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Review Article.....!!!

**“A REVIEW ON ANTIDEPRESSANT ACTIVITY BASED ON *ALBIZIA LEBBECK*  
[L]”**Kavitha S K<sup>1\*</sup> Dr Rupesh kumar Mani<sup>2\*</sup>

Department of pharmacology, Sri Adichunchanagiri college of pharmacy, Adichunchanagiri University,  
B G Nagar, Mandya-571448.

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**FOR CORRESPONDENCE:****Kavitha S K\*****ADDRESS:**

Department of pharmacology,  
Sri Adichunchanagiri college of  
pharmacy, Adichunchanagiri  
University, B G Nagar,  
Mandya-571448.

**ABSTRACT**

*Albizia lebeck* (L.) Benth. (Family: Mimosaceae) is commonly known as Siris, Shiris in Hindi; Lebeck Tree in English and Bhandi, Mrdupuspa in Sanskrit. *Albizia lebeck*, 900m in the Indian traditional system of medicine-Ayurveda uses variety of herb or mixture of herbs to drive therapeutic benefit in pathological conditions. *Albizia lebeck* (L) Benth is one such herb, It is mainly distributed in tropical and subtropical areas of India, Andaman Island, Myanmar, tropical Africa, *Albizia lebeck* has been of seen interest due to varied phytochemicals and Ayurvedic research due to their excellent medicinal values. Traditionally, it is used as anti-asthmatic, anti-inflammatory, anti-fertility, antiseptic, anti-dysenteric and antitubercular Anticancer/ antitumor, Anti allergic / antihistaminic, anti yeast, antifungal, Antimicrobial etc It is also used in the treatment of ringworms and wounds by washing the affected areas, gonorrhoea, leucorrhoea, bronchitis, leprosy, paralysis, helmenth infection and other genital diseases. The phytoconstituents reported in the plants are melacacidin, D-catechin,  $\beta$ -sitosterol, albiziahexoside, betulnic acid and echinocystic acid glycosides, which are responsible for various potent physiological and pharmacological activities. This review includes the detailed exploration of the botany, phytochemistry and Traditional uses aspects of *Albizia lebeck* is an attempt to provide a direction of further research.

**INTRODUCTION:**

Depression is a serious neurological disorder, characterized by disturbances in sleep and appetite as well as deficit in cognition and energy <sup>[1]</sup> Major depressive disorder is a complex and frequent psychiatric condition that poses significant challenges to both the patients who experience it and the physicians who treat them. The goal of therapy is for patients to achieve remission, which requires identifying and measuring symptoms at the outset and throughout treatment to document both response and resistance to treatment. <sup>[2]</sup> Mood disorder are the second primary cause for disability adjusted life years worldwide and the leading cause of years lived with disability in all the age groups in the world. Each drug used to treat this disorder has a success rate of about 60%. In addition, most therapies require several weeks of treatment before improvement of signs and symptoms are observed and there are numerous side effects caused by antidepressants <sup>[3]</sup> Depression in general has three main forms such as.

1. Psychotic depression characterised by severe depression,
2. Postpartum depression characterised by perturbations in the levels of hormones and physical features after child birth and
3. Seasonal Affective Disorder (SAD) concerning specially the winter months with less sunlight. <sup>[2]</sup>

There is no single known cause of depression. Rather, it likely results from a combination of genetic, biochemical, environmental, and psychological suggesting a genetic link. However, depression can occur factors. Some types of depression tend to run in families, in people without family histories of depression as well as.

**Antidepressants and their classification**

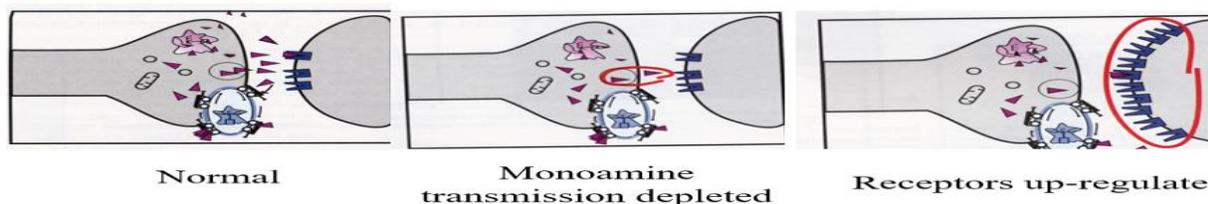
Imipramine was discovered in 1958 as an antidepressant regimen <sup>[4]</sup> The antidepressants have been divided into five groups:

- i. Tricyclic antidepressants (TCAs),
- ii. Selective serotonin-reuptake inhibitors (SSRIs),
- iii. Monoamine oxidase inhibitors (MAOIs),
- iv. Serotonin-norepinephrine reuptake inhibitor (SNRI) and
- v. Non-TCA antidepressants.

**Pathophysiology of depression:**

There are no useful biomarkers or imaging abnormalities to determine Pathophysiology of depression during life time. The post-mortem study of brain does not reveal any consistent structural or neurochemical abnormality. Majority of the currently available medications were discovered empirically. Most current theories are based on 'amine hypothesis' [4]

## Monoamine receptor hypothesis



### The Symptoms of depression

1. Decreased energy, fatigue, feeling 'slowed down'
2. Depressed mood
3. Difficulty in concentrating or making decisions
4. Feeling restless.
5. Insomnia, early- morning awakening or oversleeping)
6. Loss of interest or work
7. Recurrent thoughts of death or suicide, suicide attempts.

**Pharmacological treatment of depression:** Since Kuhn introduced Imipramine in the 1950s, the availability of antidepressant drug has expanded greatly, not only in terms of number, but also and especially, in terms of diversity in the associated pharmacological effects. The first generation antidepressant, the tricyclic antidepressant (TCAs) and MAO inhibitors (MAOIs), increase the concentrations of 5-HT and NE and are effective in alleviating the symptoms of depression. Although both types of drugs have been used with great success for many years, there are several undesirable side effects that limit their application. TCAs act on many other transmitter systems in the CNS and peripherally, eg- the histaminergic or acetylcholinergic system <sup>[5]</sup> leading to sedation, hypotension, blurred vision, dry mouth, and other unwanted effects. In addition, TCAs may be life-threatening and fatal in overdose, especially due to their effects on the cardiovascular system. ***Albizia Lebbeck:*** *Albizia lebbeck* 900m in the Indian traditional system of medicine-Ayurveda uses variety of herb or mixture of herbs to derive therapeutic benefit in pathological conditions. *Albizia lebbeck* (L) Benth is one such herb.

**Taxonomy :** *Albizia lebbeck* Linn.

**Family :** Mimosaceae

**Habitat :** All over india, from the plains up to Himalayas: also in the Andaman's.

**English :** Sins tree, East Indian walnut.

**Kannada:**Sirisa

**Uses & ethno pharmacological uses are as follows.**

**Ayurveda:** Shirisha, Bhandi, Bhandila.

**Unani :** Siras

**Sidda/ Tamil :** Vaagei

**Action :** Antiseptic, antibacterial, antiallergic.

**Bark :** Used in bronchitis, bark and seeds in piles



Plants produces primary and secondary metabolites during their metabolic pathway like proteins, sugars, amino acids, carboxylic acids and alkaloids, flavonoids, terpenoids, coumarins, glycosides, phenolics, saponins etc. The presence of these phyto-constituents makes them an efficacious herbal drug. Many parts of plant shows specific characteristics and properties. So for the use of all plants parts in pharmacological, antimicrobial and clinical research, it is therefore necessary to identify the active principles (phytoconstituents) and also their possible side effects to enhance product quality <sup>[6]</sup>

**Pharmacological activities reported are as follows**

Isolation and characterization of several biologically active ingredients have been reported and also extensive pharmacological evidence in a well designed animal studies with biomarkers of significance. Literature review was carried out by visiting national institutes of health database and other sources to collect the details of chemistry and biological activities.

**Anticancer/ antitumor activity**

Anticancer activity of various isolated components chemically distinct have been reported, which employed contemporary study design(in vitro). New bioactive triterpenoid saponins isolated roots of *Albizzia lebeck* namely oleanane- type saponins, named lebbecliosides A-B(1-2) showed significant cytotoxic activity against U-87 MG and TGI cancer cells with IC50 values of 3.46 and 1.36  $\mu$ m for 1 and 2 respectively when compounds 1-2 were evaluated for their inhibitory effect on the metabolism of high grade human brain tumor cells, the human glioblastoma U-87MG cell lines and the glioblastoma stem like TGI cells isolated from a patient tumor, and know to be particularly resistant to standard therapies<sup>10</sup>. Lam et al have reported isolation of a monomeric 5.5 KDa protein- with haemolytic activity towards rabbit erythrocytes from seeds of *Albizzia lebeck* and reduced viability of murine splenocytes and inhibited proliferation of breast cancer cells and hepatoma cells.<sup>[7]</sup>

**Nootropic/ cognitive effect and anxiolytic effect**

Saponins fraction from butanolic fraction of dried leaves has been reported to possess anxiolytic activity and nootropic activity, when conventional animal models of anxiety and memory/learning was employed to study the effect as early as 2001-02. The results are positive and the behavioral changes correlated with biochemical levels of excitatory neurotransmitters<sup>[8]</sup>

**Immunomodulatory activity**

The immunomodulatory effect of the bark was evaluated by studying humoral and cell mediated immune responses. The hot aqueous extract and its butanolic fraction were administered once daily for one week in mice, immunized previously with sheep red blood cells. At the dose levels tested(6.25 , 12.5 and 25 mg / kg) *Albizzia lebeck* treated mice developed higher serum antibody titres compared to the vehicle treated group and the effect was comparable to the standard drug muramyl dipeptide(MDP). Delayed type hypersensitivity response was suppressed in SRBC immained unaltered in both mice and rats signifying powerful Immunomodulatory property<sup>[9]</sup>

**Formulations containing A. lebeck bark extract:** By using aqueous, ethanolic and petroleum ether extracts in varied concentrations along with different polymer, the gel formulation was designed. The

physiochemical parameters of formulations (pH , viscosity, spread ability etc.) were determined. The results showed that formulation containing 2.5 gm of ethanolic extract of bark have promising effect than other formulations<sup>[10]</sup>

### CONCLUSION:

*Albizia lebbek* has been traditionally used in the cure of various diseases, as we have illustrated in this review. Moreover, numerous research works have been reported for its uses. The plants appear to have a broad spectrum of activity on several ailments. The various parts of the plant have been explored for anti-asthmatic, anti-inflammatory, anti-fertility, a, anti-dysenteric, anti-tubercular and many other activities. It is reported to contain melacacidin, D-catechin,  $\beta$ -sitosterol, echinocystic acid glycosides and triterpenoids, which may be responsible for the different biological activities. Hence, It is pure phytoconstituents may be isolated and used as lead molecules for synthesizing novel agents having good therapeutic activity. Standardization of extracts, phytopharmacology , isolation and characterization of active phytoconstituents, elucidation of mechanism of action of the isolated compounds and clinical trial of the extracts/drugs are essential in respect of development of quality herbal medicine. In the changing global scenario the interest towards plants with medicinal value is increasing substantially in the primary healthcare system both in the developed and developing countries. Therefore, the information will help the scientists and researchers to screen the compounds responsible for different bioactivities, and to elucidate mechanism of actions.

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