By Dr. Donna Schwontkowski

NEEM
Neem

Latin Name: Azadirachta indica

AKA: Village dispensary, bead tree, holy tree, Indian lilac, margosa oil, Persian lilac, Pride of China

Family: Meliaceae – Mahogany

Uses:
This herb is used for centuries in India for digestive system upsets, skin ulcers, infections and malaria. Neem twigs were used regularly as toothbrushes, and the leaf gel was used to fight periodontal disease (inflammatory disease of the gum).

<table>
<thead>
<tr>
<th>SKIN DISORDERS</th>
<th>IMMUNITY / INFECTIONS</th>
<th>DISEASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Psoriasis</td>
<td>• Enhance immunity</td>
<td>• Diabetes, type 2</td>
</tr>
<tr>
<td>• Ulcers – protective and healing effects</td>
<td>• Melanoma, cancer, glioblastoma (malignant brain tumor)</td>
<td>• Reye’s syndrome</td>
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<tr>
<td>• Leaf and bark extracts for skin ulcers</td>
<td>• Virus (Dengue, polio)</td>
<td>• Heart disease (irregular heartbeat, high blood pressure, coronary artery disease, high cholesterol)</td>
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<td>• STD</td>
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<td>• Cystic fibrosis</td>
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<td>• Respiratory disorders</td>
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<td>• HIV/AIDS</td>
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<td>• Athlete’s foot</td>
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<td>• Conjunctivitis</td>
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<td>• Fever</td>
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<tr>
<td>• Diarrhea</td>
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<tr>
<td>• Scabies</td>
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<tr>
<td>• Colds/flu</td>
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<tr>
<td>• Leaf and bark extracts for GI upsets, malaria and infections</td>
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</tbody>
</table>
The extracts from neem often have a pungent smell similar to garlic. This is because they contain sulfurous compounds.

<table>
<thead>
<tr>
<th>TEETH AND GUMS</th>
<th>INSECTICIDAL</th>
<th>OTHER</th>
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</thead>
<tbody>
<tr>
<td>• Leaf gel – fight periodontal diseases</td>
<td>• Mosquito repellent</td>
<td>• Antifertility</td>
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<tr>
<td>• Twigs – used as toothbrushes. Neem leaves and stick ethanol extracts had antibacterial effect on Streptococcus mutans. Stick extract had higher antibacterial properties.</td>
<td>• Lice</td>
<td>• Deodorant for stinky sweat</td>
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<tr>
<td></td>
<td></td>
<td>• Liver protection</td>
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<tr>
<td></td>
<td></td>
<td>• Anti-androgen</td>
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<tr>
<td></td>
<td></td>
<td>• Anti-mutagenic</td>
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<tr>
<td></td>
<td></td>
<td>• Sedative</td>
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<tr>
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<td>• Tonic</td>
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</table>
**Why Does It Work?**

- Anti-plaque action (Good results comparable to chlorhexidine)
- Anti-ulcer – (leaves)
- Supports healthy skin and clear complexion
- Astringent
- Antibacterial
  (Strep mutans, Staphylococcus aureus, E. coli, Pseudomonas aeruginosa)
- Antifungal (Candida albicans)
- Antimicrobial
- Antiviral – group B coxsackieviruses
- Anti-fever
- Antiparasitic – leaves are anthelmintic
- Boosts immune system
- Supports clear breathing and a healthy respiratory system
- Anti-inflammatory – (leaves)
- Contraceptive - leaves at dose of 20 mg, 40 mg and 60 mg /rat/day for 24 days showed spermicidal activity.
- Insecticide (molluscs, nematodes)
- CNS depression from acetone extract
- Supports healthy blood sugar levels in normal range
- Supports healthy digestive environment in GI tract
- Encourages proper fat and water metabolism
- Soothes and lubricates the skin (external use)
- Can lower body temperature

Treat this herb with respect especially when taking internally

**What’s In It?**

140+ compounds in it

- Nimbin
- Nimbinin
- Nimbidin
- Nimbandiol
- Nimbogone
- Nimbonolone
- Nimbrolide
- Quercetin
- beta-sitosterol
- Margolone
- Mimbolinin
- Nonacosane
- And a lot more
Neem

Contraindications

Don’t take it with acetaminophen.

May intensify BP lowering medications or blood sugar lowering medications.

Neem seeds and neem seed oil should not be taken internally – may be toxic – especially in kids. In infants and young kids, causes toxic encephalopathy.

Not recom in pregnant or breastfeeding women.

Not for those trying to conceive.

Not for those with allergies to plants in the mahogany family.

Not for anyone with wasting diseases or debility.

Neem leaf poisoning symptoms: ventricular fibrillation, cardiac arrest, slowed heart rate or low blood pressure.

Lab Report Changes: May increase ammonia levels in body. May decrease blood sugar. High concentrations may inhibit thyroid function particularly conversion of T3 and T4.

Injections of neem oil may damage uterus and surrounding glands, increase white blood cell count and cause inflammation of the endometrium.

Don’t recommend for those with liver disease patients.

Dosage

Bark extract at 30-60 mg x2 for 10 weeks by mouth for ulcers

Gel formulation containing neem extract 2x/day before bed and after breakfast for 6 weeks used for plaque and gingivitis

Neem cream or oil (2-5% neem oil) has shown protective effects against mosquito bites

No proven safe or effective dose in kids; use not recommended. Supposedly cases of death in kids – vomiting, drowsiness, loose stools, metabolic acidosis, anemia, Reyelike syndrome, altered sensation and consciousness, seizures, decreased responsiveness, and liver enzyme increases with evidence of liver damage.

Taking neem bark extract by mouth for up to 10 weeks appears well tolerated in adults as well as neem leaf extract gel for use within the mouth for up to 6 weeks. A 5% neem cream or 0.5 to 2% neem oil is also likely safe when applied on the skin as insect repellent for up to 2 weeks.
Neem

Some Applications of Neem from the Herbal World

Neem Leaf Paste

Make a paste using neem leaf powder and a small amount of water – just enough to create the desired consistency. Apply paste to the affected skin or tissue. Let sit for about 20 minutes, until nearly dry. Rinse and pat dry.

Herbalized Neem Oil

This is a traditional preparation of neem leaves in a base oil. Herbalized oils are simpler to purchase than to make. See below for recommendations on how to use herbalized neem oil. Banyan’s neem oil is a traditional Ayurvedic preparation in a sesame oil base; it can therefore be applied directly to the skin, scalp, hair, nails, teeth and gums.

Neem Seed Oil

Neem seeds are composed of up to 50% oil. Neem seed oil is a pure oil extracted from neem seeds. This preparation is quite potent and should be used appropriately. It is mentioned here for the sake of distinction from the traditional herbalized preparation in sesame oil. Here are a few more ideas about how to experience the benefits neem has to offer:

For Healthy Skin, Nails, Hair and Scalp

Apply herbalized neem oil (see above) directly to the affected skin or nails, and either cover it loosely with a soft cloth, or let it breathe and absorb uncovered.

Massage herbalized neem oil (see above) directly into the roots of the hair and scalp at least 60 minutes before bathing and rinse; or apply before bed and let sit overnight.

For Oral Hygiene

Use herbalized neem oil to promote healthy teeth and gums. Swish to cover teeth and gums and spit.

Apply herbalized neem oil or neem paste (see above) directly to the affected teeth or gums.

For your convenience, Banyan offers the benefits of neem to you in a variety of ways that can be used externally, including neem leaf powder to make a paste, herbalized neem oil, neem soap, and Soothing Skin Balm—all made with 100% certified organic ingredients. (www.BanyanBotanicals.com)
# Human Studies

## WOUNDS & SORES

### Singh 2014
After 8 wks, 50% healing of **chronic wounds** was observed in 43.80% of patients treated with A. indica (neem) oil, in 18.20% of patients treated with Curcuma longa powder capsules (Haridra) and 70.00% of patients treated with both herbs.

### Läuchli 2014
A retrospective, non-controlled analysis of ONE wound dressing, a mixture of hypericum oil and neem oil, showed it to be cost-effective treatment of **post-surgical scalp wounds with exposed bone**.

### Läuchli 2012
Retrospectively, **scalp wounds with exposed bone** treated with a mixture of hypericum (H. perforatum) oil & neem showed rapid induction of granulation tissue, which covered the entire exposed bone surface in 6 of 9 cases after 4 weeks, & showed a reduction in the mean area of exposed bone of 95%.

### Mainetti 2013
A retrospective non-controlled review concluded that 1 Primary Wound Dressing®, a mixture of hypericum and neem oil, could be an effective therapy for the treatment of **burn wounds**, with benefits including pain reduction and simplicity of use.

### Rasheed 2012
The optimal formula of **anti-acne moisturizer** which included Andrographis paniculata, Glycyrrhiza glabra, Ocimum sanctum, Azadiracta indica and Green tea, was satisfactorily effective to control acne inducing bacteria i.e., Staphylococcus epidermis and Propionibacterium

### Charles 1992
Neem’ and ‘Turmeric’ used as a paste for the treatment of **scabies** in 814 people. **97% of cases were cured within 3 to 15 days** of treatment with no side effects.

## DISEASES

### Waheed 2006
A study on 10 patients with **Type-2 diabetes** mellitus and no previous medication, and 10 further patients taking oral hypoglycemic agents found Azadirachta indica has significant hypoglycemic activity in high doses and can be successfully combined with oral hypoglycemic agents.

### Khillare 2003
Minimum effective spermicidal concentrations for tender and old neem leaves were found to be 2.91 +/- 0.669 mg/million sperm and 2.75 +/- 0.754 mg/million sperm, respectively to immobilize and **kill 100% human spermatozoa within 20 s in man**.
Human Studies

**Farnsworth 1982**
Of 1600 Indian plants tested, 90 showed positive semen coagulating properties. 19 plants that have been studied for their fertility inhibiting effects in male includes Azadirachta indica, Withania somnifera, etc. which showed spermicidal activity “in vitro” and several of them seem promising.

**Bandyopadhyay 2004**
It is found that neem bark extract has therapeutic potential for controlling gastric hypersecretion (too much stomach acid) and gastroesophageal and gastroduodenal ulcers in a group of patients.

**INSECTICIDAL**

**Sharma 1995**
Repellent action of neem oil mixed with coconut oil found effective for protection against Anopheline, Aedes, Armigeres and Culex mosquitoes at varying rates of efficacy.

**Ansari 1996**
Malaria incidence reduced by burning 1% neem oil in kerosene lamps from dusk-to-dawn in living rooms.

**Mishra 1995**
Neem oil mixed in coconut oil (1-4%) applied topically to humans revealed 81-91% protection from bites of anopheline mosquitoes.

**Sharma 1993**
Concentrations of 2% neem oil mixed in coconut or mustard oil provided 100% protection against Phlebotomus argentipes throughout the night under field conditions.

**Sharma 1993**
Two percent neem oil mixed in coconut oil, applied topically to human volunteers, provided complete protection for 12h from bites of Anopheline species.

**Pålsson 1999**
Among several plants, smoke of the leaves of Azadirachta indica used at night to reduce mosquito biting found to have (76.0%) repellency. Smoldering H. suaveolens showed (83.6%-85.4%) repellency.

**HAIR**

**Abdel-Ghaffar 2007**
Neem seed extract shampoo on 60 heavily lice-infested children proved to be highly effective against all stages of head lice. No side effects, such as skin irritation, burning sensations, or red spots on the scalp, forehead or neck, respectively, were observed.
# Human Studies

## MOUTH, GUMS, TEETH

<table>
<thead>
<tr>
<th>Study</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Balappanavar 2013</td>
<td>Neem (2%) and tea (0.05%) showed <strong>comparative effectiveness on gingiva better than chlorhexidine</strong> (P &lt; 0.05). The salivary pH rise was sustained and significant in both these groups compared to control.</td>
</tr>
<tr>
<td>Abdel-Ghaffar 2012</td>
<td>After 10-minute incubation with the neem seed extract-containing shampoo, none of the <strong>lice</strong> in the hair of 12 children survived, when being observed for 22 h. A second group of eight children had been treated for 20 min with identical results.</td>
</tr>
<tr>
<td>Balappanavar 2009</td>
<td>Study found 3% neem was more effective in <strong>toothbrush decontamination</strong> than either 2% triclosan, 0.2% chlorhexidine gluconate or 1% sodium hypochlorite.</td>
</tr>
<tr>
<td>Sharma 2008</td>
<td>A double blind study to evaluate various <strong>mouthwashes</strong> including Azadirachta indica (Neem) extract, on gingival tissue interleukin-2 (IL-2) and interferon-gamma levels in patients with chronic gingivitis found Neem reduced levels but not statistically significantly.</td>
</tr>
<tr>
<td>Pai 2004</td>
<td><strong>Dental gel containing neem extract</strong> (25mg/g) significantly (P&lt;0.05) <strong>reduced the plaque index and bacterial count</strong> compared to commercially available chlorhexidine gluconate (0.2% w/v).</td>
</tr>
<tr>
<td>Prashant 2007</td>
<td>Evaluation of antimicrobial effects of chewing sticks of mango and neem tree on microorganisms shows that, in combination, <strong>chewing sticks may provide maximum benefit against 4 organisms causing dental caries: Streptococcus mutans, S. salivarius, S. mitis, and S. sanguis.</strong></td>
</tr>
<tr>
<td>Bukar 2004</td>
<td><strong>Oral hygiene tools</strong> used by respondents included toothbrush/ paste 36 (7.9%), chewing stick 250 (54.9%), charcoal 159 (34.9%) and ordinary water 10 (2.2%). Of those using chewing sticks; 168 (67.2%) use Salvadora persica, 36 (14.4%) use Azadirachta indica &amp; 46 (18.4%) use Eucalyptus camaldulensis.</td>
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Neem

Animal Studies

TUMORS AND CANCER

Ali 2015
Stigmasterol (99.9% pure) isolated from A. indica reduced tumor size and cumulative number of papillomas in 7,12-dimethylbenz[a]anthracene (DMBA)-induced skin cancer in mice. This chemopreventive activity may be linked to the oxidative stress and other properties of stigmasterol.

Liu 2015
A. indica supplementation in rats with DMH-induced colorectal carcinogenesis significantly reduced the number of aberrant crypt foci, moderated the increase in the enzyme activity of alkaline phosphatase & appreciably improved changes in the ultrastructural architecture of colon cells.

Arumugam 2014
An ethanol fraction of neem leaf (EFNL) inhibited MNU-induced breast tumor progression in rats. EFNL treatment was highly effective in reducing breast tumor burden & suppressing its progression even after the treatment stopped. It altered cell proliferation, apoptosis (killed cells) & angiogenesis (prevented the new growth of tumor cells).

Dkhil 2013
After treatment with methanolic neem leaf extract, the histological damage and apoptosis (cell death) caused by cisplatin (chemotherapy drug) were improved in adult rats. Malondialdehyde and nitric oxide were significantly decreased. The antioxidants were significantly elevated.

Othman 2011
Female mice treated with neem leaf extract had a higher incidence of cell death in breast cancer tissues compared with the cancer controls.

DISEASES

Bhanwra 2000
Liver necrosis was produced by administering single dose of paracetamol (2 g/kg, p.o.). Aqueous A. indica leaf extract (500 mg/kg, p.o.) significantly (P < 0.01) reduced Paracetamol-induced liver necrosis (death of the tissue), as observed macroscopically and histologically.

Parshad 1994
Decreases in serum testosterone (p<0.01), bilirubin and K+ found in male Wistar rats when given oral extract of neem for 10 weeks.
Animal Studies

SKIN AND WOUND HEALING

Bansod 2015
Biogenic silver nanoparticles from A. indica in combination with oils extracted from medicinal plants, including A. indica, demonstrated remarkable antimicrobial activity against pathogens present on the skin of animals in an excision wound model using rabbits.

Gautam 2015
A. indica leaves extract (500 mg/kg) administered orally, 1x daily for 10 days improved wound healing in diabetic rats through enhanced angiogenesis mediated through the inhibition of high blood sugar, oxidative stress, and down- and upregulation of inflammatory mediators and growth factor expression.

ANTI-INFECTION

Thakurta 2007
The antibacterial and antisecretory activity of neem extract against Vibrio cholerae, was evaluated which showed antibacterial activity against the multi-drug-resistant Vibrio cholerae, reduced secretion and inhibited hemorrhage induced by Vibrio cholerae in mouse intestine.

Sadekar 1998
Poultry (broilers) survivors of infectious bursal disease (IBD) treated with A. indica (neem) had enhanced antibody titers against New Castle Disease Virus. Results show neem may benefit immunosuppressed conditions like IBD, in poultry.

Zeitlin 1997
Agents, including neem found effective in preventing vaginal transmission of genital herpes in mice.

Bhonde 1999
Different neem formulations viz. Achook (0.15% EC), Bioneem (0.03% EC), Nimbecidine (0.03% EC) and Neemark (0.03% EC) showed fungicidal action against plant pathogenic fungi such as Fusarium oxysporum, Alternaria solani, Curvularia lunata, Helminthosporium sp. and Sclerotium rolfsii.

Lans 1998
Azadirachta indica and Curcuma longa were the main plants of the 20 plants used to treat ruminants. Primary uses included parasites, internal and external injuries and pregnancy-related conditions.
Animal Studies

CONTRACEPTION

_Talwar 1997_  
Candida albicans, C. tropicalis, Neisseria gonorrhoeae, Staphylococcus aureus, Escherichia coli, Herpes simplex-2 and HIV-1 inhibited by a polyherbal cream also shown also to have contraceptive efficacy in rabbits and baboons. _A. indica_ used in early stages of unwanted pregnancy.

INSECTICIDE

_Su 1998_  
Neem products from Azadirachta indica may be an effective ovicide against _Culex_ mosquitoes.

_Ndumu 1999_  
Undiluted neem oil was found to kill all the larvae of a three-host tick, a parasite found on cattle in Nigeria.

_Hadis 2003_  
Field trials on the mosquito repellent activity of 4 plant products against _Mansonia_ population in western Ethiopia at 50% concentration showed the protection of 91.6%, 87.0%, 96.0%, 97.9% for rue, neem, pyrethrum and DEET respectively.

Sources

http://www.herbmed.org/Sponsored/neem.html
http://www.fitnessformulary.com/content/monographs/bottomline-neem.php
http://www.himalayawellness.com/herbalmonograph/margosa.htm
http://www.banyanbotanicals.com/info/ayurvedic-living/living-ayurveda/herbs/neem/
Videos on Neem

Top 10 Benefits of Neem
https://youtu.be/HkomxfOAiHc

David Wolfe on Neem Powder
https://youtu.be/3VRJsKaPhqE

Neem – An Ayurvedic Herb for Healthy Skin & Blood
https://youtu.be/I9u7KXaer50
He’s often using Ayurvedic terms like pitta, vatta… just listen for the important info and notice what the tree looks like in reality. He’s also talking about the Banyan Botanicals Company products.

Making Fresh Neem Leaves Soap by Skin Passion
https://youtu.be/2FsuxAmzqos
Crazy music in the background.

Grandma’s Neem Leaf Remedy
https://youtu.be/wTqAWT6CBrs
This one is a homey video.

Homemade Neem Powder
https://youtu.be/j3C-1ShtrDj4
Another goofy music background but this one shows you the basic procedure of how to make your own herb powder for any herb.