NEEM OIL LIMONOIDS: PRODUCT OVERVIEW

Authors: Muhammed Majeed, Ph.D., Satyan, K.S., Ph.D., Lakshmi Prakash, Ph.D.

info@sabinsa.com  www.sabinsa.com
Neemoids®
(NEEM OIL LIMONOIDS)

INTRODUCTION

NEEMOIDS™ (Neem oil Limonoids) is a trademarked natural extract from Sabinsa Corporation, obtained from cold pressed neem seed oil and standardized to contain not less than 50% Total Limonoids and 1000 ppm Azadirachtin. Potential cosmeceutical applications include antibacterial, antifungal, antiparasitic, insect repellant, anti-pediculosis formulations for topical use in skin and hair care.

The Neem tree (*Azadirachta indica*) is traditionally labeled as “The Village Pharmacy” on account of its multifaceted healthful properties. Its biological properties range from immunomodulatory and anti-inflammatory effects to antimicrobial and pesticidal attributes. The leaves and seeds of *Azadirachta indica* yield limonoids with wide biological applications. These have antibacterial activity and have been traditionally used in the management of skin conditions such as eczema, psoriasis and certain fungal infections.

Neem (*Azadirachta indica*)

Neem oil limonoids are obtained from the cold pressed seed oil of *Azadirachta indica*. Traditionally, the seed oil and leaves have been used as insect repellant and as pesticides.

Neem oil limonoids containing Azadirachtin could be used in hair care formulations due to their anti-head lice, antidandruff and antifungal activities.
Limonoids and protolimonoids of Gedunin type such as nimbolin A (3), nimbolin B, nimbin (2), nimbidin (mixture of limonoids), gedunin(1) and Azadirachtin (4) are found in neem oil. These limonoids are formed from Δ⁷-euphol/ tirucallol precursors by oxidative degradation of C-17 side chain resulting in the loss of four carbon atoms.¹
BIOLOGICAL ACTIVITY

Insect repellant activity:
Neem products are good mosquito repellents showing 90 to 100% protection against malaria vectors and about 70% against *Culex quinquefasciatus*\(^2,3\). One controlled study evaluated the efficacy of a cream formulation containing 5% neem oil against *Culex quinguefasciatus* and *Anopheles culicifacies*. 4-5 g of the cream was applied to the exposed skin areas of human volunteers in Ghaziabad, India in the summer months of May/June and the monsoon months of August/September. Neem cream was found to offer 82% protection against *Culex* bites and 100% protection against *Anopheles* bites, as compared to untreated controls\(^4\).

Antibacterial activity:
The seed oil at concentration of 0.3% on agar plates was found to be active against *Staphylococcus aureus* and at 0.4% was active against *Salmonella typhosa*. The seed oil was found to be inactive against *Pseudomonas aeruginosa*\(^5\), but was active against *E.coli* and *Proteus* species at a concentration of 3%, and active against *Klebsiella pneumoniae*\(^6\), at a concentration of 6%. The undiluted neem seed oil was tested against various strains of bacteria, to yield zones of inhibition as shown in Figure 1.

Figure 1: Inhibitory effect of Neem oil against bacterial cultures
In a double-blind placebo controlled clinical trial on 55 patients with abnormal vaginal discharge due to microbial infections (bacterial vaginosis), seed oil administered intravaginally to adults at a dose of 5ml/day for 2 weeks, was found to inhibit the growth of *Chlamydia trachomatis*.

**Antifungal activity:**
Methanol and butyl-methyl-ether extracts showed antifungal activity against the following strains of fungi including *Epidermaphyton floccosum*, *Microsporum canis*, *Microsporum gypseum*, *Trichophyton concentricum*, *Trichophyton entagrophytes*, *Trichophyton rubrum* and *Trichophyton violaceum*.

**Anti-head lice activity:**
Traditionally, neem oil has been used by people, especially women in South Asia, to repel/kill head lice, *Pediculus capitis* belonging to the order Phthiraptera. In animal models, sucking lice (*Pediculus* sp.,) on infested bonnet macaque apes (*Macaca radiata*), disappeared on spraying neem oil.

Infestation with human head lice *Pediculus capitis*, was prevented and controlled by lightly wetting the scalp with a diluted (1:10) perfumed spray containing 1000 ppm Azadirachtin in ethanol. In a ten day trial, Neem oil preparations, ‘NeemAzal-F’ and NeemAzal-FT’ were slightly diluted with water and used three times (1st, 3rd, 10th day), as a shampoo for 5-10 minutes, for the treatment of lice-infested scalp, followed by thorough washing. No allergic effects were observed and the products were found to be effective in removing the infestation.

**Anti-inflammatory activity:**
Seed oil administration intramuscularly to rats at a dose of 50mg/ml offered protection against cotton pellet induced granuloma.
TOXICITY STUDIES
Ethanol/water (1:1) extract of the dried seed showed LD₅₀ 681mg/kg on intraperitoneal administration. The 24-h oral LD₅₀ was established as 14 ml/kg in rats and 24 ml/kg in rabbits¹³. No mutagenic activity was observed in Ames assay¹⁴. Single application of neem oil (1%) did not produce skin irritation in rabbits or any adverse effects in guinea pigs after exposure to aerosol¹⁵.

A pilot study in India, on 814 people suffering from scabies, revealed that application of a preparation containing neem and turmeric for 3 to 15 days resulted in improvement in 97% of the cases. No untoward side effects were observed in any of the patients¹⁶.

COSMECEUTICAL APPLICATIONS
NEEMOIDS® is a free flowing pale brown to yellowish brown powder obtained from cold pressed Neem seed oil and contains not less than 50% total Limonoids and 1000 ppm Azadirachtin. Potential applications include antibacterial/antifungal/antiparasitic /insect repellent/anti-pediculosis formulations including creams, lotions, hand/body washes, shampoos, oils and related products.
REFERENCES

9. Rice M, World Neem Conference, Bangalore India, Souvenir, 8-24, 1993
GLOBAL CONTACT & PROFILE

USA:
Sabinsa Corporation – NJ
70 Ethel Rd West, #6
Piscataway, NJ 08854
O: +1.732.777.1111
F: +1.732.777.1443
E: info@sabinsa.com

Sabinsa Corporation – UT
750 S. Innovation Circle
Payson, UT 84651
O: +1.801.465.8400
F: +1.801.465.8600
E: info.utah@sabinsa.com

Australia:
Sabinsa Australia Pty Ltd
O: +61 (02) 9356 2211
F: +61 (02) 9356 2308
E: australia@sabinsa.com

China:
Sabinsa China Office
O: +86 (25) 5238 9432/33
F: +86 (25) 5238 9436
E: marketing@sabinsa.com.cn

Europe:
Sabinsa Europe GmbH
O: +49 6103 270 1111
F: +49 6103 270 1127
E: sabinsa.europe@sabinsa.com

Japan:
Sabinsa Japan Corporation
O: +81 (42) 997-4620
F: +81 (42) 997-4621
E: info@sabinsa.co.jp

Malaysia:
Sabinsa Malaysia Sdn Bhd
O: +60-379-606-535
F: +60-379-607-535
E: malaysia@sabinsa.com

South Africa:
Sabinsa S.A. (Pty) Limited
O: +27-76-483-7758
F: +27-11883-4567
E: sa@sabinsa.com

“The vision of a research scientist takes on social and commercial expressions.” This in short explains the genesis and growth of the Sabinsa – Sami Labs Group of Companies.

Company Profile:

Sabinsa Corporation, founded in 1988, is a manufacturer and supplier of herbal extracts, cosmeceuticals, minerals and specialty fine chemicals. Sabinsa’s mission is to provide alternative and complementary natural products for human nutrition and well-being. Over the past ten years, Sabinsa has brought to market more than 50 standardized botanical extracts and privately funded several clinical studies in conjunction with prestigious institutions in support of these products. Its present operations have grown to employ 1000 people worldwide in ten manufacturing, R&D and/or distribution facilities. Additionally, botanical cultivation efforts undertaken by the organization now total nearly 40,000 acres to ensure sustainable supplies on its key products. All products intended for human consumption are certified Kosher.

Visit us: www.sabinsa.com