REVIEW OF LITERATURE

1. **Kirtikar et al., (1998)** reported the presence of condensed tannins 7-11%, catechin, isomer of leucocyanidin, Melacacidin, Leuco-anthrocyanidin, Lebbecacidin, Friedelin, Beta-Sitosterol, Betulinic acid and its glycosides in bark of *Albizzia lebbeck.*

2. **Agrawal et al., (1991)** isolated three main saponins named albizzia saponins A, B and C from the bark of *Albizzia lebbeck.*

3. **Jangwan et al., (2010)** isolated and characterized a new cytotoxic saponin from the methanolic extract of the stem bark of *Albizzia lebbeck* with the help of FABMS, $^{13}$C NMR and chemical studies. The isolated compound exhibited potent cytotoxic activity against human aqueous cell carcinoma [HSC-2 and HSC-3].

4. **Pal et al., (1995)** isolated three main saponins named Albizzia saponins A, B, and C from the barks of *Albizzia* lebbeck. Their structures were established through spectral analyses as acacic acid lactone 3-O-$\beta$-D-xylopyranosyl-(1→6)-$\beta$-D-glucopyranoside, 3-O-$\beta$-D-glucopyranosyl-(1→2)-O-[\(-\alpha\)-L-arabinopyranosyl-(1→6)]-$\beta$-D-glucopyranoside and 3-O-$\beta$-D-xylopyranosyl-(1→2)-$\alpha$-L-arabinopyranosyl-(1→6)-O-[\(-\beta\)-D-glucopyranosyl-(1→2)]-$\beta$-D-glucopyranoside.

5. **Prakash et al., (2009)** evaluated the scientific basis of anti-inflammatory activity of different organic solvent extracts of *Albizzia lebbeck* using the carrageenan, dextran, cotton pellet and Freund’s complete adjuvant induced rat models. The petroleum ether and ethanol extracts at 400 mg/kg showed maximum inhibition of inflammation induced by carrageenan, dextran, cotton pellet and Freund’s adjuvant.

6. **Saha and Ahmed, (2009)** studied that the bark extract of *A. lebbeck* has significant analgesic and anti-inflammatory properties, and it justifies the traditional use of this plant in the treatment of various types of pains and inflammation.

7. **Pathak et al., (2009)** studied the effect of *Albizzia lebbeck* methanolic extract on the bone erosion turnover by analyzing various markers of bone erosion like histological and radiological analysis of the joints in Freund’ complete adjuvant induced- arthritis in rats. It can be concluded that *Albizzia lebbeck* methanolic extract possesses strong anti-arthritic property by modulating bone erosion.
8. Baruah et al., (2000) evaluated the immunomodulatory effect of the bark of *Albizzia lebbeck* by studying humoral and cell mediated immune responses. At the dose levels tested (6.25, 12.5 and 25 mg/kg, p.o.), *A. lebbeck* 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 sheep red blood cells immunised mice treated with *A. lebbeck* extract. The macrophage migration index remained unaltered in both mice and rats. These results are discussed in the light of possible immunopotentiating effects of *A. lebbeck*.

9. Baruah et al., (2001) reported the antiallergenic activity of hot aqueous Stem Bark decoction and its butanolic fraction in various models like antiPCA or mast cell stabilizing activity.

10. Shashidhara et al., (2008) tested successive chloroform, methanol and water extracts of bark and leaves of *Albizzia lebbeck* for its in vitro mast cell stabilizing effect against compound 48/80. Methanolic extract of leaf and methanolic and water extracts of bark have shown maximum activity comparable to that of disodium chromoglycate.

11. Gupta et al., (2005) studied decrease in the weights of testes, epididymides, seminal vesicle and ventral prostate by oral administration of saponins isolated from *Albizzia lebbeck* bark at the dose level of 50 mg/kg/b.w. per day for 60 days to male rats. The production of round spermatid was reduced by 73.04% in *Albizzia lebbeck* treated rats. The population of preleptotene spermatocytes and spermatogonia were reduced by 65.07% and 47.48% and secondary spermatocytes by 73.41%, respectively. Sperm motility as well as sperm density were reduced significantly. *Albizzia lebbeck* reduced the fertility of male rats by 100%.

12. Tripathi et al., (1979) conducted Studies on the decoction of the bark of *Albizzia Lebbeck* which has been in use in the Ayurvedic system of medicine for bronchial asthma and eczema. In sensitized albino rats, *A. lebbeck* was found to significantly inhibit the synthesis of antibodies, as tested by antigen-antibody precipitation by the micro agar gel diffusion technique. Administration of *A. lebbeck* to sensitized guinea pigs was found to markedly reduce the secretion of the macrophage migration inhibition factor, as tested by the rate of migration of macrophages on antigen containing solidified agar serum medium. By in vitro studies, it was found that *A. lebbeck* significantly inhibited the phytohaemagglutinin (PHA) induced...
blastogenic response of human lymphocytes, as tested by tritiated thymidine incorporation in DNA. Present studies indicate that the anti-anaphylactic activity of *A. lebbeck*, besides being due to cromoglycate-like action on the mast cells as reported earlier (Tripathi *et al.*, 1979), is also due to inhibition of the synthesis of antibodies and suppression of T-lymphocyte activity. Whether the suppression of antibody synthesis is only due to inhibition of the helper cell activity of T-lymphocytes or is also due to the direct suppression of B-lymphocytes is not known. The present study also shows that the effects of the drug also occur in different species, viz. guinea pigs, albino rats and man.

13. *Pathak et al.*, (2010) evaluated the methanolic extract of *Albizzia* lebbeck (AL) for the possible mode of action by studying its antioxidant potential in adjuvant-induced arthritic rats. The biological defense system constituting the superoxide dismutase, catalase level showed a significant increase while the lipid peroxide content was found to decrease to a large extent on AL treatment. It can be concluded that *Albizzia lebbeck* methanolic extract possesses strong anti-arthritic property.

14. *Brahmankar et al.*, (2001) studied nootropic activity and reversed amnesic effect of scopolamine in the saponins containing fraction of *Albizzia lebbeck*. The saponins containing fraction exhibited decreased noradrenergic and serotonergic transmission and was without any effect on cholinergic and dopaminergic transmission.


17. *Ueda et al.*, 2003 isolated *Albizzia* hexoside (1), a new hexaglycosylated saponin, from leaves of Albizia lebbeck. Saponin 1, which is an analog of cytotoxic *Albizzia*atrioside A (2), did not show cytotoxicity. However, 1 is a potential source of 2 and related bioactive saponins for medicinal use because leaves, which can be regenerated after collection, contain 1 in substantial quantity.

18. *Chintawar et al.*, (2002) reported the effect of saponin containing n-butanol fraction (BF) extracted from dried leaves of *Albizzia lebbeck* on learning and memory in albino mice using passive shock avoidance paradigm and the elevated plus maze. Significant improvement was observed in the retention ability of the
normal and amnesic mice as compared to their respective controls. The brain concentrations of GABA and dopamine were decreased, whereas the 5-HT level was increased. The data indicate the involvement of monoamine neurotransmitters in the nootropic action of BF of *A. lebbeck*.

19. **Kasture et al., (2000)** studied anticonvulsant activity of the ethanolic extracts of leaves of *Albizia lebbeck* and flowers of *Hibiscus rosa sinesis* and the petroleum ether extract of flowers of *Butea monosperma*. The bioassay guided fractionation indicated that the anticonvulsant activity lies in the methanolic fraction of chloroform soluble part of ethanolic extract of the leaves of *A. lebbeck*, acetone soluble part of ethanolic extract of *H. rosa sinesis* flowers and acetone soluble part of petroleum ether extract of *B. monosperma* flowers.

20. **Resmi et al., (2006)** evaluated the antioxidant potential of aqueous extract of *Albizia lebbeck* (ALL) in diabetic rats. Oxidative damage in the liver and kidneys of diabetic rats as evidenced by a marked increment in the levels of TBARS and CD, and also a distinct diminution in GSH content was nullified by ALL, as these parameters showed a tendency to retrieve towards normalcy on co-administration of the herbal drug. The antioxidant enzymes registered a decline in activity in diabetic rats thus revealing the damaging effects of free radicals generated due to alloxan exposure. The activities of these enzymes returned to normalcy in ALL-administered rats indicating the antioxidant efficacy of the drug in resisting oxidative insult.

21. **Chulet et al., (2010)** assessed antibacterial activity of *Albizia lebbeck* leaves. The successive ethyl acetate extract of *Albizia lebbeck* leaves are found inhibitory effect against *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Bacillus cereus*. The extract shows sensitivity for both gram positive and gram negative bacteria with maximum against *Pseudomonas aeruginosa* and minimum against *Escherichia coli*.

22. **Une et al., (2001)** studied the effect of saponin containing n-butanolic fraction (BF) extracted from dried leaves of *Albizia lebbeck* on cognitive behavior and anxiety in albino mice. The elevated plus maze was used for assessment of both nootropic and anxiolytic activity. Results showed significant improvement in the retention ability of the normal and amnesic mice as compared to their respective controls. Animals treated with BF (25 mg/kg) spent more time in the open arm in a dose-dependent manner. The BF was without any significant effect on motor
coordination studying. However, it significantly inhibited passivity and hypothermia induced by baclofen (10 mg/kg), a GABA agonist. The data emanated in the present study suggests involvement of gamma-aminobutyric acid (GABA) in the nootropic and anxiolytic activity of saponins obtained from A. lebbeck.

23. Tripathi et al., (1977) studied the effects of the decoction of the bark and flower of Albizia lebbeck for its anti-asthmatic and anti-anaphylactic activity. The decoctions protected the guinea pig against histamine as well as acetylcholine induced broncho-spasm. Chronic treatment with the bark decoction has also protected the sensitized guinea pigs against antigen challenge. However, the drug has no significant effect on the rat mesenteric mast cell count and has not protected the mast cell from the disruption induced by compound 48/80. The antiasthmatic and antianaphylactic activities of the drug cannot be wholly due to smooth muscle relaxant, antihistamine or antispasmodic activity nor are mediated through stability of mast cells or adrenal gland. The effect seems to be due to inhibition of phenomenon of sensitisation.

24. Gupta et al., (2004) evaluated the antifertility activity of the methanolic pod extract of Albizia lebbeck (L.) Benth in male albino rats. A. lebbeck pod extract brought about a significant decrease in the weights of testis, seminal vesicles, epididymis and ventral prostate. The sperm motility and density were significantly reduced. There was a marked reduction in the numbers of primary spermatocytes, secondary spermatocytes and spermatids. The Sertoli cell count as well as its cross sectional surface area were significantly decreased. The methanolic extract of A. lebbeck pods causes spermatogenic arrest in male albino rats.

25. Nabachandra et al., (1991) isolated and characterized lupeol, oleanolic acid, docosanoic acid and beta-sitosterol from the hexane extract of Albizia lebbeck pods. Oral administration of triterpenes isolated from Albizia lebbeck pods did not cause any significant change in the body weights but a significant reduction in the weight of reproductive organs i.e. testis, epididymides, seminal vesicle and ventral prostate were observed. Testicular sperm count, epididymal sperm count and motility were significantly reduced.

26. Dixit et al., (1997) separated three new macrocyclic alkaloids, named as budmunchiamines L4, L5, and L6 (1-3) from methanolic extract of the seeds of Albizia lebbeck. The known budmunchiamines A, B, C, and F have also been
found. The structures of 1-3 have been determined, by the use of spectroscopic methods and by comparison with budmunchiamines L1-L3, reported earlier from this plant.

27. **Besra et al., (2002)** showed antidiarrhoeal activity of the aqueous methanol extract of *Albizia lebbeck* seeds (2.5-5 mg/kg I.P.) which strengthens the earlier use of the seeds in the treatment of diarrhoea and dysentery

28. **Kirtikar et al., (1998)** reported the flowers on steam distillation gave colorless, sweet-smelling oil [4.3%] and on fractionation, it yielded p-nitro benzoate, Benzyl alcohol and Benzoic acid.