

# **Azadirachta indica (Nimba)**

By

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**Introduction** Azadirachta indica, commonly known as ‘Neem’, associated since ancient times with healing in the sub-continent of India has, owing to its wide range of medicinal properties, attracted worldwide prominence in recent years. The tree is also known as margosa, limba, mimba, nimba, kohomba, and Indian lilac. Neem has been extensively used in Ayurveda, Unani and Homoeopathic medicinal systems and has become a cynosure of modern medicine. The early Ayurvedic literature, especially Caraka Samhita, and the Unani system of medicine, clearly document Neem’s medicinal and therapeutic uses. Even in Africa and Tropical America, where Neem has been introduced in recent times, it is regarded as a valuable herbal treatment for various ailments. A large number of medicines, cosmetics, toiletries and pharmaceuticals are now based on Neem products. Since its various parts have so many diverse uses in the traditional medicine of India, the Neem tree has been called “the village pharmacy”. Some Indian poets call it ‘Sarva Roga Nivarinin’ (the one that cures all ailments). Mahatma Gandhi encouraged scientific investigations of the tree as a part of his programme to resurrect Indian traditions. This eventually led to the publication of over 2000 research papers and intense commercial interest in Neem.

Over 140 biologically active compounds, that are chemically diverse and structurally complex, have been isolated from different parts of the Neem tree. All its parts - leaves, flowers, seeds, fruits, roots and bark have been used traditionally for the treatment of ailments like inflammation, infections, fever, skin diseases and dental disorders. Under the overall co-ordination of FAO’s Forestry Department, International Neem Network, comprising national institutions from 23 different countries, is currently focusing its work on exploring and evaluating the genetic diversity of the neem tree.

## 2. Basic Information

**Gana:** Kandughna, Vamanopag, Tiktaskandh; Aragvadhadi, Guduchyadi, Lakshadi

**Kula:** Nimba kula

**Family:** Meliaceae (Meli-honey) bead tree (Latin) Plants of melia

**Latin name:** Azadirachta (Persian name meaning best great tree);

**English name:** Neem, Margosa tree

**Sanskrit names:** Nimba, Pichumarda (pichu = leprosy, that which cures leprosy), Pichumanda (CCRS), Paibhadra, Hinguniryas, Sarvatobhadra, Sheeta, Peetsarak, Arishtaphal, Jeshtamalak, Yavaneshta, Neta Shukpriya, Subhadra, Krimighna

**Vernacular names:**

Kanada: Bevinamara

Hindi: Neem, Nimba

Punjabi: Nimb

Bengali: Nim

Gujarati: Limba

Marathi: Kadunimba, Kadulimba

Tamil: Vempu, Veppamaram, Veppam

Telegu: Vepa, Yapachettu

Malyalam: Veppu

## Historical Aspects

The etymology of the Sanskrit name indicates the tree as a provider of good health, one without untoward reactions and useful in dermatoses. By its association with the birth of saints Neemai (Chaitnya Mahaprabhu) and Saibaba, it has acquired a holy aura. The medicinal properties of the Margosa tree have been recognized for many centuries. In mythology, when amrita (elixir of immortality) was being carried by Garuda to heaven, a few drops fell on the Neem tree which bestowed healing medicinal values on the tree. Traditionally on the New Year day everyone was ordained to eat of the tender leaves and flowers, with black pepper, asafoetida, salt, cumin, thyme, tamarind and jaggery. Even now many Indians continue the practice.

### 3. Botanical Description

*Azadirachta indica* is a large evergreen tree measuring 8-10 metres (12-18 CCRS-Database) in height, with a straight trunk and branches spread out in all directions.

**Bark** is channeled, tough, fibrous, brownish grey with a rough scaly surface from which latex is obtained. Internally, it is yellowish, laminated and coarsely fibrous. The smooth transverse surface is found to be minutely chequered, pale, narrow with medullary rays and tangential bands of parenchyma alternate with groups of bast fibres, which appear to be surrounded by lignified thick, black, rough parenchyma cells.

**Leaves** are compound, equidistant, eye-shaped with 6 to 14 leaflets, paired, foliated, bilateral (alternate –CCRS), 20-38 cm long on the stalk, ovate-lanceolate, oblique or sub falcate and bluntly serrated. They fall in winter and new reddish tender leaves appear in autumn followed by flowering and then fruiting at the beginning of rainy season.

**Flowers** are small, white (could also be pale yellow), scented, many in number, in long slender, very lax axillary panicles.

**Fruit** when fresh is greenish yellow in colour and hard; on ripening it turns yellow and soft and after drying becomes darker. The native term for such fruit is 'nimboli'. Fruits contain sweet, slightly pungent and sticky pulp and a single seed.

**Seeds** are dirty brown, 1cm long, 4-5 mm wide, with a clear raphe but an indistinct hilum. They taste bitter and have a characteristic odour.

**Oil** is extracted from the seeds.

**Habitat:** *Azadirachta indica* is a native of India but is now widely distributed throughout Africa. It does not grow well in heavy rainfall areas.

**Chemical composition:** External skin astringent but internal is pungent. Bark contains a bitter resin called margosin. It also contains volatile oil, gum, white secretion, sugar and astringent element. Seed contains 40% stable oil and traces of sulphur.

### Propagation & Cultivation

Propagated from seeds, it is a hardy tree, which grows well in saline soils and drought conditions. Since their viability is very short, seeds should be sown immediately after ripening. They germinate within three weeks time. Root suckers and stem cuttings are also used for planting. It can be grown in all types of soil, but black-loam soil is more

suitable. Within one year the seedlings grow up to a height of 120 cm. Rapid multiplication through leaf culture has been found quite successful. Tissue culture techniques have been reported for the production of azadirachtin from cultures of leaves and flowers. 20 weeks old callus of leaves is reported to yield maximum concentration of azadirachtin - up to 2.68%, whilst 12 weeks old flower callus yields 2.46% of azadirachtin on dry weight basis.

## 5. Ayurvedic Properties

**Guna-** laghu; **Rasa-** tikta, kashaya; **Vipaka-** Katu; **Veerya-** sheeta

**Dosha:** Kapha-Pitta shamak by tikta rasa, Vatavardhak by sheet veerya & kasaya rasa

**Useful Parts:** Flowers, leaves, bark, seeds and oil

### **Actions and Uses:**

**Bark** is bitter, astringent, acrid, refrigerant, depurative, antiperiodic, vulnerary, demulcent, insecticidal, liver tonic.

It is useful in hyperdipsia, leprosy, skin diseases, eczema, leucoderma, pruritis, intermittent and malarial fevers, wounds, ulcers, burning sensation, tumor, tubercular glands, anorexia, vomiting, dyspepsia, intestinal worms, hepatopathy, cough, bronchitis, urine incontinence, diabetes, inflammation, amenorrhoea, lumbago, haemorrhoids, otalgia, syphilis and fatigue.

**Leaves** are katu rasa and vipaka, astringent, acrid, depurative, antiseptic, ophthalmic, anthelmintic, alexeteric, appetizer, insecticidal, demulcent and refrigerant.

The leaves contain nimbin, nimbinene, 6-desacetynimbiene, nimbabdiol, nimbolide and quercetin. The presence of beta-sitosterol, n-hexacosanol and nonacosane is also reported.

They cure loss of taste and are useful in burning sensation, leprosy, skin ulcers, TB, boils, eczema, and malarial and intermittent fevers. Nimba leaves are also good for the eyes and are an effective treatment for worms, pitta diseases and poison but they aggravate vata

**Flowers** are bitter, refrigerant, ophthalmic, stomachic, anthelmintic and tonic.

They are useful in burning sensation, ophthalmopathy, colic, dyspepsia, intestinal worms and general debility

**Seeds** are bitter, acrid, thermogenic, purgative, emollient, anodyne, anthelmintic,

depurative, vulnerary, uterine stimulant and urinary astringent.

They are useful in tumours, leprosy, skin diseases, odontalgia, intestinal worms, wounds, ulcers, diabetes.

**Oil:** The kernels yield a greenish yellow to brown, acrid bitter fixed oil (40.0-48.9%) known as **oil of Margosa** which has many therapeutic uses and is well-documented in Indian pharmacopoeia. It is bitter, anthelmintic, anodyne, depurative.

It is useful in chronic skin diseases, syphilitic sores, ulcers, ringworm, scabies, worms, fever and leprosy. Medicinal properties of the oil are attributed to the presence of bitter principles and odorous compounds which are widely used in the pharmaceutical industry. Intrauterine medication of oil controls different types of metritis. The oil is reported to have anti-fertility properties. It possesses anti-fungal and antiseptic activity and is found to be active against both Gram negative and Gram positive micro-organisms.

Effect of Neem oil has been evaluated in diabetes as antihyperglycaemic agent.

**Fruit** has Katu rasa and vipaka, snigdha guna and usna veerya.

It is said to cure leprosy, abdominal tumour, piles, worms and diabetes

**Sap:** Some trees, especially in proximity of water, naturally exude a sap from the stem-tip which is refrigerant, nutrient and tonic.

It is useful in skin diseases and a tonic in dyspepsia and general debility.

**Gum:** The neem bark exudes a clear bright and amber-coloured gum, known as the East India gum. The gum is stimulant, demulcent and tonic and is useful in catarrhal and other infections.

## 6. Therapeutic Uses

Vidradhi, granthi, vrana, kandu, twakdosha, apachi, nadvrana, sandhishotha, amavata, palitya, khalitya, krimi, daha, aruchi, vamana, grahini, yakridvikara, amlapitta, kaphapitta, chhardi, arsha, vibandha, raktavikara, phiranga, Upadamsha, Shotha, Kasa, Bahumootrata, Kashtaprasava, Sootika roga, Kushtha, Madhumeha, Dhatukshaya, Yakshma, Jwara, Vishamajwara, Abhishyanda, Netraroga.

### External:

- Leaves and bark are anti microbial, wound-cleansing, wound-healing, remove foul

- smell, reduce burning sensation and itching. Poultice of leaves is tied over abscesses.
- Seed oil is wound healing, antileprotic and analgesic (used in abscess).
  - In pruritis, hot water bath with decoction of neem leaves is given and neem oil is used for massage.
  - Chronic lymphadenitis and fistulae are treated with wicks dipped in neem oil.
  - In joint swelling and arthritis, massage is useful.
  - Application of seed powder controls lice and other microbes on the scalp.
  - Nimba taila nasya is used in psoriasis and baldness.

### **Internal:**

#### **Digestive system:**

- By its kashaya and tikta rasa it improves taste and is constipative. Fruit, on the other hand, is purgative.
- Leaves are anthelmintic and stimulant of liver functions.
- Its bark decoction with honey is useful in jaundice, anorexia, vomiting, dysentery, intestinal worms and liver diseases.
- Ointment prepared from seeds is applied in piles.

#### **Respiratory System:**

- Tikta rasa helps to reduce kapha from respiratory passages. Leaves are useful in excessive mucous secretion.
- Bark decoction is useful in chronic cough. 30 –60 cc of liquid collected from the trunk is given in TB and leprosy.

#### **Urinary system:**

- It is effective in kaphapittaja prameha.

#### **Reproductive system:**

- Neem seeds are uterine stimulant. Seed powder is used in dysmenorrhea and puerperium.
- Continuous use of leaves leads to depletion of body tissues (dhatu-ksaya) especially semen (shukra).
- Leaf juice is a uterine tonic and should be given immediately after delivery to postpartum women.
- Since it is excreted in human milk, it is useful in preventing cough and skin diseases in infants.

**Skin:** It is useful in all skin conditions especially in burning sensation.

#### **Immune System (Satmikaran):**

- In general debility, young leaves and gum are useful.
- The concept of chewing nimba leaves on Marathi New Year is to prevent kapha diseases.
- Nimba madya is useful in emaciation and TB.
- Nimba is the best rasayana in medoroga.
- The juice of the leaves is very useful in syphilis.

**Temperature:**

- It is antipyretic, antioxidant (amapachak) and a preventative for intermittent fever (including malaria).
- Also useful in chronic kaphajwara.

**Eyes:** Tender leaves and flowers are useful in many eye disorders.

**Specific Target areas**

**Dosha:** Pitta & Kapha

**Dhatu:** Rakta, medas, shukra

**Mala:** reduces mutra and purisha

**Organ:** stomach, eye

**7. Popular Formulations**

Nimbadi churna, Nimbarishta, Nimbaharidra khanda, shankhapushpi taila, Jwarasamhara rasa, Mahamarichyadi taila, Pathyadi kwatha, Mahamanjishthadyarishta, Punarnavadi kwatha, Mahasudarshana churna, Raktashodhaka vati, Mahagandhaka vati, Panchaguna taila, Madhyama narayana taila, Guduchyadighana kwatha.

**8. Animal Health**

**Leaves** are carminative and aid digestion.

- The tender leaves along with Piper nigrum are found to be effective in intestinal helminthiasis.
- The paste of leaves is useful in ulceration of cow-pox.
- An aqueous extract (10%) of tender leaves is reported to possess anti-viral properties against vaccinia, varola, fowlpox and New Castle disease virus.
- Extract of leaves yields fractions which markedly delay blood-clotting time.

- Strong decoction of fresh leaves is stated to be antiseptic.
- Hot infusion of leaves is used as anodyne for fomenting swollen glands, bruises and sprains.
- Neem leaves contain appreciable amount of protein, minerals and carotene and adequate amount of trace minerals except zinc. These may be helpful in alleviating the copper deficiency when feeding straw and dry fodder.
- For cattle and buffalos, neem leaves have significant quantity of digestible crude protein (DCP) and total digestible nutrients (TDN). Cattle can be fed twigs and leaves in small quantities when mixed with other feeds.

**Seed cake** can considerably reduce the dependence of high producing animals on protein supplements.

- It contains high protein and all essential and non-essential amino acids.
- The processed cake can be employed as a good poultry feed.
- Since it is bitter, it acts as a good appetizer.
- It is also a vermifugal.

**Neem oil** can be used in poultry rations. The fatty acid composition of oil indicates that it is a rich source of long chain fatty acids. It contains azadirachtin, meliantriol and salannin. It has shown antihyperglycaemic effect in dogs.

Nimboli (**fruit**) is used as a tonic, antiperiodic, purgative, emollient and as an antihelminthic for animals. The dry fruits are bruised in water and employed to treat cutaneous diseases.

## 9. Toxicology

Clinical trials on Nimbidin showed no evidence of toxicity in rats at 100 mg/kg/ day/ p.o. for 6 weeks and it exhibited healing effect on peptic ulcers in humans at 300 mg/kg /day/p.o. for 3 weeks, without any side effects.

Neem seeds with oleoresin from *Chrysanthemum cinerariaefolium* Vis.

Flowers are toxic against housefly, pulse beetle and lesser grain borer.

## 10. Trade & Commerce



Neem oil has a good export potential. In the 5 years from 1991 to 1996, its export shot up from 3 tonnes to nearly 152 tonnes.

## **11. Therapeutic Evaluation**

Nimbidin is found to be effective in various skin diseases such as furunculosis, arsenical dermatitis, ulcers due to burns, herpes labialis infections, scabies, seborrhoeic dermatitis.

- Nimbidin gargles and dentifrices are effective in treatment of bleeding gums pyorrhoea.
- Dried leaves are extracted with 70% alcohol, the extract dried and dissolved in propylene glycol (4.6), is used in different skin diseases of fungal infection. When applied in the form of a lotion, it cured ringworm infection in 4-8 days.
- Lotion of neem applied externally twice a day for 3 consecutive days was found highly effective on scabies.
- It also exhibited cure for eczema (weeping, acute and chronic eczema).
- 3 gm of neem leaf extract administered to patients orally as single dose on empty stomach, exhibited remarkable anthelmintic property (in round worms)

## **12. Household Remedies**

### **1. Digestive Disorders**

The acrid, astringent, stomatic action of neem works wonders in treating digestive disorders like diarrhoea, dysentery, hyperacidity and constipation.

#### **1.A. Diarrhoea & Dysentery**

1 tablespoon of neem leaves juice with sugar to be given t.i.d.

#### **1.B. Nausea & Hyperacidity**

Ingestion of 2-5 neem leaves for a few days relieves nausea.

10 gm of neem bark powder boiled in a cup of plain water reduced to one-fourth given for a few days cures hyperacidity and reduces nausea.

#### **1.C. Constipation**

2-3 gm of neem powder with 3-4 black peppers given tid acts as a laxative and demulcent.

## **2. Respiratory Disorders**

Commonest symptom found in many respiratory disorders like bronchitis, pharyngitis, tuberculosis, pleuritis etc is cough.

Decoction of neem bark is used as an anti-tussive for dry cough.

1 gm of dry neem leaf powder with honey taken twice daily helps to relieve the condition.

## **3. Urinary Disorders**

Neem is found effective in conditions like albuminuria, phosphaturia, and burning micturation.

3 gms of neem leaves powder boiled with 4 cups of water and reduced to 2 cups. This decoction strained and given bid helps in these conditions.

In burning micturation, 1tablespoon neem leaves juice taken tid is helpful.

## **4. Skin Diseases**

The leaves applied in the form of poultices or decoctions are recommended for boils, ulcers and eczema. Neem oil is also used for skin diseases like scorfula, indolent ulcers and ringworm.

### **Leucoderma**

Regular administration of 10 drops of neem oil mixed with 1tsp of sugar, given b.i.d, should ensure good success in curing this disorder.

## **5. Diabetes**

Neem being bitter, stomachic, antipuritic, tonic and revitaliser works wonders in this disease. 5 ml of neem juice taken daily in the morning on empty stomach for 3 months should help control diabetes. 10 neem leaves chewed or powder taken daily in mornings also controls diabetes.

## **6. Fungi Infections**

Neem is reported to be effective in treating many fungi that infect the human body, e.g.:

- a. athlete's foot fungus that infects hair, skin and nails;
- b. a ringworm that invades both skin and nails of feet;
- c. a fungus of the intestinal tract,
- d. a fungus that causes infection of the bronchi, lungs and mucous membranes and
- e. a fungus that is a part of the normal flora but sometimes gets out of control leading to lesions in mouth, vagina, skin, hands and lungs.

## **7. Viral Diseases**

Neem has been traditionally used in India to treat several viral diseases. Even many medical practitioners believe that smallpox, chickenpox and warts can be treated with a paste of neem leaves - usually rubbed directly on the infected skin area. Experiments with smallpox, chickenpox and fowlpox show that neem is convincingly effective in preventing them from spreading over unaffected cells. Recent tests have shown that neem is effective against herpes virus and the viral DNA polymerase of hepatitis B virus.

## **8. Dental Care**

Rural inhabitants in India and Africa have been using neem twigs as tooth brush for centuries. Neem twigs contain antiseptic ingredients, which provide required dental hygiene. Neem in the form of powder is also used to clean teeth and massage gums.

## **9. Chagas Disease**

Chagas disease is a major health problem in Latin America, crippling millions of people every year. Lab tests in Germany & Brazil show that neem may be an answer to this dreadful disease. The disease is caused by a parasite and **spread by** an insect called **kissing bug**. Research has shown that feeding extract of neem leaves to the bugs not only frees them from parasites but azadirachtin prevents the young insects from molting and adults from reproducing.

## **10. Malaria**

Recent experiments have shown that one of neem's components, gedunin is as effective as quinine against malaria. Infusion of nimba leaves is used to treat malaria in India and

in many parts of Africa. China too has adopted neem in a very big way for its anti-malarial operations. Their formulation, 'Quinahausu', based on neem, has proved very effective in curing malaria. Neem-oil treated mosquito nets and mosquito-repellent cheap tablets are also becoming popular.

### **Clinical Evidence**

- Wandscheer et al found larvicidal action of ethanolic extracts from the kernels of ripe fruit endocarps of *Melia azedarach* and *Azadirachta indica* against the dengue mosquito *Aedes aegypti*. The lethality bioassays were carried out according to the recommendations of the World Health Organization. Both seed extracts proved lethal for third to fourth instar larvae. Since no downstream processing was undertaken to purify the active agents in the extracts, the findings were considered very promising, suggesting that it may be possible to increase the larvicidal activity further by improving the extraction and the fractionation of the crude limonoids.
- Effects of aqueous extracts of garlic (*Allium sativum*) and neem (*Azadirachta indica*) leaf on hepatic and blood oxidant-antioxidant status during experimental gastric carcinogenesis were investigated in male Wistar rats by Arivazhagan S et al. Their results suggested that the modulatory effects of garlic and neem leaf on hepatic and blood oxidant-antioxidant status may play a key role in preventing cancer development.
- Clinical studies on the effect of Neem (*Azadirachta indica*) bark extract on gastric secretion and gastroduodenal ulcer were carried out in human subjects by Banyopadhyay et al. (They had shown earlier that Neem bark aqueous extract had potent antisecretory and antiulcer effects in animal models and had no significant adverse effect.) A group of patients suffering from acid-related problems and gastroduodenal ulcers were orally treated with the aqueous extract of Neem bark. The lyophilised powder of the extract when administered for 10 days at the dose of 30 mg twice daily caused a significant ( $p < 0.002$ ) decrease (77%) in gastric acid secretion. The volume of gastric secretion and its pepsin activity were also inhibited by 63%

and 50% respectively. Some important blood parameters for organ toxicity such as sugar, urea, creatinine, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, albumin, globulin, hemoglobin levels and erythrocyte sedimentation rate remained close to the control values. The bark extract when taken at the dose of 30-60 mg twice daily for 10 weeks almost completely healed the duodenal ulcers monitored by barium meal X-ray or by endoscopy. One case of esophageal ulcer (gastroesophageal reflux disease) and one case of gastric ulcer also healed completely when treated at the dose of 30 mg twice daily for 6 weeks. The levels of various blood parameters for organ toxicity after Neem treatment at the doses mentioned above remained more or less close to the normal values suggesting no significant adverse effects. They thus concluded that **Neem bark extract had therapeutic potential for controlling gastric hypersecretion and gastroesophageal and gastroduodenal ulcers.**<sup>[11]</sup><sub>[SEP]</sub>

- The drug Nimbidin was tried in 40 cases of Parinamashula to evaluate its clinical efficacy. The results were significantly encouraging since among the cases who completed full course of treatment, about 60% patients showed 51-74% improvement.

Publication Types:

Clinical Trial

**Nimbidin in Duodenal Ulcers** by V Balakrishnan & Narendranath; Nagarjuna Vol XXVIII (12) pp10-12: 1985

Also Trop Gastroenterology Vol VI (1) pp23-25: 1985

Parinamashula has been described as Vata dominant with avarana of kapha and pitta which indicates the involvement of sensory nerves, mucosal resistance and hyper secretion of digestive juices in the eticpathological manifestation of the disease. The clinical features have been correlated with the disease entity duodenal ulcer in modern parlance in which typical pain has been said to occur in empty stomach which is relieved by taking some eatable or antacids. Moreover there is pain between ½ to 3 hrs of eating. Amongst factors the role of H-Pylori is also been emphasised these days (Harrison 1998). The radiological evidence though useful infor establishing the diagnosis, the endoscopic examination of the upper gastrointestinal part is considered more confirmative which provides information regarding the exact size, shape and condition of the ulcer. In addition it should be ensured to prevent recurrence and development of complications. the medical management with antacids, H2 receptor antagonists, anti-cholinergic agents and diet regulation are the principal measures for achieving these objectives.

In recent past, a number of single and compound herbal and herbo-mineral preparations like yashtimadhu kvatha, Satavari svarasa, Sutasekhar rasa with and without panchakarma therapy, sutasekhar rasa with gold, the combination of sutasekhar rasa, Kamdudharasa, and Dhatri lauha, Tiladi gutika and matravasti with Sahachara taila; snehapana with mahatiktta ghrta etc (Warrier et al, 1977, Pandey et al 1979, Kishore et al 1981, Warrier et al 1987, and Dash et al 1989) are important Ayurvedic recipes which are reported to provide moderate to substantial relief in the patients of Parinamashula.

Considering the fact that Nimbidine is a derivative of one single plant and the disease Parinamashula requires a multidimensional approach, the results of this clinical study seem quite as 40% had more than 75% relief and 10% cases had relief between 51 & 74%. If analysed on the basis of patients who completed the treatment, over 59% showed good improvement and around 15% of patients showed fair response.

Dosage: 150 gm Nimbidine tid with water for 30 days.

Diet: First 10 days a) milk and bread for bf, b) milk and roti for lunch and dinner. Next 20 days a) milk and bread for bf, b) rice, dal & veg curry for lunch and c) roti, dalma and milk in dinner.

Criteria of assessment: The assessment of the clinical features both subjective such as pain, nausea, vomiting, burning sensation, acid eructations etc and objective findings like tenderness in epigastrium as recorded initially was conducted after 15 days and at the end of the treatment in terms of their severity and/or frequency. The radiologic and/or endoscopic examinations were carried out initially at the end of the trial.

To interpret the efficacy of the drug, it can be attributed Tikta rasa and other principles which being pittashamak, vranaropaka and antimicrobial is likely to diminish hypersecretion of digestive juices, to increase mucosal resistance as well as to combat H. Pylori which would be conducive to healing ulcer thereby reducing pain and reducing other complaints.

These results also pave way for further study of the drug in respect of combination with some other drug, longer duration of treatment and on a larger sample.

**Raasekhraan S et al gave 72 days treatment with nimbidin\***, for clinical trials, to a male patient aged 60, having psoriatic lesions of 13 yrs duration with no family history of skin diseases, with very encouraging results.

\*Dosage: The isolate Nimbidin was administered as capsules, containing 100 mg of the powder, and was administered internally at a dose of one capsule tid.

1 gm of Nimbidin was mixed well in 100 mg of coconut oil. The suspension so obtained was used for external application.

A daily intake of approx 2400 calories of non-veg diet rich in proteins was provided.

After 72 days of regular administration of nimbidin, the patient recovered from all symptoms of psoriasis. His general health also improved and body weight increased from 62 kg to 64 kg. No side effects were noted during or after the treatment. External application of Nimbidin suspension healed the fissures developed over the lesions and also controlled the itching.

Nimba is a common drug widely used in various types of skin diseases in Ayurveda. One of the active principles isolated from the oil of Azadirachta Nimbidin, was taken for the above clinical study. Nimbidin is an amorphous bitter principle which in graded

hydrolysis gives nimbidinic acid and a tetra nor triterpene nimbidin. It is fairly soluble in alcohol and melts at 90-100° C.

Preliminary clinical trial with Nimbidin on psoriasis has been reported by Nair et al (1978). They reported subsidence of the psoriatic symptoms in 2 to 20 weeks time with Nimbidin.

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Miscellaneous Medicinal Uses:

Preliminary research supports the traditional use of neem and certain extracts to **clean teeth, inhibit plaque formation** and help **prevent gum inflammation** (V.K. Patel & H. Venkatakrishna-Bhatt, International journal of Pharmacology, Therapy and Toxicology, 26 (1988).



One group of investigators found evidence that the oil can **fight** as many as **200 types of bacteria** (Rx.com Natural Medicines - Neem 2.5.01 p2/3 - D.V.K. Rao et al, Indian Journal of Medicinal RESEARCH, 84 (1986) p314.

Neem's astringent tannins also probably contribute to its long-standing **use for skin wounds**, as they help to **promote healing** by constricting tissue and controlling oozing and bleeding. A paste made of neem and turmeric proved effective in treating chronic ulcers and scabies in more than 800 rural villagers in India (V. Charles & S.X. Charles, Tropical & Geographical medicine, 44(12)1992: 17881.

Neem may also have promise as a pain reliever. In a 1994 experiment, leaf extract not only **controlled inflammation** but also significantly **limited pain** in rats both at apparently non-toxic doses (K.M. Koley et al, Fitoterapia, 65 (6) 52428.

Although relatively higher doses were needed to be effective, neem leaf extracts also **reduced fever** in these test rats, suggesting that its traditional use as a fever-controller may have merit (ibid).

The yellow oil drawn from the seed kernels in concentration of about 10% smells something like garlic. It contains glycerides and important bitter principles. Various studies indicate that this oil may be a safe non-irritating and **effective contraceptive**. In test-tube experiments it immobilizes human sperm within 30 seconds and insertion of this oil picchu into the vagina before intercourse prevented pregnancy in ten couples over 4 menstrual cycles without altering the timing of ovulation (K.C.Sinha et al, Indian Journal of Medical Research, 79 (1984) 131

Positive results from preliminary rat studies suggest that neem oil helps **control blood glucose** levels in diabetes.

implying but not proving that its traditional use for this disease may be justified. (V.P. Dixit et al Journal of Ethnopharmacology, 17 (1986):95

The tree holds promise as a weapon against malaria in developing countries ; 2% neem oil mixed in coconut oil provided protection from mosquito bites for 12 hours in a group of 12 volunteers. Neem extracts have also demonstrated **anti-malarial** properties in test-tube studies. (S.A.Khalid et al Journal of Natural Products 52 (1989):922.

Neem extracts have also (azadirachtin in particular) have proved to be extremely effective **agricultural pesticides** and **insect repellents**. The Environmental Protection

Agency has endorsed the limited use of a neem formulation as a pesticide for certain crops (Lawrence Review of Natural Products, St Louis: Facts and Comparisons, April 1991).

As a pesticide neem apparently does not harm warm-blooded animals, fish or birds.

Caution: Although apparently safe for adults in recommended doses, neem oil is potentially poisonous to infants and small children because of a still undefined toxin to which they appear to be particularly susceptible (R.Sinniah et al, Journal of Ethnopharmacology, 23 (1988):39. Characteristic reactions recorded in a group of 13 infants included drowsiness, metabolic acidosis, seizures, loss of consciousness, coma, and in 2 cases death (S.M.Lai et al Singapore Medical Journal, 31 (5) 1990:46365.

In 1925, K.K.Chatterji, a surgeon from Calcutta, published in the Lancet some dramatic regressions of cancer with the Neem oil and copper salts of margosic acid (A note on margosa oil in the **treatment of cancer**. The Lancet 1925; ii: 1063-1064). In some cases treatment with ethyl esters, copper margosate has cleared up the growth and removed all evidence of malignancy.. The injections were also given locally in the tumour mass.

Chatterji did refer to the properties of Neem in Ayurveda. (Source: Ancient Science of Life Vol XXII No. 3 ISSN 0257-7941 Jan 2003, p78)