

NEEM

The Ultimate Herb

By John Conrick

NIMBATI IVASTHYAMDADATI

Ancient Sanskrit saying

“NEEM, TO GIVE GOOD HEALTH”



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requirements by between 30% and 50% for nonketotic, insulin fast and insulin-sensitive diabetes.

- **AIDS** - The National Institutes of Health reports encouraging results from in vitro tests for neem as an antiviral agent against the AIDS virus.
- **Cancer** - Polysaccharides and limonoids found in neem bark, leaves and seed oil reduced tumors and cancers without side effects in a number of different studies.
- **Heart disease** - Neem extracts have delayed the coagulation of blood, calmed erratic heartbeats and helped reduce elevated heart rates and high blood pressure.
- **Herpes** - Recent tests in Germany show that neem extracts are toxic to the herpes virus and can aid in a rapid healing of cold sores.
- **Periodontal disease** - German and American researchers have proven that neem extracts prevent tooth decay and periodontal disease.
- **Dermatology** - Neem is highly effective in treating skin disorders like acne, eczema, itching, dandruff and warts.
- **Allergies** - Neem has antihistamine properties that help inhibit allergic reactions when applied externally or consumed as a decoction.
- **Ulcers** - Neem extracts give significant protection from discomfort and speed the healing of gastric and duodenal lesions.
- **Birth control (men)** - In India and the United States, trials show neem extracts reduced fertility in male monkeys without inhibiting libido or sperm production, making it potentially the first male birth control pill.
- **Birth control (women)** - Used as a vaginal lubricant or injected into the fallopian tube, neem oil was up to 100 percent effective in preventing pregnancy.
- **Hepatitis** - Tests show neem adversely effects the virus that causes hepatitis B.
- **Fungi** - Neem is toxic to several fungi that attack humans,

including those that cause athlete's foot and ringworm, and *Candida*, an organism that causes yeast infections and thrush.

- ***Malaria*** - An active ingredient in neem leaves, called iroquin A, is toxic to resistant strains of malaria. In vitro studies show 100 percent mortality of the malaria gamete in 72 hours with a 1:20,000 ratio.
- ***External parasites*** - Neem quickly kills external parasites and a neem decoction is safer and just as effective as standard treatments for head lice and scabies.
- ***Insect repellent*** - Studies have shown that one neem compound is a more effective insect repellent than the widely used synthetic chemical known as DEET (N, N, -diethyl-m toluamide), a suspected carcinogen with long periods of use.
- ***Insecticide*** - Neem extracts have been approved by the U.S. Environmental Protection Agency for use on food crops. It is non-toxic to birds, animals, beneficial insects or man and protects crops from over 200 of the most costly pests.

A key advantage to using neem, as opposed to some medical treatments and other herbs, is its compliance with the first tenant of the Hippocratic Oath taken by all physicians: "First, cause no harm." Over thousands of years, neem has been used by hundreds of millions of people and no hazards have been documented for normal dosages. Only at very high levels may neem be toxic, something each of us understands can be true of anything taken internally.

Many of the more difficult to treat disorders against which neem has proven to be effective include heart disease, diabetes, psoriasis, malaria, ulcers, *Candida* and gum disease. These diseases do not always respond to the most advanced treatments available through modern medicine. Neem offers its users the ability to take action against these and other seemingly intractable diseases with a safe and time-proven herb.



History & Uses of Neem

The History of Neem

Shortly after Julius Caesar established the Roman Empire, Pliny the Elder issued a public complaint: the ever-increasing volume of medicines imported from India was causing a serious drain on the Roman gold treasury. By that time, medical practitioners on the Indian subcontinent had been studying and documenting the effects of hundreds of botanical compounds for more than 2,500 years. As early explorers traveled to India to trade for gold, silks and spices, carefully compiled Indian medicines were also brought back to Persia, Mesopotamia, Egypt, Greece and Rome.

Indian mythology has several stories that relate how neem became a sacred tree blessed with the ability to heal all diseases. The most common story tells of the time Indra, the king of the Celestials, was returning to Heaven with a golden pot filled with Ambrosia he had taken from the Demons. Some of the precious Ambrosia spilled from the pot and landed on a neem tree thereby making neem trees blessed with miraculous healing properties for all eternity.

The first indication that neem was being used as a medical treatment was about 4,500 years ago. This was the high point of the Indian Harappa culture, one of the great civilizations of the ancient world. Excavations at Harappa and Mohenjo-Daro in north-western and western India that date to that period found several therapeutic compounds, including neem leaves, gathered in the ruins.

Among the most ancient surviving documents that have been translated are the *Caraka-Samhita* (approximately 500 BC) and *Susruta Samhita* (approximately 300 AD). These books have been traced to earlier works dating to 2,000 BC and 1,500 BC respectively, and are the foundation of the Indian system of natural healing, Ayurveda. In these ancient texts neem is mentioned in almost 100 entries for treating a wide range of diseases and symptoms, most of which continue to vex humanity.

The *Sarira Sthanam* recommended that newborn infants should be anointed with herbs and oil, laid on a silken sheet and fanned with a branch of a neem tree with ample leaves. As the child grew it was given small doses of neem oil when ill and bathed with neem tea to treat cuts, rashes and the lesions of Chicken pox. Daily brushing with neem twigs helped keep both child and adult free of cavities and diseases of the gums. At the wedding ceremony neem leaves were strewn on the floor of the temple and the air fanned with neem branches. During adulthood neem bark was burned to make the red ash to be used for religious decoration of the body and neem branches were fanned at the front of religious processions. Neem oil lit the night in small lamps. The wood was used to cook the daily meals of beans and grains that had been kept free of insects during storage by mixing them with a light coating of neem oil or by mixing them with neem leaves. Ayurvedic preparations with neem were given for illnesses and neem wood used to make the roof of the house. And at the time of death, neem branches cover the body and neem wood was burned in the funeral pyre.

Neem was so much a part of Indian life that most people were not even conscious of how many ways neem impacted

their lives. Long revered for its many healing properties, neem came close to providing a cradle-to-grave health care program and was a part of almost every aspect of life in many parts of the Indian subcontinent up to and including the modern era. But it has really only been since the dramatic interest in neem by the people of Europe and the United States that they have come to realize the value and significance of neem. A movement to protect the relatively few neem trees in India and the many products given by them is growing as the people of India see the possibility that richer Western nations will create a larger demand for and increase the price of neem products.

To address this potential problem, the Indian government is considering legislation that would ban the export of neem seeds – now regarded as a national treasure – and limit foreign sales to neem oil and manufactured products only.

Current Uses of Neem, India

Centuries of proven effectiveness against many diseases have given neem an esteemed place in the culture of India. Neem touches the daily life of almost every Indian, from the poorest peasant who snaps off a twig to use as a toothbrush, to wealthier individuals who purchase manufactured neem-based toothpaste, soap and medicine. Therefore, when manufacturers in India applied for government approval of a new neem capsule to be used to treat diabetes, it was granted in less than 24 hours. After almost 4,500 years of almost continuous use, even the Indian equivalent of the FDA apparently believes that “anything from neem has to be good” (Larson, 1993).

In India neem is rarely found naturally in forests. Instead, it is grown along roadsides and around homes. In the ancient book, *Brihat Samhita*, the neem trees should be planted near the home to ensure good health to those that live there. Villagers with easy access to neem trees have developed many innovative uses for them. It is a common practice for villagers to wash wounds in water boiled with neem leaves. They put fresh leaves under their mattresses and in stored grain to repel in-

❖ II ❖

Neem as a Medicinal Herb

Taking care of yourself is the best way to feel good and keep your body strong and free of disease. Most problems with the body can be traced to poor diet, poor hygiene and a lack of sleep and exercise. It is easier to take a pill or apply a medicinal salve to correct an illness than it is to change a lifetime of bad habits. But changing bad habits into good habits is the best way to heal and prevent illness.

That said, true illnesses and long term conditions do need to be addressed and corrected if possible. An ill body drains us physically and mentally. To alleviate illnesses, Ayurvedic herbalists have developed a vast store of knowledge and a long line of medicinal preparations over the thousands of years that they have been healing their patients. With hundreds of medicinal plants found on the Indian subcontinent, Ayurvedic healers have been very successful in treating the diseases of the people of this region. Their store of herbal preparations and medicinal herbs provides remedies for almost any human illness or malady. The neem tree is among the most important of these herbs.

Ayurveda prescribed herbs that destroy disease organisms directly and herbs that help the body itself fight the diseases.

Those that received the aspirin began to see the fever go down after two hours by about one degree then slowly rise. Those given nimbidin had their temperature go down by about one degree after one hour, two degrees after two hours then rise by about half a degree after three hours and stabilize (Pillai *et al*, 1980).

To reduce fevers in adults drink two cups of neem leaf tea made with five neem leaves each. Repeat, if needed, after four hours. Since some of the compounds in neem resemble those found in aspirin, neem is not recommended at this time for use by small children for fever reduction.

Infectious Diseases

Neem extracts have been found to be antiseptic, (Rojanapo *et al*, 1985) anti-fungal (Bhowmick and Choudharg, 1982) and anti-viral (Rai and Sethi, 1972), (Sankaram *et al*, 1987). This combination of healing properties makes neem an extremely effective remedy for infections caused by a variety of pathogens. One gram of neem extracts, particularly the nimbidines, was experimentally equal to 800 units of penicillin or .5 grams of streptomycin sulphate (Singh and Sastry, 1981).

Bacterial

Preliminary studies in laboratories have shown that there have been significant effects on several bacteria strains (Rao, 1969), (Chopra *et al*, 1952, 1958), (Sankaram *et al*, 1987), (Rojanapo *et al*, 1985). Mahmoodin, one of neem's many medicinal compounds, shows significant antibacterial activity against various gram-positive and gram-negative organisms (Siddiqui *et al*, 1992). The bacteria *staphylococcus aureus* that can cause peritonitis, cystitis and meningitis is killed or rendered harmless by small doses of leaf extract (Schneider, 1986). The bacteria *streptococcus pyogenes*, *cornebacterium* and *E. coli* were affected by neem extracts (Thaker and Anjaria, 1986), (Fabry *et*

cedes a rash by several days and can persist for several months after the rash resolves.

Neem is a potent immune stimulant that can keep shingles at bay if taken internally during times of stress. It also can inactivate viruses thereby preventing the virus from multiplying sufficiently to cause an outbreak. If the rash does appear, coating the rash with neem-based cream or neem leaf poultice will reduce the pain as well as help to heal the skin. Drink mild neem leaf tea until the symptoms subside.

Herpes simplex 1 (cold sores)

HSV1 is a common virus that almost all adults carry though few exhibit symptoms such as cold sores on the lips and face. The virus is inactive in the nerves around the lips until activated by stress, exposure to cold or sunburn. A tingling sensation usually is noticed just before an eruption of a cold sore. Tests in Germany show that neem extracts are toxic to the herpes virus and can quickly heal cold sores (Schmutterer, 1992).

At the first indication of an eruption, a mild neem leaf tea after breakfast and dinner, combined with topical application of a neem-based cream to the affected area, is recommended. This may stop the cold sore from actually developing. If a sore does develop continue both oral and topical applications until the eruption has peaked. Then continue with only the topical cream applications until the sore has healed.

Colds

Caused by a wide variety of viruses, colds usually confine their infection to the nose and throat, but can spread to other areas causing more serious secondary infections. Colds are better prevented than cured, but increasing interferon and stimulation of the immune system are the most effective treatments for colds.

Ringworm

Affecting the smooth skin and scalp, these fungal infections are often accompanied by profound itching and redness of the affected skin. This fungus produces circular ring lesions up to six inches in diameter on the skin and can cause loss of hair in patches of the scalp. Neem has historically been an effective treatment for fungal infections of the skin. Early studies verified scientifically that the fungus that causes ringworm is effectively controlled with neem extracts (Narayan, 1965).

In one trial, patients with long term and severe cases of ringworm were selected for study. They had used commercial ointments containing salicylic acid and benzoic acid for over three years, yet had failed to stop the infection. They were each treated with alcoholic neem leaf extract in a carrier lotion. Within just two to three days after using neem extract on the areas the patients were clear of the infection and remained so for the one-year follow-up period (Singh *et al*, 1980).

Washing with neem soap or shampoo and rubbing neem lotion onto the affected areas clears this fungal infection in several days.

Yeast infection

Typically caused by *Candida Albicans* this infection occurs in moist areas of the vagina or on the head of the penis of uncircumcised men.

For vaginal yeast infections, a neem-based cream can be applied with cotton swabs or as a douche with neem leaf extract. For infections of the skin around the penis, rubbing a neem-based cream on the affected areas several times per day, especially after washing or getting the area wet, will relieve the itching, heal the skin and get rid of the infection. Drinking three cups of neem tea for several days will help rid the body of both external and internal infection.

Thrush

Also caused by *Candida Albicans*, this infection occurs in the area of the mouth.

Drinking neem leaf tea will promote healing and reduce the pain and inflammation. Children under 12 should only gargle with the tea and not swallow. For the redness appearing on the skin around the mouth, a neem-based cream should be applied regularly until the infection has cleared.

Diaper rash

Diaper rash is usually caused by irritation from substances such as irritating detergents used to wash cotton diapers and substances found in feces and urine in prolonged contact with the skin. Changing diapers frequently and keeping the area dry will help prevent the rash. If the rash persists try changing detergents or use disposable diapers.

If a rash develops wash the baby's skin with neem shampoo and dry with a clean towel. Then apply a neem-based cream or neem leaf powder. Neem will reduce the inflammation, soothe the baby's skin, kill any thrush organisms and keep the baby's skin protected from moisture.

Sexually Transmitted Diseases

Neem has been a traditional treatment for sexually transmitted diseases. Gonorrhea, syphilis and vaginal infections were treated with decoction of neem leaf and topical applications of neem oil. Men drank neem tea and bathed in water boiled with neem leaves. Women drank neem tea and douched with a decoction of neem leaves. Both men and women smeared neem oil on the afflicted areas.

Studies show that a neem-based cream used as a vaginal lubricant is effective against organisms such as *Trichomonas*,

Candida, and *Giardinella vaginalis* that cause vaginal infections (Khan and Wassilew, 1987), (Garg *et al*, 1993). Other studies have indicated neem can be effective against the types of bacteria that cause syphilis and gonorrhea (Singh *et al*, 1987), (Sankaram *et al*, 1987). These studies are only preliminary but promising and more research is being done in this area.

AIDS

Neem has immuno-stimulating properties for both the lymphocytic and cell-mediated immune systems. When human white blood cells infected with HIV were cultured with neem extracts, the production of viral proteins dropped dramatically. Dr. Upadhyay and Dr. Berre'-Sinousi (one of the scientists who identified the AIDS virus) believe the neem extracts block production of viral proteins, thereby stopping replication of the virus.

Studies of the effects of neem bark and neem leaf extracts show they significantly reduced the P-24 viral proteins and induced in vitro production of IL-1 interferon (Upadhyay *et al*, 1993a). The National Institute of Health, in a preliminary study, reports encouraging results from in vitro tests where neem bark extracts killed the AIDS virus (Larson, 1993). Another possible effect neem may have on combating the AIDS virus is its apparent ability to enhance the cell-mediated immune response to infection. In cases where HIV has not advanced to full-blown AIDS despite many years of living with the infection, some of the patients appear to have the enhanced cell-mediated immune responses (Caldwell, 1994) that neem can help produce. Using extracts made by soaking neem bark in water, Dr. Van Der Nat (Netherlands) determined that the extract produces a strong immune stimulating reaction. The neem bark extract stimulated lymphocyte function that increased production of MIF, a lymphokine that attaches macrophages and monocytes to infectious agents. (Upadhyay *et al*, 1990).

States were reported to the U.S. Centers for Disease Control and Prevention. It is easily controlled with antibiotics but many people may get the disease and not know it because the symptoms are frequently mild. If left untreated it may eventually destroy organs or lead to blindness, heart disease, mental illness and death. Like almost all STD's prevention is key, primarily use of latex condoms during sex. As an adjunct a neem-based lubricating cream could provide additional protection, especially in the case of a condom's rupture.

Neem has anti-spirochaetal properties so that it works as both a preventive measure and in the treatment of primary, secondary and tertiary stages of syphilis (Siddiqui and Mitra, 1945), (Bhandari and Mukerji, 1959), (Puri, 1993).

Neem creams used as a vaginal lubricant or birth control may be effective against the syphilis spirochete and may prevent contraction of the disease. As with gonorrhea, creams containing 10 to 25 percent neem oil were used. Drinking neem tea three times per day for two weeks is recommended as an immune stimulant to supplement antibiotic treatment.

Chlamydia

Caused by a microorganism called Chlamydiae, up to 13 percent of women in the United States have Chlamydia, many without symptoms. Chlamydia is implicated in many cases where women are unable to conceive due to scarring of the fallopian tubes.

Neem may be useful in preventing infection through the use of a neem-based cream as a vaginal lubricant. Alternately, immediately after intercourse or if the disease has taken hold, use of a douche made with water boiled with 50 neem leaves will act as a bactericide. A neem-based cream applied internally to the vagina clears up Chlamydia trichomatous infections in one to three weeks (Garg et al, undated). For stubborn cases, supplement with two cups of neem tea daily for a week to attack the agents from inside.

Neem oil and neem extracts have the added benefit of preventing vaginal and sexually transmitted diseases (Upadhyay *et al*, 1990), (Garg *et al*, undated), (Lal *et al*, 1985), (Sinha *et al*, 1984a).

Years of study in India by some of the world's leading contraceptive scientists resulted in the development of a neem-based polyherbal vaginal cream that has both spermicidal and anti-microbial action. The cream combines 10 to 25 per cent neem oil, a surfactant (like sodium lauryl sulphate used in many shampoos) and quinine hydrochloride, a synthetic flavoring agent used in bitters and fruit flavorings for beverages. Initial tests of its effectiveness showed that it compared favorably with the chemical-based foams and gels. It was safer and easier to use, caused no irritation or discomfort, was nearly 100% effective, and was therefore used more frequently than the foam or gel spermicides (Garg *et al*, 1993). The effect does not appear to be hormonal and is considered a safe and effective alternative to other methods that use hormones (Prakash *et al*, 1988), (Mateenuddin *et al*, 1986).

During the Phase I clinical trials using the cream in India it was discovered that the cream had tremendous benefits for decreasing sexually transmitted diseases in addition to its birth control properties. Neem oil and leaf extracts have spermicidal, anti-microbial, anti-fungal and anti-viral properties. But most importantly they enhance the local immune response, particularly the TH1 type response (See the section on HIV for more details). Therefore, neem and neem extracts can prevent pregnancy and prevent diseases caused by *Candida albicans*, *C. tropicalis*, *Neisseria gonorrhoeae*, the multidrug-resistant *Staphylococcus aureus* and urinary tract *Escherichia coli*, Herpes simplex-2 and HIV-1 (Talwar *et al*, 1997b).

In India, vaginal creams and suppositories made with neem oil are quickly becoming the birth control method of choice (Paranjapo and Paranjapo, 1993), (Garg *et al*, 1993), (Riar *et al*, 1993). They are non-irritating and easy to use while almost 100 percent effective. The studies leading to the development of these products proved that neem oil killed sperm in the vagina within thirty seconds and was effective for up to five

hours. Most spermicidal creams must be reapplied at least every hour (Sinha *et al*, 1984a).

Certain purified extracts of neem have also been tested to determine if distinct compounds can be more effective than simple neem oil for birth control. When tested against human sperm, the neem extract (sodium nimbinate) at 1000 mg was able to kill all sperm in just 5 minutes and required only 30 minutes at a 250-mg level. (Sharma *et al*, 1959a), (Khare, 1984), (Lal *et al*, 1987), (Riar *et al*, 1988), (Sinha *et al*, 1984b). But simple neem oil has been shown to work well both before and after sex while some purified extracts only worked before sex as a preventive (Riar *et al*, 1991). After the testing of many neem compounds it appears as though neem oil is the most effective form of neem for birth control, particularly hexane extracted neem oil.

Neem oil has been found to prevent implantation and may even have an abortifacient effect similar to pennyroyal, juniper berries, wild ginger, myrrh and angelica. The effects were seen as many as ten days after fertilization in rats though it was most effective at no more than three days (Sinha *et al*, 1984b), (Lal *et al*, 1985). In a study on rats, neem oil was given orally eight to ten days after implantation of the fetus on the uterine wall. In all cases, by day 15, the embryos were all completely reabsorbed by the body. The animals regained fertility on the next cycle, showing no physical problems. Detailed study of the rats revealed increased levels of gamma interferon in the uterus indicating that neem oil enhanced the local immune response in the uterus. (Mukherjee *et al*, 1996). Post coital use of neem oil as birth control does not appear to work by hormonal changes but produces changes in the organs that make pregnancy no longer viable (Tewari, 1989), (Bardhan *et al*, 1991). By being a non-hormonal post-coital contraceptive it is expected that neem oil would have fewer side effects (Prakash *et al*, 1988).

A distillate of hexane extracted neem oil, a mixture of six primary active fractions, resulted in a product that could completely abrogate pregnancy in rodents with no apparent side effects. The neem compound mixture caused the activation of

T-lymphocyte cells of CD8+ subtype and phagocytic cells followed by an elevation in cytokines gamma-interferon and tumor necrosis factor alpha(TNF). The experiment indicates that an active fraction of hexane extracted neem oil can be taken orally for early post implantation contraception based on cell mediated immune reactions (Mukherjee *et al*, 1999).

I doubt that, given all of the options for birth control available to most people in the more affluent parts of the world, a homemade neem-based cream preparation would be a first choice. However, neem has the additional properties of strengthening the immune system in the vaginal tract and acting as an antibacterial and antiviral agent without irritating the vaginal tract as so many of the commercial spermicidal creams and lubricants can. As for ingesting neem for contraception - until a high quality neem oil with proven purity is developed neem oil is not recommended for any internal consumption in any appreciable amounts.

To prevent pregnancy use a water based vaginal lubricant with ten-percent neem oil added. Apply before intercourse to give the surface of the vaginal wall time to become coated with the material. If there was no neem lubricant available during intercourse applying the lubricant soon after intercourse will prevent implantation, however, careful consideration must be given to the implications of this procedure.

Birth control (men)

Neem may become the first truly effective birth control "pill" for men (Riar, 1988). Neem leaf tablets ingested for one month produced reversible male antifertility without affecting sperm production or libido (Deshpande, 1980), (Sadre, 1984). In India and the United States, exploratory trials show neem extracts reduced fertility in male monkeys without inhibiting libido or sperm production (Sharma *et al*, 1987) and ethanol extracts of neem leaf given to male rats caused females who mated with them to be unable to become pregnant as long as the males took the extract (Choudhary, 1990).

In a test of neem's birth control effects with members of the Indian Army, daily oral doses of several drops of neem seed oil in gelatin capsules were given to twenty married soldiers. The effect took six weeks to become 100 percent effective, it remained effective during the entire year of the trial and was reversed six weeks after the subjects stopped taking the capsules. During this time the men experienced no adverse side effects and retained their normal capabilities and desires (National Research Council, 1992). There were no pregnancies of any of the wives during the study.

For long term birth control for men it appears that a very minute amount of neem oil injected in the vas deferens provides up to eight months of birth control. The tests revealed no obstructions, no change in testosterone production and no anti-sperm antibodies. The local lymph nodes showed increased ability to respond to infections, indicating an immune response may be responsible for the birth control effect in men as it is in women (Upadhyay, 1993b).

Taking 30 drops of neem leaf extracted with alcohol or two grams of neem leaf daily for six weeks will reduce the motility of sperm thereby preventing them from reaching and impregnating the egg. The neem material must be taken daily for the effect to continue. Approximately six weeks after ceasing consumption, sperm motility should return and the birth control effect will be reversed.

Skin Diseases

According to Ayurveda, skin diseases are caused by the excess of sugary substances in the body. To counteract them, the opposite of sugar – bitter – is prescribed (Puri, 1993). Neem is an herb of choice for skin diseases because of its bitter principles and has proven to be highly effective in treating disorders like psoriasis, acne, eczema, itching, dandruff and warts (Ghosh, 1987). Neem has been used for treating all sorts of skin problems for thousands of years and is considered to be

equal, or even superior, to aloe in its healing properties.

Psoriasis

Psoriasis is a noncontagious skin disorder that usually appears as inflamed swollen skin lesions covered with a silvery white scale. It has no cure and not all treatments work for each individual, often requiring people to combine therapies in order to discover the regimen that is most effective. Psoriasis on its own can come and go often with long periods of remission. In most cases, however, psoriasis is persistent.

Neem oil is probably the best product currently available for treating psoriasis. It moisturizes and protects the skin while it helps heal the lesions, scaling and irritation. Experiments and reports from patients with psoriasis have shown taking neem leaf orally, combined with topical treatment with neem extracts and neem seed oil, appear to be at least as effective as coal tar and cortisone in treating psoriasis. (Narayan, 1978).

In a case study a patient with severe psoriasis was given neem extract (nimbidin) three times a day and the skin treated with nimbidin mixed in coconut oil. The treatments lasted less than three months, stopped the itching and redness and continued to improve the condition of the skin for the duration of treatment. The final result of the treatments was the complete disappearance of the signs of psoriasis. They produced no noticeable side effects (Rajasekbaran *et al*, 1980). Anecdotal reports indicate that improvements are faster when the areas treated with neem are also exposed to sunlight.

The usual treatment for psoriasis involves either coal tar or cortisone. Coal tar products are messy and smell, and cortisone can thin the skin after repeated use. Neem has neither drawback. Topical applications of neem are easy and inexpensive, and since it is usually oil or cream based, neem helps to lubricate the skin. There are no unpleasant smells or stains on clothing, and its antibacterial and anti-viral compounds help prevent infections. It also can be used for extended periods of time without side effects. Neem can also take the place of oral medications and injections that may have strong side

small amount of neem lotion to the scalp afterwards will relieve each of these problems.

Skin ulcers

Skin ulcers most commonly occur on the leg due to inadequate blood supply or drainage. The destruction of the surface tissue can be shallow or deep and is usually inflamed and painful.

Like any other open wound they should be washed with a neem soap and covered with a neem lotion. For individual ulcers, apply neem leaf extract or damp whole leaves to the skin ulcer and cover with a gauze bandage overnight or until it is healed. Replace the bandage and extract daily. Drink two neem leaf teas daily for three days in severe cases.

Warts

Warts are harmless but contagious growths on the skin or mucous membranes. They infect the topmost layer of the skin and do not have roots. Warts are caused by any of the thirty types of papillomavirus. Removal typically involves either freezing or corroding acid but neem can prevent the virus from replicating and can cause the growth to slowly fade away. Neem also keeps the viruses from infecting cells and spreading new warts.

To treat the wart, cover it with whole neem leaves or soak the gauze portion of a small bandage with neem leaf extract or a neem based cream and place it over the wart. Change the bandage and reapply daily. After a week, check the area to determine the progress of the treatment.

Periodontal Diseases

Teeth and their supporting structure, the gums (gingiva) are subject to infection by streptococcus bacteria that cause cavi-

ties and pyorrhea which, if left untreated, can eventually lead to gingivitis. The bacteria adhere to the surface of the tooth and form colonies called plaque that becomes home to other bacteria. These bacteria use sugars and produce an acid that dissolves the tooth surface. This creates cavities and can eat through to the pulp, causing the pain of a toothache. If the bacteria reaches below the gum line, the infection creates the bleeding gums of gingivitis that leads to tooth loss or requires painful surgery to correct.

In a study to determine the most effective method for reducing plaque formation and the level of bacteria on tooth surfaces researchers compared antibiotics to a number of plant materials with known antibacterial properties, including neem. They found that microorganisms found in inflamed gums are resistant to penicillin (44%) and tetracycline (30%) but were not resistant to antibacterial plant extracts like neem. And unlike antibiotics, antibacterial plant extracts produced no allergy in the gingiva that could inhibit their effectiveness.

When a recent study examined neem chewing sticks for their effectiveness they proved to have both anti-plaque and antibacterial properties. The extracts of the chewing sticks were also found to be very effective in killing *Strep mutans* and *Strep faecalis* (Almas, 1999).

In a follow-up clinical study fifty patients with confirmed gingivitis were selected, forty of whom had shown severe bleeding and pustular discharges from the gums. After just three weeks of brushing twice a day with a paste that included leaf extracts, 80% showed significant improvement. The patients also showed a 50% reduction in bacterial populations and elimination of halitosis (bad breath) with no side effects (Patel and Venkatakrishna, 1998).

Neem has been used in India and all of south Asia for thousands of years as the preferred method for maintaining healthy teeth and gums. The people of India chew a neem twig until the end becomes bristles then brush with the natural "toothbrush" to clean their teeth after meals. The bark and sap within the twig help clean the teeth and protect the mouth from disease. For those not inclined to chew neem twigs, tooth-

Digestive Disorders

Digestive disorders include conditions that disrupt the digestive process by obstruction or interfere with the breakdown or absorption of nutrients. They also include conditions that simply cause distress such as heartburn, abdominal pain or diarrhea.

Neem is generally accepted in the Ayurvedic medical tradition as a therapy for ulcers and other types of gastric discomfort. People throughout the Indian subcontinent routinely take neem leaves for relief of stomach problems of any sort. Scientific validation of these practices is consistent in studies of the effectiveness of neem and neem extracts for gastric relief. Neem promotes a healthy digestive system by protecting the stomach, aiding in elimination and removing toxins and harmful bacteria.

Heartburn/indigestion

Neem leaves are often used to treat heartburn and indigestion. They are effective because some neem extracts reduce the concentration of hydrochloric acid in the stomach. Other compounds with apparent prostaglandin inhibition capabilities may also play a part in reducing gastric secretions.

At the onset of indigestion traditional Ayurvedic practice is to drink a strong neem tea made with five neem leaves along with 1/4 teaspoon each of ginger and baking soda. The mixture is said to protect the stomach and reduce discomfort.

Peptic/duodenal ulcers

Raw areas in the gastrointestinal tract, when bathed in acidic gastric juice, cause discomfort and can lead to severe problems if not alleviated. The discovery that many gastric ulcers were caused by the bacteria *Helicobacter pylori* raging uncontrolled in sections of the gastrointestinal tract provided a new

The amazing part of the experiment isn't that neem can reduce anxiety. That is something that had been reported many times before scientific experimentation finally quantified it. The amazing part is that neem extracts will only work in small doses. This unique quality of neem could make neem extract a safer alternative than drugs currently used for stress that compound their effects with higher doses up to a point where they can become dangerous.

A warm neem tea can produce a calming effect by relieving the symptoms of stress; rapid heart rate, elevated blood pressure and increased metabolism. Neem reduces rapid heart rates, reduces blood pressure and relaxes tense muscles.

Insomnia

Depression and stress are major causes of insomnia. Approximately 90 percent of depressed patients have some form of sleep abnormality, and 50 to 95 percent of depressed patients complain of severely disturbed sleep. Neem has been proven to reduce stress and relax muscles, producing an effect conducive to sleep. Nimbidin, a neem leaf extract, has been shown to help initiate sleep up to 74% faster than the control group (Pillai *et al*, 1984).

A warm neem tea shortly before bedtime should produce a calming effect conducive to sleep.

Pain

Inhibition of prostaglandin synthetase by limonoids (and/or polysaccharides) reduces perceived pain. Neem leaf and bark extracts have been shown to be a more potent inhibitor of prostaglandin synthetase than acetylsalicylic acid (aspirin) and pethidine hydrochloride (Okpako, 1977), (Pillai *et al*, 1978a, 1978b), (Tandan *et al*, 1990). In some cases neem was effective at reducing pain for a significantly longer period than standard agents. Neem also reduces the activity of the central nervous system, which also reduces perceived pain (Debelmas and

son. This not only prevents the infected person from developing malaria but also stops the disease from spreading (Jones *et al*, 1994).

Neem leaf extract substantially increases the state of oxidation in red blood cells, preventing normal development of the malaria plasmodia (Etkin, 1981). An active ingredient in neem leaves, called Irocin A, is toxic to resistant strains of malaria, with 100 percent of the plasmodia dead in 72 hours with only a 1:20,000 ratio of active ingredients (Abatan and Makinde, 1986). In other experiments alcoholic extracts of neem leaf performed almost as well as the more refined compounds (Badam *et al*, 1987).

Two other compounds found in neem leaves called gedunin, a limonoid, and quercetin, a flavonoid, are at least as effective as quinine and chloroquine against malaria (Badam *et al*, 1987), (Ekanem, 1978), (Iwu *et al*, 1986), (Khalid *et al*, 1989a, 1989b), (Obaseki and Jegede-Fadunsin, 1986), (Rochanakij *et al*, 1985). Another molecule, gedunin, an extract of neem bark and neem leaves, has also been found to be effective in treating malaria (Khalid *et al*, 1989a, 1989b). When neem leaf extract was compared to 22 extracts of related species the neem extract, gedunin, was by far the most effective against *Plasmodium falciparum*. It was even more effective than the standard treatment of chloroquine (MacKinnon *et al*, 1997).

Several other studies show that neem extracts are effective against chloroquine-resistant strains of the malaria parasite (Obih and Makinde, 1985), (Bray *et al*, 1990). Neem seed extracts have been tested and highly purified compounds have proven to be more effective than any other anti-malaria treatment. That the compounds were effective against strains of the disease that are resistant to other drugs suggests a possible alternate mode of action. In addition, these compounds were effective not only against the parasitic stages that cause the infection but also against the stages responsible for continued malaria transmission (Dhar *et al*, 1998).

The antimalarial effects of neem appear to be greater in the body than on a petri dish. This has led some to speculate that stimulation of the immune system is a major factor in

General Conditions

Neem works against a wide range of diseases and chronic conditions. Most of them have not responded well to medications currently available. Though not a panacea, neem can be a major factor in preventing and treating these problems, some of which have been successfully treated with neem for centuries. Prescription medicines made from neem extracts, approved by the Indian equivalent of the FDA, are used to treat a number of these conditions.

Diabetes

Diabetes is an incurable, chronic metabolic disorder that develops when the pancreas can no longer produce sufficient insulin. Blood sugar levels rapidly elevate yet the body is unable to use the energy contained in the sugar, leading to weakness and eventually unconsciousness. Diabetes is the leading cause of blindness in people ages 25 to 74. It damages nerves, kidneys, the heart and blood vessels and may result in the amputation of limbs.

Neem leaf is a traditional herb for treating diabetes (Alam, et al, 1989) and has been scientifically proven effective in treating and preventing diabetes (Murty *et al*, 1978), (Chakrabarty, 1984a, 1984b), (El-Harwary *et al*, 1990). Neem leaf was compared to other plants with historical use as blood sugar lowering medicinals and proved to have the most potent activity (Chattopadhyay, 1999).

Both the leaf and the oil have hypoglycemic properties. In tests using oral doses of neem leaf extracts there was a significant reduction of insulin requirements for non-insulin dependent diabetes (Pillai and Santhakumari, 1981b), (Luscombe and Taha, 1974), (Murty *et al*, 1978). In the tests using neem oil it was proven effective and has been able to inhibit increases in blood sugar levels by as much as 45% in test animals (Sharma *et al*, 1983), (Dixit *et al*, 1986).

Capsules containing neem and a number of other herbs are currently available in many countries for the treatment of

ish. Thereafter, the tea should be taken only every other day for another two weeks.

Inflammation

Taking neem leaf or neem bark orally and applying a cream containing neem oil topically has been used for centuries to reduce inflammation. A compound called sodium nimbinat found in neem leaves has been shown to provide significant relief to inflamed tissue (Okpanyi and Ezeukwa, 1981), (Lorenz, 1976). Other compounds such as nimbin, nimbinin and nimbidol are comparable to cortisone acetate in reducing inflammation (Wali *et al*, 1993), (Narayan, 1978), (Tandan *et al*, 1990). In one test with hydrocortisone, neem extract (sodium nimbinat) and several natural saponins, neem was over four times more effective at reducing inflammation than hydrocortisone and more effective than the other agents tested (Bhargava *et al*, 1970).

Topical application of a neem-based cream over the inflamed area can provide relief from the pain and from the inflammation itself. Supplementing the topical treatment with a mild neem leaf or neem bark tea will give the body compounds to reduce and help heal the cause of the inflammation.

Fatigue (chronic)

No one knows what causes chronic fatigue. There are theories that it is caused by excessive stress, rampant fungal infection or Epstein-barr viruses. Neem extracts have proven effective against both fungal and viral infections as well as an ability to relieve stress (Jaiswal *et al*, 1994), (Rao *et al*, 1969), (Thind and Dahiya, 1977). Neem also works to enhance the immune response on a cellular level so it is more effective in fighting disease-causing agents (Kroes *et al*, 1993), (Chaiki *et al*, 1987), (Upadhyay *et al*, 1990).

Conjunctivitis

The inflammation of the eye may be caused by bacteria, viruses or allergies. Because neem is active against each of these causes it can be treated with drops of room temperature neem tea prepared from powdered neem leaves (Puri, 1993). *[Tincture should not be used due to the alcohol used in the extract.]

A few drops of the tea into each eye every three hours for two to three days should be sufficient. Overnight, a natural cream with neem oil should be wiped around the eye and eyelid.

Bad breath

The usual reason for chronic bad breath is bacteria, infections or gastric upset. The most common site of bad breath causing bacteria is the back of the tongue, where bacteria grow unregulated and produce gases by their digestive actions. The bacteria that cause bad breath can form a film that is difficult to gargle away and must be either scraped or brushed away. Once the film is removed and the bacteria are exposed neem extract will easily destroy the bacteria.

Neem toothpastes and mouthwashes contain proven anti-bacterial and anti-viral compounds that can stop bad breath where it originates. If the cause is infection of the mouth, brushing the teeth and gums with neem toothpaste and rinsing afterward with neem extract will kill the infection and promote healing. For bad breath caused by gastric upset, ingestion of neem leaves or fresh seed kernel is traditionally recommended to relieve the upset and correct any acid imbalance.

Hangover

The headaches, stomach upset and general ill feeling of a hangover can be relieved by neem tea. Neem "resets" the blood glucose levels, opens constricted blood vessels, reduces blood

any problems with putting neem on the skin, either oil or leaf. In fact, whenever neem is applied topically, it seems to cure just about any dermatological problem. The safety of neem applied outside the body has never been a question. For any skin disease or skin allergy, neem is considered the ultimate cure.

Toxicological Perspective

Numerous studies of possible toxicity resulted in a determination that leaf and bark are very low in toxicity, especially when taken orally (Khattak *et al*, 1985), (Sinniah and Baskaran, 1981), (Sinniah *et al*, 1983), (Uwaifo, 1984), (Pillai and Santhakumari, 1984b), (Bhargava *et al*, 1970), (Rojanapo *et al*, 1985), (Debelmas and Hache, 1976), (Singh *et al*, 1987). But large doses of neem leaves taken internally have caused some side effects in some of the animals in which it was tested (Sinniah *et al*, 1983), (Okpanyi and Ezeukwa, 1981). It appears that neither should be taken in large doses for extended periods of time.

Extensive research has been conducted on neem oil extracts for regulatory agencies in several countries, including the United States, and has been found to be safe in limited dosage for short periods of time. Tests on animals required by the Environmental Protection Agency showed that alcohol extracts of the seed produced no external irritation in rabbits and no toxic effects on mice when taken internally, even in very large amounts (Larson, 1987).

Some people taking neem oil internally experienced nausea and general discomfort (Chopra *et al*, 1965), which is the case with many of the sulphur compounds containing oils. Excessive consumption of raw neem oil has been implicated in reduced liver functioning (Thompson and Anderson, 1978), (Okpanyi and Ezeukwa, 1981), (Bhide *et al*, 1958a), (Sinniah *et al*, 1983). The toxic effects of neem oil consumption has been disputed (Rochanakij *et al*, 1985), (Larson, 1987) by some researchers that believe contamination with aflatoxin or inadvertent additions of the oil of the chinaberry tree, a related

❖ IV ❖

Major Active Constituents

Figuring out exactly how an herb works and which compound or combination of compounds are making it work is difficult. Constituting possibly hundreds of compounds, some active and others not, herbs are usually analyzed for their most active compound. This is done by systematically isolating each compound and determining its structure. This can show the class of chemical it belongs to and can indicate what type of effect it can be expected to have. With complex molecules, this process is very time-consuming, very expensive and often frustrating.

Neem trees have many unique compounds that have been identified and others that are as yet unidentified. The more common and therefore the most analyzed compounds are as follows:

nimbin - anti-inflammatory, anti-pyretic, antihistamine, anti-fungal

nimbidin - antibacterial, anti-ulcer, analgesic, anti-arrhythmic, anti-fungal

nimbidol - antitubercular, anti-protozoan, anti-pyretic

gedunin - vasodilator, anti-malaria, anti-fungal

sodium nimbinate - diuretic, spermicide, anti-arthritic

Obtaining Quality Neem Oil

To bring the many therapeutic effects of neem oil to all the people that could benefit from them requires a major change in neem oil's quality. From the picking of the fruit to filling the oil into drums, careful attention to quality is the only way to get the best oil possible. It is now known that if the neem seed is not dried and stored properly and the oil is not expressed in a hygienic way the oil will be very dark, have a foul odor and may contain dangerous contaminants.

Methods for obtaining neem oil

The first thing to consider is the collection of the seeds. Neem is not considered a plantation tree in India so the seeds must be gathered from wild trees growing on the fringes of farms, along hillsides and from roadsides and shade trees around homes in the rural villages. Collection of the seeds is a seasonal affair that has historically been organized by cooperatives that press the oil from the seeds for soap manufacture.



TRADITIONAL NEEM OIL PRESS

As the ripe fruit falls to the ground, it is gathered from around the trees. Birds will have eaten some of the fruit and the seeds excreted. Other fruit may have been on the ground for weeks, covered with mold or simply rotten. The collected fruit is then carried to a water supply to wash away the fruit covering the seed. After washing, the seeds are set out to dry in the sun. The dry seeds are bagged and sold to village merchants who later sell them to an oil processing facility.

There are three main processes for extracting the oil from

the available supply. Neem has not been a part of any major western herbal traditions and remains almost unique to Ayurveda.

Neem remained unique to Ayurveda and to India in part because the seeds cannot be stored and because neem survives only in tropical climates. Wherever there are below freezing temperatures, neem will not grow (unless grown in a greenhouse). This has excluded Europe and the rest of the non-tropical regions from growing neem trees. Therefore, to most western herbalists, neem is still unknown.

Despite the tremendous advances that have been made in science and technology, a clear understanding of the mechanisms that enable herbs to provide their curative actions remains elusive. In fact, after thousands of years as a mainstay in Western medicine, scientists still don't know exactly why or how aspirin (originally from willow bark) works. What can be determined is that many herbs continue to provide relief from many ailments and are used because they work. A few herbs are particularly effective for a broad range of ailments and seem to stand out above others.

Chaparral from the southwest United States, echinacea from the plains states and neem from India are each considered to be the most effective herbs from these ancient medical heritages. Each seems to impart an ability to ward off diseases, to lessen the severity of existing conditions and to heal those who use them.

COMPARISON OF HERBAL EFFICACIES

	Chaparral	Echinacea	Neem
Anti-bacterial	yes	yes	yes
Anti-fungal	yes	yes	yes
Antiseptic	yes	yes	yes
Anti-viral	yes	yes	yes
Anti-inflammatory	yes	yes	yes
Antipyretic	no	no	yes
Anti-cancer	yes	yes	yes
Analgesic	yes	no	yes

the home gardener, another company sells both quart containers and small individual-use tubes. Other products made from neem oil and extracts are being tested for approval against plant fungi and nematodes.

cess until Neem. It worked. I am so happy. So is my dog Breck.”
– D.M. - Alexandria, VA

Psoriasis

“I have has psoriasis for about twenty years. Neem cream has been the best product I have used, even better than the prescription medications.” – S.A.

“My husband suffered for years with psoriasis on his scalp, face arms and hands. Neem cream has done more for his skin in two weeks than the hundreds of dollars worth of skin products he has tried.” – C.D. – Canada

Rash

“I had a persistent rash in the center of my back that was caused by harsh, hot water while bathing. After putting neem lotion on it for only two days it disappeared and never came back.”

Scabies

“I had an awful case of scabies on my arms, hands, feet and legs, and progressing to my torso. I went to the doctor and used prescription cream as directed - with no relief at all. I then tried neem soap in the shower in the morning and at night, following the shower with neem lotion applied to my whole body. I felt some relief after the first application, and, after three days, the scabies were gone.” – M.B. - Santa Anna, CA

Skin

“The areas I have used neem lotion on have become very soft and have a new feel to it.” – E.S. - Leesburg, FL

Though these repellents are effective they may also be responsible for severe medical problems reported by some people who use them. A safer alternative is needed.

Neem has been used since antiquity as an insect repellent for both people and food crops. One compound (salannin) found in neem leaves, seeds and seed oil is a safer and more effective insect repellent than the widely used chemical ingredient called DEET (N, N-diethyl-m-toluamide) currently found in most commercial repellents (National Research Council, 1992).

Neem extracts tested by the Malaria Institute were found to repel the mosquito that causes malaria for up to twelve hours. Neem provides protection from not only mosquitoes but also from biting flies, sand fleas and ticks. Because of neem's proven effectiveness, insect repellents made with neem are being used in malaria-prone tropical countries.

For those seeking a safe alternative to potentially dangerous synthetic repellents neem offers an attractive alternative for the following reasons:

- Neem oil is an excellent skin moisturizer while DEET is not recommended for repeated application to the skin, around the face or on the hands of small children.
- Neem oil is a natural vegetable oil while DEET is not recommended to be sprayed on furniture, plastics, watch crystals, leather and painted surfaces including automobiles. DEET may actually dissolve all synthetic fabrics but nylon.
- Neem oil has been used safely for centuries while DEET is a synthetic chemical that has only been used for a short time and may pose future unknown health risks. Many researchers believe DEET to be partly responsible for the devastating effects of Gulf War Syndrome.
- Neem is a healing herb that is famous for its wound healing properties. Cuts, scrapes and poison oak and ivy can be salved with neem oil lotions. DEET products contain warnings against getting them in open sores or on damaged skin.

pounds. The number and complexity of the compounds found in neem that affect insects make resistance to neem highly unlikely if properly used. This is extremely important as insects are rapidly developing resistance to the major synthetic insecticides. More and more insects are even developing resistance to natural bacterial controls like *Bacillus thuringensis* (Bt).

In the United States, a stable concentrate of azadirachtin was perfected by Robert Larson in 1985 after more than a decade of work. A more concentrated product is now being marketed to commercial growers. These products have at least a one-year shelf life if stored properly. Because the product is so new and the supply limited, the commercial preparations are relatively expensive, about \$30.00 per pint. However, the higher price of the neem product should be weighed against the reduced harm to the environment that it represents. Synthetic pesticides are less expensive in the short run, but factoring in their total impact dramatically increases their true long-term cost.

As a side note, neem has been found to be beneficial to bees. Bees are coming under assault on several fronts. There are mites and diseases that cause bees to produce less pollen and honey and to become sick and die. Neem treated bees showed reduced levels of Nosema and chalkbrood over bees treated with the most current medicines and miticides. Though it appears that azadirachtin is the most active component of the neem compounds, crude neem oil topically applied to the bees provided significant protection against several bee mite species (Melathopoulos *et al.*, 2000). The neem treated bees produced three times as much pollen and twice the amount of honey as the non-treated bees (Liu *et al.*, 1989).

Agricultural fungicide

Neem provides plants and animals with protection from many types of fungi (Murthy and Sirsi, 1958b), (Bhowmick and Choudharg, 1982), (Schmutterer and Ascher, 1986). In several tests, spraying neem oil on plants prevented the outbreak

spectrum anti-viral activity (Andrei *et al*, 1985). The leaf compounds were extremely effective at reducing virus yield after infection by 99% without being toxic (Descalzo and Coto, 1989). The extracts act directly on the ability of the virus to replicate and infect cells, not by inducing an interferon production increase (Andrei *et al*, 1988).

The fruit of the chinaberry also contain some medicinal compounds. When specific extracts of the fruit were given to rats that had induced ulcers the rats showed decreases in the acidity of the gastric juices and reduced the ulcers by over 80 percent in 10 days of treatment. (Hanifa and Al-Khatib, 1984). These compounds required purification and isolation to be safe and effective, therefore no chinaberry fruit should ever be eaten or in any way ingested.

Though chinaberry and neem are from the same family, chinaberry should never be confused with neem. Neem is a safe and effective herb with thousand of years of testing and usage behind it. Ongoing tests continue to illustrate the lack of toxicity of neem and neem extracts. However, chinaberry is a tree with a long history of causing harm to those who ingest any part of the tree. It is only marginally effective as a plant pest toxin but plants sprayed with chinaberry extracts should be treated the same as you would any toxic pesticide.

Chinaberry trees should be removed from your yard if you have small children or pets that might put chinaberry fruit in their mouth. Children have died from eating 6 to 8 ripe fruits. Two dogs that ate a few chinaberry fruit developed signs of poisoning within a few hours. Though the dogs received emergency treatment, neither dog survived longer than 36 hours (Hare *et al*, 1997). Such poisonings are rare but the potential is there as long as the chinaberry tree is within reach of small children and pets.

“Cooking” Neem

If you go into almost any Indian store that carries food items and ask for “neem” they will usually assume you are asking for curry leaf also known as “cooking” neem. They will usu-

First Aid Balm

<i>Ingredients:</i>	neem oil	28 oz
	bees wax	8 oz
	eucalyptus oil	1/2 tsp
	wintergreen oil	1 tsp
	mint oil	1 oz

Heat the bees wax and neem oil together until they melt and mix. Let cool until the mixture is 100° F then add the other oils and stir for one minute.

**This is not for cuts or abrasions but for aches, pains and inflammation. For congestion place one teaspoon in a cup of very hot water and inhale the vapors.*

Neem Cream

<i>Ingredients:</i>	neem oil	2 oz
	almond oil	8 oz
	bees wax	4 oz
	zinc oxide	1 oz
	boric acid	1/4 tsp
	water	6 oz
	fragrance	4 drops

Dissolve the beeswax into the oil by heating the beeswax, neem oil and almond oil to 100° F, stirring until thoroughly dissolved. In a separate container heat the water to 100° F and dissolve the boric acid into it. Mix the two containers together while still hot and stir until the mixture has cooled to luke-warm. Add the zinc oxide and fragrance and stir until cool.

Neem Baby Oil

<i>Ingredients:</i>	sesame oil	9 oz
	neem oil	1 oz
	sandal oil	1 tsp

Simply mix the oils together while luke warm and stir for one minute. No fragrance is needed because of the natural aroma of the sandal oil.

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