

# A Review Study on Benefits of Neem

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**ABSTRACT:** *Neem, also known as Azadirachta indica, is an evergreen, temperature-tolerant, blooming plant that originated in India but has now spread to other continents. It is one of the medicinal plants with a broad variety of therapeutic properties, and every component of the tree is utilized as medicine both locally and in pharmaceutical companies after preparation. Neem is a very important plant. The benefits of neem have been shown in a number of studies. Its usage in a variety of diseases has been described in Ayurveda. Because the public's knowledge of herbal goods is growing, the demand for neem products is rising day by day. With proven nutritive, antifungal, and creepy crawly repellent qualities of Neem, Neem mixes eaten via soil improve these regular defense frameworks. Neem is a plant whose components may be used in a variety of ways. Many therapeutic advantages of neem have been documented by researchers. Neem has anti-diabetic, anti-inflammatory, and anti-cancer properties. Many Hindu ceremonies include the usage of neem. This review work depicts a variety of neem applications, providing individuals with valuable information and educating them about the wonders of neem.*

**KEYWORDS:** *Antifungal, Health, Herbal, Neem, Pharmaceutical Industries.*

## 1. INTRODUCTION

For ages, the neem tree (*Azadirachta indica*) has been thought to have miraculous health-promoting qualities. Truth be told, there is evidence that neem was used for medicinal purposes as far back as 4,500 years ago. Its use dates back to ancient India and surrounding countries, where it has long been revered as one of the most useful plants on the planet. The neem tree is still renowned as the "Village Dispensary" since all parts of it are recognized to have unique medicinal potential. The neem tree belongs to the mahogany family's meliaceae and is a fast-growing, evergreen tree well-known for its drought tolerance. The neem tree grows to be a large shade tree with a thick, circular canopy and a lifespan of 150-200 years. Despite the fact that neem is known for its strong, unpleasant odor, the blooms have a delicious nectar-like fragrance that can be detected for kilometers. Neem is an endless resource since it is a fast-growing tree that requires minimal water. Neem is often used in Ayurveda to balance pitta and kapha. It's chilly, light, and dry qualities will exacerbate vata in general. Neem is often given in combination with other plants to help suppress its vat-stimulating properties[1]–[4].

### 1.1. Benefits of Neem:

#### 1.1.1. Antioxidant Activity:

Free radicals, also known as responsive oxygen species, are a major contributor to the development of many diseases. Nonetheless, neutralization of free radical activity is one of the most important steps in the disease's treatment. Antioxidants help to stabilize/deactivate free radicals before they attack targets in biological cells, and they also help to activate anti-oxidative proteins that help to limit the damage caused by free radicals/receptive oxygen species. Antioxidant activity has been discovered in therapeutic plants. Plant natural products, including as seeds, oil, leaves, bark, and roots, play an important role in the prevention of diseases due to their high antioxidant content. The antioxidant activity of *A. indica* leaf and bark concentrations was investigated, and the results clearly showed that leaf and bark extracts/fractions of neem produced in the lower areas had substantial antioxidant capabilities[5]–[7]. Another study looked at the antioxidant activity of leaves, fruits, flowers, and stem bark extracts from the Siamese neem tree, and the findings showed that extricates from leaf, bloom, and stem bark had a lot of antioxidant potential.

#### 1.1.2. Anti-Cancer Properties:

Malignant growth is a multifactorial disease that affects people all over the globe. The enhancement and progression of malignant development is aided by the alteration of molecular/genetic pathways. On the one hand, the allopathic therapy module is appealing, but it also has an unfavorable impact on the typical cell. Plants and their components have previously been shown to limit the growth of malignant cells via modulating cell expansion, apoptosis, tumor suppressor genes, and a variety of other molecular pathways. Flavanoids and other chemicals found in neem have an important role in preventing malignant tumor progression. A large number of epidemiological studies indicate that increased flavonoid intake is linked to a lower risk of cancer[8]–[10].

### 1.1.3. *Neem's Anti-Inflammatory Properties:*

Plants or isolated products of plants are used to treat or function as anti-inflammatory agents. In a cotton pellet granuloma test in rats, a concentrate of *A. indica* leaves at a dosage of 200mg/kg, p.o., showed significant anti-inflammatory action. Other research findings revealed that neem leaf extricates have a substantial anti-inflammatory effect, albeit it is less efficient than dexamethasone, and that nimbidin stifles the components of macrophages and neutrophils that are involved in inflammation. Previous research has shown that bark and leaf concentrations have immune-modulating and anti-inflammatory properties, and that oil seeds have antipyretic and anti-inflammatory properties.

Experimentation was carried out on albino rats to assess the pain relieving action of neem seed oil, and the results revealed that neem seed oil has a significant pain relieving effect in the portion has dose-dependent pain relievin examination was carried out to investigate the impact of neem seed oil (NSO) carrageen an-incited rear paw edem, and the results revealed that NSO indicated expanded hindr the dynamic increment NSO showed the most severe (53.14 percent) edema impediment at the fourth hour after carrageen an injection at the part of 2 mL/kg body weight.

### 1.1.4. *Effect on the liver: hepatoprotective:*

Therapeutic plants and their constituents have a strong hepatoprotective effect with no antagonistic effects. The hepatoprotective role of azadirachtin-An in carbon tetrachloride (CCl<sub>4</sub>)-induced hepatotoxicity in rats was investigated, and histology and ultrastructure findings confirmed that pretreatment with azadirachtin-A dose-dependently reduced hepatocellular corruption. Aside from side effects, the results show that pretreatment with azadirachtin-An at higher dosage levels returns the rat liver to normal function.

### 1.1.5. *Effect on Wound Healing:*

Different plants/their components play an important role in the damage-recovery process. The damage patching activity of concentrates of leaves of *A. indica* and *T. cordifolia* was evaluated in Sprague Dawley rodents using extraction and cut injury models, and the results revealed that concentrates of the two plants essentially propelled the damage mending activity in both extraction and entry point damage models. Furthermore, the stiffness of the recovering tissue of the two plants treated groups was considerably greater as compared to the control groups in section point wounds. The findings revealed that *Azadirachta indica* leaf concentrates improve damage retouching activity by increasing provocative response neovascularization. An investigation was conducted to assess the 70 percent alcoholic neem root bark extract (NRE) in diabetes, and the findings revealed that the neem root bark extract provided demonstrably significant outcomes in the 800mg/kg part. Another study looked at *Azadirachta indica*'s pharmacological hypoglycemic action in diabetic rodents, and the results showed that in a glucose versatility test with neem extract 250mg/kg, glucose levels were fundamentally lower when compared to the control group, and *Azadirachta indica* essentially decreased glucose levels at the fifteenth day in diabetic rodents.

### 1.1.6. *Antibacterial Effects:*

The antimicrobial sufficiency of home grown choices as endodontic irrigants was surveyed and differentiated from the standard irrigant sodium hypochlorite, and the results confirmed that leaf concentrates and grape seed extricates showed zones of restriction prescribing that they had antimicrobial properties. Furthermore, leaf extract exhibited much more inhibitory zones than 3 percent sodium hypochlorite. The antibacterial development of guava and neem isolates against 21 strains of food borne pathogens was assessed, and the delayed result of the study suggested that guava and neem extracts contain compounds with antibacterial properties that could be useful in controlling food borne pathogens and deterioration life forms..

### 1.1.7. *Antifungal Activity:*

Researchers looked at the effectiveness of various neem leaf concentrates on seed-borne parasites *Aspergillus* and *Rhizopus*, and found that both alcoholic and water extracts effectively suppressed and controlled the growth of both infectious species. Furthermore, the alcoholic neem leaf concentration was the finest.

### 1.1.8. *Dentistry:*

A study was conducted to assess the efficacy of neem-based mouth flush in terms of its anti-gingivitis effect, and the results revealed that *A. indica* mouth flush is as effective in reducing periodontal records as chlorhexidine. Another study looked at the antibacterial capabilities of natural neem concentrates against three bacterial strains that cause dental caries, and the findings showed that oil ether and chloroform extracts had

strong antimicrobial activity against *S. mutans*. *Streptococcus salivarius* was resistant to chloroform extraction, while *Fusobacterium nucleatum* was extremely susceptible to both ethanol and water extraction.

### 1.2. *Neem's Potential Contraceptive Properties:*

Neem, whether used as a pre- or post-coital contraceptive, prevented sperm growth by 0.05 to 1%. Immune modulators in filtered concentrations that animate the cells and macrophages that terminate pregnancies. Fertility was restored after a series of cycles, with no adverse effects on future pregnancies.

#### 1.2.1. *Compound that stimulates the immune system:*

The most important benefit of neem is its immune-boosting qualities. It aids lymphocytic and cell-intervened frameworks, such as "Killer T" cells, which may demolish organisms, infections, and malignancy cells by injecting toxic synthetic chemicals into invaders.

#### 1.2.2. *Sexually Transmitted Infections (STIs):*

Neem has a lot of promise for controlling diseases that are directly transmitted. Neem provided 75% protection against HIV infection.

#### 1.2.3. *Stress:*

Neem leaf extricates have sedative properties at low dosages. At large dosages, about 400 or 800 milligrams per kilogram of body weight, the effect fades. It also helps to relieve tension and stress.

#### 1.2.4. *Heart Problems:*

Blood clots, increased cholesterol, arrhythmic cardiac activity, and hypertension are all significant causes of heart attacks. Its leaf extracts reduced coagulation, reduced circulatory strain and bad cholesterol, slowed or stopped a rapid or unusually high pulse, and suppressed erratic heart beats.

#### 1.2.5. *Blood and Skin:*

Neem is well-known and praised for its ability to rejuvenate skin and give it a more balanced look. It has an unfathomably cooling effect on the body, reducing excess heat that may show up as skin flaws, due to a limited extent to its harsh taste.

#### 1.2.6. *System of Defense:*

Its cleansing effects on the body make it an amazing invulnerable ally, especially when it comes to removing ama from the body.

#### 1.2.7. *Metabolism:*

The fat and water-processing characteristics of neem enable appropriate fat and water processing and elimination, preventing water retention in the body.

#### 1.2.8. *Malaria:*

Malaria (jungle fever) is a common disease in India and the tropics. The use of neem leaves prevents the usual progression of the jungle fever (Malaria) illness. Despite the fact that Neem may be effective in the treatment of skin inflammation and other chronic diseases. Neem oil is an excellent treatment for psoriasis.

### 1.3. *In Ayurveda, neem is used to treat a variety of ailments:*

Neem has a bitter flavor, which gives it a revolutionary cooling energy (virya). This cooling effect, along with its capacity to support healthy blood, helps to regulate pitta, particularly when the rakta dhatu is hot (the blood). Excess pitta may manifest in a variety of ways, one of which is the skin. Neem glues and oils have long been used to soothe and moisturize the skin, as well as to calm irritated and inflamed feelings, maintain a comfortable body temperature, and promote healthy skin and nails. Because of its light and dry properties, neem may also help to balance kapha. Neem promotes healthy digestion and arouses meda dhatu agni (the metabolic/stomach-related rule found within adipose tissue), allowing for proper digestion and maintaining glucose levels that are now within normal limits. Usually given internally to promote a state of parity in the liver, pancreas, and digestive system. The bitterness of neem also enhances taste, which is essential for proper digestion. In the prana vaha srotas, neem has a similar regulating effect on pitta and kapha (the respiratory sections). On a larger scale, neem aids in the regular purification of the body's systems as well as the regeneration of solid tissues. Because neem is vata irritating on its own, it is combined with other herbs to get the best effect. because of its

disagreeable flavor As a result, it is often recommended during late-spring Ayurveda (which falls between March and April on the Hindu calendar).

#### *1.4. Neem's many parts in use:*

##### *1.4.1. Flowers:*

Except for the blooms, most parts of the neem tree are very unpleasant. White and delicate, neem blossoms with their grey buds are much too beautiful to eat and incomparably soothing. During the evening, the flowers have a fragrant, almost magical jasmine-like fragrance and bloom once toward the evening and then again at night. A bunch of them dispersed appropriately beneath the tree during the downpour. These neem flowers, also known as Vepampoo in Tamil, may be used fresh, dried, or powdered. They're often used in the South to prepare a variety of meals, including bloom rice, pachadi, rasam, lentils, and so on. They're often dry simmered and then sprinkled on top of the meal to add flair. Anorexia, nausea, belching, and intestinal worms may all be treated with neem blossoms.

##### *1.4.2. Leaves:*

The healing powers of neem leaves are unrivaled. Aside from its use in pest and disease management, it may also be fed to animals when mixed with other grains. Neem leaves are used as manure in rice fields in certain parts of India, especially in the south Indian states. Neem leaves are used as a mulch in tobacco and tomato crops in certain countries. They may be effectively used to eliminate weeds by spreading them over plant roots to retain moisture. Neem leaves may also be used to keep creepy crawlies away from stored woolen and silk clothing.

##### *1.4.3. Bark & Twigs:*

If you were born in India, you may have seen someone chewing on a neem twig. People have been using a neem twig as a makeshift toothbrush for quite some time now. It destroys bacteria, maintains the soluble dimensions in your salivation, keeps tiny organisms in check, relieves sore gums, and whitens your teeth. The twig also shreds into threads, which function much like fibers, destroying and preventing plaque.

##### *1.4.4. Oil of Neem:*

Neem oil, extracted from neem seeds, is high in therapeutic qualities, which makes it a great ingredient in cosmetics and other useful products such as cleansers, hair oils, hand washes, and cleanser. It may be used to treat a variety of skin ailments and is considered to be an effective mosquito repellent. Neem may also be mixed with coconut oil and applied to the body. It is said that in India, little children are urged to use neem oil as a kind of all-purpose remedy. Apart from being an excellent Ayurvedic healer, neem oil may also be used to protect various plants. It may also be found in creams, cleansers, and other skin care products.

## **2. DISCUSSION**

In every part of the globe, herbal medicines are used to cure a variety of ailments. The neem tree is an important component of these herbal medicines, and it has been mentioned in many ancient medical texts. It is regarded as the pinnacle of Indian pharmacopeia by traditional Indian healers. Neem's bark, leaves, flowers, seed, and natural product mash were and are still used to cure a broad range of illnesses and complaints, including disease, diabetes, ulcers, skin issues, and bowel obstruction, among others. Researchers from all around the globe are studying the Neem tree and its characteristics in order to develop new anti-infection medicines. Agents of beautification: Different parts of the Neem tree are extensively used in the manufacture of cleansers, skin creams/salves, shampoos, toothpastes, beauty aids, and toiletries.

Neem twigs are becoming more popular as germicide tooth brushes. In most cases, Neem oil/extract is used to make cosmetics such as cleansers and toothpastes. Researchers are also looking at the benefits of Neem for agricultural development. Neem oil, Neem cake, leaves, and other parts of the Neem tree are now widely used in farming in many parts of the globe as a result of these findings. Its primary segments are insect storage, soil modification, manure, and a strong foliar pesticide. In every part of the tropics, a significant portion of the collected nourishment is wasted throughout capacity due to worms, insects, and other invasio to use synthetic bug sprays on p is said and done and all the more expl away for their personal usage Neem oil has offered ranchers a POW pests

## **3. CONCLUSION**

Soil Amendment: Neem cake (the leftover material after the oil is extracted from the seed portions is termed cake) has been used as an effective soil formation for a long time all across the Indian subcontinent. Ranchers

in this region have discovered via trial and error that using Neem cake in the soil creates larger, more useful plants with fewer or no bugs or illnesses. Several studies were also conducted by different researchers to determine why plants grew better in soil with Neem cake. Their findings revealed that Neem cake is higher in plant-available nutrients than fertilizers; it killed harmful nematodes, promoted a large population of night crawlers, helped maintain nitrogen in the soil accessible for plants, and provided essential insect protection. Plants are particularly vulnerable to nematodes. Nematodes siphon juice from plant foundations to the point that they are unable to provide sufficient nutrients to the plant. In such case, the plants seem unlucky, fail to grow, and may eventually perish despite sufficient nutrition, water, and care. The use of Neem cake in soil also helps to maintain soil free by promoting night crawler activities in soil, which aids in the more effective and efficient absorption of nutrients and water by plants. By initially sheltering plants from creepy crawly/bother, neem cake allows plants to develop a strong resistance structure against these nuisance assaults.

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