



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,Botanical description,pharmacological implementation ,

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 ,lavanoid ,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]

Kingdom:-Plantae, Order:-Rutales,

Suborder:-Rutinae,Family:-Meliaceae.

Genus :-*Azadirachta*,Species:-*Indica*.

BOTONICAL DESCRIPTION OF A.INDICA (NEEM) :-

Neem belongs to 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 types of ingredients such as :-

- -Azadirachtin, nimbin, nimbidin, saponin, nimbinate, solanin, gedunin and quercetin. 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 the 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 valuable compounds 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 limonoid present in seed is the key constituents responsible for the both antifeedant and toxic effect in insect. [6]. Result suggests that the ethanol extract of neem leaves showed in vitro anti-bacterial 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) and lipoxygenase (LOX) enzyme [8]

PHARMACOLOGICAL IMPLEMENTATION OF AZADIRACHTA INDICA:-

- **ANTI-OXIDANT ACTIVITY:-** Free radical or reactive oxygen species are one of the fundamental offenders in the genesis of different illness. Notwithstanding, 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 biological cells. [9] Furthermore assume job in the control of harm brought about by free radicals by activating the anti-oxidative protein [10]. Plant products such as seed, oil, root, bark, leaves, demonstrate an essential job in illness aversion 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 macro-phages and neutrophils pertinent to inflammation[13].It is also found that immunomodulator and anti-inflammatory impact of bark and leaves concentra-tes 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 inhibiyion against gm(-ve)bacteria(*B.subyilis*,*B.cereus*,*S.pneumoniae* 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 examin -ed on a diabetic rats .After 24 hours of treatment *Azadirachta indica* 250mg/kg (single dose study) reduced Glucose(18%),Cholestrol(15%),Triglycerides(32%),Urea(13%),Creat-inine(23%),and Lipid(15%).In a glucise tolerancetest in diabetic rats with neem extract 250 mg /kg demonstrate glucose levels were significantly less compared to the controll-ed 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 rxttract of *azadirachta indica* in the merceptomethylimidazole ,indomethacine ,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 polysachharides and limonoids found in neem bark ,leaves ,seed and oil reduced the tumour and cancers showed effectiveness against lymphocytic leukemia.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 HIVand Polio viruses.[19]
- **HEPATO PROTECTIVE ACTIVITY:-**Extract of neem leaf helps to protect fhe liver from damage which in turn helps to cleanse the blood ,Neem leaf minimise the factor thatinduce 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 effect disappear at higher doses approx 400or 800mg/kg of body weight .It also reduced the anxiety and stress.
- **ANTI -VITILIGO:-**Vitiligo is belived to be an auto immune disorder thar 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 origin received much attention as they are well tested for their efficacy and generally believed to be safe for human use. It is the best classical approach in the search of new molecules for the management of various diseases. Thoroughly depicted the fact that it is a popular remedy among the various ethnic groups, Unani, Ayurvedic and traditional practitioners for the treatment of ailments.

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