

# Medicinal uses of neem (*Azadirachta indica*) in human life : A Review

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## ABSTRACT

Neem (*Azadirachta indica*) belonging to *Maliaceae* family is very important medicinal plant which is traditionally used to treat different diseases. Each part of the neem tree has some medicinal property and is thus commercially exploitable. It has been used in different medicinal systems: Ayurveda, unani, homeopathic medicine, therefore considered as cynosure of modern medicine. It is now considered as a valuable source of unique natural products for development of medicines against various diseases and also for the development of industrial products. The objective of this paper was to evaluate medicinal applications of neem in human life.

**Keywords:** *Azadirachta indica*, Neem, Medicinal uses

## INTRODUCTION

Neem is an omnipotent tree and a sacred gift of nature. Neem tree is mainly cultivated in the Indian subcontinent. Neem is a member of the mahogany family, *Maliaceae*. Today it is known by the botanical name *Azadirachta indica* (*A. indica*) A. Juss. Neem has been used extensively by humankind to treat various ailments before the availability of written records which recorded the beginning of history. Since prehistoric times, neem has been used by humankind (Venugopalan, 2013). The latinized name of neem, *Azadirachta indica*, is derived from the Persian. Azad means "free"; dirakht means "tree"; i-Hind means "of Indian origin". Hence it literally means "the free tree of India" (Neem Foundation, 2018). The neem tree is an incredible plant that has been declared the "Tree of the 21st century" by the United Nations (United Nations Environment Programme, 2018). The US National Academy of Science published a report in 1992 entitled "Neem: A tree for solving global problems" (National Academy of Science, 1992).

Neem provides shade, ornamental look, shelterbelt, fuel wood and construction material and also helps in degraded land reclamation and soil conservation activities. *Azadirachta indica* is tropical evergreen tree, native to India and Burma; it has been transplanted to Africa, the Middle East, South

## SOME BIOACTIVE COMPOUNDS FROM NEEM

Neem compound	Source	Biological activity	Reference
Nimbin	Seed oil	Spermicidal	(Sharma, 1959)
Nimbolide	Seed oil	Antibacterial Antimalarial	(Rochanakij, 1985), (Khalid, 1989), (Rojanapo, 1985)
Gedunin	Seed oil	Antifungal Antimalarial	(Khalid, 1989), (Rao, 1977)
Azadirachtin	Seed	Antimalarial	(Jones, 1994)
Mahmoodin	Seed oil	Antibacterial	(Devakumar, 1996)
Gallic acid, Epicatechin, Catechin	Bark	Anti-inflammatory and immunomodulatory	(Van der Nat, 1991)
Margolone, Margolonone and Isomargolonone	Bark	Antibacterial	(Iffat, 1989)
Cyclic trisulphide and Cyclic tetrasulphide	Leaf	Antifungal	(Pant, 1986)

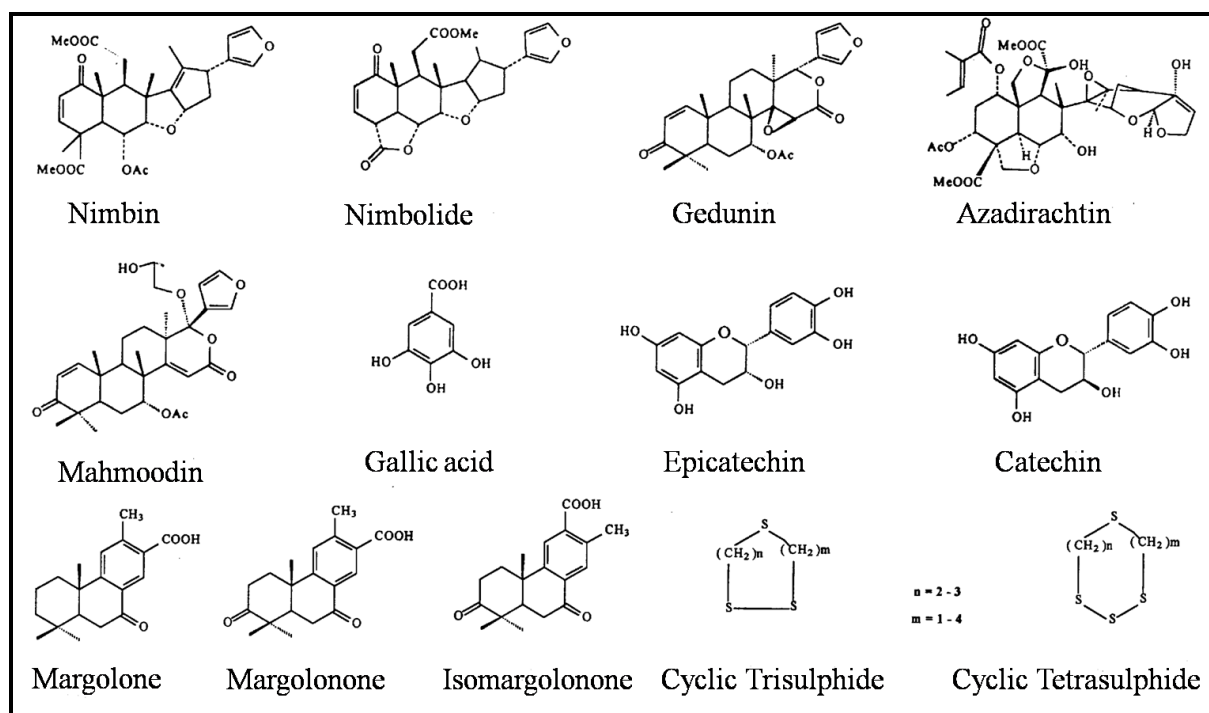


Fig. 1 Structure of bioactive neem compounds

## MEDICINAL USES OF NEEM IN HUMANKIND:

## 1) Antibacterial activity

Recent research shows the isolation and identification of the antibacterial active compound from petroleum ether extract of neem oil (Zhang, 2010). Elavarasu *et al.* studied *in vitro* anti-plaque microbial activity of neem oil (Elavarasu, 2012).

## 2) Antiviral

Galhardi *et al.* studied the *in vitro* antiviral property of *Azadirachta indica* polysaccharides for poliovirus

(Galhardi, 2012). The research of Xu *et al.* showed the *in vitro* antiviral activity of neem seed kernel extracts against duck plague virus (Xu *et al.*, 2012).

## 3) Sexually transmitted disease

Few researchers have focused on neem efficacy in treating sexually transmitted diseases. The reports that have been completed are overwhelmingly positive. Recent research of Shokeen *et al.* showed the evaluation of the activity of 16 medicinal plants against *Neisseria gonorrhoeae* (Shokeen, 2009).

**4) Neem and the immune system**

Thoh *et al.* studied that azadirachtin interacts with the tumor necrosis factor (TNF) binding domain of its receptors and inhibits TNF induced biological responses (Thoh, 2010).

**5) Anti-inflammatory activity**

The study of Alam *et al.* showed the anti-inflammatory activity of epoxyazadiradione against macrophage migration inhibitory factor (Alam, 2012). Thoh *et al.* found that azadirachtin interacts with retinoic acid receptors and inhibits retinoic acid-mediated biological responses (Thoh, 2011).

**6) Antioxidant effect**

Manikandan *et al.* researched that antioxidant and protective effects of active neem leaf fractions against hydrogen peroxide induced oxidative damage to pBR322 DNA and red blood cells (Manikandan, 2009).

**7) Anticarcinogenic activity**

Chatterjee *et al.* showed that identification of a sulfon oquinovosyldiacylglyceride from *A. indica* and studies on its cytotoxic activity and DNA binding properties (Chatterjee, 2010). Mahapatra *et al.* showed novel molecular targets of *Azadirachta indica* associated with inhibition of tumor growth in prostate cancer (Mahapatra, 2011).

**8) Skin diseases**

Neem has a remarkable effect on chronic skin conditions. Acne, psoriasis, eczema, ringworm and even stubborn warts are among the conditions that can clear up easily when high quality, organic neem oil is used. Neem oil and leaves has been used in Siddha medicine for the treatment of skin diseases (Thas, 2008). In addition, neem oil can be used as an excellent component of cosmetics to help clear, beautify and rejuvenate the skin.

**9) Antisnake venom activity**

Ashis *et al.* studied a snake venom phospholipase A2 (PLA2) inhibitor (AIPLAI) was isolated from leaves of *A. indica* (neem) and the mechanism of PLA2 inhibition by AIPLAI *in vitro* condition was also studied (Ashis, 2008).

**10) Digestive disorders**

Neem is generally accepted in the ayurvedic medical tradition as a therapy for ulcers and other types of gastric discomfort. Neem promotes a healthy digestive system by protecting the stomach, aiding in elimination

and removing toxins and harmful bacteria. Bandyopadhyay *et al.* studied the neem bark extracts of gastroprotective effect (Bandyopadhyay, 2004).

**11) Parasitic diseases**

Neem quickly kills external and internal parasites. Neem extracts have hormone mimics that interfere with the life cycle of parasites, inhibit their ability to feed and prevent the eggs from hatching. Abdel *et al.* studied the efficacy of a single treatment of head lice with a neem seed extract (Abdel, 2012). Luong *et al.* found that neem leaf slurry is a sustainable, natural product and anopheline larvicide in west African Villages (Luong, 2012).

**CONCLUSION**

This article gives information about structure of some bioactive compounds and from article it is clear that the neem has many medicinal uses in human life.

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**Conflict of Interests**

No funds were received for this study. Authors do not have any conflicting interests.

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