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Medicinal Plants with Antidepressant Properties: A Comprehensive Review

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Abstract

Depression, a prevalent mental health disorder, continues to pose a significant global burden. As conventional antidepressant treatments often come with side effects and limited efficacy, there is a growing interest in exploring alternative and complementary therapies. Medicinal plants have been used for centuries in various cultures to alleviate mood disorders. This review aims to provide a comprehensive analysis of medicinal plants with potential antidepressant properties. We delve into their botanical profiles, active compounds, mechanisms of action, preclinical and clinical evidence, safety considerations, and possible interactions with conventional antidepressants. By synthesizing current research, this review offers insights into the therapeutic potential of these natural remedies in managing depression.

Keywords: depression; clinical trials; medicinal plants; herbal medicines

Introduction

Depression is a life-threatening chronic illness which affects people worldwide. Drugs used to treat this disease have multiple side effects and may cause drug-drug or drug-food interactions. The depressed mood is a feature of some psychiatric syndromes such as major depressive disorder, but it may also be a normal reaction to living events such as bereavement, a symptom of some bodily ailments or a side effect of some drugs and medical treatments. Patients with major depression have symptoms that reflect changes in the brain, monoamine neurotransmitters, specifically norepinephrine, serotonin, and dopamine (Gold et al., 1988). Some features of depressive disorder overlap those of the anxiety disorders, including severe phobias, generalized anxiety disorder, social anxiety disorder, post-traumatic stress disorder, and obsessive-compulsive disorder. Additionally, only 30% of patients respond adequately to the existing drugs and the remaining do not achieve complete recovery. Thus, finding effective treatments that have adequate efficacy, fewer side effects and lower cost seem to be necessary. The purpose of this study was to review animal and double-blind clinical studies on the anti-depressant effects of medicinal herbs. In this study, validated scientific articles indexed in PubMed, SID, Web of Science and Scopus databases were reviewed. A database search was performed using the following terms: clinical trials, depression, major depressive disorder, essential oil, extract and medicinal plant. Positive effects of a number of herbs and their active compounds such as St John's-wort, saffron, turmeric, ginkgo, chamomile, valerian, Lavender, Rosa damascene, Echium ammonium, Rhodiola rosea Land Citrus maxima in improvement of symptoms of mild, moderate or major depression have been shown in clinical trials. The above plants show antidepressant effects and have fewer side effects than synthetic drugs. Hence, they have the potential to treat patients with depression.

Mental health disorders are classified into depressive disorders and anxiety disorders [1]. These may present with different symptoms and last for months or years. They may be recurrent and severely affect the patient's quality of life and ability to function. The cost of these conditions can be expressed in years of life with a disability. In 2015, an estimated 50 million years of disability were spent worldwide for depressive disorders and 24.6 million years for anxiety disorders [1]. In the same year, 788,000 people ended their lives [1]. The symptoms of depressive disorders are sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration, which can lead to suicide [1]. They are divided into major depressive

disorder or depressive episode and dysthymia. Major depressive disorder or depressive episode includes depressed mood, loss of interest and enjoyment, and decreased energy, and can be mild, moderate or severe. Dysthymia exhibits similar symptoms that are less intense but last longer [1].

The symptoms of anxiety disorders include feelings of anxiety and fear. Types of anxiety disorders are generalized anxiety disorder, panic disorder, phobias, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder [1]. Symptoms can be mild, moderate, or severe, and tend to be chronic. Pharmacological therapy for depressive disorders uses tricyclic antidepressants, monoamine oxidase inhibitors, selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake inhibitors, norepinephrine and dopamine reuptake inhibitors, serotonin antagonist and reuptake inhibitors [2]. Pharmacological therapy for anxiety disorders includes selective serotonin reuptake inhibitors, selective serotonin and norepinephrine reuptake inhibitors, pregabalin, tricyclic antidepressants, buspirone, benzodiazepines, and monoamine oxidase inhibitors [3]. However, patients often do not adhere to these synthetic antidepressants or anxiolytic therapies due to adverse events or signatory delay in effectiveness.

Serious side effects of synthetic antidepressants and anxiolytics include headaches, sexual dysfunction, addiction, seizures, and suicide [4]. These were reduced in 45% of the studies, where herbal medicines were used for the same indications [4,5]. Plants and products derived from them that are commonly used in the Western world as dietary supplements or over-the-counter medicines for the above indications [the use of some of them is supported by the European Medicines Agency herbal monograph] were studied here, focusing on recent clinical trials, safety profiles and whether or not their use is justified.

Saffron

Saffron is a valued herb, obtained from the stigmas of the C. sativus Linn [Iridaceae], with therapeutic effects. It has been described in pharmacopoeias to be variously acting, including as an anti-depressant, anti-carcinogen, and stimulant agent. Saffron contains active chemicals that have been shown to prevent the intake of serotonin, dopamine, & norepinephrine. There is some evidence that saffron may also influence the neurotransmission of serotonin and dopamine. This is one of the probable components of saffron that is being researched for its ability to boost a happy mood and relaxation. The primary bioactive constituents of saffron seem to be crocin's and crocetins. Crocin's and crocetins are responsible for the distinctive deep yellow colour of safranin. It is thought that these drugs give antidepressant effects through several mechanisms.

Crocin, quercitrin, & safranin are all powerful antioxidants that may combat depression by preventing or alleviating oxidative stress, which is known to be elevated in depressed patients. Crocin and crocetin were particularly promising in this regard. There is a synergistically impact when all three are together, which studies have proven to enhance potency under these settings. Safranal is responsible for the unique flavour and scent of saffron. Mood, memory, & learning capacities may all benefit, and brain cells may be protected from oxidative stress, according to the research. Finally, saffron flower petals are a good source of kaempferol. Anti-inflammatory, anti-carcinogenic, and mood-lifting qualities have all been attributed to this molecule. it also serves as a dye in food products and textiles and as an aromatic in perfumes and cosmetics. These dried floral constituents most often are the vibrant stigmas of the flower, but sometimes also include styles and other floral tissue (e.g., filaments) [6]

Rosa damascene

Rosa damascene mill L., known as Gole Mohammadi in is one of the most important species of Rosaceae family flowers. R. damascene is an ornamental plant and beside perfuming effect, several pharmacological properties including anti-HIV, antibacterial, antioxidant, antitussive, hypnotic, antidiabetic, and relaxant effect on tracheal chains have been reported for this plant. R. damascene is a medicinal plant that is mostly known in the world for its perfume effect. However, in traditional medicine, it has been used for treatment of abdominal and chest pain, strengthening the heart, menstrual bleeding, and digestive problems. It also has beneficial effects on depression [7]. The medicinal functions of Rosaceae are partly attributed to their abundance of phenolics compound. Phenolics possess a wide range of pharmacological activities, such as antioxidants, free-radical scavengers, anticancer, anti-inflammatory, antimutagenic, and antidepressant [8].

Turmeric

Turmeric [Curcuma longa] is a yellow spice, part of the ginger family (Zingiberene). It has been empirically used for centuries in Ayurvedic and traditional Chinese medicine in a wide variety of diseases and conditions [9]. Research conducted in the last half century has revealed that the active compounds of turmeric were curcuminoids, which are polyphenolic pigments that give turmeric its yellowish colour. Curcumin is the primary curcuminoid and main active component in turmeric and the compound for which most studies have been done.

Lavender

Lavender, a plant from the Lamiaceae family, comes in many species with different chemical characteristics. Lavender oil is the essential oil extracted from flowers and stalks of the lavender plant by steam distillation. It is a colorless or pale-yellow liquid with a sweet, floral, herbaceous aroma [10]. Lavender oil is a multi-ingredient mixture that contains more than 160 substances. The major components of lavender oil are linalool, linalyl acetate, 1,8-cineole, b-ocimene, terpinen-4-ol, and camphor [11]. Silexan, a proprietary essential oil from Lavandula angustifolia flowers, has been approved in Germany and several other countries for the oral treatment of anxiety. Moreover, evidence for antidepressant-like properties of Silexan has been observed in anxious patients suffering from comorbid depressive symptoms and in patients with mixed anxiety–depression disorder, which may indicate intrinsic antidepressant-like properties independent of its anxiolytic activity.

Citrus maxima

Citrus maxima Merr. (Rutaceae) is known as pummel. It has been used in indigenous system of medicine as sedative in nervous affections, convulsive cough and in the treatment of hemorrhagic diseases and epilepsy [12] as well as depression [13]. Result Since ancient times, people have been using plants in various ways as a source of medicine. We believe that plants having the potential anti-depressant activity can be used as an adjuvant in the treatment of depression and other mood disorders. We can conclude that herbal plants are very rich source which is responsible for increasing the antidepressant activity. The plants discussed above having antidepressant property were assessed by different tests. However, further studies are necessary to find the exact mechanism of antidepressant effect and to isolate the active compound [s] responsible for this pharmacological activity. 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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