Essential News

Essential Therapeutics

The Ultimate Professional Aromatherapy Range

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Welcome to our July edition of Essential News

In the marketplace for essential oils, adulteration and fraud is all too commonplace.

See the inside information in our two-part story, **Aromatic Heresies - on Essential Oil Adulteration.**

Also in this issue:

- The diverse benefits of pure Neem oil.
- Camellia vegetable oil - a superior oil for massage and body care applications.

I hope you enjoy it.

Best Regards,

Ron Guba, Editor

Neem leaves and fruit.
Neem oil is expeller pressed from the seeds.

Neem Oil

An ancient oil with many benefits

The Neem tree, *Azadirachta indica,* is native to India and Burma and now grown in other tropical countries, including Australia. Historically the tree has been used for a wide range of medical disorders and is sometimes dubbed the "village pharmacy" or the "Wonder Tree" in India.

As long as 4,000-4,500 years ago, various parts of the Neem tree were used in beauty and medicinal products by the ancient East Indian Harappa people. Evidence of these uses exists in remains excavated in the region where the Harappa people formerly lived (present-day Afghanistan, Pakistan, and northwestern India). Neem extracts made from the leaves bark and seeds, including the oil pressed from the seeds, are still used extensively in traditional Ayurvedic and Unani Tibb medicine.

In *The Yoga of Herbs*, a book based on Ayurvedic medicine principles, by Drs. Vasant Lad and David Frawley, the major uses of Neem preparations are described as:

"For use in skin diseases like urticaria, ringworm, and eczema, parasites (including scabies), fever, malaria (for which it is famous), cough, thirst, nausea, vomiting, diabetes, tumors, obesity, arthritis, rheumatism, and jaundice.

Further: Neem is one of the most powerful blood-purifiers and detoxifiers in Ayurvedic usage. It cools the fever and clears the toxins involved in most inflammatory skin diseases or those found in ulcerated mucous membranes. It is a powerful febrifuge, effective in malaria and other intermittent and periodic fevers (in which case it is usually used with black pepper and gentian).

Neem can be taken whenever a purification or reduction program is indicated.

Continued...

Neem Oil continued from page 1

It clears away all foreign and excess tissue, and possesses a supplementary astringent action that promotes healing. Yet it should be used with discretion where there is severe fatigue or emaciation. With the medicated oil, it is one of the best healing and disinfectant agents for skin diseases, and an anti-inflammatory agent for joint and muscle pain." (1)

Other traditional uses for Neem extracts and oil include the use on infected wounds, skin infections, psoriasis and for serious conditions such as leprosy and tuberculosis. (2)

Based on traditional usage, modern research has supported some of these benefits. Recent research has investigated the possible benefits of Neem extracts in regards to:

Anti-infectious properties, as in dealing with bacterial, fungal and viral infections.(3)

Anti-inflammatory effects, as a possible adjunct in helping arthritic conditions. (4)

Potential **anti-cancer** and **immuno-stimulating** properties. (5)

Neem extracts can be **hypoglycemicaemic** and have a potential use in adult onset diabetes. (6)

Contraceptive – Neem extracts show potential as a possible inexpensive, non-toxic contraceptive. (7)

In agriculture, the most exciting use for Neem is that it is an excellent, basically non-toxic natural insect repellant, anti-feedant (stops insects from feeding) and insecticide. The main active compound is the triterpenoid, azadirachtin. This compound is structurally similar to insect hormones known as ecdysones. Ecdysones control the molting (the periodic shedding and secretion of a new exo-skeleton) and metamorphosis of insects as they pass from larva to pupa to adult.

Neem extracts with azadirachtin do not kill insects outright, but by interfering with their growth cycle, many insects that attack crops do not develop properly (they cannot molt, for example) and cannot reproduce further. Yet Neem is not harmful to beneficial insects such as bees, ladybugs and earthworms, nor to mammals or birds.

Neem extracts and oil can also be useful to control fungal and viral infections in plants. Neem extracts are also useful to repel and kill insects pests on animals and humans. (8)

Neem Oil

Perhaps the most important product from the "Pharmacy Tree" is Neem oil. The seeds of the Neem tree have a high oil content, up to 45% by weight. After the seeds are dried, the best Neem oil is produced by expeller pressing.

As with many common vegetable oils, the oil can also be extracted by the petrochemical solvent, hexane. An inferior oil is generally produced in this way by extracting the remaining oil left in pressed seeds after expeller pressing using hexane. This oil is often used for producing Neem soap. However, such oil is not recommended for general use.

Neem oil is generally light to dark brown, bitter and has a rather strong odour that can be said to combine the odours of both peanut and garlic. As with all vegetable oils, Neem oil is mostly comprised of triglycerides. The average composition of the fatty acids in Neem oil follows:

Fatty Acid	Type	Average %
Oleic	Omega 9 monounsaturated	42
Stearic	Saturated	21
Palmitic	Saturated	19
Linoleic	Omega 6 polyunsaturated	15
Arachidic	Saturated	2

The most 'active' compounds in Neem oil are not the triglycerides (the 'vegetable oil' part) which are emollient and moisturising for the skin, but a variety of other oil-loving compounds.

Considered the most important are the triterpenoid compounds (containing 30 carbon atoms), known as liminoids: azarachtin and the related compounds salannin, gedunin, azadirone, nimbin, nimbidine, nimbicidine, nimbinol and more. These compounds are only present in small amounts in the oil, but are very potent. The average content of azarachtin in Neem oil is 1500ppm or 0.15%.

Neem oil also contains a fair content of phytosterols, primarily campesterol, beta-sitosterol and stigmasterol.

The Benefits of Neem Oil

Expeller pressed Neem oil has been used in many of the therapeutic indications mentioned before.

The most straightforward uses are using Neem oil topically for a variety of skin conditions.

Inflamed skin conditions as with eczema and psoriasis. Neem oil has shown anecdotal success in helping these conditions, with its emollient, anti-inflammatory and pain & itch relieving properties. In this case, the use of undiluted Neem oil is not recommended. (9) Instead, use a 10% to 20% concentration diluted in other suitable vegetable oils or best added to creams such as our Ultimate Base or Essential Base Cream, or mixed into our Double Strength Aloe Vera Gel. The use of Neem oil along with Essential Fatty Acid vegetable oils (such as Hemp Seed & Rose Hip) with suitable essential oils (such as German Chamomile and Calendula CO2 extract) can be advised.

Parasite infections. Neem has proven useful against both the scabies mite and head lice. In these cases it can be advised to use Neem oil either undiluted or at a high concentration, for example, 1 part (33%) to 2 parts of any good vegetable oil.

With scabies, one Indian study 814 people with a scabies infestation used a paste made from Neem leaf (3 parts) and turmeric powder (1 part). 97% of the participants were cured within 3 to 15 days of daily application. (10) Another study demonstrated that the use of a 5% Tea Tree oil solution killed scabies mites and larvae more effectively than a standard 5% treatment using the insecticide, permethrin. (11)

Neem oil contains the same active compounds as the leaf and the oil has similar activity. Hence, a simple and effective scabies treatment can be the daily application of using a high concentration of Neem oil (undiluted or 33% or more in any good vegetable oil) with 5% Tea Tree oil added.

The same applies for the treatment of head lice. A recent study demonstrated that a shampoo with Neem extract was completely effective in killing all stages of head lice (including eggs) in sixty infected children after only 10 minutes, with no signs of irritation. (12)

With a shampoo, the actual content of Neem extract would be relatively low, with no more than a 10% concentration. Hence, the use of undiluted or 33% or more of Neem oil in vegetable oil would in fact be more concentrated than the shampoo used in the study. Again, the addition of essential oils will add to the effectiveness. 10% concentrations and above of a number of common essential oils have shown to be anecdotally effective in killing head lice and their eggs and some such products as such have been approved for this use by the Australian Therapeutic Goods Administration.

Neem flowers

Neem oil can be used in shampoo as well, certainly as a useful preventative. A simple way is to use a product like our Essential Base Shampoo. For every 100mL of shampoo, mix in 5mL of Neem oil. The addition of 1mL each of Tea Tree and Eucalyptus Australiana can be useful as well.

For other skin conditions, Neem oil can find use in the following ways:

Neem oil, unlike vegetable oils in general, has a good anecdotal history of use in dealing with topical bacterial and fungal infections. Some research studies, mostly in vitro (testing directly on a micro-organism), have demonstrated that Neem oil does have anti-bacterial, anti-fungal and anti-viral activity. For example, one study detailed that a 12.5% concentration of Neem oil inhibited the growth of 71.4% of fourteen different strains of bacteria. (13) Hence, using Neem oil undiluted or at a high concentration, would be more effective.

The addition to Neem oil of 5%, 10% or more of specific essential oils with noted anti-infectious activity, such as Tea Tree, Palmarosa, etc., would significantly add to the anti-infectious strength of any preparation. An example of a formula could be the addition of 5% each of Tea Tree and Palmarosa essential oil added to 90% Neem oil. Such a formula can be applied to tinea and other minor skin infections.

For use in the garden, Neem oil is an excellent botanical pesticide. Neem can be effective against a range of plant pests, including many leaf eating insects, white fly, aphids, scale insects, cabbage worm. Japanese beetle and more. Also for fungal problems such as black spot, rust and leaf spot.

Neem is also a excellent insect repellant in general for mosquitoes, midges and other biting insects. In one Indian study, Neem oil used at only 1% to 4% in Coconut oil gave up to 91% protection from mosquito bites for up to 12 hours after application. (14)
In another study, only 2% Neem oil gave 100% protection from sand fly bites for seven hours and longer. (15)

Neem oil works best when emulsified into water to create sprays. I can suggest that you try our *Essential Solubiliser* at a one to one ratio with Neem oil.

For most garden applications, the use of 5mL to10mL of Neem oil (mixed with Solubiliser) added to one litre of water will be sufficient.

For repelling mosquitoes and biting flies, use a higher amount, as in 10mL Neem oil &1mL Lemon Eucalyptus essential oil in 15mL Solubiliser added to 80mL of water.

Safety Issues

Neem oil has been used topically as a medicine and in cosmetics for millennia with a good safety record and is considered safe by various governmental authorities for topical application.

There have been occasional allergic reactions to Neem oil, so if you do have eczema or sensitive skin in general, it is recommended test a small amount on your skin first.

Neem **leaf** extracts have also been used for thousands of years, ingested as a herbal medicine, again with a good safety record. Neem leaf also contains significant amounts of azadirachtin and related liminoids as does Neem oil.

Yet, there are a number or reported cases in India of serious poisoning incidents, including some fatalities in children who have ingested Neem oil, in reported amounts as small as 5mL to 10mL. (16) No analysis of the Neem oil reported in these cases was undertaken. Whether or not the Neem oil ingested was simply expeller pressed Neem oil (or something else) and what possible constituents are responsible for the toxicity is not known.

Based on these incidents, Neem oil is classed as a Schedule 6 poison in Australia. Neem oil is considered safe for topical application. But, Neem oil is **not to be ingested**. Please keep out of reach of children and Neem oil containers should have a child resistant cap.

Since Neem does have some demonstrated contraceptive and anti-fertility effects (at high dosages), certainly do not ingest while pregnant or if you are trying to become pregnant.

Camellia Oil

Camellia or "Tea Seed" oil is a relatively new vegetable oil in Western countries, yet it has been used for hundreds of years, especially as an excellent cooking oil in Southern China and Japan. In Japan, the oil has been used for both hair and skin care, often used to enhance the lustrous hair of the geishas

The vegetable oil is derived from the seeds of three closely related species: *Camellia sasanqua* (syn. *C. oleifera), Camellia japonica* and *Camellia sinensis* (the common tea plant), all native to Eastern Asia. *C. sasanqua* is the most common source of the vegetable oil and is what we use for our *Essential Therapeutics* Camellia oil.

Above: Camellia flower and seed pod

Both *C. sasanqua* and *C. japonica* are also well known as popular garden varieties of Camellia bushes. The Japanese language characters for Camellia symbolise the meaning of the "Tree of Spring". The Camellia bush, in different varieties, blossoms all winter long, after which the flowers are replaced by nuts which are then picked for their oil in the autumn.

Properties and Uses

The oil is expeller pressed from the seeds and is lightly refined. It is light amber in colour, basically odourless and has a lovely, light silky feel on the skin. The composition of Camellia oil is somewhat similar to Olive oil, but it does have a lighter, less oily feel on the skin.

As you can see below, Camellia oil is very rich in monounsaturated Oleic fatty acid.

Typical Fatty Acid Profile of Camellia		
C16:0	Palmitic acid	9%
C18:0	Stearic acid	1%
C18:1	Oleic acid	80%
C18:2	Linoleic acid	9%
C20:0	Arachidic acid	1%

Camellia oil is excellent as a light massage oil with good slip and as a carrier for essential oils for Aromatherapy preparations, especially facial treatments. Camellia oil can be used as is, or mixed with other vegetable oils of choice.

In cosmetics, Camellia Oil has excellent skin moisturising and hair conditioning properties and penetrates the skin well.

Camellia oil can be added as a good active ingredient to shampoo and conditioner bases, gels, creams and lotions. It is excellent in products for mature, damaged, and dry skin and is beneficial for strengthening nails.

A good combination would be the use of equal amounts of Camellia oil and an 'EFA' oil, such as Hemp Seed.

Please see our product specials section, so we can encourage you to try this luxurious oil!

Aromatic Heresies

On Essential Oil Adulteration Part 1

"…A great many of the essential oils obtained from the more expensive spices, are frequently so much adulterated, that it is not easy to meet with such as are at all fit for use: nor are these adulterations easily discoverable. The grosser abuses, indeed, may be readily detected.

Thus, if the oil be adulterated with alcohol, it will turn milky on the addition of water; if with expressed oils, alcohol will dissolve the volatile, and leave the other behind; if with oil of turpentine, on dipping a piece of paper in the mixture, and drying it with a gentle heat, the turpentine will be betrayed by its smell.

The more subtile (subtle) artists, however, have contrived other methods of sophistication, which elude all trials. And as all volatile oils agree in the general properties of solubility in spirit of wine, and volatility in the heat of boiling water, etc., it is plain that they may be variously mixed with each other, or the dearer sophisticated oils with the cheaper, without any possibility of discovering the abuse by any of the before-mentioned trials…"

Perhaps the above quote appears that it could have been written recently. In fact, this quote is from the controversial book, *A Treatise on Adulterations of Food, and Culinary Poisons,* by the chemist Frederick Accum, published in **1820** (www.gutenberg.org/etext/19031).

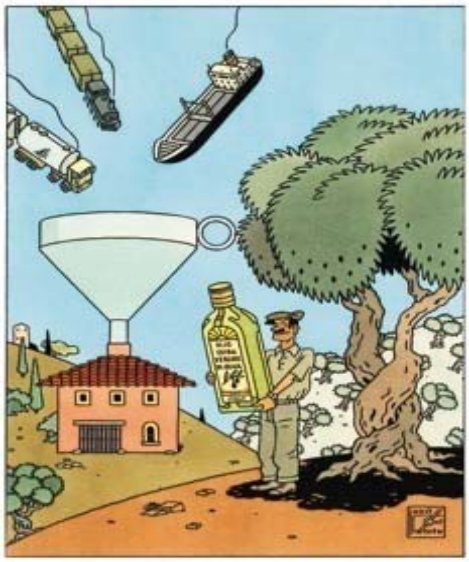
Well before the 1800's, once essential oils became items of commerce hundreds of years ago, unscrupulous traders quickly began to find ways to adulterate and extend essential oils for a better profit.

The question is: Is anything different in today's marketplace for essential oils?

In one sense, yes. Companies that purchase large quantities of essential oils for use in various products can either obtain the necessary equipment and expertise or contract to analytical laboratories to determine to a varying degree of certainty the purity and authenticity of essential oils. So, those companies that wish to perform proper quality assurance can do so – but it is still relatively uncommon.

Alas, however, the poor consumer, be they a retail customer, an aromatherapist, any health professional or a company depending on the hopeful honesty of their 'artist' supplier who gives them "good prices".

As we shall consider, the hopeful consumer is in the same position as those in the 1800's, where "the more subtle artists have contrived methods of sophistication which elude all trials". Such 'artists' are well and truly in operation today, happily conning unsuspecting consumers and businesses.



A cartoon depicting the common practice of adulterating olive oil with other cheap, highly refined vegetable oils.

http://intlxpatr.wordpress.com/2007/10/25/the-olive-oil-scandal/

Why is adulteration so popular?

Money is the most obvious reason, coupled with the fact that 'artists' generally can get away with it!

Consider this: A "Lavender oil", acceptable in aroma, can be made from a blend of synthetic and natural aromatic compounds (linalool, borneol, terpineol, etc.), some inexpensive Lavandin oil and a small amount of the least expensive clonal True Lavender oil for a cost of about $20.00 per kg.

This is not a 'fragrance' oil, where the aroma is more of a 'perfume' and is not reasonably matched to the aroma of a real True Lavender oil.

A blend of real clonal True Lavender oils can be done for perhaps $70.00 per kg in bulk, which will authentically meet the B.P. 2007 (British Pharmacopoeia) standard.

A top quality, high-altitude grown French population (grown from wild seed stock) True Lavender is in the order of $160.00 per kg, in multiple 200 kg drums purchased direct from the growing co-operative.

We regularly see Lavender oil 'blends' of the quality of the first 'Lavender oil' mentioned above, being sold to consumers in a one kilogram bulk size in the order of $175.00. Starting at $20, that is a price mark up of over 700%! A 5mL bottle may be $4.00, where the actual cost of 'oil' is about 10 cents.

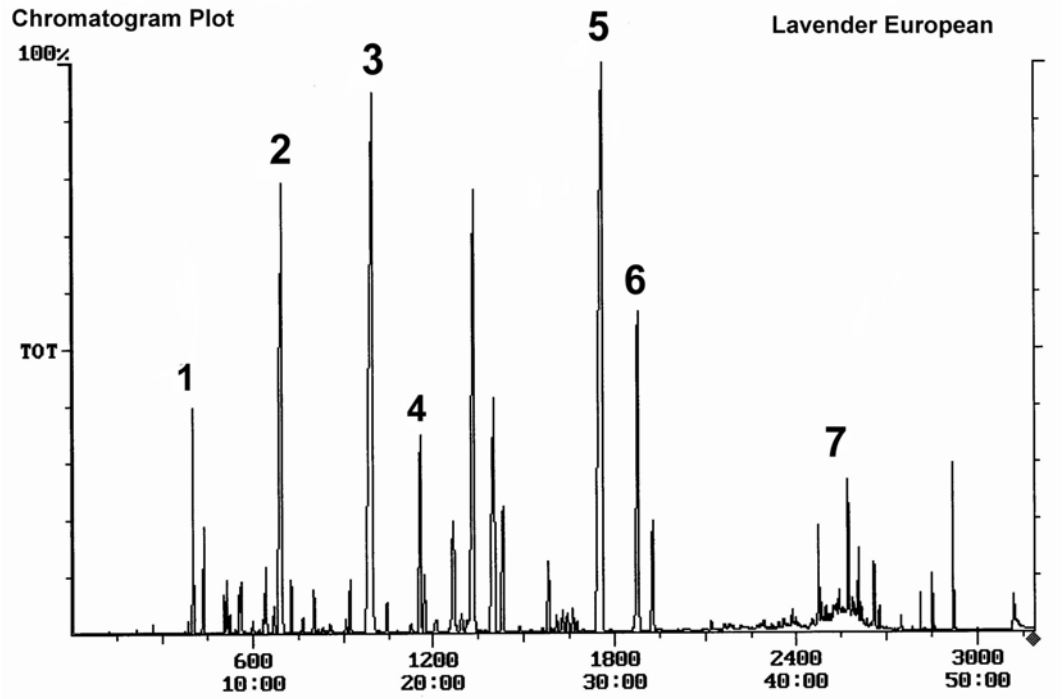
In cases such as this, the "Lavender oil" can be promoted as 100% pure & natural, Aromatherapy-grade French True Lavender oil. The price is pitched to be attractively less expensive than a realistic price for an authentic population True Lavender oil, yet enjoying a huge profit margin.

The supplier may well provide material safety data and a certificate of analysis to further impress customers. Such a 'certificate of analysis' is not worth the paper it is printed on. Yet, unless the consumer is going to undertake a full expert analysis of the product (such as gas chromatography/mass spectrometry, optical rotation, etc.), the 'artist' company has no real concerns.

In one particular case, we know of a supplier who sends out samples of their oils for gas chromatographic analysis to a local university and infers that by doing this and detailing major constituents of the oil is a guarantee of authenticity. However, what is **not** being said is that the analyst is not asked or paid to comment on quality or adulteration. He is paid to just simply determine what the major aromatic compounds are and nothing else. This easily allows for the addition of both 'nature identical' synthetic aroma chemicals and isolated compounds from inexpensive essential oils to be blended together to create a similar profile to an authentic essential oil. More of the craft of the subtle artist.

We must remember that the vast majority of the market for essential oils and fragrance compounds is for use in household products, cosmetics, fragrance products and flavours. In these markets, the use of authentic essential oils is often too expensive for use. Hence, inexpensive, fully synthetic (or containing small amounts of natural aromatic compounds or essential oils) fragrance blends are the norm.

So, for example, it is clear that Sorbent toilet tissue scented with Rose, does not actually use any real Rose oil at thousands of dollars per kilogram! Stretching the truth a bit further, we can also be certain that real jasmine absolute is NOT being used in a Jasmine 'Aromatherapy' liquid hand soap.



GC/MS analysis of "Lavender European" offered as a pure "Aromatherapy" grade essential oil.

See next page for explanation.

From Page 6

The chromatograph is an example of a **grossly adulterated** Lavender essential oil. It appears this product has passed through at least two levels of construction, first as a Lavandin blend with synthetics and inexpensive fractions of essential oils added, then further blended by another company to create an inexpensive "True Lavender" blend. This product is being promoted in bulk as a fine "Aromatherapy grade" True Lavender essential oil and is a good example of conscious fraud by an unscrupulous company. Such a "blended" product has its uses in say, fragrancing a laundry detergent. But it does not belong in small bottles as an authentic True Lavender oil for therapeutic use.

The numbered 'peaks' on the chromatograph represent:

Peak 1 Alpha-pinene 6%. This is only found in tiny amounts in True Lavender. Inexpensive terpene fractions, likely from Pine oil, have been added.

Peak 2 1,8 cineole 8%. Cineole is less than 1% in True Lavender oil. The high cineole content is a sign of the cheap Lavandin oil used in the product.

Peak 3 Linalool 25%. This is an appropriate amount of linalool for True Lavender. However, we detected plinol as well in small amounts, which shows that synthetic linalool has been added, synthesised from turpentine.

Peak 4 Camphor 5%. As with 1,8 cineole, this high camphor content is from the Lavandin/synthetic blend used.

Peak 5 Linalyl acetate 30%. This is a reasonable amount of linalyl acetate which is found in both True Lavender and Lavandin. The source here is from Lavandin oil with added synthetic linalyl acetate. Because the Lavandin oil in the blend has been diluted with other added compounds, synthetic linalool and linalyl acetate were added to boost their content to levels seen in natural Lavender oil.

Peak 6 Isobornyl acetate 7%. This compound, with a pine needle odour, is synthesised from pine oil. It has been added to improve the overall aroma.

Peak 7 Mineral oil 10%. You will see the peaks under # 7. These represent various sesquiterpene compounds naturally occurring in both True Lavender and Lavandin oil.

However, notice the "hump" above the arrow. These are a variety of hydrocarbon compounds found in petrochemical-derived mineral oil. It has been added to reduce the price further and the producer hoped the mineral oil would not be noticed "hiding" under the sesquiterpenes.

This article will be continued in the next issue of *Essential News*.

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