

## Neem – The gift of nature

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This plant, known as “the village pharmacy” in India, has been used for at least 4000 years for its medicinal qualities. Neem which belongs to family Meliaceae, has a botanical name *Azadirachta indica*. This is a very fast growing; ever green tree which reaches the height of 15 to 20 meters. Neem is known for its medicinal properties and is used as a main ingredient in many home remedies. Neem has been used to treat a wide range of ailments, including wounds, burns, sprains, bruises, earache, headache, fever, sore throat, food poisoning, shingles, colds, flu, hepatitis, mononucleosis, fungal infections, yeast infections, sexually transmitted diseases, acne, skin diseases, heart diseases, blood disorders, kidney problems, digestive problems, ulcers, periodontal diseases, nerve disorders, malaria, fatigue, and a host of others. It is anti-bacterial, anti-viral, anti-septic, and strengthens the body’s overall immune response. It is heartening to see that a traditional Indian plant medicine has now led to several therapeutically and industrially useful preparations and compounds, which generates enough encouragement among the scientists in exploring more information about this medicinal plant. As the global scenario is now changing towards the use of nontoxic plant products having traditional medicinal use, development of modern drugs from neem should be emphasized for the control of various diseases. In fact, time has come to make good use of centuries-old knowledge on neem through modern approaches of drug development. Neem and its products for their better economic and therapeutic utilization.

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### INTRODUCTION

Medicinal properties of neem have been known to Indians since time immemorial. The earliest Sanskrit medical writings refer to the benefits of neem’s fruits, seeds, oil, leaves, roots and bark. Each of these has been used in the Indian Ayurvedic and Unani systems of medicine. Neem is one of the most powerful blood purifiers. It cleanses and enhances circulation. It is believed that neem is a vitaliser, restoring balance to the system. Antibodies to strengthen the immune system and boosting the resistance of the body to cope with illnesses. Neem is almost a prerequisite for a healthy life. A wash made of neem leaves boiled in water is used to swab the body after a

bout of chicken pox. The oil from its seeds is applied to the scabs to prevent itching and infection. A paste of fresh neem leaves is used to rid hair of lice and control dandruff. Tender leaves of the plant are chewed to rid stomach of worms. Traditionally, a few neem leaves were eaten on an empty stomach every day for a couple of weeks before the beginning of the hot season as a preventive measure against summer maladies. Nimbolis (the fruit) were eaten when they were pulpy and ripe to ease digestion. Neem is accepted as an effective coolant. It is, therefore, considered a boon in a country like India, where temperatures soar to alarming heights and a large number of heat-related ailments affect people.

#### Neem products:

A wide variety of neem products including neem oil products can be produced from different regions of India. Neem products are free from pesticides and other preservatives and are offered at industry leading prices and in wholesale.

#### Neem oil:

Neem products like neem oil that is extracted from seeds

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of the neem and its fruits. It has been used for centuries in many treatments as a medicine. It is light to dark brown, bitter in taste and has strong odour. Quality Neem oil is widely used as effective pesticide, nematicide, fungicide and miticide.

#### Neem leaves:

Neem leaves that finds usage in various medicinal applications. Further, neem leaves helps in purifying the blood and heals a skin when water is boiled along with them. It is highly beneficial in curing measles and chicken-pox sores. Neem leaves are also used in packing wool and silk to protect them from moths and other insects.

#### Neem seed:

The neem seeds offered by us are procured from reliable vendors across the nation and are used in various insecticides, pesticides and also in various medical formulations. These neem seeds are also used for the oil extraction. Before procurement of neem seeds, these are inspected thoroughly so that the client has no problem in using it.

#### Neem cake:

Neem cake which is used as an organic fertilizer and a repellent for pests and insects. This neem cake is extensively used for preventing the crops from pests and also serves as a conditioner for soil. Available at industry leading prices, these neem cake are in high demand by clients spread worldwide.

#### Neem leaves powder:

Clients are offered with quality neem leaves powder which is known for its antiseptic and curative properties. Neem leaves powder has an instant germicidal and anti bacterial action that cures allergies, bed sores, prickly heat and rashes. Hygienically packed, these neem leaves powder are offered at industry leading prices.

#### Neem tea:

Tea is considered as the flixir of life and our range of neem tea has become the preferred choice by our clients for its curative features. We also offers neem leaf, neem tea, neem cake, neem leaf powder and neem oil. Procured from reliable vendors, these neem tea are appreciated worldwide owing to the following features:

- Rich aroma and taste
- No side effects
- Free from artificial ingredients

#### Nutritional composition of neem:

The neem tree plantations located in Southern Sonora, México show significant contrast in morphology and oil content. In the 11 selected trees, tree height varied from 3.5 to 5.0 m, weight of 10 fruits from 3.5 to 7.75 g, kernel percentage

from 21.1 per cent to 31.9 per cent, and oil content from 15.4 per cent to 24.5 per cent (Table 1). Proximal analysis of seeds from Yaqui Valley is presented in Table 2. In seed from India, maximum oil content was obtained in seed from Hisar. Seed oil content in most of the proveniences was not consistently correlated with seed morphology (data not shown). Average per cent of fatty acid content was oleic acid 45.6 per cent, linoleic acid 16.8 per cent, palmitic acid 17.21 per cent, stearic acid 15.2 per cent, and linolenic acid 1.3 per cent. The results indicated that the trees evaluated have a high genetic variation identified by differences in height, branching type, leaf form, and color. Fruit form, size, weight, kernal proportion, composition, and oil content were also variable. In agreement with Kaura *et al.* (1998), seed morphology (seed length and seed weight) and oil content was studied in *Azadirachta indica* from five provinces of northern and western India. Trees with wide ranges of girths were considered for study. Maximum average oil content was observed in trees from Hisar province. Seed oil content in most of the provinces was not consistently and significantly correlated with morphological parameters of seeds. Tree age had no significant effect on oil yield. This is important in order to improve neem populations; better fruits produce oils of higher quality and uniform plantations produce stable oils. Fruit weights were dissimilar for each tree. The fruits weight was contrasting, it could be an important component in tree yield potential; average fruit weight ranged from 0.775 g (tree 24) to 0.325 g (tree 61). The kernal weight as percent of fruit weight ranged from 31.9 per cent (tree 69) to 21.1 per cent (tree 39), which corresponded to oil content values of 23.8 per cent and 15.4 per cent, respectively (Table 1). The fatty acid profile analyses of contrasting samples showed no differences; most fatty acids showed average values: oleic acid, 45.5 per cent; inoleic acid, 16.8 per cent; palmitic acid, 17.2 per cent; stearic

**Table 1.** Tree height, growth rate and fruit and kernal characteristics of selected neem trees in Yaqui Valley, ITVY, Bacum, Sonora, Mexico, 2005.

Trees	Tree height (cm)	Growth rate (cm/month)	10 fruit wt. (g)	Kernal (%)	Oil content (%)
01-06	4.0	8.3	4.0	25.4	21.6
02-15	4.3	9.0	3.8	25.2	20.0
03-24	5.1	10.6	7.8	23.8	22.5
04-39	5.0	10.4	4.1	21.1	15.4
05-48	4.5	9.4	4.2	25.3	20.6
06-53	5.0	10.4	4.4	22.2	18.7
07-57	5.5	11.5	5.0	20.9	16.4
08-61	3.5	7.3	3.2	28.1	23.1
09-67	4.2	8.6	5.1	30.3	24.5
10-68	5.0	10.4	3.6	31.3	23.8
11-69	5.0	10.4	4.9	31.9	23.8
Average	4.6	9.7	4.6	26.0	21.0

acid, 15.2 per cent; and linolenic acid, 1.3 per cent (Table 2). The protein content in the fruit was 12.9 per cent (moist) and 14.3 per cent (dry) (Table 3).

**Table 2.** Fatty acids profile in contrasting samples of seeds neem

Kernal content (%)	Fatty acid %				
	Oleic	Linoleic	Palmitic	Stearic	Linolenic
30	45.73	18.44	18.21	15.70	1.33
25	45.73	18.72	17.93	15.03	1.25
20	44.99	16.55	18.33	17.02	1.49
Average	45.55	16.77	17.21	15.23	1.33

**Table 3.** Proximal analysis of neem seed.

Basis	Concentration (%)					
	Protein	Moisture	Ash	Fat	Fiber	NFEz
Moist	12.9	9.66	5.08	23.1	30.4	18.8
Dry	14.3	0.00	6.42	25.6	33.7	20.0

Nitrogen free extract

### Health benefits of neem:

Each and every part of neem tree is being used and it has lots of health benefits. Below are the some of the benefits that neem possesses:

#### *Immunostimulant activity :*

The aqueous extract of neem bark possesses anticomplement activity, acting both on the alternative as well as the classical pathway of complement activation in human serum (Vander Nat., 1987). Recently, an aqueous extract of stem bark has been shown to enhance the immune response of Balb-c mice to sheep red blood cells in vivo (Njiro and Kafi-Tsekpo, 1999). The aqueous extract of leaf also possesses potent immunostimulant activity as evidenced by both humoral and cell-mediated responses( Sen *et al.*, 1992, Ray *et al.*, 1996). Leaf extract at 100 mg/kg after three weeks of oral administration causes higher IgM and IgG levels along with increased titer of antiovalbumin antibody (Ray *et al.*, 1996). Neem oil has been shown to possess immunostimulant activity by selectively activating the cell-mediated immune mechanisms to elicit an enhanced response to subsequent mitogenic or antigenic challenge (Upadhyay *et al.*, 1992).

#### *Cure eczema:*

Recent studies indicate that neem leaf extracts (in form of a soap or shampoo containing neem oil) can easily relieve the itching and redness of eczema. To obtain the benefits of neem, a warm bath with neem leaves in it can be taken. The neem bath heals and protects from any minor skin infections.

#### *Effective detoxification:*

It works as blood purifier and is very helpful in eradicating

toxins from the blood. It also helps making our immune system very strong and efficient to fight against any foreign invasion.

### Dental care:

The twig of neem tree is largely used as a tooth brush in different regions of India, Pakistan and Bangladesh. This keeps the teeth whiter and prevents gum problems. Neem is also used to treat bad breath, tooth decay, bleeding and sore gums and to prevent cavities. Hence, it is an important ingredient in a variety of oral care products sold worldwide.

#### *Good for digestion:*

Neem tea is an effective tonic for both indigestion and constipation because of the content of tict rasa. Eating neem will help get rid of intestinal worms, thus performing its role as a de-worming agent. It also eliminates the problem of acidity. It is highly recommended in hyperacidity and epigastric pain.

#### *Effective against diabetes:*

Diabetes is a disease of excess sweetness so bitter herbs and foods must be used to counteract the imbalance. Neem has been shown to control blood sugar levels and prevent adrenaline as well as glucose induced hyperglycaemia.

#### *Effective against arthritis:*

The pain, inflammation, and swelling of the joints in arthritis can be greatly reduced by massaging muscle aches and joints with neem oil. In addition to its anti-inflammatory effects there are several compounds like polysaccharide, catechin, and limonoids present in neem that act as pain killers.

#### *Anti cancer:*

The poly-saccharides and limonoids found in neem not only reduce the tumors and cancers but are also effective against lymphocytic leukemia. Another protein found in the neem leaf has been found to boost the immune response and helps to kill colon cancer cells.

#### *Skin care:*

Neem leaves paste when mixed with fresh turmeric (haldi) and applied to the face, clears the face of pimples and also reduces scars. Dry skin, dandruff, itchy scalp, wrinkles, skin ulcers and other conditions that can be effectively resolved by the use of soaps, lotions, and creams, containing neem leaf extracts and oil.

#### *Anti bacterial:*

Neem oil contains powerful antiviral and antibacterial properties that make it the first choice in over a hundred household, agricultural, medicinal and cosmetic products.

Infections caused by bacteria (such as acne) or fungus (such as jock itch) are both curable by using neem oil. To kill germs and bacteria on skin, boil some neem leaves in water regularly and use the water to wash body.

#### *Anti malaria:*

Neem usage boosts the body's immune system making a person less likely to contract malaria and more likely to heal faster if he does. Since neem also acts as a natural pesticide, it repels mosquitoes which primarily carry malarial infection.

#### *Hair health:*

When used as hair oil, neem promotes shiny, healthy hair, combats dryness, prevents premature graying and may even help with some forms of hair loss.

#### **Contraceptive properties:**

Modern research suggests that neem does indeed kill sperm within seconds after contact and that the protection lasts for five hours. It is a safe and effective method of birth control, with no side effects. On top of preventing pregnancy, it may also protect from some sexually transmitted diseases.

These are the various natural health benefits that can be received from the regular intake of neem and neem leaf extracts. Since the tree is found in abundance, finding neem products is very easy.

#### **Conclusion:**

Development of modern non-toxic drugs from neem has earlier been suggested (Biswas *et al.*, 2002) and IRAB

represents such dream. This fractionated acetone/water neem leaf extract is the only drug reported to have activities against Malaria and HIV/AIDS. Recent *in vivo* studies have substantiated the earlier *in vitro* reports of pharmacological properties. The drug is reportedly safe, and thus further studies both on the extract and/or its chemical constituents are highly suggested to streamline these innovative findings into strategies for achieving the health components of the millennium development goals (MDGs).

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