NEEM

Azadirachta indica, commonly known as neem, nimtree or Indian lilac and in Nigeria called dogoyaro or dogonyaro, is a tree in the mahogany family Meliaceae. It is one of two species in the genus Azadirachta, and is native to the Indian subcontinent and most of the countries in Africa. It is typically grown in tropical and semi-tropical regions. Neem trees also grow on islands in southern Iran. Its fruits and seeds are the source of neem oil.

Description-

Neem is a fast-growing tree that can reach a height of 15–20 meters (49–66 ft), and rarely 35–40 m (115–131 ft). It is deciduous, shedding many of its leaves during the dry winter months. The branches are wide and spreading. The dense crown is roundish and may reach a diameter of 20–25 m (66–82 ft). The neem tree is similar in appearance to its relative, the chinaberry (*Melia azedarach*).[6]

White and fragrant flowers are arranged in more-or-less drooping axillary panicles which are up to 25 cm (10 in) long. The inflorescences, which branch up to the third degree, bear from 250 to 300 flowers. An individual flower is 5–6 mm ($^{3}/_{16}$–$^{1}/_{4}$ in) long and 8–11 mm ($^{5}/_{16}$–$^{7}/_{16}$ 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 14–28 mm ($^{1}/_{2}$–1+$^{1}/_{8}$ in) by 10–15 mm ($^{3}/_{8}$–$^{5}/_{8}$ in). The fruit skin (exocarp) is thin, and the bitter-sweet pulp (mesocarp) is yellowish-white and very fibrous. The mesocarp is 3–5 mm ($^{1}/_{8}$–$^{1}/_{4}$ 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.

Etymology

Neem (नीम) is a Hindi noun derived from Sanskrit Nimba (निंब).

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 of 400–1,200 mm (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 of 21–32 °C (70–90 °F). It can tolerate high to very high temperatures and does not tolerate temperature below 5 °C (41 °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 and other such public buildings or in most people's back yards. In very dry areas the trees are planted on large tracts of land.

Phytochemicals

Neem fruit, seeds, leaves, stems, and bark contain diverse phytochemicals, some of which were first discovered in azadirachta seed extracts, such as azadirachtin established in the 1960s as an insect antifeedant, growth disruptor, and insecticide. The yield of azadirachtin from crushing 2 kg of seeds is about 5 g. In addition to azadirachtin and related limonoids, the seed oil contains glycerides, diverse polyphenols, nimbolide, triterpenes, and beta-sitosterol. The yellow, bitter oil has a garlic-like odor and contains about 2% of limonoid compounds. The leaves contain quercetin, catechins, carotenes, and vitamin C.

Traditional medicine

Products made from neem trees have been used in the traditional medicine of India for centuries, but there is insufficient clinical evidence to indicate any benefits of using neem for medicinal purposes. In adults, no specific doses have been established, and short-term use of neem appears to be 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.

Pest and disease control

Neem is a key ingredient in non-pesticidal management (NPM), providing a natural alternative to synthetic pesticides. Neem seeds are ground into powder that is soaked overnight in water and sprayed on the crop. To be effective, it must be applied repeatedly, at least every ten days. Neem does not directly kill insects. It acts as an anti-feed ant, repellent, and egg-laying deterrent and thus protects the crop from damage. The insects starve and die within a few days. Neem also suppresses the subsequent hatching of their eggs. Neem-based fertilizers have been effective against southern armyworm. Neem cake may be used as a fertilizer. Neem oil has been shown to avert termite attack as an ecofriendly and economical agent.

Applications of neem oil in the preparation of polymeric resins have been documented in the recent reports. The synthesis of various alkyd resins from neem oil is reported using a monoglyceride (MG) route and their utilization for the preparation of PU coatings. The alkyds are prepared from reaction of conventional divalent acid materials like phthalic and maleic anhydrides with MG of neem oil

Other uses

Tree: the neem tree is of great importance for its anti-desertification properties and possibly as a good carbon dioxide sink. It is also used for maintaining soil fertility.

Fertilizer: neem extract is added to fertilizers (urea) as a nitrification inhibitor. Animal feed: neem leaves can be occasionally used as forage for ruminants and rabbits. Teeth cleaning: neem has traditionally been used as a type of teeth-cleaning twig. ESTs were identified by generation of subtractive hybridization libraries of neem fruit, leaf, fruit mesocarp, and fruit endocarp by CSIR-CIMAP Lucknow

References –

- https://en.wikipedia.org/wiki/Azadirachta_indica
- https://www.healthline.com/nutrition/neem