anxiety, drowsiness, agitation, and cardiac arrhythmias. These limitations highlight the need for safer and more effective therapeutic alternatives. Medicinal plants, known for their diverse bioactive compounds and relatively fewer side effects, offer a promising approach for the management of depression. Therefore, the present focus is directed toward exploring the potential role of medicinal plants as alternative or complementary therapies in the treatment of depressive disorders.

The antidepressant effects were primarily evaluated using Hole Board Test (HBT), Forced Swimming Test (FST), Tail Suspension Test (TST), Open Field Test (OFT), Elevated Plus Maze Test (EPMT), and Muscle Coordination Activity Test (MCAT), which included Rotarod and Triple Horizontal Bar (THB) methods. Although minor procedural modifications were adopted across studies, the fundamental principles of these experimental models remained consistent

Hole Board Test (HBT)

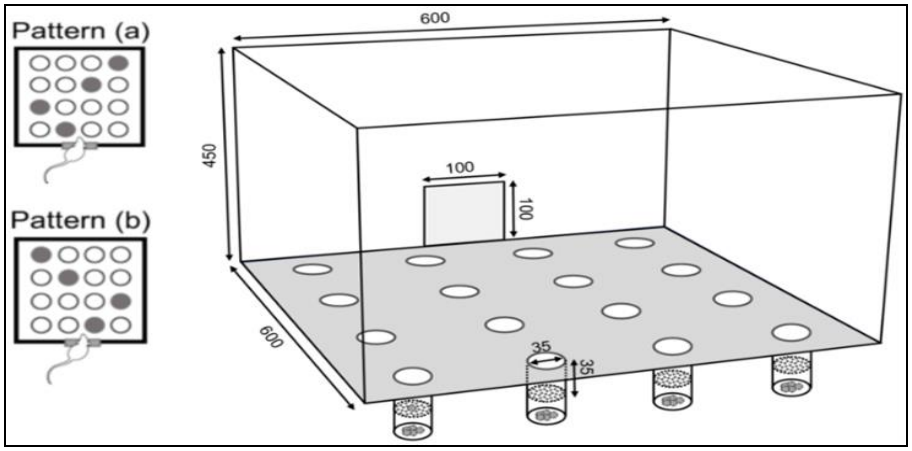

FIG. NO. : 1

The Hole Board Test is widely used to assess exploratory behavior and anxiety-related responses in rodents. The apparatus consists of a flat platform with evenly spaced holes, where animals are placed to explore a novel environment. The frequency and duration of head-dipping behavior are recorded over a fixed time period. Increased head-dipping behavior indicates enhanced exploratory activity and reduced anxiety, whereas reduced head-dipping suggests heightened anxiety levels. The underlying concept of this test is based on

the balance between an animal's natural curiosity and its tendency to avoid unfamiliar surroundings. In addition to head-dipping, behaviors such as grooming, rearing, and locomotor activity can also be evaluated, providing a broader assessment of emotional and behavioral states.[8]

Forced Swimming Test (FST)

FIG. NO. 2

The Forced Swimming Test, also known as the behavioral despair test, is one of the most commonly employed methods for screening antidepressant activity. This model was originally described by Porsolt and is based on the observation that rodents exposed to an inescapable stressful situation eventually exhibit immobility, which reflects a state of behavioral despair. In this test, animals are divided into control, standard, and test groups and treated with respective substances over a defined period. The experiment includes a pre-test session for adaptation, followed by a test session after 24 hours. During the test session, the duration of immobility is recorded. A reduction in immobility time is considered indicative of antidepressant-like activity. Immobility is defined as the absence of active escape-directed behaviors, except for minimal movements necessary to keep the head above water.[9,10]

Tail Suspension Test (TST)

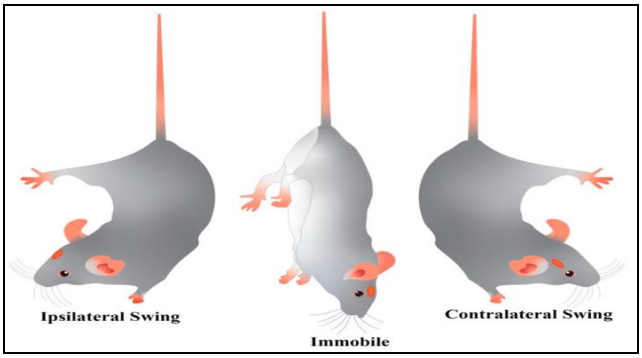

FIG NO 3

The Tail Suspension Test is conceptually similar to the FST, differing mainly in the method used to induce immobility. In this model, mice are suspended by their tails using adhesive tape, and immobility is recorded over a fixed observation period. Prior to testing, animals are weighed and administered test compounds, followed by an appropriate waiting period depending on the route of administration. Reduced immobility time in this test is interpreted as an antidepressant effect. To minimize experimental bias, studies are often conducted using blinded procedures with coded treatment solutions.[11]

Open Field Test (OFT)

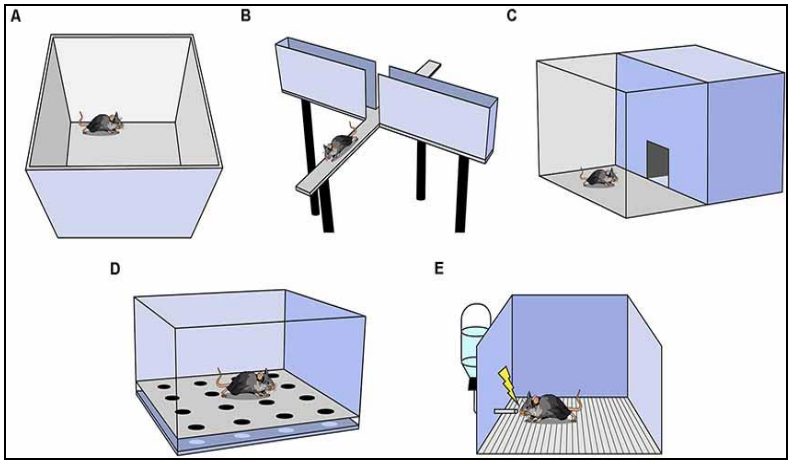

FIG. NO.: 4

The Open Field Test is utilized to evaluate locomotor activity, exploratory behavior, and anxiety-related responses in rodents. Animals are placed in an open arena and allowed to explore freely for a specific duration. Parameters such as the number of line crossings, rearing frequency, central square entries, and time spent in the central area are recorded. Increased movement and exploration of the central area are associated with reduced anxiety and enhanced exploratory behavior. Repeated exposure over consecutive days also allows assessment of habituation to a novel environment.[12]

Muscle Coordination Activity Test (MCAT)

Motor coordination and muscle strength are essential components of behavioral assessment, particularly to differentiate antidepressant effects from nonspecific motor stimulation or sedation. MCAT is used to evaluate muscle coordination and neuromuscular performance. Several apparatus and protocols have been described for this purpose.[13]

Elevated Plus Maze Test (EPMT)

Fig. NO. 5

The Elevated Plus Maze Test is a widely accepted model for assessing anxiety-like behavior. It is based on the natural aversion of rodents to open and elevated spaces, combined with their innate curiosity to explore new environments. The apparatus consists of two open arms and two closed arms arranged in a plus shape, elevated above the ground. Animals are allowed free access to all arms, and the number of entries and time spent in the open arms are recorded. Increased open-arm exploration is considered indicative of reduced anxiety levels.[14]

Rotarod Test

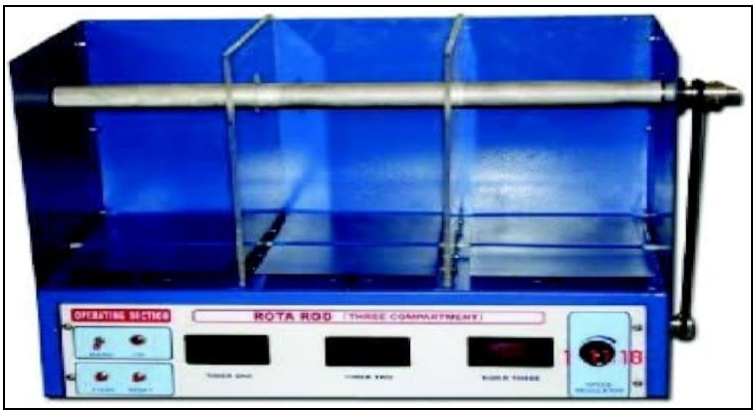

Fig. No. 6

The Rotarod apparatus consists of a rotating rod elevated above the base, allowing assessment of balance, grip strength, and motor coordination. The rod rotates at a controlled speed with gradual acceleration. The latency to fall from the rod is recorded, with improved performance indicating better motor coordination and muscle strength.[15]

TRADITIONAL UESD

1. Bacopa monnieri

Bacopa monnieri **(family Scrophulariaceae),** commonly known as Brahmi, is an aquatic medicinal herb widely distributed in tropical and subtropical regions, including Bangladesh. In traditional medicine, particularly in Bangladesh, Brahmi is extensively used as a neurological tonic to enhance cognitive function and intellectual development. It is also employed in the treatment of epilepsy, cardiac disorders respiratory ailments digestive disturbances toothache, and for blood purification. In certain regions, B. monnieri is additionally used to manage rheumatism and to prevent miscarriage Experimental studies have confirmed the antidepressant activity of Bacopa monnieri, supporting its traditional application in central nervous system disorders.[16]

2. Artemisia absinthium

Artemisia absinthium L**. (family Asteraceae),** commonly known as wormwood, is an aromatic and bitter medicinal herb widely used in Iranian traditional medicine. The plant has long been valued for its ethnomedicinal and biological properties, particularly its anthelmintic activity In addition, A. absinthium has been reported to possess antifungal, antimicrobial, choleretic, antiseptic, balsamic, depurative, digestive, diuretic, and emmenagogue properties, and has also been traditionally used in the management of leukemia and sclerosis. The essential oil composition of A. absinthium has been previously characterized. Experimental studies have further established its antidepressant activity, supporting its traditional application in central nervous system disorders.[17]

3. Eichhornia crassipes

Eichhornia crassipes, belonging to the family **Pontederiaceae** commonly known as water hyacinth, is a free-floating perennial aquatic plant. Phytochemical analysis has revealed the presence of carbohydrates, alkaloids, flavonoids, tannins, saponins, terpenoids, proteins, and phenolic compounds, along with essential minerals such as iron, manganese, and zinc. In traditional medicine, E. crassipes has been used as a nervine tonic, stimulant, antispasodic, antioxidant, and antidepressant agent, indicating its potential therapeutic value in neurological disorders.[18]

4. Urtica dioica

Urtica dioica belong to family **urticaceae** has been shown to produce significant antidepressant-like effects in validated animal models such as the Forced Swimming Test (FST) and Tail Suspension Test (TST). Both acute and repeated administration of U. dioica extracts resulted in behavioral effects comparable to those observed with standard antidepressant agents, including fluoxetine and haloperidol. These findings suggest that Urtica dioica possesses pharmacological properties consistent with antidepressant activity.[19]

5. Selaginella bryopteris

Selaginella bryopteris is a pteridophytic plant belonging to the family **Selaginellaceae** and is popularly known as “Sanjeevani booti.” It is a lithophytic species commonly found in tropical regions of India, particularly across the Aravalli mountain ranges. The plant exhibits remarkable desiccation tolerance; during dry seasons, it appears dormant with tightly curled fronds, while rehydration restores its green, active form. Due to this unique revival ability, it is also referred to as Punjemeriam or Hathazori in Unani medicine.[20]

6. Rosa damascene

Belong to family **rosaceae Rosa damascena** Mill., commonly known as Damask rose, is Globally recognized for its fragrance and extensive use in the perfume industry. In traditional medicine, the plant has been used for the treatment of abdominal and chest pain, menstrual disorders, digestive ailments, and for strengthening cardiac function. Additionally, R. damascena has been reported to exert beneficial effects in the management of depression, further supporting its therapeutic relevance in emotional and psychological disorders.[21]

7. Hypericum Species *(Hypericum perforatum L. and Hypericum maculatum*)

Hypericum perforatum L. **(family Hypericaceae),** commonly known as St. John's wort, is one of the most extensively studied medicinal plants for the treatment of depression. It is widely used in the management of mild to moderate depressive disorders. Several well-documented clinical studies have demonstrated that alcoholic extracts of H. perforatum exhibit therapeutic efficacy comparable to conventional antidepressant drugs, with a significantly lower incidence of adverse effects. In addition, Hypericum maculatum has been reported to possess antipanic and anxiolytic effects in human subjects, further supporting the role of Hypericum species in the treatment of affective disorders.[22]

8. Centella asiatica Linn

Centella asiatica Linn. (CA) is a clonal, perennial, herbaceous creeping plant belonging to the family **Apiaceae (Umbelliferae).** Preliminary phytochemical screening of the plant has revealed the presence of bioactive constituents such as saponins, terpenoids, alkaloids, and phenolic compounds. Traditionally, C. asiatica has been used as a cardiotonic, nervine tonic, sedative, stomachic, carminative, appetite stimulant, antileprotic, febrifuge, and memory enhancer. Several pharmacological studies have demonstrated its sedative and anxiolytic effects, antiepileptic activity, memory-enhancing potential, cardioprotective properties, and immunomodulatory action. In addition, experimental evidence supports the antidepressant activity of Centella asiatica, highlighting its therapeutic potential in mood disorders.[23]

9. Tecoma stans

Tecoma stans Linn., belong to a family *bignoniaceae* commonly known as "yellow bell flower," is a medicinal plant traditionally used for various therapeutic purposes. The flowers are rich in flavonoids, while the leaves contain alkaloids such as tecomine and tecostamine, which exhibit potent hypoglycemic activity. Anthranilic acid present in the plant is also associated with antidiabetic effects. The roots are traditionally used as diuretics and vermifuges.[28] Tecoma stans is considered relatively non-toxic, as it is widely used in Latin America for the management of diabetes and is also utilized as fodder for cattle and goats in Mexico Flavonoids, which are abundant in this plant, have been well documented for their antidepressant properties, suggesting the potential role of Tecoma stans in the management of depressive disorders.[24]

10. Cucurbita pepo Cucurbita pepo belong to the family **cucurbitaceae is** a cultivated species belonging to the genus Cucurbita. Experimental studies have shown that both

aqueous and alcoholic extracts of C. pepo produce significant antidepressant-like effects in animal models. The antidepressant activity observed in the Forced Swimming Test (FST) was comparable to that of the standard antidepressant drug imipramine. The FST is a sensitive and reliable behavioral model used to evaluate antidepressant efficacy, in which animals are subjected to an inescapable swimming situation that induces behavioral despair resembling depressive-like states in humans. These findings suggest that C. pepo possesses notable antidepressant potential.[26]

11. Andrographis paniculata

Andrographis paniculata **(*family Acanthaceae*)** is a well-known Indian medicinal plant traditionally used as an anti-inflammatory and antipyretic agent in the treatment of fever, cold, laryngitis, diarrhea, and rheumatoid arthritis The behavioral despair models, including the Forced Swimming Test and Tail Suspension Test, have been employed to assess its potential antidepressant activity. Experimental findings from these studies indicate a significant reduction in depressive-like behaviors, suggesting that A. paniculata may be effective in alleviating symptoms of depression and mood suppression commonly observed in modern lifestyles.[27]

12. Citrus maxima

Citrus maxima Merr. **(family Rutaceae),** commonly known as pomelo or pummel, has been traditionally used in indigenous systems of medicine for the treatment of nervous disorders. It has been employed as a sedative in nervous affections, convulsive cough, epilepsy, and hemorrhagic conditions. Traditional medical practices also report its use in the management of depressive disorders, suggesting its potential role in mood regulation.[28]

13. Passiflora foetida *Passiflora foetida* **(family Passifloraceae**), commonly known as stinking passion flower, is an herbaceous climbing plant widely used in traditional Mexican medicine for the management of various central nervous system (CNS) disorders. Phytochemical investigations have revealed the presence of hydrocyanic acid, flavonoids, and β-carboline (harman) alkaloids in P. foetida. Harman alkaloids have been identified as key bioactive constituents in Passiflora incarnata Linn., a closely related species that has been extensively studied for its neuropharmacological effects. Experimental studies have demonstrated the antidepressant activity of Passiflora foetida, supporting its traditional use in mood-related disorders.[29]

14. Cassia occidentalis

Cassia occidentalis, belong to the family **fabaceae** commonly known as coffee senna, is a medicinal plant native to southern India and belongs to the family Caesalpiniaceae. It is known as Kasmard in Sanskrit, Kasondi in Hindi, and Ponnavaari in regional languages. Leaves, seeds, and roots of the plant are traditionally used for the treatment of fever, menstrual disorders, tuberculosis, and general weakness. Pharmacological studies have reported a wide range of biological activities of C. occidentalis, including antibacterial antiplasmodial, antimutagenic, hepatoprotective, and antidiabetic effects. In addition to these properties, the plant has also been evaluated for its anxiolytic and antidepressant activities, supporting its traditional use in central nervous system-related disorders.[30]

15. Momordica charantia

(Family: Cucurbitaceae) Momordica charantia, belonging to the family Cucurbitaceae, is commonly known as bitter melon, bitter gourd, balsam pear, karela, or pare. The plant is widely distributed in tropical and subtropical regions such as Asia, India, East Africa, South Africa, the Amazon basin, and the Caribbean. It has been traditionally used both as a food source and as a medicinal plant in various indigenous systems of medicine. Phytochemical studies of M. charantia have revealed the presence of diverse bioactive compounds, including alkaloids, flavonoids, glycosides, triterpenoids, steroids, phenolic compounds, tannins, and fixed oils. Previous reports have indicated its antidepressant and anxiolytic properties; however, systematic biological investigations of different plant parts such as leaves, seeds, and roots are limited. Moreover, the fruit of M. charantia has not been extensively evaluated through comprehensive biological studies. Therefore, the antidepressant activity of the unripe fruit along with leaves of M. charantia has been assessed using stress-induced depression models such as the Forced Swim Test (FST) and Tail Suspension Test (TST). [31]

16. Alafia multiflora

Alafia multiflora **(family Apocynaceae)** is a medicinal plant widely distributed across tropical regions of Africa. Phytochemical screening of the stem bark has revealed the presence of phenolic compounds, tannins, flavonoids, anthraquinones, and alkaloids. Several plant-derived flavonoids and terpenoids are known to cross the blood–brain barrier and modulate brain function, including interaction with ionotropic γ-aminobutyric acid (GABA) receptors. Owing to its flavonoid-rich composition and strong antioxidant activity, A.

multiflora is presumed to exert pharmacological effects on the central nervous system, including potential antidepressant activity.[32]

17. Areca catechu Linn is a slender, monoecious palm belonging to the family **Arecaceae** and is native to Southeast Asia. The plant has been traditionally used for centuries due to its psychotropic and therapeutic properties. The fruits and seeds of A. catechu contain a variety of bioactive constituents, including polyphenols, fats, vitamins, and parasympathomimetic alkaloids. Consumption of areca nut is known to produce psychostimulant effects such as mild euphoria, which may enhance alertness and work capacity.

Several experimental studies have investigated the potential antidepressant efficacy of Areca catechu nut ethanol extract and its various fractions using both behavioral and biochemical approaches. Behavioral assessments, including acute and sub-chronic Forced Swimming Test (FST) and Tail Suspension Test (TST), were employed to evaluate antidepressant-like activity in animal models. In addition, biochemical analyses involving the estimation of monoamine neurotransmitters and their metabolites using high-performance liquid chromatography (HPLC) were conducted to understand the underlying mechanism of action. The ethanolic extract of Areca catechu nut (ACEE) demonstrated significant antidepressant-like activity in rats, as evidenced by a reduction in immobility time in both FST and TST. Importantly, ACEE did not induce motor incoordination or impair locomotor performance, indicating that the observed antidepressant-like effects were not due to nonspecific stimulation or sedation. The results suggest that Areca catechu nut ethanolic extract, particularly at a dose of 50 mg/kg, possesses notable antidepressant-like activity without causing motor dysfunction.[33]

18. Clitoria ternatea L.

(Family: *Fabaceae*) Clitoria ternatea L. (CT), commonly known as butterfly pea, is a perennial herbaceous plant belonging to the family Fabaceae. It has been used for centuries in traditional Ayurvedic medicine for the treatment of various ailments. The roots of C. ternatea possess laxative, diuretic, anthelmintic, and anti-inflammatory properties and are traditionally employed in the management of conditions such as severe bronchitis, asthma, and hectic fever. Pharmacological studies have demonstrated that Clitoria ternatea exhibits a wide range of biological activities, including nootropic, anxiolytic, anticonvulsant, antidiabetic, antipyretic, anti-inflammatory, and analgesic effects. The plant has also been reported to enhance memory and increase acetylcholine levels in experimental animal models. In

addition, Clitoria ternatea has shown significant antidepressant activity, supporting its potential role in the treatment of depressive disorders.[34]

19. Aegle marmelos (L.) Corrêa

(Family: **Rutaceae**) Aegle marmelos (AM), commonly known as the bael fruit tree, is a highly esteemed medicinal plant in Ayurveda and is widely distributed throughout India. Various parts of the plant possess significant therapeutic value. Numerous pharmacological studies have demonstrated that A. marmelos exhibits a broad spectrum of biological activities, including antidiarrhoeal, antidiabetic, anticancer, radioprotective, antifungal, antimicrobial, antimicrofilarial, anti-inflammatory, antipyretic, and analgesic effects. Experimental investigations have shown that the methanolic extract of Aegle marmelos leaves produces significant anxiolytic and antidepressant effects, possibly through enhancement of monoamine levels at postsynaptic sites. Therefore, Aegle marmelos may serve as a promising natural source of psychotherapeutic agents for the management of stress-related disorders such as anxiety and depression.[35]

20. Rosmarinus officinalis

Rosmarinus officinalis, belong to the family **lamiaceae** commonly known as rosemary, is an aromatic evergreen plant that grows wild in many Mediterranean countries and is widely cultivated worldwide. The plant is valued for its high essential oil content, which is extensively used in the perfume industry and as a flavoring agent in food products Rosemary has a long history of use in traditional medicine and is well recognized for its potent antioxidant properties Traditionally referred to as the “herb of remembrance,” R. officinalis has been associated with memory enhancement and cognitive improvement. Experimental and clinical studies have demonstrated its positive effects on memory and learning abilities Phytochemical investigations have led to the isolation of bioactive compounds such as salvigenin, rosmanol, and cirsimaritin, which contribute to its neuroprotective and antidepressant activities. These findings support the potential role of Rosmarinus officinalis in the management of depressive disorders.[36]

21. Melissa officinalis

Melissa officinalis (family **Lamiaceae)**, commonly known as lemon balm, is an aromatic medicinal plant native to the eastern Mediterranean region and western Asia. The dried or fresh leaves and aerial parts of the plant are primarily used for medicinal purposes. Traditionally, lemon balm has been employed as a tonic, antispasmodic, carminative,

diaphoretic, sedative-hypnotic, and memory-enhancing agent, as well as for wound healingand relief of stress-induced headaches. In contemporary medicine, it is widely used for managing stress-related conditions, mild insomnia, and viral infections such as herpes simplex.

Experimental studies have demonstrated significant antidepressant-like activity of M. officinalis. Aqueous extracts produced a marked reduction in immobility time along with increased climbing behavior in animal models, comparable to the effects of the standard antidepressant drug imipramine. The essential oil exhibited a dose-dependent reduction in immobility and enhanced climbing behavior at all tested doses, while a significant increase in swimming behavior was observed only at the highest dose (300 mg/kg). Additionally, the aqueous extract, but not the essential oil, caused a dose-dependent decrease in spontaneous locomotor activity, suggesting a mild sedative effect.[37]

22. Basella alba L.

(Family**: Basellaceae**) *Basella alba L.* (synonym: Basella rubra Roxb.) is a highly heat-tolerant and fast-growing perennial vine belonging to the family Basellaceae. It is widely known by various common names such as Malabar spinach, Indian spinach, Ceylon spinach, vine spinach, climbing spinach, East-Indian spinach, Chinese spinach, and cyclone spinach. The plant is native to tropical regions of Southern Asia and is believed to have originated from India or Indonesia. Phytochemical investigations of Basella alba leaves have revealed the presence of several bioactive constituents, including flavonoids, saponins, phenolic compounds, and tannins. These phytochemicals have been reported to exhibit significant antidepressant activity, indicating the therapeutic potential of Basella alba in the management of depressive disorders.[38]

Name of plant	Part used	Extraction	Animal model	Reference
Becopa monniera	Leaves	Methanolic extract	Swiss albino mice	16
Artemisia absinthium	Aerial parts	Methanolic extract	Swiss albino mice	17
Eicchornea crassipes	Leaves	Aqueous and chloroform extract	Swiss albino mice	18
Urtica dioica	Root leaves	Methanolic extract	Male swiss albino mice	19
Selaginella bryopeteris	Aerial parts	Pet ether chloroform methanol ethanol and aqueous extract	Swiss albino mice	20
Rosa damascene	leaves	Methanolic extract	Swiss albino mice	21
Hypericum species	Leaves	Ethanolic extract	Female swiss albino	22

			mice	
Centella asiatica linn	Leaves	Ethanolic extract	Male swiss albino mice	23
Tecoma stans	Flower	Ethanolic extract	Male swiss albino mice	24
Cucurbita pepo	Seed	Alcoholic extract	Male swiss wister rats	26
Andrographis paniculata	Leaves	Ethanolic extract	Rats	27
Citrus maxima	Leaves	Aqueous extract	Swiss albino mice	28
passiflora foetida	Leaves	Methanolic extract	Male swiss albino mice	29
Cassia occidentalis	Leaves	Ethanolic extract	Wister rats	30
Momordica charantia	Unripe fruit	Ethanolic extract	Swiss albino mice	31
Alafia multiflora	Stem barks	Aqueous extract	Wister albino rats	32
Areca catechu	Palm, fruit	Ethanolic extract	Male swiss albino mice	33
Clitoria ternatea	root	Ethanolic extract	Swiss albino mice	34
Aegle marmelos	Leaves	Methanolic extract	Male swiss albino mice	35
Rosmarinus officinalis	Root	Isolation of salvigenin rosmanol and cirsimaritin	Male swiss albino mice	3
Melissa officinalis	Leaves	Aqueous extract	Male swiss albino mice	37
Basella alba l.	Leaves	Methanolic extract	Swiss albino mice	38

CONCLUSION

Medicinal plants represent a promising and valuable source of potential antidepressant agents. The present review highlights that a wide range of plant species, including Bacopa monnieri, Hypericum perforatum, Centella asiatica, Melissa officinalis, Aegle marmelos, and Clitoria ternatea, have demonstrated significant antidepressant-like activity in various experimental models such as the Forced Swimming Test, Tail Suspension Test, Open Field Test, and related behavioral assays. These effects are mainly attributed to the presence of bioactive phytoconstituents such as flavonoids, alkaloids, phenolic compounds, terpenoids, and saponins, which may act through modulation of monoaminergic neurotransmitters, antioxidant mechanisms, neuroprotection, and stress-response pathways.

Compared with synthetic antidepressants, medicinal plants may offer the advantage of better tolerability, lower incidence of adverse effects, and multi-target therapeutic actions. However, despite encouraging preclinical and limited clinical evidence, the currently available data are still insufficient to establish these plants as definitive alternatives to conventional antidepressant drugs. Most studies remain limited to animal models, and variations in extraction methods, plant parts used, dose regimens, and experimental protocols make direct comparison difficult.

Therefore, there is a strong need for further well-designed pharmacological, toxicological, phytochemical, and clinical investigations to identify active constituents, clarify mechanisms

of action, standardize herbal formulations, and confirm long-term safety and efficacy in humans. Overall, medicinal plants hold substantial therapeutic potential in the management of depression and may contribute significantly to the development of safer, effective, and affordable antidepressant therapies in the future

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