

Neem tree

Neem



Azadirachta indica, flowers & leaves

Scientific classification

Kingdom: Plantae
Division: Magnoliophyta
Order: Sapindales
Family: Meliaceae
Genus: Azadirachta
Species: *A. indica*

Binomial name

Azadirachta indica

A.Juss., 1830^[1]

Synonyms^{[1][2]}

- *Antelaeazadirachta* (L.) Adelb.
- *Meliaazadirachta* L.
- *Meliaindica* (A. Juss.) Brandis

Description

Neem is a fast-growing tree that can reach a height of 15–20 metres (49–66 ft), rarely to 35–40 metres (115–131 ft). It is evergreen, but in severe drought it may shed most or nearly all of its leaves. The branches are wide and spreading. The fairly dense crown is roundish and may reach a diameter of 15–20 metres (49–66 ft) in old, free-standing specimens. The neem tree is very similar in appearance to its relative, the Chinaberry (*Meliaazedarach*).

The opposite, pinnate leaves are 20–40 centimetres (7.9–15.7 in) long, with 20 to 31 medium to dark green leaflets about 3–8 centimetres (1.2–3.1 in) long. The terminal leaflet is often missing. The petioles are short.

The (white and fragrant) flowers are arranged in more-or-less drooping axillary panicles which are up to 25 centimetres (9.8 in) long.

The inflorescences, which branch up to the third degree, bear from 150 to 250 flowers. An individual flower is 5–6 millimetres (0.20–0.24 in) long and 8–11 millimetres (0.31–0.43 in) wide. Protandrous, bisexual flowers and male flowers exist on the same individual tree.

The fruit is a smooth (glabrous) olive-like drupe which varies in shape from elongate oval to nearly roundish, and when ripe is 1.4–2.8 centimetres (0.55–1.10 in) by 1.0–1.5 centimetres (0.39–0.59 in). The fruit skin (exocarp) is thin and the bitter-sweet pulp (mesocarp) is yellowish-white and very fibrous. The mesocarp is 0.3–0.5 centimetres (0.12–0.20 in) thick. The white, hard inner shell (endocarp) of the fruit encloses one, rarely two or three, elongated seeds (kernels) having a brown seed coat.

Ecology

The neem tree is noted for its drought resistance. Normally it thrives in areas with sub-arid to sub-humid conditions, with an annual rainfall 400–1,200

millimetres(16–47 in). It can grow in regions with an annual rainfall below 400 mm, but in such cases it depends largely on ground water levels. Neem can grow in many different types of soil, but it thrives best on well drained deep and sandy soils. It is a typical tropical to subtropical tree and exists at annual mean temperatures between 21–32 °C (70–90 °F). It can tolerate high to very high temperatures and does not tolerate temperature below 4 °C (39 °F). Neem is one of a very few shade-giving trees that thrive in drought-prone areas e.g. the dry coastal, southern districts of India and Pakistan. The trees are not at all delicate about water quality and thrive on the merest trickle of water, whatever the quality. In India and tropical countries where the Indian diaspora has reached, it is very common to see neem trees used for shade lining streets, around temples, schools & other such public buildings or in most people's back yards. In very dry areas the trees are planted on large tracts of land.

Weed status[edit]

Neem is considered a weed in many areas, including some parts of the Middle East, and most of Sub-Saharan Africa including West Africa and Indian Ocean states. Ecologically, it survives well in similar environments to its own, but its weed potential has not been fully assessed.



Neem tree



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Neem leaves are dried in India and placed in cupboards to prevent insects eating the clothes and also while storing rice in tins.^[4] Neem leaves are dried and burnt in the tropical regions to keep away mosquitoes.^[citation needed] These leaves are also used in many Indian festivals like Ugadi. See below: #Association with Hindu festivals in India. As Ayurveda herb, Neem is also used in baths.

As a vegetable

The tender shoots and flowers of the neem tree are eaten as a vegetable in India. A souplike dish called Veppampoocharu (Tamil) (translated as "neem flower rasam") made of the flower of neem is prepared in Tamil Nadu. In West Bengal, young neem leaves are fried in oil with tiny pieces of eggplant (brinjal). The dish is called nim begun and is the first item during a Bengali meal that acts as an appetizer.^[5] It is eaten with rice.

Traditional medicinal use

Products made from neem trees have been used in India for over two millennia for their medicinal properties.^[4] Neem products are believed by Ayurvedic practitioners to be anthelmintic, antifungal, antidiabetic, antibacterial, antiviral, contraceptive and sedative. It is considered a major component in Ayurvedic and Unani medicine and is particularly prescribed for skin diseases.^[7] Neem oil is also used for healthy hair, to improve liver function, detoxify the blood, and balance blood sugar levels. Neem leaves have also been used to treat skin diseases like eczema, psoriasis, etc.

However, insufficient research has been done to assess the purported benefits of neem. In adults, short-term use of neem is safe, while long-term use may harm the kidneys or liver; in small children, neem oil is toxic and can lead to death. Neem may also cause miscarriages, infertility, and low blood sugar.

Safety issues

Neem oil can cause some forms of toxic encephalopathy and ophthalmopathy if consumed in large quantities.^[10]

Pest and disease control[edit]

Neem is a key ingredient in non-pesticidal management (NPM), providing a natural alternative to synthetic pesticides. Neem seeds are ground into a powder that is soaked overnight in water and sprayed onto the crop. To be effective, it is necessary to apply repeatedly, at least every ten days. Neem does not directly kill insects on the crop. It acts as an anti-feedant, repellent, and egg-laying deterrent, protecting the crop from damage. The insects starve and die within a few days. Neem also suppresses the hatching of pest insects from their eggs. Neem cake is often sold as a fertilizer.^[11]

Neem oil has been shown to avert termite attack as ecofriendly and economical agent.

Chemical compounds

Salimuzzaman Siddiqui was the first scientist to bring the anthelmintic, antifungal, antibacterial, and antiviral constituents of the Neem tree to the attention of natural products chemists. In 1942, he extracted three bitter compounds from neem oil, which he named as nimbin, nimbinin, and nimbidin respectively.^{[17][full citation needed]} The process involved extracting the water insoluble components with ether, petrol ether, ethyl acetate and dilute alcohol. The provisional naming was nimbin (sulphur-free crystalline product with melting point at 205 °C, empirical composition C₇H₁₀O₂), nimbinin (with similar principle, melting at 192 °C), and nimbidin (cream-coloured containing amorphous sulphur, melting at 90–100 °C). Siddiqui identified nimbidin as the main active antibacterial ingredient, and the highest yielding bitter component in the neem oil.^{[18][full citation needed]} These compounds are stable and found in substantial quantities in the Neem. They also serve as natural insecticides.

Genome and Transcriptomes[edit]

Neem genome and transcriptomes from various organs have been sequenced, analyzed and published by Ganit Labs in Bangalore, India.^{[20][21]}

Gallery

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Squirrel on Neem tree

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Flowers in Hyderabad, India.

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Animals under a Neem tree

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Neem flowers in closeup

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A Neem tree with blossoms