

A Review On: Phytochemistry and Medicinal uses of Neem Tree.

Modhave Anuja S.^{*1}, Lengre Mansi D.^{*2}, Pro.Bangar Sampat S^{*3}

H.S.B.P.V.T's, GOI, College of Pharmacy, Kashti, Shrigonda, Ahmednagar, Maharashtra, India, 414701.

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ABSTRACT:Neem (*Azadirachta indica*) is a member of the Meliaceae family and its role as health-promoting effect is attributed because it is rich source of antioxidant. It has been widely used in Chinese, Ayurvedic, and Unani medicines worldwide especially in Indian Subcontinent in the treatment and prevention of various diseases. Earlier finding confirmed that neem and its constituents play role in the scavenging of free radical generation and prevention of disease pathogenesis. The studies based on animal model established that neem and its chief constituents play pivotal role in anticancer management through the modulation of various molecular pathways including p53, pTEN, NF-κB, PI3K/Akt, Bcl-2, and VEGF. It is considered as safe medicinal plants and modulates the numerous biological processes without any adverse effect. In this review, I summarize the role of *Azadirachta indica* in the prevention and treatment of diseases via the regulation of various biological and physiological pathways.

Keywords : *Azadirachata*, Chemistry, Medicinal properties, Neem, Pharmacological

INTRODUCTION:

Azadirachta indica is popularly known as Indian neem or margosa tree. It's been extensively used in ayurveda, unani and homoeopathic medicine since time immemorial. In Sanskrit a "good health" condition is expressed as "Nimba" (Sitasiwi et al., 2018), which on due time derived in to "Neem", further the tree is considered as "Sarvaroganivarini" means cure all ailments. In Ayurveda neem is known as "Arishta" meaning 'reliever of sickness'. The tree is still regarded as "village pharmacy" or "Divine tree" due to presence of medicinal properties in India (Amritalingam, 2001). If the developing countries are considered more than 80% of the population is believed to be dependent on medicinal plants for curing various diseases or disorders (Rupani and Chavez, 2018). Further, the total trade in medicinal plants in India during 2004-05 has been 4,530 crore. India ranks second in the world in terms of

the volume and value of medicinal plants export. Neem is one of the indigenous medicinal plants of India which possess medicinal properties in each and every part viz., roots, seeds, flowers, bark, leaves, fruit pulp etc. (Kirtikar and Basu, 1975). Neem is one of the examples of complementary medicine through phytotherapy (Jose et al., 2020). Each of the plant part has been used in the Indian Ayurvedic and Unani systems of medicine and has become a cynosure of modern medicine.

In Ayurvedic literature neem is well known for its medicinal properties viz., Neem bark is cool, bitter, astringent and acrid. In addition to this, it is used to cure tiredness, cough, fever, loss of appetite, worm infestation etc. It also heals wounds and vitiated conditions of kapha, vomiting, skin diseases, excessive thirst and diabetes. Along the bark, chemical compounds present in the leaves are reported to be valuable for eye disorders and insect poisons. It treats Vatik disorder and acts as anti-leprotic. It's fruits are bitter, purgative, anti-hemorrhoids and anthelmintic'. In the view of its immense utilities, this review summarizes the wide range of medicinal uses, pharmacological activities, biological activities of neem tree and its compounds and their chemistry.

Botanical Description of Neem.

Neem Tree



leaves



Bark of Neem



Taxonomic position of Azadirachta indica (neem).

Order - Rutales

Suborder - Rutinae

Family - Meliaceae

Subfamily - Melioideae

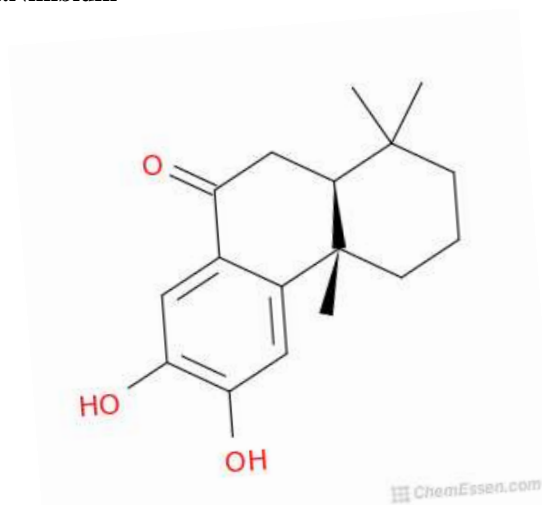
Tribe - Melieae

Genus - Azadirachta

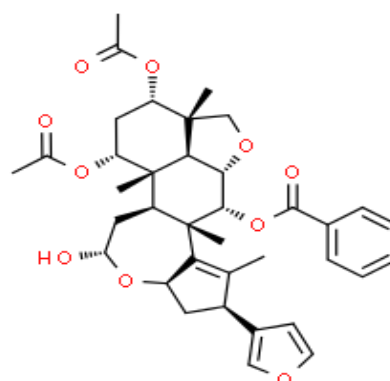
Species - indica

Chemical Constituent :

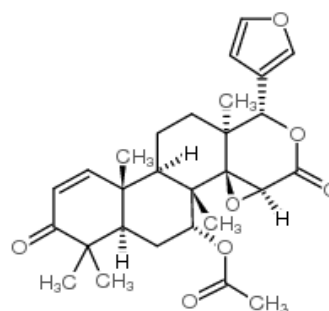
1.Nimbidin



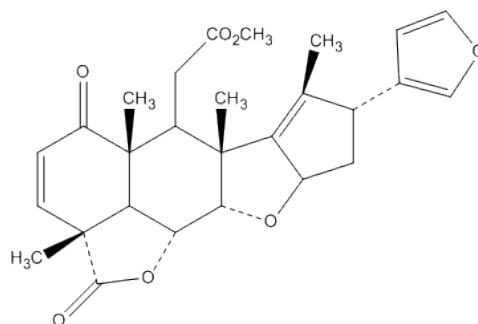
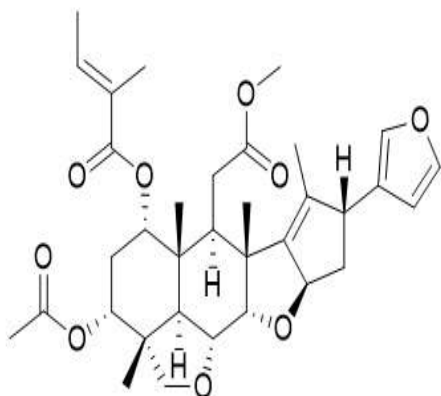
2.Nimbolinin :



3. Gedunin

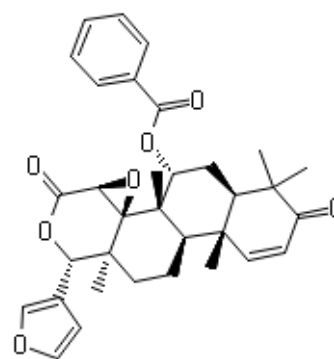
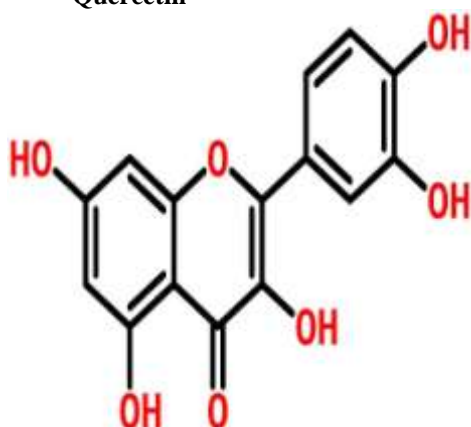


3. Salannin



3. 7-desacetyl-7-benzoylgedunin

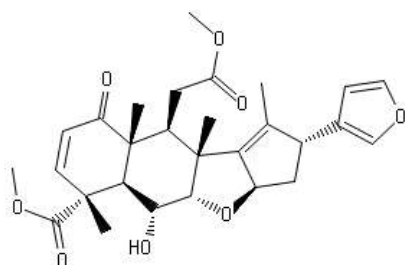
4. Quercetin



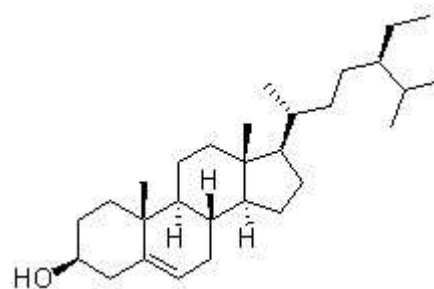
4. beta-sitosterol

Leaves Ingredients

1. 6-Deacetylnimbin



2. Nimbolide



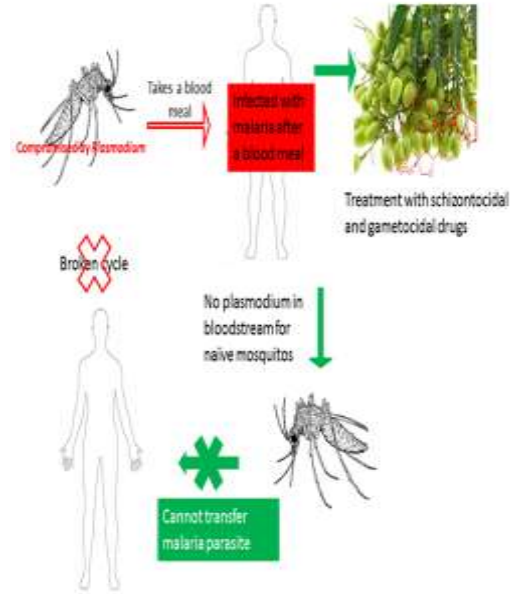
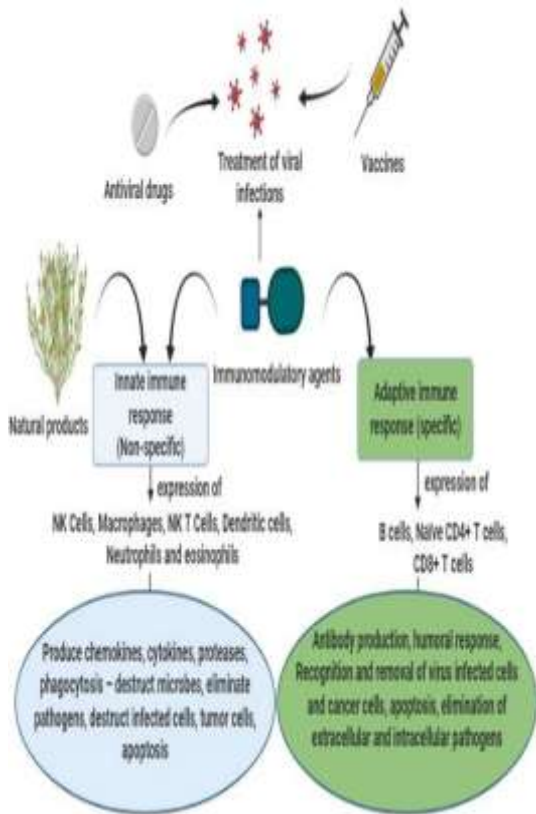
Medicinal Uses and pharmacological activities:

Anticancer agents:

1-O-deacetylchinalide B and 15-O-deacetylnimbolindin-B are proved to be beneficial to hinder cell growth in human cervical adenocarcinoma.

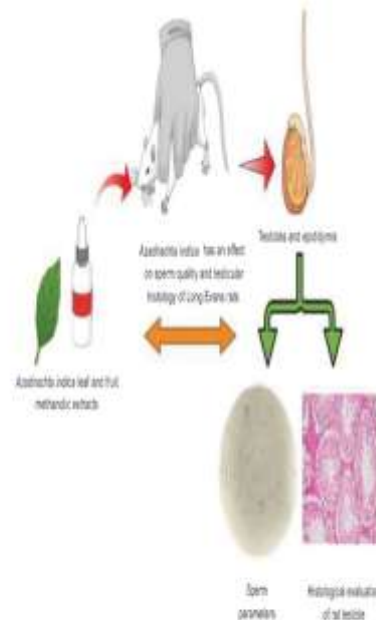
azadiramide- A, is primarily found in Neem leaf ethanolic extracts, showed to stop cell growth and induce apoptosis in both the estrogen independent MDAMB-231 and estrogen dependent MCF-7 cell lines of breast cancer in human beings .

Antiviral activity:



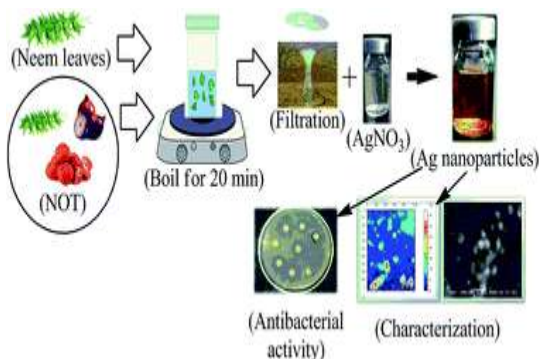
One of the neem's components, "gedunin" (a limonoid), is as effective as quinine against malaria.

Antifertility effect:



Nimbin and nimbidin have been found to have antiviral activity. They affect potato virus X, vaccinia virus, and fowl pox virus.

Antibacterial activity:



nimbidin, nimbin, nimbolide, gedunin, mahmoodin, margolone, and cyclic trisulfide contribute to the anti-bacterial activity of neem

Antimalarial activity:

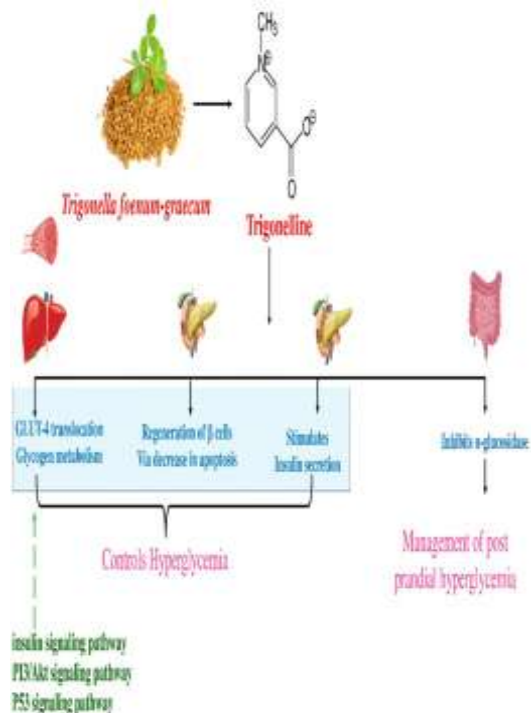
Methanolic extracts of Azadirachta indica exhibit antifertility activity

Aqueous extracts of seeds and leaves contain sodium nimbinate (triterpene) which showed antifertility activity .

Antifungal activity:

Extracts of neem leaf, neem oil seed kernels are effective against certain fungi including Trichophyton, Epidermophyton, Microspore, Trichosporon, Geotricum and Candida.

Hypoglycaemic activity



Neem leaf extracts showed promising results in decreasing blood sugar level and prevents adrenaline as well as glucose-induced hyperglycaemia. Recently, hypoglycaemic effect was observed with leaf extract and seed oil in normal as well as alloxan-induced diabetic rabbits

Antiulcer effect:

Neem leaf and bark aqueous extracts produce highly potent antacid secretory and antiulcer activity. A significant antiulcer effect was observed with nimbidin in preventing acetylsalicylic acid, indomethacin, stress or serotonin-induced gastric lesions as well as histamine or cysteamine-induced duodenal ulcer.

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