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# Comparative Study between Herbal and Synthetic Antidepressant Drugs

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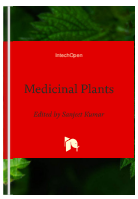



## Abstract

According to the WHO report approximately 450 million people suffer from mental and behavioural disorder. Depression is one of the most common neurodegenerative disorders which arise due to the imbalance of neurotransmitters release at the synaptic cleft. A large number of synthetic drugs are being used as standard treatment for depression, they have many adverse effects that a limit the therapeutic treatment. Traditionally herbs are used for the treatment of depression which may offer advantage in terms of safety and tolerability, possibly by improvement in patient compliance. Herbal drugs are more commonly used because these have small a· ·nt of chemicals, these produced less side effects than standard d. Overall, this chapter presented an overview of the research that has been done on the many herbs, Mechanism of action involving monoamine reuptake, neuroreceptor binding and channel transporter



Sections

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# Comparative Study between Herbal and Synthetic Antidepressant Drugs

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## Abstract

According to the WHO report approximately 450 million people suffer from mental and behavioural disorder. Depression is one of the most common neurodegenerative disorders which arise due to the imbalance of neurotransmitters release at the synaptic cleft. A large number of synthetic drugs are being used as standard treatment for depression, they have many adverse effects that a limit the therapeutic treatment. Traditionally herbs are used for the treatment of depression which may offer advantage in terms of safety and tolerability, possibly by improvement in patient compliance. Herbal drugs are more commonly used because these have small amount of chemicals, these produced less side effects than standard drugs. Overall, this chapter presented an overview of the research that has been done on the many herbs, Mechanism of action involving monoamine reuptake, neuroreceptor binding and channel transporter function, and neural communication or HPA modulation. Several pharmaceutical companies are working on "triple" reuptake inhibitors that stop all three monoamines from being reabsorbed. Studies into the interplay of monoamine systems with other neurotransmitters (e.g., CRF, neurokinins, glutamate, and GABA etc.) will aid in the development of realistic, integrated neurochemical models of depression.

**Keywords:** depression, neurotransmitter, monoamine reuptake inhibitors, selective 5-hydroxytryptamine reuptake inhibitors *and Achyranthes aspera*

## 1. Introduction

Depression is a weakening disease and it is mostly affecting modern society. The world health organization forecasts that in 2022 depression will become the major common cause of loss of interest in the working in the entire world. Thus the research of depression is one of the most important way through which we can obtain new treatment of depression and improve the developed drugs which can work better for depressive individuals. It will also assist to develop and create new approaches that will be used for better treatment of depression. Chemical transmission is the major tool through which nerves communicate with each other. Now it is well known that the presynaptic and postsynaptic events are responsible for the plasticity and learning

within the Central nervous system. Chemical transmission requires different types of steps including synthesis of the neurotransmitters, their storage in secretary vesicles, and their release into the synaptic cleft between presynaptic and postsynaptic cleft. The initial step of the synthesis of neurotransmitters is the facilitated transport of amino acids from blood to the brain, in the brain precursors are converted into neurotransmitters enzymatically. These are stored in the synaptic vesicles, and finally released into the synaptic cleft via calcium dependent process. The release rate of neurotransmitters determined the rate of firing of neurons which means that the drug alter the firing rate of neurons. This modification of neurons carried out the alteration of release of neurotransmitters. After this released neurotransmitters bind with somatodendritic auto receptors. Thus binding of neurotransmitter to auto-receptors is responsible for reducing the synthesis of neurotransmitters or additional release from the presynapse. The synaptic results of neurotransmitter are ceased via binding with specific receptors and reuptake into the pre-synapse. Neurotransmitters metabolized by monoamine oxidase enzymes in the presynapse [1].

## 2. Plant profile

*Achyranthes aspera* (family-Amarantheceae) is commonly known as Latjira in Hindi. The plant is used for the treatment of dysentery, fever and diabetes [2]. *A. aspera* is available as weed in whole India, Asia and many other parts of the world such as Mexico, Central America and Africa [3]. It is described as bitter, pungent, purgative, heating, laxative, stomachic, carminative and digestive and is also used for the treatment of bronchitis, heart disease, piles, itching abdominal problems, ascites, rheumatism, abdominal enlargement, rabies and also for enlarged cervical gland. It is use as folk medicine. It is also known as medicinal herb in different types of system of medicine in India. It is known by different names such as *Chirchita* (Hindi), *Apamarg* (Sanskirt), *Aghedi* (Gujrati), *Apang* (Bengali), *Nayurivi* (Tamil), *Kalalat* (Malayalam) [4]. This plant grows on road sides. It is also found as field boundaries and waste places as a weed throughout India up to an altitude of 2100 m and in South Andaman Islands [5]. The leaves extract of *A. aspera* having antifertility effect [6]. Methanolic extract of *A. aspera* shows wide varieties of pharmacological activities however, little is known about its anti-depressant activity. Most of the researches are not found its antidepressant activity by using open field test and forced swimming test, so the aim of present study to assess the anti-depressant activity of *A. aspera* extract against physically induced depression in rats, using open field test and forced swimming test apparatus [5]. *A. aspera* (Chirchita) belong to the family Amaranthaceae. Two different varieties of *A. aspera* are mentioned in Ayurvedic and Chinese medicines, 1st is red and 2nd is white [2].

**Common name of** *A. aspera:* [7].

**Arabian**: Atkumah, Na'eem, No'eem, Mahout, Wazer (Yemen).

**Ayurvedic**: Apamarg, Chirchita, Shikhari, Shaihkharika.

**Bengali**: Apang.

**English:** Prickly chaff flower, Hawai chaff flower, Devil's horse whip.

**French:** Achyranth a feuillers rudes, collant, Gendarme.

**Gujrati:** Safad Aghedo, Anghadi, Andhedi, Agado.

**Hindi:** Latjira, Chirchita, Lamchichra, Sonpur, Onga.

**Indonesia:** Jarong.