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NEEM – A REVIEW

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Abstract: Since old period natural treatment stayed as medication's spine which is monetary, more secure and effectively accessible to the majority of individuals in world. Among assorted natural fortune, Neem is a profoundly regarded tree with a few advantageous properties and applications particularly known for its fantastic helpful, ethno medicinal values for mankind. It has been utilized in various medication frameworks: Ayurveda, Unani, Homeopathy, people medication and subsequently considered as cynosure of present day medication. Each and every part of neem have some organic and therapeutic properties subsequently an important source of characteristic restorative items. Neem has indicated antiviral, anti-fungal and anti-bacterial properties. It is utilized in instances of incendiary skin conditions. Generally, Neem has been utilized for skin and blood cleaning conditions. Neem not just treats infections and diseases, but it additionally gives us the strength of battling sicknesses by improving our immunity.

Introduction: In traditional medicine large portion of the diseases have been cured by administration of plant or plant product. These plants are broadly utilized as ethno medicine around the world. Neem is scientifically known as *Azadirachta indica*. The neem is India’s native plant and utilized in the majority of tropical and subtropical nations and is of incredible therapeutical worth and circulated widely in the world. [1] Azadirachta indica implies as (=Melia azadirachta L. and Melia indica Brandis) is known as the Indian lilac or Margosa. [2] In India it is popular with numerous different names like “Divine Tree”, “Wonder tree”, “free tree of India”, “Mareria medica” “Panacea of all diseases” "Heal All", "Nature's Drugstore", and "Village Dispensary". [3]

Azadirachta has three species i.e. Azadirachta indica (Rutales: Meliaceae), A. excels , and A. siamensis. [4]

Azadirachta indica is one of the most income delivering plant grown in India due to the presence of unique phytoconstituents present in it and furthermore because of various pharmacological properties related with it. The significance of the neem tree has been perceived by the US National Academy of Sciences, which published a report in 1992 entitled ‘Neem - a tree for solving global problems’. The advancement of neem research has earlier been documented. [5] This plant also named as miracle or wonder tree because of its multiple properties and there is almost nothing this plant can’t do. [6]

Keywords: Neem, Nimbidin, folk medicine, Leprosy, Polysaccharide, Anti-inflammatory, Skin protector.

Taxonomy of Neem:
Kingdom – Plantae
Division – Magnoliophyta
Class – Dipsacales
Order- Rutales
Sub-order- Rutinae
Family- Meliaceae
Subfamily- Melioideae
Tribe- Melieae
Genus - Azadirachta
Species – indica [7]

FIG.1 NEEM

Vernacular names: [8,9]	
Common name	Neem
English	bastard tree, bead tree, cornucopia, Indian cedar, Indian lilac, margosa tree, neem, paradise tree, Persian lilac
Sanskrit	Arista, Nimba, Nimbah, Picumarda
Hindi	Nim, Nimb
Guajarati	Danujhada, Limbado, Limbra, Limdo
Bengali	Nim, Nimgachh
Kannada	Bemu, Bevinamara, Bivu, Kaybevu
Punjabi	Bakam, Drekh, Nim
Spanish	Margosa, mim
French	azadirac de l'Inde, margosier, margousier
Arabic	azad-daraknul-hind
Brazil	Neem, nim
Ethiopia	Azaddarakht
Indonesia	Imba, intaran, membh, mempheuh, mimba
Iran	azad-darakhat-hindi
Kenya	Mkilifi, mwarubainikamili
Laos	Kadao
Malawi	Mkina, ndya
Malaysia	Baypay, mambu, sadu, veppam
Myanmar	Bowtamaka, tamabin, tamaka
Nigeria	Dongoyaro
Pakistan	Nim
Singapore	Kohumba, nimba, veppam
Sri Lanka	Kohomba
Thailand	Khwinin, sadao, salaam

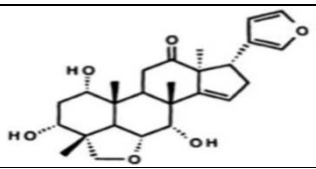
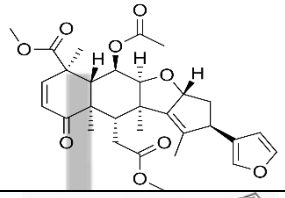
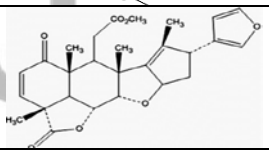
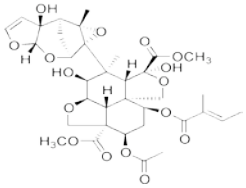
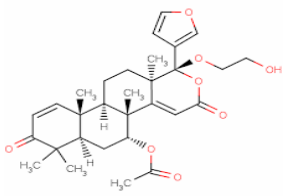
Morphology: It is a tree 40-50 feet or higher, with a straight trunk and long spreading branches framing a wide round crown; it has unpleasant dim brown colored bark with wide longitudinal gaps isolated by level edges. The leaves are compound, imparipinnate, each including 5-15 leaflets. The compound leaves are themselves exchanging with each other. It bears many bloomed panicles, generally in the leaf axils. The selel are applaud and around one cm long with pleasant smelling white oblanciolate petals. It produces yellow drupes that are ellipsoid and glabrous, 12-20 mm long. Fruits are greenish, turning yellow on maturing,

sweet-smelling with garlic like scent. New leaves and blossoms come in March-April. Natural products develop among April and August relying on locality. [10,11]

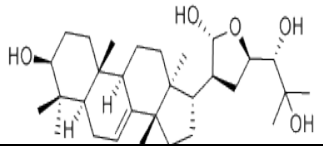
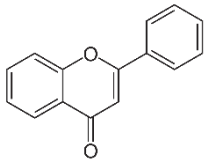
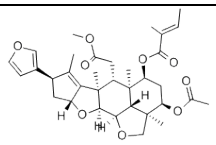
Distribution: A local to east India and Burma, it is grown in quite a bit of south East Asia and West Africa, and all the more as of late Caribbean and south and Central America. In India it grows normally in Siwalik Hills, dry timberlands of Andhra Pradesh, Tamil Nadu and Karnataka to a height of roughly 700 m. It is developed all through the drier areas of tropical and subtropical India, Pakistan, Sri Lanka, Thailand and Indonesia. It is additionally developed and frequently naturalized in Peninsular Malaysia, Singapore, Philippines, Australia, Saudi Arabia, Tropical Africa, the Caribbean, Central and South America. [12,13,14]

Phytochemicals present in Neem:

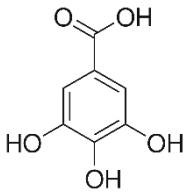
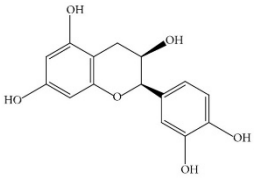
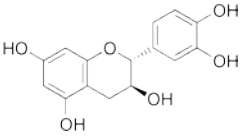
1. **Seed**

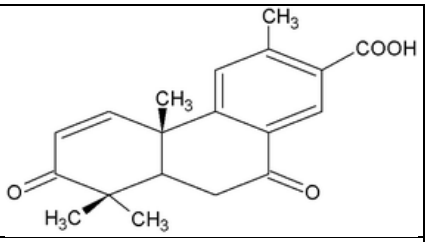
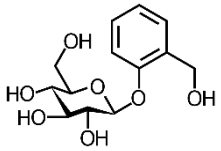
Compound	Property	Chemical structure
Nimbidin	Anti-pyretic, Anti-inflammatory, Anti-arthritic, Hypoglycaemic, Anit-gastric ulcer, Spermicidal, Anti-fungal, Anti-bacterial, Diuretic. [15,16,17,18,19,20,21]	
Nimbine	Anti-malarial, Antibacterial, Spermicidal [22,23]	
Nimbolide	Antibacterial, Antimalarial [24,25]	
Azadirachtin	Anti-malarial, insect repellent [26,27]	
Mahmoodin	Antibacterial [28]	

2. Leaf:

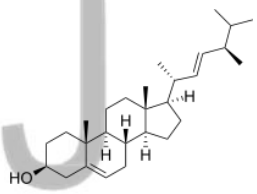
Compound	Property	Chemical structure
Meliantriol	Antifeedant	
Flavonoid	Hyperglycemic	
Salanin	Antifeedant [29]	
Methanolic Extract	Antipyretic and Inhibit Plaque formation [30]	
Aqueous Extract	Anti-viral, Anti-bacterial, Anti-fertility, Anti-carcinpogenic, Immune stimulation, hepatoprotective, hypoglyceamic, anti-ulcer, [31, 32, 33, 34, 35, 36,37]	
Acetone Extract	CNS Depressant [38]	
Cyclic trisulphide	Antifungal	
cyclic tetrasulphide	Antifungal [39]	

3. Bark:

Compound	Property	Chemical structure
Gallic acid	Inhibits Chemiluminescence Generation, Antiinflammatory, Immunomodulatory	
Epicatechin	Antiinflammatory, Immunomodulatory	
Catechin	Antiinflammatory, Immunomodulatory [40, 41,42]	

Margolonone	Antibacterial, Antitumor [43]	
Glycoside	Antiacid Secretory and antiulcer [44]	
Ethanolic Extract	Hypotensive, Spasmolytic, and Diuretic	
Chloroform Extract	Anti-Inflammatory [45]	
Aqueous Extract	Immune stimulant, analgesic [45]	
Polysaccharides GIa	Antitumour	
Polysaccharides GIb	Antitumour [47]	
Polysaccharides GIIa	Anti-inflammatory	
Polysaccharides GIIIa	Anti-inflammatory	
NB-II peptidoglycan	Immunomodulatory	

4. Fruit:

Compound	**Property**	**Chemical structure**
Phytosterols	Antiulcer	

Ethnic view:

The plant is viewed as a divine plant and is utilized by the Hindus in a few functions, customs and in the celebration of New Year day. It is related with a rural celebration "Ghatasthapana" to turn away illnesses. The Juice of new green leaves of Azadirachta indica was regarded as a" Kam vasna" suppressor (desire for sex) so holy people and "sanyasees" in shrines used it for this purpose. [48]

In the Indian states of Andhra Pradesh, Karnataka and Telangana, Neem flowers are noticeable for their usage in 'Ugadi Pachhadi' (soup-like pickle), which is made on Ugadi day. In Andhra Pradesh, Karnataka, and Telangana, a little proportion of Neem and Jaggery (Bevu-Bella) is used on Ugadi day, the Telugu and Kannada new year, exhibiting that one should take both bitter and sugared things in their daily life, bliss and agony. In the midst of Gudi Padva, which is the New Year in the region of Maharashtra, the old everyday practice with respect to drinking a little measure of neem squeeze or glue on that, earlier day starting festivities, is found. As in various Hindu festivals and their relationship with some food to keep up a key good ways from antagonistic responses of the change of seasons, neem juice is

connected with Gudi Padva to remind people to use it in the midst of that particular month or season to assuage summer pitta. In Tamil Nadu in the midst of the pre-summer quite a while of April to June, the Mariamman temple festivity is a thousand year-old show. The Neem leaves and flowers are the most fundamental bit of the Mariamman festivity. The sculpture of the goddess Mariamman will be garlanded with Neem leaves, flowers. In Tamil Nadu people use to adorn their environmental factors with the Neem leaves and flowers as a sort of embellishment and moreover to evert heinous spirits ailments. [49]

Neem as a Folk Medicine:

Each A. indica tree's part is generally utilized in customary Indian medication for everyday cure against different human diseases. Indians have adored the neem tree (A. indica) since ages. For quite a long time, people used to clean their teeth with neem twigs, spread skin problems with neem leaf juice, administered neem tea as a tonic to increase appetite and treat fever and to execute intestinal worms. Traditionally, patients experiencing Chicken Pox rest on the leaves in India inferable from its therapeutic worth. They also used to place neem leaves in books, grain canisters, organizers, and wardrobes to fend off inconvenient bugs. The tree has reassured a wide range of agonies, fevers, contaminations, and different grievances so it has been classified "The Village Pharmacy". Rural people frequently utilized water decoction of neem leaves for the anticipation and treatment of different afflictions. [50,51]

Neem in Ayurveda:

As per reports of the World Health Organization, 80% of the total population depends majority on conventional treatments which include the use of plant. The history of the plant neem goes back a long far, with signs it was utilized in clinical medicines around 4,500 years back. There is proof found from excavations at Harappa. also, Mohenjo-Daro in Northwestern and western India, in which a several medical compound including neem leaves, were assembled in the ruins. India's antiquated books of information are known as the Vedas. Some of the most antiquated records that have been translated, are the Charka-Samhita (around 500 BC), and the Sushruta Samhita (around 300 AD) These books are the establishments of the Indian arrangement of natural mending, or Ayurveda. These writings notice neem in very nearly 100 entries for treating numerous diseases which influence human (Conrick). In Sanskrit, the language of old Indian writing, neem is alluded to as Nimba, which is derived from the term Nimbati Swastyamdadati, which signifies 'to give great wellbeing.

Rasa Panchak of Neem:

Hindi/ Sanskrit	
Virya	Shita
Vipak	Kattu
Guna	Ruksha
Rasa	Tikta

English	
Potency	Cold
Metabolic Property	Bitter
Physical Property	Dry
Taste	Pungent

Neem whole plant is extensively used in Ayurvedic System Medicine for various disorders. The Neem bark has cool, unpleasant, and astringent properties. It is mostly used to treat sleepiness, Kapha dosha imbalance, worms, fever and loss of hunger. On account of its astringent properties, it is particularly useful in healing wounds. Neem leaf has both sharp and astringent tastes. As per Maharishi Ayurveda, the Neem leaf is particularly helpful in adjusting Vata Disorder. It eliminates ama and different poisons from the body, purifies the blood, and kills harming free extremists. It is used for nourishing the hair (keshya). Neem is likewise worshipped for its antibacterial and antiviral properties. Individuals sprinkle new Neem leaf close to the beds of patients with influenza or fever, and drape a bunch of leaves on the entryway outside. The air that crosses the neem leaf is sanitized of infections and microorganisms, helping to purifying the room and prevent the spread of sickness. juice of neem leaves with honey twice a day is very beneficial for skin disorders. It is recommending in Ayurveda to take bath with water of boiled Neem leaves. Paste of neem is very useful in healing of ulcers/wound. Neem is also very affective for hair problems like hair loss, hair damage, dandruff etc. For diabetic problem dry leaves of neem with lukewarm water empty stomach twice in a day is very helpful. [52]

Ayurvedic properties of Neem[53]	
Leaf	Leprosy, eye problem, epistaxis, intestinal worms, anorexia, biliousness, skin ulcers.
Bark	Analgesic, alternative and curative of fever
Flower	Bile suppression, elimination of intestinal warms and phlegm.
Fruit	Bile suppression, elimination of intestinal warms and phlegm.
Twing	Piles, intestinal worms, urinary disorder, epistaxis, phlegm, eye problem, diabetes, wounds, and leprosy
Gum	Cough, asthma, piles, phantom tumor, intestinal worms, spermatorrhoea, obstinate urinary disorder, diabetes
Oil	Leprosy and intestinal worms
Seed	Leprosy, and intestinal diseases
Root	Refrigerant, diuretic

Neem in Modern medication system:

Various medicinal plants have been utilized for quite a long time to treat diseases everywhere on the world. The phytochemicals recognized from medicinal plants are representing an energizing open door for the improvement of new kinds of therapeutics. [54] From last five decades, aside from chemistry of neem, extensive progress has been accomplished in medicinal property. It is currently considered as a significant source of unique natural products for the improvement of medicines against different diseases and for the advancement of modern items. [55] Each part of the neem tree has some medicinal property and is thus commercially exploitable. Researchers from the developed world are working broadly in investigating Neem tree and its properties to formulate new medicine. In the process of modern synthesis Neem is utilized in corrective items and some medication its quality gets change either because of other inorganic/organic fixings or because of present day manufacturing processes. Various parts of Neem tree are being utilized broadly in cosmetic manufacturing of soap, skin creams/location, shampoos, toothpastes, beauty products and toiletries. The Neem twigs are usually being utilized as tooth brushes. As a rule, Neem oil/separate is being utilized for making these beauty care products like cleansers and tooth glues etc. The modern use of neem is utilizing in the agriculture (farming) area by being an insecticide in food storage as a bug spray, as soil change, fertilizer enhancer, and viable foliar pesticide.

Examples of modern products having Neem as an ingredient:

1. Vestige Neem Capsule
2. Diebenil Liquid
3. Neem Aura Lotion
4. BIOTIQUE neem shampoo
5. Live Stamin – Neem seed
6. Neeta – Pure Neem Oil
7. Tekzon-Neem Oil
8. VEDr- Neem
9. Kanaek-Immunity Booster
10. Alna- Blood purifier
11. Rosscore – Neem Tablets
12. Bixa Neem capsule

Various uses of Neem:

Anti-inflammatory	The bark choroform extract is known to possess anti-inflammatory properties. Bark extract is effective against inflammatory somititis. [56]
Anti-diabetic	The aqueous neem leaf extract helps in reducing blood sugar level and thus prevents glucose induced hyperglycemia. [57]
Hepato-protective	Neem is helpful in the treatment of liver damage. The aqueous extract of leaf is found to be very effective in the liver damage treatment.[58]

Anti-fertility	Neem is known to have anti-fertility properties from the ancient times. It is one of the cheapest anti-fertility agents. Neem seed oil significantly inhibits the sperm motility and count. The aqueous and old tender leaves of neem is known to kill spermatozoa. It is also a very great abortifacient and an anti-implantation agent.[59,60]
Anti-malarial	The alcoholic extracts of neem leaves and seed extract have the potential to inhibit the growth of malarial parasite.[61,62]
Anti-viral	The methanolic and aqueous extracts of neem leaf are effective against various viruses like chikunguneya and vaccina virus. [63]
Anti-periodontal effect	Neem is good for maintaining the dental health. Its extracts help in peventing tooth decay and Periodontal disease. [64]
Skin protector	Neem oil is good for skin and it is helps in treating various skin problems like acne, sunburn, psoriasis, eczema, ringworm. [65]
Anti-cancer	Active compounds like limonoids, terpenoids, steroids have been widely used in the treatment of various cancerous growths. [66]
Anti-arithritic	Nimbidin extracted from the seed oil has effective properties against arthritis and thus acts a good anti-arthritis agent. [67]
Immunomodulator	Gallic acid, catechin, epicatechin are known to have immunomodulatory effects.
Anti-ulcerogenic	The aqueous extracts of neem bark give protection against ulcers. A Lipophilic isolation called Phytosterols of the neem fruit is a good anti-ulcerogenic agent.
Anti-pyretic	The methanol extract of neem leaves acts as a good anti-pyretic agent. The nimbidin extracted from the seed oil is a well known anti-pyretic agent. [68]
Anti-bacterial	The leaves, seed, bark oil has anti-bacterial properties which are effective against both strains of bacteria i.e. gram positive bacteria as well as gram negative bacteria. A neem extract called nimbolide is an anti-bacterial agent.Methanol extract of neem is also a good anti-bacterail agent.[69, 70]
Anti-hypertensive	The hypertensive conditions can be treated by the alcoholic extracts of the neem leaf. [71]
Anti-oxidant	A. indica has been considered for its anti-oxidant properties also, delayed consequences of the assessment evidently demonstrated that leaf also, bark extracts of neem developed in the lower areas have great anti-oxidant properties. [72]

Conclusion:

Prominence of natural products or their subordinates role in the treatment of various diseases and anticipation is expanding worldwide due to their no harm causing properties. Neem and its fixings have therapeutics proposal and have been generally used overall especially in Indian Subcontinent since old time. Clinical based assessments attested that neem presumes key role in abhorrence of various illnesses.

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