A REVIEW ON BIOCHEMICAL AND PHARMACOLOGICAL PROPERTY OF ALBIZIA LEBBECK

Ekta Singh Chouhan*, Shivangi Yadav, Anamika Tiwari
Department of Food Science and Nutrition, Banasthali Vidyapith, Banasthali, Rajasthan, India.

ABSTRACT
Albizia lebbeck is commonly known as Shirish, has various therapeutic properties. Use of Albizia lebbeck has been comprehensively recommended to remove toxins from the human body. It also use for the treatment of respiratory tract problem like asthma, allergies, anti-tussive and seasonal cold. Researches on Albizia lebbeck also reported anti-inflammatory, anti-asthmatic, anti-microbial and anaphylatic, analgesic, anti-diarrhoeal, immunomodulatory properties of the plant. It is considered as an antidote against all types of poisons. The plant contains saponin, alkaloids, glycosides and flavonoids. Albizia lebbeck potential in some antioxidants such as DPPH free radical scavenging activity, nitric oxide scavenging activity, hydrogen peroxide scavenging activity and reducing power assay. Albizia lebbeck has taken as an important medicinal tree found in India arid zone region.

Key Words:- Albizia lebbeck, Anti-tussive, DPPH, Saponin, Antidote, Immunomodulatory.

INTRODUCTION
Herb and plants products for combating diseases since olden times. Indian system of medicine has a deep root in our tradition and caters to the large section of our population. Other alternative medicines attractiveness and uplifting uses the common people health is still not become as efficient as they due. The human and animals uses the active constituent are more beneficial than the vitamins and minerals that are present in herbal medicines Albizia lebbeck is one of them which are commonly used in ayurvedic system of medicines (Sivakumar B et al., 2013; Barbosa ADP et al., 2014).

The world Albizia lebbeck has arrived from the eighteen centuary. Albiz lebbeck as an exotic species whose assault is from Australia to India. Its vernacular name is shirish. Albizia lebbeck found throughout the india, ascending to the 13000 m. in the Himalayas. It is wild, available plant in the tropical and subtropical Asia and Africa with economic important for industrial medicinal uses. Albizia lebbeck is a large grayish tree bark; young shoot glabrous. Leaves are evenly 2-pinnate and leaflets are 5-9 in pairs, 2.5-5.0 cm long, broadly oblong and pale green, unequal sided, very obtous glabrous above and recticulately veined below (Yadav SS et al., 2011; Sivakrishnan S and kottaimuthu A, 2013).

Flowers are stalked, white fragrant in globose umbellate head 2-3.8 cm diameter. Peduncles 3.8-7.5 cm long, solitary or 2-4 together from the axils of the upper leaves (Une HD et al., 2001). Calyx 4mm. long teeth short, coroll 1 cm long ; tube glabrous; lobes 2.5m long, statement much larger than the corolla. Pods are 10-30 cm long and 2.5-5.0 cm broad, flat straw colours and contain 4-12 pale brown seeds. Flower and fruiting periods are april to june (Padamanabhan V et al., 2012. Chhimwal J et al., 2013).

Vernacular names
There are some common names of Albizia

Corresponding Author
Ekta Singh Chouhan
Email:- ers.ekta@ivgmail.com
Albizia lebbeck hind- Garso, Siris, Sanskrit- Barhapusha, bhandi, kalinga, urdu-darash, west indies-women tongue, brazil-heart to back, Ceylon-kona, English-parrot tree. French Acasia-lebbeck, Bois noir Albizia lebbeck is found throughout the India. Albizia lebbeck is a large, erect, unarmed, deciduous, spreading tree belonging to the arid zone region.

Scientific classification

Chemical composition

Low moisture content makes the shelf life longer period. Low lipid content is a favourable aspect in the preventing the rancidity so its store for long period of time. The ash content is higher than that of other legumes which has been reported to range between 7.8%, an indication that it may possess a higher mineral content. Therefore the Albizia lebbeck is cheap potential source of protein, energy and minerals for supplementation (Chandra J and Mali MC, 2014).

Phytochemicals

Tri-0-glycosides: kaempferol and quercet 3-0-a-rhamnosyl-a, glycopyranosyl-a-agalactopyranosides, were known in the leaves of Albizia lebbeck. Pods have 3,5 dihydroxyl 4,7 dimethoxy flavones and N-benezol L phenyl alaninol. The beans of the plant contain albiginic acid a new triterpenoids sapogenin. The plant also contains saponin, alkaloids, phenolic glycosides and flavones. Albizia lebbeck potential utility as source of phenolic compounds like saponin, alkaloids, glycosides, flavonoids and tannins in methanolic extract (Suruse PB et al., 2013; Imran I et al., 2014).

Antioxidant activity

Albizia lebbeck have pharmaceutical properties in some diseases. Polyphenols compounds have radical scavenging activity that’s why can use in treating free radical damages and diseases. Methanol extract of Albizia lebbeck potential in DPPH, Hydroxyl radical, Iron cheating assay and ABTS. The antioxidant capacity of Albizia lebbeck bark was considerably higher. The ethanol root extract of Albizia lebbeck was examine for its antioxidant potential by nitric oxide scavenging, hydrogen peroxide scavenging activity and reducing power assay taking ascorbic acid as a standard (Priyanka et al., 2013; Siahpoosh A and Mehrpeyma Z, 2014). The metanolic extract of Albizia lebbeck can be used as a source of natural antioxidant and as a possible use in pharmaceutical industries (Kumar S et al., 2014).

Pharmacological activity

Saponin is glycosides constituent often referred to as natural detergent because of their foamy nature. It has been the saponin has anti-carcinogenic activity, immune modulation activity and regulation of cell proliferation as well as health reimbursement such as cholesterol lowering capacity. The toxic effect of cyanogenic glycosides decreases heart rate, decrease sympathetic activity and decrease systematic vascular resistance. Tannin decreases the protein solubility by foaming a complex with protein causing decreases the digestibility and causing miserable growth. Tannin content is negligible in tree. The alkaloids present in albizia lebbeck are fungicidal and cytotoxic for the cancer cell increasing in vitro (Swathy B et al., 2010, Malla S et al., 2014).

Ayurvedic Pharmacology Properties of Albizia lebbeck

Ayurvedic pharmacology of Albizia lebbeck is depends on the experimental, biophysical, inferential and intuitional mechanism. The action of the substances based on the five system of the action or attributes of a substances Rasa (taste), Guna (property), vipaka (metabolites), Virya (ppotency)and prabhhava which are given in table-2.

Effect on anaphylactic shock

The use of Albizia lebbeck bark had a significantly cromoglycate like action on the mice mast cells. The crude extract of seed of Albizia lebbeck at a dose of 0.5mg/ml has exhibited stabilizing effect on the mast cells in mestyen and peritoneal fluid on aphylaxis mice. Albizia lebbeck bars also have a beneficial cromoglycate activity on the mast cell of mice (Johri RK et al., 1985, Mohammad F et al., 2012).

Anti-asthmatic activity

The studies on Albizia lebbeck stem bark decoction reported notably decreases in WBC (white blood cells) eosinophilic count and ESR. Albizia lebbeck was given in 48 cases of bronchial asthma at a dose 40ml per day for one month. The investigation indicated mild improvement in case of bronchial asthma no adverse reactions were reported. Albizia lebbeck flower decoction of 50mg/kg body weight has significantly exploited against histamine induced bronchospasm (Jaiswal M et al., 2007; Kumar D et al., 2010; Kajaria D et al., 2013).

Pulmonary eosinophilia

The recent studies on preliminary screening 35 cases of tropical eosinophilia were treated with Albizia lebbeck flower for 6 weeks. The dose 200mg twice a day with water. The results indicate that 82% cases showed excellent response, 12% showed good response where as
6% showed poor response. No side effect observed (Sharma DGK and Dubey DN, 2015).

**Anti-tussive activity**

*Albizia lebbeck* exhibited antitussive activity on sulphur dioxide induced cough in experimental animals group. Results indicates significant decrease cough incident in comparison to control group (Yadav SS et al., 2010).

**Anti-fertility activity**

*Albizia lebbeck* methanol extract of pods shown anti-spermatogenic property by reduction in spermatogosity, sreamocyte, and spermgonia count, reduction in sperm density and sperm motility and diminish in size of testes in male rats. Oral administration of the 50mg/kg body weight in male rat’s results in significantly decreases in weight of testes, epididymis, seminal vesicle and ventral prostate (Gupta RS et al., 2004).

**Anti-diarrheal activity**

Aqueous and methanol extract of *Albizia lebbeck* exhibited activity against the Salmonella, E. coli. Hexane and petroleum ether extracts did not exhibit any activity. *Albizia lebbeck* posses anti bacterial activity against infectious diarrhea. None of extracts showed action against Shigella and Candida. It has also been shown that *Albizia lebbeck* has moderate activity against V. cholerae, A. hydrophilis and B. subutilis (Acharya S et al., 2009, Balekar N et al., 2010).

**Allergic conjunctivitis**

In comparative clinical studies shows the effect of *Albizia lebbeck* bark extract on rats. Results indicated significantly decreased in all kind of allergy symptoms in a clinical study the role of 29% of *Albizia lebbeck* bark and 500 mg capsule of *Albizia lebbeck* showed very favorable response in all kinds of allergic conjunctivitis (Mishra SS et al., 2010; Venkatesh P et al., 2010).

**Anti-microbial activity**

*Albizia lebbeck* stem bark exhibited antimicrobial activity against the staphylococcus aureus, Pseudomonas aeruginosa, Trichophyton rubrum, Bacillus cereus and Escherichia coli but the bark is glycosides isolated (Chulet R et al., 2010).

**Anti-inflammator activity**

*Albizia lebbeck* methanolic extract of bark given at the dose of 400mg/kg inhibited of edema at the end of 4 hr. anti-inflammatory effect of *Albizia lebbeck* has been reported at the end of 6 hrs in evaluation to control group (Saha A and Muniruddin A, 2009; Yadav et al., 2010).

**Table 1. Scientific Classification of Albizia lebbeck**

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Plantae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>Fabales</td>
</tr>
<tr>
<td>Family</td>
<td>Fabaceae</td>
</tr>
</tbody>
</table>

**Anti-arthritic activity**

Localized bone erosions take as great signs for the diagnosis of rheumatoid arthritis. The effect of *Albizia lebbeck* methanol extract on the bone erosion turnover was considered. Various marker of bone erosion like histological and radiological examination of the joints in arthritis induced rats. The results indicate that the methanol extract of *Albizia lebbeck* possesses strong antarthritic property (Pathak N et al., 2009, Pandey S et al., 2010).

**Analgesic activity**

The analgesic property of *Albizia lebbeck* bark was considered by acetic acid induced writing test. The bark extract at 400mg/kg dose showed significantly reduction in the number of writhes at the 52.4% inhibition. The *Albizia lebbeck* bark administration in a dose of 250mg/kg indicating analgesic activity (Kajaria D et al., 2011).

**Antidiabetic activity**

The stem barks extract of *Albizia lebbeck* potential against the diabetease. The results verified the antidiabetic potential of *Albizia lebbeck* the hypoglycemic effect exhibited by the extract is mediated by the increasing glucose adsorption, decreasing glucose dispersion rate and at the cellular level by promoting glucose transport crossways the cell membrane (Bhutkar M and Bhise S, 2013, Kumar D et al., 2013).

**Immunomodulatory Activity and Antipyretic activity**

The bark extract of *Albizia lebbeck* has shown significantly immunomodulatory activity. The ethanol and aqueous extract of *Albizia lebbeck* leaves were administration to the experimental animal shown to be exhibit strong immunomodulatory effect (Chaudhary M et al., 2012). Albizia lebbeck flower ethanol extract was significantly decreases the body temperature at the dose of 1g/kg body weigh (Mohamed E et al., 2013).
Genus | Albizia  
Species | Lebbeck  
Subfamily | Mimosoideae  
Class | Dicotyledonae  

<table>
<thead>
<tr>
<th>Components</th>
<th>Value (% composition)</th>
</tr>
</thead>
</table>
| Moisture | 4.55  
| Crude protein | 38.04  
| Crude lipid | 5.66  
| Crude fiber | 11.96  
| ash content | 8.76  
| Nitrogen free extract | 32.3  

Table 3. Phytochemical present in different part of Albizia lebbeck

<table>
<thead>
<tr>
<th>Part of Albizia lebbeck</th>
<th>Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flowers</td>
<td>Various sterols (taxerol, cycloartemol, lupeol, campesterol, sitosterol)</td>
</tr>
<tr>
<td>Leaf</td>
<td>Pipecolicand derivatives</td>
</tr>
<tr>
<td>Root</td>
<td>Echinocystic acid (saponin)</td>
</tr>
</tbody>
</table>

Table 4. Ayurvedic properties of the Albizia lebbeck

<table>
<thead>
<tr>
<th>Rasa</th>
<th>Guna</th>
<th>Virya</th>
<th>Vipaka</th>
<th>Prabhava</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tikta, Kasaya, Madhura, Katu</td>
<td>Lghu, Tikshna, Rukshna</td>
<td>Anushna</td>
<td>Katu</td>
<td>Tridosha shamaka, Vishaghna</td>
</tr>
</tbody>
</table>

CONCLUSION

Albizia lebbeck plant has been accredited with a number of properties. The various activites have been revalidated in present time on several well designed clinical new models and trials. Albizia lebbeck review reveals antidiabetic, anti-inflammatory, antipyretic, antifertility and anti diarrhea etc. activites of the plant in different forms with no side effects and safety aspects of this plant. The Albizia lebbeck provides healthy and useful food with many nutrients to the human body as high in protein, low cholesterol and high fibers. Antioxidant activity along with other activity seems to be gifted drug for various disesase conditions so this plant future explored pharmacological industries. Albizia lebbeck a cheap, reliable and safe resource based on plant to meet the demand of nutrients rich food.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST: The authors declare that they have no conflict of interest.
REFERENCES


Muhammad Z, Ahmad S, Qayum M, Ercisli S. Compositional studies and antioxidant potential of Albizia lebbeck (L.) BENTH. Pods and seeds. Turkish Journal of Biology, 37, 2013,25-32.


