A phytomedicine: Azadirachta indica (Neem)

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ABSTRACT

In the traditional medicine therapy system most of the disease has been treated by administration of phytomedicine such as plant or plant derived product. Most of them Neem (AZADIRACHTA INDICA) is very useful traditional phytomedicinal plant in India. Each part of neem plant consisting some medicinal property. It is now considered as valuable source of unique natural products for the development of medicines against various diseases and also for the development of industrial medicinal product. During last five decades, the chemistry of the neem compound, considerable progress has been achieved regarding the biological activity and medicinal application of Neem. This review gives a superficial view mainly on the pharmacological and biological activities of Neem and some of their isolated compounds.

Key word:- Introduction, Taxonomical classification, Botonical description, Pharmacological implimentation,

INTRODUCTION

Azadirachta Indica commonly known as Neem, is native of India has great medicinal value and distributed wide spread in the world. The chemical constituents contain many biologically active compounds that can be extracted from neem including alkaloid, lavonoid, carotenoid, phenolic compounds, steroid and ketones, biologically most active compound is azadirachtin, it is actually a mixture of seven isomeric compounds labelled as azadirachtin A-G and azadirachtin E is more effective [1]. In 1992 the US National Academy of sciences, which published a report entitled 'Neem-A tree for solving global problem' [2]

TAXONOMICAL CLASSIFICATION :-[3]

Kingdome:-Plantae, Order:-Rutales,
Suborder:-Rutinae, Family:-Meliaceae.
Genus :- Azadirachta, Species:-Indica.
BOTANICAL DESCRIPTION OF A. INDICA (NEEM) :-

Neem belongs in the family of Meliaceae which is found in abundance in tropical and semitropical region like India, Bangladesh, Pakistan and Nepal. It is a fast growing tree with 20-30 meter tall and trunk is straight and has diameter about 4-5 ft. Its fruit are green drupes which turn golden yellow after ripening in the month of June to August [4]

ACTIVE COMPOUNDS OF AZADIRACHTA INDICA (NEEM) :- Azadirachta indica shows therapeutic role in health management due to rich source of various type of ingredient such as :-

- Azadirachtin, nimbin, nimbidin, sod.nimbinate, solanin gedunin and quer cetin. Leaves contain ingredients such as nimbin, ascorbic acid, n-hexacosanol and amino acid, 7-desacetyl-7-benzoylgedunin, 17-hydroxyazadiradione and nimbiol[5]

MECHANISM OF ACTION OF ACTIVE COMPOUNDS:-

Azadirachta indica has therapeutic implication in disease prevention and treatment. But exact molecular mechanism in the prevention of pathogenesis is not understood entirely. It is considered that azadirachta indica shows therapeutic activity due to rich source of antioxidant and other valueable compound such as azadirachtin, salanin and quercetin, possible mechanism of action of azadirachta indica is presented as follows:-

- Azadirachta indica (Neem) plant parts shows anti-microbial role through inhibitory effect on microbial growth/potentiality of cell wall break down. Azadirachtin, a complex tetranortriterpenoid limonois present in seed is the key constituents responsible for the both antifeedant and toxic effect in insect. [6]. Result suggest that the ethanol extract of neem leaves showed in vitro antibacterial activity against both staphylococcus aureus and MRSA with greatest zones of inhibition noted at 100% concentration [7]

- Neem plays role as free radical scavenging properties due to rich source of antioxidant. free radical scavenging activity and reductive potential in the following order: -
  
  { Nimbolide> Azadirachtin > Ascorbic acid}  

- Neem also plays role as anti inflammatory via regulation of pro-inflammatory enzyme activities including cyclooxygenase (COX) Lipooxygenase (LOX) enzyme [8]

PHARMACOLOGICAL IMPLIMENTATION OF AZADIRACHTA INDICA:-

- ANTI-OXIDENT ACTIVITY:- Free radical or reactive oxygen speciese are one of the fundamental offenders in the genesis of different illness. Notwith standing, neutralization of free radical activity is one of the imperative strides in the maladies counteractive action. Antioxidants stabilize/deactivate free radicals, regularly before they assault focuses in biologic cells. [9] Furthermore assume job in the control of harm brought about free radicals by activating the anti-oxidative protein [10]. Plant product such as seed, oil, root, bark, leaves, demonstrate an essential job in illness averse because of the rich source of anti-oxidant [11]

- ANTI-INFLAMMATORY ACTIVITY:- Plants and their isolated derivatives are in the practice to treat /act as Anti -inflammatory agent. A study result has confirmed that extract of Azadirachta indica leaves at a dose of 200 mg/kg P.P.O., showed significant anti-inflammatory effect in cotton pellet granuloma assay in rodent. [12] An examination result proposed that the nimbidin stifles the
element of macrophages and neutrophils pertinent to inflammation[13]. It is also found that immunemodulator and anti-inflammatory impact of bark and leaves concentrates and anti-pyretic and anti-inflammatory exercise of oil and seeds[14]

- **ANTI-BACTERIAL ACTIVITY**: Acetone extract of Azadirachta indica exhibit stronger inhibition against gm(+ve)bacteria(E.choli, and p.auruginosa) with MIC values of 10mg/ml and 25 mg/ml respectively. In contrast chloroform extract exhibit stronger inhibition against gm(-ve)bacteria(B.subyilis,B.cereus,S.pneumonae and S.aureus) with MIC value of 10mg/ml for all bacteria. The cytotoxicity was evaluated based on the LC50 values of the extract [15]

- **ANTI-DIABETIC ACTIVITY**: The hypoglycemic activity of azadirachta indica has examine -ed on a diabetic rats. After 24 hours of treatment Azadirachta indica 250mg/kg (single dose study ) reduced Glucose(18%), Cholesterol(15%), Triglycerides(32%), Urea(13%), Creatinine(23%), and Lipid(15%). In a glucose tolerancetest in diabetic rats with neem extract 250 mg /kg demonstrate glucose levels were significantly less compared to the control group. Azadirachta indica significantly reduce glucose level at 15th day in diabetic rat [16]

- **ANTI-DENTAL CARIES**: A Neem extract dental gel significantly reduce plaque and bacteria (streptococcus mutants) and Lactobacilli species were tested) over the control group that used commercially available mouthwash containing the germicidal Chlorhex-idin gluconate(0.2%w/v)[17]

- **ANTI-ULCER ACTIVITY**: It is reported that the gastro-protective property of dried bark extract of azadirachta indica in the mercaptopethylimidazole , indomethacin ,LU,HST induce ulcer . It act mainly by inhibiting acid secretion and blocking the oxidative damage of gastric mucousa. Inhibition of acid secretion is done by inhibiting the activity of proton pump and inhibition of oxidative damage of mucousa are done by blocking of lipid peroxidase and scavenging of endogenous Hydroxyl radical(OH)[18]

- **ANTI-TUMOUR AND ANTI-VIRAL ACTIVITIES**: Researchers in India, Europe and Japan found that polysachcharides and limonoids found in neem bark, leaves, seed and oil reduced the tumour and cancers showed effectiveness against lymphocytic lukemia.mitotic inhibition activity by Neem leaf extract was observed. several reports have also highlighted the pronounced anti viral efficacy of aq.extract of neem oil[NIM-76] have also been report to supress HIV and Polio viruses.[19]

- **HEPATO PROTECTIVE ACTIVITY**: Extract of neem leaf helps to protect the liver from damage which in turn helps to cleanse the blood, Neem leaf minimise the factor that induce chemically damage of hepatic cell by stabilizing serum marker enzyme and boosting levels of anti oxidant ,like those found in vitamin C and E and carotenoid ,which neutralize the free radical and protect from damage.

- **ANTI -STRESS**: Low doses of Neem leaf extract produced sedative effect. the effecf disappear at higher doses aprox 400or 800mg/kg of body weight. It also reduced the anxiety and stress.

- **ANTI -VITILIGO**: Vitiligo isbelived to be an auto immune disorder that cause patches of skin yo loss its colour .the doses of four grams of neem leaves three times a day ,ideally taken before each meal . Neem oil is applied on over the affected areas aid in thereversal of discolouration.[20]

- **SKIN DISORDER**: Neem are used in to treat the many skin disorder ,including Scabies and lice in a paste cimbination with curcuma longa(Turmeric), Neem(A.indica) was used to treat scabies in 814 people 97% of them cured within 3-15 days of application [21]

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CONCLUSION:- The above collected information on regarding the use of Azadirachta indica in word is match with available literature. Recent years, ethno-botanical and traditional uses of natural compounds, especially of plant origine received much attention as they are well tested for their efficacy and generally believed to safe for human use. It is best classical approach in the search of new molecules for the management of various deseases. Thorough depicted the fact that it is a popular remedies among the various ethnic groups, Unani, Ayurvedic and traditional practioners for the treatment of ailments.

REFERENCES:


