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A Comprehensive Review of Herbal Plants with Antidepressant Activity

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ABSTRACT :

Depression is a mental health condition that can significantly affect a person's mood, behavior, and way of thinking. For people who are clinically depressed, a number of synthetic medications are used as conventional treatment; nevertheless, they frequently have side effects that can impair therapeutic results. Investigating antidepressants made from plants that have a favorable risk-benefit ratio and demonstrated advantages is therefore worthwhile. Because of the combined effects of their therapeutic ingredients, a number of medicinal plants and their derivatives have shown antidepressant characteristics. Monoamines including noradrenaline, dopamine, and serotonin are known to be at lower concentrations in the brain during depression. So, drugs that either inhibit monoamine oxidase or prevent these neurotransmitters from being reabsorbed could be useful in treating depression by raising low monoamine levels. This review focuses on medicinal plants and plant-based formulations that have shown antidepressant efficacy in trials conducted on humans and animals. Review articles provide evidence of prior study demonstrating that these plants either have antidepressant qualities based on traditional use or have been scientifically demonstrated to have such qualities.

Keywords: Keywords: Depression, Medicinal plants, Antidepressants, Herbal medicine

1. Introduction:

Depression

Globally, depression is the most common mental disorder, and it greatly increases lifetime risk as well as the burden of disability. It appears as persistent feelings of hopelessness, worthlessness, and sadness; it is frequently accompanied by alterations in sleep patterns, agitation, fatigue, and a general change in lifestyle. Suicidal thoughts may even arise as a result of these symptoms, which might affect cognitive ability and emotional health [1]. Over the world, millions of people suffer with depression, a prevalent and complex mood condition. Prolonged depressive and disappointing feelings together with a lack of interest in activities are among its characteristics. Because depression affects so many people, it is a serious public health concern because of the suffering, mental dysfunction, morbidity, and financial cost it causes. Compared to men, women receive the diagnosis more frequently [2]. Types of depression are Depressive Disorder (MDD), also known as clinical depression, is characterized by persistent feelings of sadness, hopelessness, and decreased interest in activities. It significantly affects daily functioning and quality of life, with symptoms lasting at least two weeks. Treatment includes medication, psychotherapy, and lifestyle modifications[3].. Persistent Depressive Disorder (PDD), previously known as dysthymia, involves chronic, low-grade depression lasting at least two years[4]. Bipolar Disorder involves alternating episodes of depression and mania or hypomania. Patients with depression have symptoms that reflect decrease in brain monoamine neurotransmitters, specifically norepinephrine, serotonin and dopamine. 500,000/year is diagnosed as suffering from depression. Although clinically depressed people are routinely treated with synthetic medications, the side effects of these medications can make treatment outcomes uncertain. A few of these adverse effects include heart arrhythmias, anxiety, agitation, dry mouth, exhaustion, and gastrointestinal or respiratory issues. Drug interactions can also happen in a number of ways. This has made the use of medicinal plants as alternative depression treatments possible[5].Medicinal plant show previous studies show significant antidepressant properties in review article , research article show in Table 1.

1.1. Tables

Table 1- List of medicinal plants reported to possess antidepressant effect

Sr. No.	Common name	Family	Parts used	References

1.	*Apocynum venetum:*	Apocynaceae	leaves	[6]
2.	*Amaranthus spinosus*	Amaranthaceae	Whole plant	*[7]*
3.	*Rhazya stricta*	Apocynaceae	Leaves	[8]
4.	*Hippeastrum vittatum*	Amaryllidaceae	Flower	[9]
5.	*Crocus sativus*	Iridaceae	Petals	[10, 11]
6.	*Ginkgo biloba*	Ginkgoaceae	Leaves	[12]
7.	*Kaempferia parviflora*	Zingiberaceae	Whole plant	[13].
8.	*Marsilea minuta*	Marsileaceae	Roots	[14].
9.	*Polygalasa sabulosa*	Polygalaceae	Whole plant	[15]
10.	*Kaempferia parviflora*	Zingiberaceae	Whole plant	[13]
11.	*Marsilea minuta*	Marsileaceae	Roots	[14]
12.	*Momordica charantia*	Cucurbitaceae	Seed, root	[16]
13.	*Asparagus racemosus*	Asparagaceae	Root	[17]
14.	*Allium sativum*	Amaryllidaceae	Rhizome	[18]
15.	*Berberis aristata*	Berberidaceae	Root	[19]
16.	*Clitoria ternatea*	Fabaceae	Root, Bark	[20]
17.	*Emblica officinalis*	Phyllanthaceae.	Fruit	[21]
18.	*Hypericum reflexum L*	Hypericaceae	Aerial part	[22]
19.	*Ginkgo biloba*	Ginkgoaceae	Leaves	[12]
20.	*Paeonia lactiflora Pall*	Paeoniaceae	Root	[23]
21.	*Tabebuia avellanedae*	Bignoniaceae.	Barks	[23] [24]
22.	*Rosmarinus officinalis L*	Labiatae	Stems and leaves	[8]
23.	*Salviaelegan Vahl*	Lamiaceae	Leaves	[25]
24.	*Withania somnifera*	Solanaceae	Aerial part	[26]
25.	*Areca catechu*	Arecaceae	Areca nut	[27]
26.	*Bacopa monnieri*	Plantaginaceae	Whole plant	[28]
27.	*Curcuma longa*	Zingiberaceae	Root	[29]
28.	*Bupleurum falcatum*	Apiaceae	Root	[30]
29.	*Glycyrrhiza glabra* L	Leguminaceae	Root	[31].
30.	*Cressa cretica*	Convolvulaceae	Whole plant	[8]
31.	*Carissa spinarum*	Apocynaceae	Root	[32]
32.	*Azadirachta indica A.*	Meliaceae	Flower	[33]
33.	*Saraca asoca*	Fabaceae	Flower	[34]
34.	*Streblus Asper L.*	Moraceae	leaf	[35]

1.2. Medicinal plants as anti- depressants

Apocynum venetum: In a forced swimming test (FST), an extract of the leaves of *Apocynum venetum* L. (Apocynaceae) significantly reduced the immobility time of male rats in the dose range of 30-125 mg/kg, suggesting a potential antidepressant effect. This impact was similar to imipramine (20 mg/kg), a tricyclic antidepressant. In the open field test, neither imipramine (20 mg/kg) nor the Apocynum extract at different doses (30, 60, and 125 mg/kg) caused any overt behavioral changes or motor dysfunction. This finding supports the theory that an Apocynum extract's particular antidepressant effect in the FST. Furthermore, it is possible that the main flavonoids in the extract, hyperoside and isoquercitrin, are connected to this impact **[6].**

Amaranthus spinosus: *Amaranthus spinosus* Linn., a member of the Amaranthaceae family, is used in the Indian traditional medical system known as Ayurveda for a variety of purposes. These include laxative, antipyretic, antileprotic, diuretic, digestive, antidiabetic, bronchitis, antisnake venom, blood diseases, piles, and antigonorrheal agent. Tribes in Kerala, India, utilize the plant's juice to reduce stomach bloating, and its leaves are cooked for 23 days without salt to treat jaundice *[7]*. *Amaranthus spinosus* (MEAS) methanolic extract was tested for antidepressant efficacy using the Forced Swimming Test (FST) and Tail Suspension Test (TST) models. The outcomes demonstrated a significant antidepressant effect **[36]**.

Rhazya stricta: The forced swimming test, a well-known animal model of depression, was used in our study to examine the possible antidepressant

effects of the medicinal plant *Rhazya stricta*. Prior studies have demonstrated that *Rhazya stricta* modifies the rat brain's monoamine oxidase inhibitory activity. Our results imply that Rhazya stricta extract or any of its constituents may have properties similar to those of an antidepressant **[8]**.

Hippeastrum vittatum: A growing number of Amaryllidaceae family members' isolated compounds are being considered as viable treatments for neurological conditions and neurodegenerative illnesses. Hippeastrum species in particular are a significant source of alkaloids with a variety of potential medicinal uses. According to the findings, montanine and other alkaloids found in Amaryllidaceae species may have psychopharmacological properties such as anxiolytic, antidepressant, and anticonvulsive actions **[9].**

Crocus sativus: This study looked into the antidepressant qualities of *Crocus sativus* L. stigmas and corms. Polarity was used to divide the *C. sativus* corms' aqueous ethanol extract. The evidence supports the appropriateness of using this plant in traditional medicine by suggesting that crocin 1 may be responsible for the antidepressant-like qualities of aqueous stigma extracts. All of these findings imply that the low polarity portions of C. sativus corms have to be taken into consideration as a novel plant material for treating depression, and they demand more research on the mechanism of action and potential antidepressant properties of chemical compounds extracted from the two fractions.**[10, 11].**

Ginkgo biloba: The potential impact of lipophilic extracts of Ginkgo biloba L. leaves on rodent models of stress and depression was investigated. In both the learned helplessness mouse model of depression and the behavioral despair test, lipophilic extracts of Ginkgo leaves (LEG) at doses of 50 and 100 mg/kg, p.o. demonstrated dose-dependent, substantial antidepressant effect. According to the current research, the lipophilic extract of ginkgo leaves' bioactive components with antidepressant and anti-stress properties are intact carboxylic acid groups including 6-AS **[12].**

Kaempferia parviflora: The hunt for cutting-edge pharmacotherapy derived from medicinal plants to treat mental diseases has advanced considerably to date. The goal of this study was to assess the rhizome extract of *K. parviflora's* anxiolytic and antidepressant-like properties. These findings revealed that the plant extract has antidepressant properties. *K. parviflora* may therefore be used as a possible source for a natural psychotherapy drug to treat depression. **[13].**

Marsilea minuta*:* The Indian system of traditional medicine, known as Ayurveda, recommends using *Marsilea minuta* Linn. (Marsileaceae) to treat mental disorders and insomnia. It has been reported that a sedative and an anticonvulsant property of the marsiline isolated from *Marsilea minuta*. *Marsilea minuta* ethanol extract was standardized for marsiline (1.15%, w/w) and its antidepressant efficacy was investigated **[14].**

Polygalasa sabulosa: For a long time, there have been theories regarding the connection between monoaminergic systems and depression. The purpose of this study was to examine scopoletin, a coumarin derived from *Polygalasa sabulosa*, for potential antidepressant-like effects using the tail suspension and forced swimming tests. Additionally, it was assessed if scopoletin might make mice behave less depressed in a forced swimming test that was brought on by stress related to immobility. The findings show that the noradrenergic (α1- and α2-adrenoceptors), dopaminergic (dopamine D1 and D2 receptors), and serotonergic (5-HT2A receptors) systems are required for its antidepressant-like activity **[15].**

Momordica charantia: Anxiolytic, antidepressant, and anti-inflammatory properties of methanol extract of dried *Momordica charantia* Linn. (Cucurbitaceae) leaves were studied in animal models. The antidepressant efficacy of the methanol extract of *M. charantia* Linn leaves was evaluated using the behavior despair test. Rats given a forced swimming dose of 300 mg/kg extract had an antidepressant effect by decreasing their mobility time; the animals' swimming behavior was similar to that of the medication imipramine **[16].**

Asparagus racemosus: *Shatavari, or asparagus racemosus,* is a highly prized plant in Ayurveda medicine due to its medicinal qualities. As you have indicated, it is useful as a nervine tonic, antioxidant, diuretic, anti-inflammatory, and antidepressant, among other things. Its flexibility is demonstrated by its capacity to cure illnesses including cystitis, dysentery, rheumatism, chronic fevers, and irritated membranes of numerous organs. Its possible antitussive and antineoplastic qualities are also being investigated for medicinal uses. The fact that it is effective in treating AIDS symptoms draws attention to its importance in contemporary medicine, as scientists are always looking into all-natural cures for a range of illnesses. The research you referenced, which concentrated on the antidepressant properties of extracts from *Asparagus racemosus* seeds, contributes to the increasing amount of empirical data endorsing the plant's traditional uses **[17].**

***Allium sativum*:** The goal of the current study was to find out how mice's depression was affected by an ethanolic extract of *Allium sativum* L. (Family: Lilliaceae), better known as garlic. Garlic ethanol extract (25, 50, and 100 mg/kg) was given orally to young Swiss albino mice of either sex for 14 consecutive days, and the tail suspension test (TST) and forced swim test (FST) were used to assess the antidepressant-like action **[18].**

***Berberis aristata*:** In Indian medicine, berberine—an alkaloid derived from *Berberis aristata* Linn. —is utilized as an antiamoebic, stomachic, and bitter tonic, as well as for the treatment of oriental sores. Research has indicated that berberine has effects on the central nervous system. In particular, it has been shown to block monoamine oxidase-A, an enzyme that breaks down serotonin and norepinephrine (5-HT). In light of this, the current investigation was conducted to clarify how berberine chloride, a substance that resembles an antidepressant, functions in various behavioral models of despair. In the forced swim and tail suspension tests, berberine (5, 10, 20 mg/kg, i.p.) reduced the immobility duration in mice; however, the impact was not dosage dependent. Its antidepressant-like effects in mice are mediated by the nicotinic oxide pathway and/or sigma receptors [19].

Clitoria ternatea: The goal of the current study was to ascertain the range of activity of *Clitoria ternatea* (CT) ethanolic extract on the central nervous system. The effects of the CT on cognitive behavior, stress, anxiety, depression, and convulsions brought on by maximal electroshock (MES) and pentylenetetrazole (PTZ) were investigated. Ultimately, it was discovered that the extract exhibited nootropic, anxiolytic, antidepressant,

anticonvulsant, and anti-stress properties. To identify the active principle causing the actions and comprehend its mechanism of action, more research is required. **[20].**

Emblica officinalis: About 5% of people suffer from depression, a common psychiatric illness. Moreover, it is challenging to forecast how a certain treatment would affect a particular patient. For millennia, several plants and herbal remedies have been utilized in conventional medical systems to address depression. In the forced swim test (FST) and tail suspension test (TST), the antidepressant potential of both acute and long-term EO treatment was assessed. EO exhibited antidepressant effect similar to that of imipramine, a common medication. According to the study's findings, EO may be used as an adjuvant in the management of depression.**[21].**

***Hypericum reflexum* L.:** As we previously stated, oral administration of the methanol extract derived from the aerial portion of *Hypericum reflexum* L. fill. flower shown efficacy in both the forced swimming test and the tetrabenazine test. The forced swimming test was used to identify antidepressant activity in the butanol and chloroform fractions of this species. Both fractions produced a significant reduction in the immobility time and either no effect or only a slight depression on spontaneous motor activity when measured in a photocell activity meter. Together, these findings confirm the traditional Canary Islands folk medicine's use of Hypericum reflexum plants to treat central neurological illnesses by showing that their butanol and chloroform fractions have antidepressant-like effects in mice **[22].**

***Paeonia lactiflora* Pall:** The current study used the tail suspension test, open-field test, forced swim test, and reserpine test to examine the antidepressant potential of *Paeonia lactiflora* (EPL) ethanol extract in mice. Our findings demonstrated that the length of immobility in the forced swim test and tail suspension test was dramatically shortened by intragastric administration of EPL at doses of 250 and 500 mg/kg for seven days. In these experiments, EPL at a dosage of 500 mg/kg performed equally well as the positive control, chlorimipramine at a level of 20 mg/kg. Nevertheless, in the open-field test, these treatments had no effect on the quantity of crossing and rearing. Reserpine-induced ptosis and hypothermia in mice was dramatically inhibited by treating them with EPL at dosages of 250 and 500 mg/kg. Nevertheless, only the hypothermia caused by reserpine was inhibited by EPL at a dose of 125 mg/kg; ptosis was not affected. In animal models of depression, the results unequivocally showed that *Paeonia lactiflora* had antidepressant properties. The central monoaminergic neurotransmitter system may be a conduit for *Paeonia lactiflora's* effect **[23].**

Tabebuia avellanedae: The ethanolic extract derived from the bark of *Tabebuia avellanedae*, a plant commonly used in traditional medicine, was tested in two depression prediction models using mice: the forced swimming test (FST) and the tail suspension test (TST). Furthermore, the mechanisms underlying this antidepressant-like response were examined, as well as the implications of the extract's relationship with the antidepressants bupropion, desipramine, and fluoxetine in the TST **[24].**

***Rosmarinus officinalis* L.:** Rosemary, *Rosmarinus officinalis* L. (Labiatae) has several therapeutic applications in folk medicine in curing or managing a wide range of diseases, including depression. In this study, the effect of the hydroalcoholic extract of the stems and leaves of this plant was investigated in two behavioral models, the forced swimming test (FST) and tail suspension test (TST) in mice. The results suggest that the antidepressant action of the extract of R. officinalis is mediated by an interaction with the monoaminergic system and that this plant should be further investigated as an alternative therapeutic approach for the treatment of depression **[8].**

Salviaelegan Vahl: Male Sprague Dawley rats were used to study the behavioral effects of a hydroalcoholic extract (60 percent ethanol) from the leaves of *Salviaelegans Vahl* (Lamiaceae). Following intraperitoneal administration, the extract's effects on spontaneous motor activity—including total motility, locomotion, rearing, and grooming behavior—were observed. Salvia elegans was tested for potential anxiolytic and antidepressant effects using the forced swimming test (FST) and the elevated plus-maze test (EPM), respectively. These findings point to the possibility of psychotropic effects for some of the Salvia elegans hydroalcoholic extract's constituents, which calls for additional research **[25].**

Withania somnifera: The classical Indian medical system of Ayurveda makes extensive use of the roots of *Withania somnifera* (WS). WS is classified as a rasayana and is used to promote both physical and mental health, to provide defense against disease and unfavorable environmental factors, and to slow down the aging process. In this work, rats were used to examine the anxiolytic and antidepressant properties of bioactive glycowithanolides (WSG), which were extracted from WS roots. In the forced swim experiments that produced "behavioral despair" and "learned helplessness," WSG also demonstrated an antidepressant effect similar to that brought on by imipramine. The research validates the use of WS as a mood stabilizer in Ayurvedic therapeutic settings for depression and anxiety **[26].**

Areca catechu: It is grown around the world, including in East Africa, Malaysia, Indonesia, the Philippines, South East Asia, India, and Sri Lanka. It is made up of many alkaloids that are generated from the amino acid lysine and belong to the pyridine piperidine group. Arecoline, Arecaidine, Guvacine (tetrahydro nicotinic acid), and Guvacoline are the different alkaloids. In the Tail Immersion Test (TST) and Forced Swimming Test (FST), these alkaloids demonstrated strong antidepressant effect **[27].**

Amaranthus spinosus: *Amaranthus spinosus,* ***(****Amaranthaceae****),*** is a plant that holds significance in traditional Indian medicine, particularly Ayurveda. Its various medicinal uses reflect its versatility and therapeutic potential**.** In Ayurveda, it is utilized for its laxative, antipyretic (fever-reducing), antileprotic (leprosy-treating), diuretic, digestive, antidiabetic, bronchitis-alleviating, antisnake venom, blood-purifying, and pile-relieving properties. The plant has been incorporated into remedies for a wide range of ailments, including jaundice, where the leaves are boiled and consumed to alleviate symptoms over a specific duration. The findings of the study you mentioned, regarding the antidepressant activity of the methanolic extract of

Amaranthus spinosus, highlight its potential in mental health treatments. The Forced Swimming Test (FST) and Tail Suspension Test (TST) are common models used to assess antidepressant effects in preclinical studies, and the positive results suggest a promising avenue for further research into the plant's therapeutic properties ***[7]***

Curcuma longa: Turmeric, or Curcuma longa, is a well-known herbal remedy from indigenous cultures. In the tail suspension test and the forced swimming test, the aqueous extracts were able to produce a dose-dependent relationship of immobility reduction in mice when given orally to the mice for 14 days at doses ranging from 140 to 560 mg/kg. At a dosage of 560 mg/kg, the extracts had more powerful effects than the standard antidepressant fluoxetine. MAO may play a role in the antidepressant activity of C. longa. Inhibition in the brain of a mouse **[29].**

Bupleurum falcatum: *Bupleurum falcatum*, commonly known as Bupleurum, is a key herb in traditional Oriental medicine and is often used in herbal combinations to treat various ailments, including depressive-like disorders. The study you mentioned investigated the antidepressant-like effect of a methanolic extract of *Bupleurum falcatum* and its neuropharmacological mechanism in mice. The tail suspension test (TST) and open field test (OFT) are commonly used behavioral tests in animal models to assess antidepressant activity and psychostimulant side effects, respectively. The TST involves suspending mice by their tails and measuring their mobility, with decreased mobility interpreted as a sign of antidepressant activity. The OFT, on the other hand, assesses locomotor activity and exploratory behavior, providing insights into potential psychostimulant effects. The findings of this study likely aimed to determine whether the methanolic extract of *Bupleurum falcatum* exhibited antidepressant-like effects in the TST while minimizing psychostimulant side effects as assessed by the OFT. Positive results in these tests would suggest the potential efficacy of *Bupleurum falcatum* as an antidepressant agent in preclinical animal models. Studies like these contribute to our understanding of the pharmacological properties of traditional herbal remedies and may provide insights into the development of novel treatments for depressive disorders **[30].**

***Glycyrrhiza glabra* L.**: The purpose of this study was to use the tail suspension test (TST) and forced swim test (FST) to examine the effects of an aqueous extract of *Glycyrrhiza glabra* L. (Family: Fabaceae), often known as liquorice, on depression in mice. This implies that the norepinephrine and dopamine levels in the brain, rather than serotonin, appear to be the mediators of the antidepressant-like effects of liquorice extract. Licorice's ability to inhibit monoamine oxidase may be a positive factor in its antidepressant-like properties. Consequently, it can be said that licorice extract may have effects similar to those of an antidepressant **[31].**

***Cressa cretica*:** Rudanti, or *Cressa cretica*, is a member of the Convolvulaceae family of traditional medicinal plants. It has been used to treat a number of illnesses, including nootropic, antituberculosis, expectorant, and bilious disorders. Using the Tail Suspension Test (TST) and Forced Swim Test (FST), this study sought to determine whether Cressa cretica plant extract (CCE) has any possible antidepressant effects. The study's findings indicate that CCE has a considerable antidepressant effect **[8]**.

***Carissa spinarum* L.:** In rodents, both the aqueous and ethyl acetate fractions of the root bark exhibited significant ($p < 0.001$) antidepressant-like activity by reducing the duration of immobility. Notably, this effect was not attributed to non-specific psychostimulant effects, as revealed by locomotor tests. Furthermore, the ethyl acetate fraction showed the most pronounced reduction in serum corticosterone levels, indicating its potent antidepressant activity. Mechanistic studies suggested the involvement of multiple neurotransmission systems, including the adrenergic, dopaminergic, and cholinergic systems, as well as the L-arginine-NO-cGMP pathway, in mediating the observed antidepressant effects of the root bark fractions **[32].**

***Bacopa monnieri*:** The current discovery on Albino rats demonstrated the antidepressant effect of *B. monnieri* in methanol extract. The experimental albino rats demonstrated improved immobility time in depression models such as TST and FST after receiving dosages of 50, 100, and 200 mg/kg of methanol extracts. Different levels of MAO-A activity were seen in the experimental animals that were administered plant extract. The mean arterial oxygen consumption (MAO) level was 2.87 ± 0.021 ng/mL in the control animal and decreased to 2.73 ± 0.09 ng/mL in the imipramine hydrochloride-treated experimental albino rats. Methanol extract had dose-dependent effects. At greater dosages, *B. monnieri* decreased MAO-A activity in the brain. These results demonstrated that *B. monnieri* could be used as a substitute for antidepressant medication [28].

Azadirachta indica A. : The present study investigated the anxiolytic and antidepressant-like effects of A. indica flower extract using stressed rats. Results demonstrated that the extract exhibited anxiolytic effects in the Elevated Plus Maze Test (EPMT) and antidepressant effects in the Forced Swim Test (FST). Chronic restraint stress for 30 days resulted in decreased levels of dopamine (DA) and serotonin (5-HT) in the cerebral cortex and hippocampus, as well as elevated blood cortisol levels. However, treatment with A. indica flower extract attenuated these changes, suggesting its potential antidepressant and anxiolytic effects[33].

***Saraca asoca* :** *Saraca asoca* flower ethanolic extract in varying doses has exhibited significant antidepressant like activity in the tested animal behavioral models. This is attributed to the presence of antioxidant bioflavonoids namely, Rhamnazin, Myricetin and quercetin. Reduction in the plasma corticosterone levels along with an increase in the antioxidant enzymatic activity like GSP-PX and SOD in the mice hippocampus may be the proposed molecular hypothesis for its neuroprotective mechanism. Other neuroprotective mechanisms of *Saraca asoca* flower need to be explored [34].

***Streblus Asper* L.** The presence of fatty acids, flavonoids, phytosterol, triterpenoids, polyphenol, acidic sugar, aldehyde, diterpene, terpene, carboxylic compounds, acid and sugar in leaves extract of *Strebulus asper* L. is shown in various literatures. Depression is associated with a decrease in monoamine levels in the synaptic cleft, namely, of the catecholamine NE and of the indoleamine 5-HT. The main biochemical causes of depression are metabolic disorders of monoamine neurotransmitters that are involved in NE, 5-HT, and DA signaling. Moreover, in many depressed patients, the

impairment of the function of the HPA axis was noticed. It has been reported that many flavonoids possess antidepressant activity. As per the literature survey we concluded that the leaves of *Strebulus asper* L. have antidepressant activity as the presence flavanoids restore the brain level of monoamines as well as increase the serotonin and dopamine level in CNS. It is also helpful in up-regulating the monoaminergic neurotransmitters [35].

References must be listed at the end of the paper. Do not begin them on a new page unless this is absolutely necessary. Authors should ensure that every reference in the text appears in the list of references and vice versa. Indicate references by (Van der Geer, Hanraads, & Lupton, 2000) or (Strunk& White, 1979) in the text.

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1.3. CONCLUSION

Herbal plants are a rich source of compounds that improve antidepressant activity, as evidenced by the tabulation of a collection of plants exhibiting antidepressant efficacy from multiple journals. This shows that herbal therapies may work well as depression treatments.

1.4. ACKNOWLEDGEMENT

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