



Review Article

A review: Medicinal plants with antidepressant properties

Harshitha Arun Pardhe^{1,*}, N.C Nagalakshmi¹, Hariprasad M.G²,
Prabhat Kumar Chourasia³, Nandini S¹

¹Dept. of Pharmacology, Mallige College of Pharmacy, Bengaluru, Karnataka, India

²Dept. of Pharmacology, KLE University College of Pharmacy, Belgaum, Karnataka, India

³Dept. of Pharmaceutics, Mallige College of Pharmacy, Bengaluru, Karnataka, India



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ABSTRACT

Depression is an affective mental disorder characterized by extreme exaggeration and mood disturbances. The aggregate of genetic, environmental and psychological factors may lead to depression leading to decreased brain levels of monoamines such as noradrenalin, dopamine and serotonin. A massive wide variety of synthetic drugs are available for depression furthermore the side effects like dry mouth, nausea, gastrointestinal problem or respiratory problems, drowsiness, anxiety and cardiac arrhythmias are major restrictions in their application. Therefore the drug which restores the reduced level of monoamines in brain and might be beneficial remedy for depression. Researchers are presently seeking for more specific alternative antidepressants from natural source with high safety and lower costs. The purpose of this review is to enlist those plants having antidepressant activity.

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1. Introduction

Depression refers to wide selection of mental state issue characterized by the absence of positive impact by extreme exaggeration, lack of interest and mood disturbance, which adversely affect cognition and psychomotor function^{1,2} Sorrow and sadness are normal human emotions, everybody has these feelings but not last longer, major depression is more where it's a period of overwhelming sorrow.³ The world health report shows signs of psychological or behavioral syndromes in about 40 million people worldwide.^{4,5} It accounts for 12.3% of the world's affliction of disease and is anticipated to rise to 15% by 2020.⁶ There are two types of mental depression first type is Unipolar depression (about 75% of cases) and the second type is Bipolar depression (about 25% of cases).⁷ There is no known clear explanation for depression alternatively; a combination of genetic, psychological, environmental and psychological factors is probably going to result. Some

quite of depression tends to occur in families that indicate a genetic connection. Nevertheless depression can also occur in people without depression family history.⁸ Recently diagnostic and statistical manual of mental disorder (DSM-V) characterized major depression by symptoms: depressed mood, diminished interest in fun, psychomotor agitation or retardation, fatigue, insomnia or hypersomnia, guilt, inability to concentrate, sense of worthlessness and suicidal thinking.^{9,10} Today, a large variety of synthetic drugs are used as standard treatment for clinically depressed patients they have adverse effects that may hinder therapeutic treatment, there specific adverse impact include dry mouth, nausea, gastrointestinal problem or respiratory problems, drowsiness, anxiety and cardiac arrhythmias such condition create opportunities for alternative depression treatment by the use of medicinal plants.¹¹ Researchers are currently searching for more specific drugs with high therapeutic efficiency with few side effects and low cost. Medicinal plants have attracted the attention of scientists working in this field because these plants have been used for a long time to treat various diseases including psychiatric disorder,

* Corresponding author.

E-mail address: pardhehari97@gmail.com (H. A. Pardhe).

and have less adverse effect than synthetic and chemical medicines.¹²

1.1. In this review, we have mainly discussed medicinal plants with antidepressant activity

1.2. Asparagus racemosus (Shatavari)

Family: Asparagaceae

Chemical composition: Steroidal saponins, vit-A, B₁, B₂, C, E, Mg, P, Ca, Fe and folic acid, essential oils, asparagine, arginine, tyrosine, flavonoids, resins, tannins glycosides etc.,

Uses: The roots are bitter, sweet oleaginous, cooling and indigestible, appetizer, useful in dysentery, tumors, inflammation, biliousness, leprosy, epilepsy, night blindness, as laxative, tonics etc.¹³ . It is also known as shatavari, is made up of dried roots and plant leaves it is a popular home remedy used as a rejuvenator, power booster.¹⁴

The prevailing investigation evaluates the antidepressant impact of methanolic extract of *Asparagus racemosus* standardized to saponins (62.2% w/w). A doses of 100, 200 and 400 mg/kg of *A.racemosus* were given daily basis for 7days and then subjected to Forced swim test (FST) and discovered helplessness check or learned helplessness (LH). The outcomes showed that methanolic extract of *A.racemosus* decreased immobility in FST and expanded avoidance response in LH indicating antidepressant pastime. In behavioral experiments, it improved the number of head twitches and expanded clonidine-caused competitive behavior indicating facilitatory impact on every serotonergic and adrenergic systems respectively. However, methanolic extract had insignificant effect on l-DOPA-prompted competitive conduct indicating absence of activity on dopaminergic system. *A.racemosus* additionally reversed changes to the endogenous antioxidant system brought on through way of FST. Thus, *A.racemosus* has massive antidepressant interest and this impact might be mediated through the serotonergic, noradrenergic structures and augmentation of antioxidant defenses.¹⁵

1.3. Rosemarinus officinalis

Family: Lamiaceae

Chemical composition: The flowering tops and the rosemary leaves mainly contains flavonoids, phenolic acids especially rosmarinic acid and essential oils etc.,

Uses: Used to treat different diseases including depression, insomnia and arthritic pains.¹⁶ It is usually called as rosemary and is an evergreen lasting bush with fragrant. It is developed around the world due to its utilize as a traditional nourishment additive and enhancing agent.

The majorities of these studies concerned assessments that are used to version antidepressant like results in mice-the Tail Suspension Test (TST) and Forced Swimming Test (FST). The control of rosemary constantly decreased

the immobility time of mice in each the TST and the FST, indicating associate degree antidepressant-like impact. Rosemary's antidepressant capability emerge as equally strengthened at the same time as it have become found to lower exploratory and anhedonic-like conduct in bulbectomized mice. There is lots evidence that the antidepressant effect of *R.Officinalis* relies upon on interactions with the monoaminergic system. Rosemary is conception to improve dopaminergic, serotonergic, noradrenergic, and cholinergic features within the brain, in all likelihood explaining its antidepressant . Rosemary has furthermore been determined to growth the attention of neurotransmitters inside the brains of mice. Several compounds in rosemary extract and essential oil are chargeable for its antidepressant activity, along with carnosol, betulinic acid, ursolic acid, and polyphenols.¹⁷

1.4. Curcuma longa

Family: Zingiberaceae

Chemical composition: Volatile oils- turmerone, curcuminoids, curcumin, sesquiterpenes and beta termerones, zingiberene, polysaccharides etc.,

Uses: Strengthening the overall energy of the body, relieving gas, dispelling worms, improving digestion, regulating mensuration, dissolving gallstones, antiseptic, antibacterial, anti-inflammatory, blood purifier, respiratory and liver disorders etc.¹⁸ .

It is a perennial herbaceous rhizomatous plant of the ginger family commonly known as turmeric. The main curcumin found in the turmeric spice is an alkaloid.¹⁹ Several scientific reports indicate that curcumin does not turn out harmful effects on the human body even at a high dose of 1000-2000 mg / day.²⁰

Epidemiological analysis have discovered that human beings ingesting curcumin in each day life have sharper brain abilities and better cognitive skills. Curcumin possesses a number of interesting features that justify its use in essential melancholy. These encompass: curcumin is an inhibitor of monoamine oxidase(MAO) enzymes, Curcumin modulates the volume of numerous neurotransmitters, and promotes hippocampal neurogenesis. The Curcumin was examined in two different behavioral models Forced swim test(FST) and Tail suspension test(TST) utilizing swiss mice weighing 26-34grms and rats of wistar strain weighing 160-220gm. The study showed that curcumin diminished the stability time each in FST and TST. The impact of *Curcuma longa* (100mg/kg) was comparative to it of Fluoxetine 20mg/kg and Tricyclic Imipramine 15mg/kg utilizes as standard drug. The antidepressant activity of Curcumin can be due to expand in serotonin, nor adrenalin and dopamine level in brain.¹⁹

1.5. *Embllica officinalis*

Family: Euphorbiaceae

Chemical composition: Tannins like emblicenin A and B, gallic acid and ellagic acid, alkaloids, phenols etc.,

Uses: In diarrhea, jaundice, inflammation, diuretic, carminative, stomachic, hemostatic, nutritive tonic, cough, asthma conditions, peptic ulcers, skin diseases, anemia, cardiac problems hair loss etc²¹., *Embllica officinalis* is particularly nutritious and one of the richest dietary sources – C, amino acids and minerals. Usually referred to as (amla) Indian gooseberry.²¹

In each experimental models of antidepressant forced swim test and tail suspension test, the standard drug Tricyclic Imipramine 15mg / kg and *Embllica officinalis* showed a major decrease within the length of immobility relative to the patient in the control group. It was done using 25g-30gm Swiss albino male mice. The study results show the potential for *Embllica officinalis* to be used as an adjuvant.²²

1.6. *Cucurbita pepo*

Family: cucurbitaceae

Chemical composition: Carbohydrates, proteins, phytosterols, polyunsaturated fatty acids, antioxidants, vitamins, carotenoids, tocopherols etc.,

Uses: Enhancing the physiological properties as wound healing, immunomodulatory, tumour growth inhibitor, vermifuge, treat problems of urinary systems, hypertension and prevent formation of kidney stones etc²³ ., It genus includes squash and gourd varieties. Pumpkin is a gourd like *cucurbita* squash and has high anti-oxidant, anti-depressant, anti-helmentitic and anti-microbial activity.³

Alcoholic and aquatic extracts had been admitted orally in male albino wistar rats weighing 150-200gm demonstrated antidepressant activity employing a template forced swimming study. The result indicated a decline in immobility with associate degree improvement in swimming time or better physical activity compared to the standard medication Imipramine 30mg / kg were the extract effectualness was found to be almost like Imipramine. According to consequences of phytochemical screening and the literature, the antidepressants like capability would possibly be due to the presence of alkaloids, glycosides and flavanoids. Flavanoids glycosides are completely hydrolysed into their aglycons by mucosal and bacterial enzymes in the intestines, and then transformed to conjugated metabolites in some unspecified time in the future of the absorption gadget . Therefore, one of the antidepressant mechanism of *C. pepo* is notion to involve flavanoids and glycosides which reach the brain tissues via the metabolizing technique, protective brain feature from Central nervous system disturbance and therefore, exerting an antidepressant impact. Thus, extracts of *C.pepo* might

also have potential therapeutic worth for the management of depressive issues.²⁴

1.7. *Centella asiatica*

Family: Umbellifere

Chemical composition: Triterpenes, saponins, flavonoids, polysaccharides, sterols, phenolic acids etc.,

Uses: Neuroprotection, wound healing, ulcer, anti viral, antibacterial, cardiac problems, etc.²⁵

The antidepressant effects of overall triterpenes from *C.asiatica* on the immobility time in pressured swimming mice and concentration of amino acid in mice thoughts tissue have become placed. Where Imipramine and basic triterpenes from *C.asiatica* extract decreased the immobility time and ameliorated the imbalance of amino acid(organic compounds) levels confirming the antidepressant activity of *C.asiatica*. They additionally investigated the possible antidepressant impact of popular triterpenes of extract with the aid of manner of measuring the corticosterone degrees in mice brain. The contents of monoamine neurotransmitters and their metabolites in rats cortex, hippocampus and neural structure are evaluated within which tremendous reduction of the corticosterone degree and growth of the contents of 5-HT, NE, DA and their metabolites in rat thoughts had been discovered that equally bolstered the postulated involvement of general triterpenes of *C.asiatica* and growing the contents of monoamine neurotransmitters for its antidepressant results.²⁶

1.8. *Glycyrrhiza glabra*

Family: Leguminosae

Chemical composition: Triterpenoidal saponins, flavonoids, tannins, alkaloids, and phenolic compounds etc.,

Uses: Prophylaxis for gastric, duodenal ulcers, anti-inflammatory, laxatives, anti-asthmatic, demulcent, expectorant, anemia, gout, sexual disabilities, fever, cough, skin diseases etc.²⁷

It is a perennial herb native to the Mediterranean region. It is now widely cultivated throughout Europe also known as liquorice .²⁸The ethanolic and aqueous extract of *Glycyrrhiza glabra* showed a major decrease in immobility time in albino rats using the antidepressant model Forced swim(FST) and Tail suspension test(TST) compared to the standard drug Imipramine 15 mg / kg. Ethanol extract in rats decreased brain MAO-A and MAO-B activity compared to control. The percentage inhibition of MAO-A was higher compared to MAO-B activity.²⁹

Liquorice extract reversed reserpine-induced extension of immobility period of mice in FST and TST. Sulpiride (50 mg/kg) and prazosin (62.5 microg/kg) significantly

attenuated the extract-induced antidepressant-like effect in TST. On the other hand, p-chlorophenylalanine (100 mg/kg) did not reverse antidepressant-like impact of liquorice extract. This implies that antidepressant-like effect of liquorice extract seems to be mediated by increase of brain norepinephrine and dopamine, however not by increase of serotonin. Monoamine oxidase inhibiting effect of liquorice could also be contributive favorably to the antidepressant-like activity. Thus, it is all over that liquorice extract could possess associate degree antidepressant-like effect.³⁰

1.9. *Dracocephalum moldavica* L

Family: Lamiaceae

Chemical composition: Terpenoids, steroids, flavonoids, alkaloids, lignans, phenols, coumarins, cyanogenic glycosides, essential oils etc.,

Uses: According to famous knowledge, the plant has been used immensely to combat heart disease, blood pressure, angina, atherosclerosis, neuralgia, migraine, headache and toothache.^{31,32}

Adult male CD-1 mice weighing 25-35gms are employed by means of using antidepressant models forced swim test (FST) and tail suspension test (TST). Imipramine and fluoxetine 15mg/kg have been used as standard and flavonoid quercetin 10mg/kg used as positive control. The extract confirmed substantial reduction in immobility time on the FST and TST when compared to negative control and reported comparable values than those obtained with the positive control.³³

1.10. *Macrotyloma uniflorum*

Family: Fabaceae

Chemical composition: Seeds of horse gram contain several beneficial additives like; flavonoids, phenols, tannins, carbohydrates, saponins, sterols, alkaloids and coumarins.

Uses: The seeds of the plant *Macrotyloma uniflorum* are historically used to deal with quite a number ailment which include neurodegenerative diseases. *Macrotyloma uniflorum* (Horse Gram) has been used historically in diverse illnesses like fever, painful intervals, multiplied bile secretion, in dysentery as astringent, vomiting, stomach upset, constipation, diarrhoea, snake chunk, maximum cancers, depression and infertility. Wistar rats of either sex weighing 150-180gms had been used, two antidepressant activity was accessed through models forced swim test and tail suspension test and potentiation of nor-epinephrine toxicity. The extract confirmed accelerated in the mobility degrees in rats in contrast to control. Antioxidants parameters like thiobarbituric acid reactive materials (TBARs), reduced glutathione (GSH) and nitrite/nitrate level have been also accessed in talent homogenate to take a glance at the oxidative defence of extract. Extract produced

substantial reduction in the ranges of (TBAs), nitrite/nitrate and enhanced stage of GSH. The grain ethanol extract of *Macrotyloma uniflorum* (Horse Gram) showed the presence of isoflavones- Daidzein and genistein. Mobility change of animals have become additionally expanded. The antioxidant activity changed into additionally increased. It have become hooked up that ethanol extracts of horse gram possess antidepressant interest due to its antioxidant and tyrosine kinase inhibiting nature.³⁴

1.11. *Malus domestica*

Family: Rosaceae

Chemical composition: Flavonoids, carbohydrates, tannins, phenolic compounds, etc.,

Uses: Antacid, soft laxatives, diuretic, hearing loss etc.³⁵

It is commonly acknowledged as apple widely consumed as a clean fruit and juice.³⁶ The study was carried out utilizing adult swiss albino mice weighing about 25-30gms. The antidepressant activity was carried out using hole board test by the usage of the well known drug Imipramine 10mg/kg the head dipping counts were significantly amplified in the extract of *Malus domestica* and brought on decreased in biochemical parameters such as monoamine oxidase when in contrast to control and was compared with standard. An apple a day if eaten with the relaxation of these food keep the medical doctors away, as a minimum for stretches of your time. Like berries, apples are excessive in antioxidants that may assist to prevent and repair oxidation harm and inflammation at the mobile degree. Apple fruit juice intake may additionally involved in growth and in production of the critical neurotransmitter acetylcholine. The researchers positioned that which encompass apples for your each day weight loss plan also can shield neuron cells in the direction of oxidative stress-introduced on neurotoxicity.³⁷

2. Conclusion

The world health record indicates that majority of the human population worldwide is getting affected by intellectual disorder depression leading to intense sorrow. As mentioned there are many more medicinal plants which create opportunities for alternative and effective treatment of depression with fewer side effects than that of synthetic drugs.

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4. Conflict of interest

None.

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Author biography

Harshitha Arun Pardhe M-Pharm

N.C Nagalakshmi M-Pharm

Hariprasad M.G PhD

Prabhat Kumar Chourasia, M-pharm

Nandini S M-pharm

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