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File: ■ Neem (*Azadirachta indica*)

■ History

■ Ethnobotany

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RE: Review of Medicinal Uses of Neem (*Azadirachta indica*)

Kumar VS, Navaratnam V. Neem (*Azadirachta indica*): Prehistory to contemporary medicinal uses to humankind. *Asian Pac J Trop Biomed.* 2013;3(7):505-514.

This ambitious and wide-ranging article attempts to compile in one place everything that is known or speculated about neem (*Azadirachta indica*) in a multidisciplinary *tour-de-force*. Although marred by poor editing, poor translation, and an uncritical confounding of fact with supposition, it is still a fascinating contribution to the ethnobotany of a little-known region of India, Tamil Nadu, and its ancient medical traditions. The article also details the adoption of neem worldwide.

Neem was used medicinally before any written records surviving to modern times. The Indus Valley civilization used neem over 4500 years ago, as seen in excavations at Harappa and Mohenjo-Daro.

The authors describe an even more ancient civilization based in now-submerged lands south of the present tip of India and today centered in Madurai. Ancient Tamil Sangam literature describes these lost lands, where academies of poets and *siddhars* (spiritual adepts) practiced medicine and alchemy. Siddha medicine, still used in India today, is one of the oldest medical systems known to man. Palm leaf manuscripts from 4000 B.C.E. are among the oldest surviving written media in Southern India; the earliest account documenting uses of neem flower, leaf, fruit, seeds, oil, roots, and bark was written in about 1650 C.E. Perishable writing materials did not last long in India's climate. Ancient Tamil manuscripts preserved at the Institute of Asian Studies, Chennai, Tamil Nadu, India, are included in the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Memory of the World Register.

Siddha sees humans and nature as part of a closed system, with earth, air, fire, water, and "ether" corresponding to the five senses and fundamental to all things, animal, vegetable, or mineral. A leading practitioner of Siddha, Bhogar, traveled to China to spread Siddha science. While there, he was called Bo-Yang, or "bliss," and later Lao-Tzu ("old master"). Lao-Tzu is said to have remained in China for hundreds of years and taught hundreds of disciples; in the 5th century B.C.E., he is said to have met Confucius; and 100 years later, while returning to India, to have authored the Taoist classics *Tao Ching* and *Te Ching*. At some point he is said to have visited South America; his visit

was described by Chile's MUYCA people. Other *siddhars* visited and taught in other parts of the world, including Arabia, Sri Lanka, Egypt, and even Rome.

Cultivated for centuries in India, neem spread with Indian immigrants. Australia, East and sub-Saharan Africa, South East Asia, and Central and South America boast at least 30 nations where neem is well established. Sichuan and Yunnan provinces in China are home to the largest populations of cultivated neem. Over 400,000 trees in Yunnan make it the raw materials center for China's neem-related industries and the largest area of neem cultivation. In India, neem plays a major role in rural industry. In Africa, besides providing shade and anti-malarial medicine, fast-growing neem (20 feet in three years from seed), thriving with scant rainfall and high temperature, has become the major firewood in Ghana's densely populated Accra Plains. Continent-wide, it is helping stop southward expansion of the Sahara Desert. Among its local names, it is "independence tree" in Senegal. The world's largest individual neem plantations, 10 sq. km. each near Arafat, Saudi Arabia, were planted to provide shade for the two million pilgrims who visit annually. In the Caribbean, most notably in Haiti, neem is helping re-forest several nations.

Neem is commonly used in traditional Indian medicine as a household remedy. Twigs clean teeth, leaf juice treats skin conditions, leaf tea is a general tonic, and leaves are a household insect repellent used in books, beds, grain bins, closets, etc. Neem has germicidal, antibacterial, antiviral, anti-inflammatory, and antioxidant effects. In 2012, researchers found that a Siddha neem preparation reduced symptoms and sped up recovery of patients with dengue fever. Sexually transmitted diseases, specifically gonorrhea, are reported to have been successfully treated with neem, but more research is needed. One of neem's compounds, azadirachtin, has been reported to interact with tumor necrosis factor (TNF), inhibiting TNF-induced responses. Researchers report anticarcinogenic activity for various neem fractions and compounds in several cancer cell lines. Neem oil and leaves are reported to clear acne, psoriasis, eczema, and other skin problems including fungal ringworm; the plant is a well-known antiparasitic that eliminates internal and external parasites. In Ayurvedic tradition, neem is used for ulcers and other digestive disorders. Neem bark extract has been studied for gastroprotective effects. Finally, neem's traditional use as an antivenom has been validated by in vitro studies of a snake venom phospholipase A2 (PLA2) inhibitor isolated from its leaves.

—Mariann Garner-Wizard

The American Botanical Council has chosen not to reprint the original article.

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