



## A REVIEW STUDY ON ANTIDEPRESSANT ACTIVITY SHOWN IN HERBAL PLANTS

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### ABSTRACT

Depression is a heterogeneous psychological condition, categorized and handled in several specific forms. While a variety of medications are being used as routine medication for psychologically depressed patients, they have negative consequences that could compromise medical care. Thus, it is worth searching at antidepressants from plants with proven advantage and beneficial risk gain. A variety of medicinal plants and medicinal products extracted from these plants have displayed antidepressant effects by means of their medicinal constituents. Due to decreased levels of monoamines such as noradrenaline, dopamine and serotonin in brain results in depression. Therefore medications which recover the decreased amounts of such monoamines in the brain either through inhibiting monoamine oxidase or through inhibiting the reuptake of such neurotransmitters in the treatment of depression may be beneficial. This analysis focuses on the formulations focused on therapeutic plants and plants that have antidepressant efficacy in animal and human studies.

### INTRODUCTION

Approximately 450 million people suffer from a mental or behavioral condition, according to world health report.<sup>[1]</sup> Depression is predicted to be the second biggest cause of global disease burden after heart disease by the year 2020.<sup>[2]</sup> Depression is an entire body disorder involving not only mood or thought, but also the mechanism of physical body and perception. Depression signs include severe feelings of sorrow, hopelessness, and frustration, as well as the failure to find satisfaction in normal activities, changes in sleep habits and appetite, energy loss, and thoughts of suicide.<sup>[3]</sup>

Mental depression is a chronic disease which affects the mood, emotions, physical health and behavior of an individual. Depression symptoms include biological and mental aspects. Biological symptoms include delay in thought and behavior, lack in libido, sleep disorder and loss of appetite. Emotional signs include sadness, negativity and apathy, low self-esteem consisting of feeling guilty, inferiority and ugliness, indecisiveness and lack of motivation. There are two different forms of depression, one as unipolar depression, and second as bipolar depression (also called as endogenous depression). unipolar depression consists of mood swings in the closely similar pattern, yet are normal (about 75 per cent of cases), non-familial, specifically associated with traumatic life events, and followed by anxiety and agitation. The latter form is Bipolar depression (about 25 percent of cases), uses a similar pattern, unrelated to external factors, external stress and generally occurs in early adulthood and is uncommon,

leading to oscillating depression and mania over a span of many weeks.<sup>[4]</sup> Depression patients have symptoms that show decreased brain monoamine neurotransmitters, especially norepinephrine, serotonin and dopamine.<sup>[5]</sup>

A variety of prescribed synthetic drugs are used as the standard medication for clinically depressed patients. But they have adverse effects that may impair therapeutic treatment. Such specific adverse effects include dry mouth, weakness, GI problems or respiratory complications, anxiety, drowsiness, agitation and cardiac arrhythmias. Additionally, there is a chance of drug-drug interactions. Such conditions provide an incentive for alternative use of medicinal plant to treat depression.<sup>[6]</sup>

### MEDICINAL PLANTS AS ANTIDEPRESSANTS

1. **Hypericum perforatum Linn** (Family- Hypericaceae): It has been used for centuries in clinical practice and known as St. John's wort. It is categorised under perennial herb, distributed across Europe, Asia, North Africa and North America. Indian plant grows to a height of 1 m spread at an altitude of 1000-3500 m in the western Himalayas. The recognised therapeutic property includes antidepressant, anxiolytic, diuretic, antibiotic, antimalarial, wound healing and anthelmintic.<sup>[7,8]</sup>
2. **Glycyrrhiza uralensis**. (Family- Fabaceae): In animal studies several flavonoids extracted from plants of nature have been reported to show antidepressant activity. The goal of this study was to investigate the effects of liquiritin, a compound of flavones derived from Glycyrrhiza

uralensis. Chronic variable such as stress which induces depression in model rats is studied and believed to be the possible association between its antidepressant-like effect and antioxidative activity by measuring erythrocyte superoxide dismutase (SOD) activity and plasma malondialdehyde (MDA).<sup>[9]</sup>

3. **Curcuma longa** (Family- Zingiberaceae): Curcuma longa (turmeric) is a well proven herbal medicine as antidepressant. Once administered orally to the mice between 140 and 560 mg / kg for 14 days, the aqueous extracts were able to elicit dose-dependent relationship of immobility reduction in the tail suspension test and the forced swimming test in mice. At a dosage of 560 mg / kg, the effects of the extracts were more potent than those of the reference antidepressant fluoxetine. The activity of *C. longa* is mediated through MAOA inhibition in mouse brain.<sup>[10]</sup>
4. **Bacopa monnieri (Linn.) Penn** (Family- Scrophulariaceae): It is generally known as Brahmi and is found in India and subtropical area up to a height of 1000 m in wet, humid and marshy areas. This has been used as a nervine tonic, and increases learning as well as memory. Alkaloids, namely brahmine, herpestine and mixture of 3 other alkaloids are active constituents. Apart from alkaloids even saponins, namely bacoside A and B, are active constituents. The standardized methanolic extract (20 and 40mg/kg, p.o.) given once daily for 5 days exhibited significant antidepressant efficacy in forced swimming tests and studied models for helplessness which was comparable to Imipramine.<sup>[11]</sup>
5. **Centella asiatica (Linn.) Urban** (Family- Apiaceae): The drug consists of dried aerial leaves. It is found in all of India's tropical and subtropical regions. Total plant triterpenes decreased mice's immobility time in forced swimming test and therefore had antidepressant activity.<sup>[12]</sup>
6. **Cimicifuga racemosa (Linn.) Nutt** (Family- Ranunculaceae): It is distributed from Kashmir to Bhutan (in temperate Himalayas, 2300-4000 m), east Europe and Siberia. Ethanolic-aqueous samples of *C. racemosa* about 50 or 100 mg / kg) decreased the immobility duration in the tail suspension test in animal testing experiments and thus exhibited antidepressant activity.<sup>[13]</sup>
7. **Crocus sativus Linn** (Family- Iridaceae): Commonly called Saffron, it is native to Greece, Asia Minor and Persia where it grows wild. The crops are also grown in Spain, France, Greece, Persia and India. Saffron at a dosage of 30 mg / day TDS and BD was found to be equally beneficial to Imipramine 100 mg / day (TDS) and Fluoxetine 20 mg / day (BD) for treating adult patients with mild to moderate depression.<sup>[14,15]</sup>
8. **Mimosa pudica Linn.** (Family- Mimosaceae): It is originally native to tropical America; has more or less been naturalized in India. Across Mexico,

aqueous extract from dried leaves is used to alleviate depression. The extract of about 6 mg / kg and 8 mg / kg, decreased immobility in the forced swimming test, thus showing antidepressant-like effect in rats.<sup>[16]</sup>

9. **Ocimum sanctum Linn.** (Family- Lamiaceae): The plant popular as Tulsi and Sacred or Holy Basil is an annual herbaceous, widely branched plant found all over India. It aims to ease the depression-related anxiety and agitation.<sup>[17,18]</sup> Tulsi also exhibited an anti-aggressive and calming effect.<sup>[19,20]</sup> Ethanolic extract of the leaves reduced immobility in a behavioral suffering involving forced swimming in rats and mice. Haloperidol and Sulpiride blocked this activity and suggested a potential action involving dopaminergic neurons.<sup>[21]</sup> Methanol extract from the roots of about 400 mg / kg, i.p. has demonstrated an improvement in swimming time, suggesting its antidepressant activity.<sup>[22]</sup>

## CONCLUSION

As described above, there are a variety of medicinal plants and formulations that have antidepressant efficacy comparable to synthetic antidepressants with clinically positive effect. Thus, drugs based on plants can also be used effectively to treat mild to moderate forms of depression, with less side effects than the older synthetic agents. From the various articles, the list of herbal plants demonstrating antidepressant activity are mentioned above, by which we can conclude that herbal plants are very rich source of substance involved for the antidepressant activity.

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