



Essential News

Essential Therapeutics

The Ultimate Practitioner Range

Vol. 18 June 2005

Greetings.

In this issue we discuss:

Real Rejuvenation – the Role of Essential Fatty Acids.

We conclude with the rest of the story, continuing from Volume 17.

When is an Essential Fatty Acid vegetable oil most effective? When it is fresh! We consider what causes rancidity and how to properly store your vegetable oils.

The misunderstood essential oil of Basil.

We discuss the many therapeutic benefits of Basil and the pros and cons of its supposed “bad reputation”. We will see that used intelligently, Basil oil is very beneficial, not “bad” or banned!

Along with some essential oil news, we hope that you enjoy our special offers for

Ron Guba, Editor

Beneficial Basil

Another member of the prolific essential oil producing Lamiaceae family, Basil has been used since antiquity for both medicinal and culinary purposes in numerous cultures.

The name Basil is derived from the Greek *basileus*, meaning king, perhaps due to its reputation as the foremost herb to preserve foods and counteract putrefaction.

It is interesting to note the strong religious and spiritual associations of Basil. Used since ancient Vedic times in India, the Holy Basil (*O. sanctum*) has many spiritual attributes in Hinduism.

From the modern Ayurvedic physician, Dr. Vasant Lad, “Basil *opens the heart and mind, bestowing the energy of love and devotion. Sacred to both Krishna and Vishnu, it strengthens faith, compassion and clarity.*” Basil has sacred attributes as well in Orthodox Christianity and Islam.



Which Basil?

The common name of Basil refers to a number of related species and varying essential oil composition. The genus *Ocimum* contains at least fifty and perhaps as high as 150 separate species. Grown in many countries, *Ocimum basilicum* has several chemotypes, or variations in essential oil composition.

“Exotic” Basil oils from the Comores, India, Thailand, etc. are rich in methyl chavicol (as discussed in this story), Egyptian and Russian oils are generally high in eugenol, European “Sweet” Basil oils contain higher amounts of linalool (as is Australian grown Sweet Basil oil) and some Indian oils can be high in methyl cinnamate.

Other herbaceous *Ocimum* species utilised for the production of essential oils include:

Ocimum sanctum or ‘Holy Basil’ – generally rich in either eugenol or methyl eugenol, but is highly variable in composition.

Ocimum gratissimum or ‘Pungent Basil’. There are four different chemotypes, the ‘Clocimum’ hybrid being rich in eugenol (like **Clove**).

Ocimum canum is rich in camphor.

With such a wide variety of basil cultivars and chemotypes, it is clear that we must specify what we are using for therapeutic purposes.

Exotic Basil – *Ocimum basilicum* var *basilicum*

For this article, I will discuss Exotic or Tropical Basil (I simply call this essential oil Basil). This Basil is the methyl chavicol-type and is most prized by French Aromatherapy practitioners.

The typical principal constituents of an Indian *O. basilicum* oil are: methyl chavicol (estragole) (74%), linalool (19.5%) and <1% of cineole, germacrene D and methyl eugenol. Methyl chavicol can be as high as 88% and linalool as low as 1% in some cultivars.

Quality Issues: Given the wide variety of chemotypes, it is important to determine that the correct type is identified by analysis. Creation of ‘Sweet’ Basil oil in years past included the extension of Sweet Basil oil with cheaper methyl chavicol oils and *l*-linalool (naturally derived or synthetic). The leftover distillation fractions of Basil oil, after the methyl chavicol has been removed, is occasionally offered as the whole oil.

Tropical Basil has a considerable range of possible therapeutic benefits:

Therapeutic Properties:

Anti-spasmodic +++, neuro-regulating, analgesic, digestive, warming

Anti-spasmodic +++, mild expectorant

Variable anti-bacterial, anti-viral, anti-inflammatory, (especially from infection origin)

Neuro-regulating, ‘yang’ tonifying, adrenal stimulant, analgesic

‘Yang’, reproductive tonic, anti-spasmodic

Venous decongestant

Therapeutic Indications:

Excellent for tight, cramped muscles in general, muscular and joint inflammation, nerve inflammations (neuritis, neuralgia), menstrual cramps, poor digestion, colic, nausea, gastritis, digestive cramps, hiccoughs and constipation.

Coughs and colds, chronic bronchitis, asthma, asthmatic bronchitis, sinusitis, etc.

Viral hepatitis (A, B and C), viral neuritis, multiple sclerosis, viral infections in general, rheumatoid arthritis, congestive prostatitis, urinary infections (due to staphylococcus)

Fatigue states - both physical and mental, anxiety ++, melancholy, depression, temporary paralysis, headaches, migraines, earaches, emotional shock, fainting and post-illness debility.

Sexual disinterest, impotence, infertility, menstrual cramps, P.M.S., possible for delayed or scanty periods.

Poor venous circulation, varicose veins.

These indications for use include some quite serious conditions, such as viral hepatitis and multiple sclerosis. I should state that Basil is certainly no proven ‘cure’ for these conditions, but are suggested by some authors (notably Pierre Franchomme and Dr. Daniel Pénœl in *L’Aromatherapie Exactement*) as a possible complementary treatment based on personal experience and anecdotal case histories.

Certainly, the most notable properties of Basil essential oil are strong anti-spasmodic, mild anti-inflammatory and ‘Yang’ stimulating. I have noted what are considered to be the most outstanding indications for use in **bold** above.

Herbal Energetics

Renaissance herbalist Gaspard Bauhin wrote in 1560, “this herb with its fine scent quickens the brain and heart, and restores the vital spirits”. Wilhelm Ryff added in 1582, “it awakens joy and courage.”

As with other members of the mint family, such as Peppermint, Basil has long been considered an excellent cerebral (cephalic) and nervous system stimulant, specifically of the sympathetic system.

Its indications for use include depression, grief, mental sluggishness, and as first aid for shock and fainting.

Overall, Basil is fundamentally a “yang”, warming, drying and stimulating tonic with a focus on the reproductive, respiratory and nervous systems.

Basil has good sympathetic nervous system and adrenal stimulant actions, useful for dealing with fatigue states, recovery from illnesses and the like.

From the 1930’s, the Italian researchers, Giovanni Gatti and Renato Cajola stated that in some instances Basil oil was better suited for lung infections than Thyme essential oil. Supporting the fiery Yang energy of the body, Basil is useful for asthmatic and bronchial conditions when depression, cold and fatigue are prominent.

For individuals who are very ‘Yin’ and airy, often with anxiety and feeling ‘out of the body’, Basil is an oil of choice for its calming and grounding effects.

Safety Issues

Basil and other herbs containing methyl chavicol have been used since antiquity with no reports of real toxicity – a long history of safety.

Unfortunately, high methyl chavicol-containing Basil oil has gained a reputation as a “dangerous” essential oil, recommended by some not to be used in Aromatherapy treatments. Instead, Sweet Basil oil, with a low content of methyl chavicol (<7%) and high linalool content has been recommended instead. But, this is a very different oil and much of the therapeutic benefit is attributed to methyl chavicol. Why is this?

Methyl chavicol (or estragole), along with safrole (as in Sassafras), methyl eugenol, anethole and elemicin are examples of naturally occurring alkylbenzene compounds.

Some of these alkylbenzene compounds, notably safrole, have been shown to be carcinogenic (cancer causing – especially liver tumours) in laboratory animals and in other carcinogenicity studies. This had led to safrole being permitted in only tiny amounts in foodstuffs and fragrances.

Methyl chavicol has also been demonstrated to be a **weak carcinogen** in rodents and has been the subject of numerous studies. At present, no government authority has restricted the use of methyl chavicol (or the herbs containing it, such as Basil and Tarragon) in foodstuffs, fragrances or herbal medicines, as the dosages concerned are considered too small to be of consequence. I must say here, that I am no particular fan of animal testing, but in the case of carcinogenicity studies, there is no other considered alternative.

In the case of alkylbenzene compounds such as methyl chavicol, it is not the compound itself that can cause cancer by damaging cellular DNA, but by a **reactive metabolite** (compounds formed as the original compound is “digested” for excretion).



With methyl chavicol, the metabolite of concern is 1'-hydroxyestragole. This is always further metabolised to 1'-sulfooxyestragole and 1'-hydroxyestragole-2', 3'-oxide. These are the **reactive metabolites** that will form adducts (or chemical links) with DNA, at high dosages causing mutations and eventually uncontrolled cell growth – better known as cancer. (1)

The major point to make is that 1'-hydroxyestragole is only created in large amounts when **large dosages** of methyl chavicol are either injected or fed to lab rodents. In the case of lab rats, these amounts can be 0.5 gram per kg of bodyweight per day. For comparison, a for an average 70 kg adult, this would be a dose of **35 grams per day** - about **47 grams** (about 50mL) of a high methyl chavicol-containing Basil essential oil. A huge amount! (2)

With **smaller dosages**, 1'-hydroxyestragole is **not** formed except in tiny amounts. Instead, methyl chavicol is metabolised to **non-reactive** (it does not cause mutations or cancer) hydroxy-allylbenzene.

In the case of studies of rats and mice, we find when they are fed methyl chavicol over a period of time, that the NOAEL level (the level at which no adverse effect is seen) is about 260mg per kg on average (about **23 grams** [about 25mL] of Basil oil for a 70kg adult) for both cancer causation and toxicity to a developing foetus. At this level and below, only a small amount of 1'-hydroxyestragole is produced. (3)

Humans are different again, and create even less 1'-hydroxyestragole at low dosages of methyl chavicol. In one study, volunteers ingesting a low dose of methyl chavicol produced a low of 0.2% and a high of only 0.4% of 1'-hydroxyestragole – a tiny amount. (4)

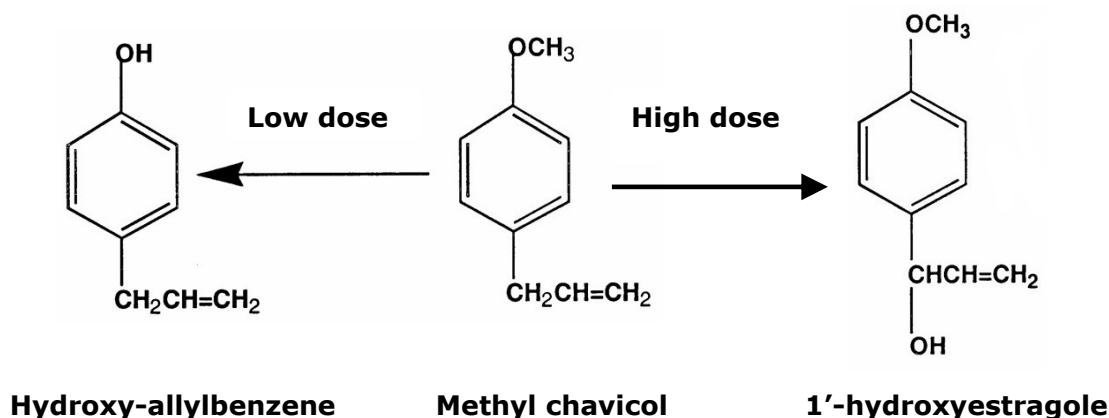


Figure 1. Methyl chavicol metabolism. At low doses, methyl chavicol is metabolised to the safe compound, hydroxy-allylbenzene. Only at high dosages is a significant percentage converted to the problematic 1'-hydroxyestragole.

A sample of two conclusions from these studies: “These findings may have important implications for the safety assessment of food flavouring, since the dose levels used in carcinogenicity studies have been *very much larger* than the estimated level of human daily intake” and “for these reasons it is concluded that the present exposure to estragole resulting from consumption of herbal medicinal products (short time use in adults at recommended posology [recommended dosages]) does not pose a significant cancer risk.” (5, 6)

Cancer studies do not give the full picture

It should also be noted that these carcinogenicity studies use high doses of the isolated compound only, in this case methyl chavicol. This does not determine then the potential protective interactions of other compounds present in an essential oil or herb.

For example, one study looked at herbs that increased the production of the carcinogen-detoxifying enzyme glutathione-S-transferase (GST) in the liver, stomach and oesophagus of mice. The herbs studied included cumin seeds, poppy seeds, tumeric – and **basil leaves**. These herbs and more increased the GST level by over 78%, high enough for these herbs to be considered as **cancer protective** agents. (7)

The American National Cancer Institute has developed a long list of foods with cancer preventative potential. Many of the culinary herbs, such as Rosemary, Oregano and **Basil** are on the list of foods with modest anticancer activity. (8)

In summary, Basil is a beneficial essential oil and does not pose any risk if we take into account:

- ★ Aromatherapy preparations are meant for treatments for specific complaints for limited amounts of time. Basil oil is not suggested to be used in high dosages as say, a perfume, for years on end or adding 5mL to pasta every day for a powerful pesto!
- ★ It must be appreciated that when Basil oil is applied to the skin, that the majority of the oil evaporates from the skin. How much methyl chavicol will penetrate human skin (or how it will be metabolised) has not been studied. Compounds such as lemon-scented citrals are absorbed at less than 3%; the absorption of Lavender oil in one study was approximately 11%. All in all, one can conservatively state that **less than 50%** of a topically applied dose (if not occluded or covered with an impermeable covering) will be absorbed.
- ★ All studies on methyl chavicol were based on either injecting or feeding methyl chavicol to lab animals and in these cases the **total dose** is absorbed.

Suggested dosages & concentration

For use in a full body application, such as massage, a 2.5% concentration limit is suggested.

For localised application to specific areas (neck, lower back, etc.) up to a 10% concentration.

It is not necessarily “dangerous” to use a higher concentration on small, specific areas – the limits above are simply a guideline for general use.

For applications in therapeutics baths and inhalations, no particular dosage limits are recommended; the dosage absorbed is quite small.

For children under 12 years of age, it appears prudent to treat Basil essential oil as is the case with phenolic essential oils such as Red Thyme and Oregano. That is, such essential oils are not generally recommended for application to the skin except in low concentrations (<1%).

French Aromatic Medicine practitioners and medical herbalists do not suggest any limit of use during pregnancy or breast feeding for either the essential oil or for herbs containing methyl chavicol. This applies even to the oral ingestion of Basil and Tarragon essential oil. (9, 10, 11)

On the other hand, one governmental group, the European Agency for the Evaluation of Medicinal Products, recommend the use of herbs with a high content of methyl chavicol be minimised with children, pregnant and breastfeeding women until “further studies of the dose-response curve in rats at low levels of exposure to estragole are undertaken.” (12)

In this case, it is a matter of personal choice. Obviously, the use of low concentrations of Basil oil presents the least potential for any harm. The last or third trimester of pregnancy sees the developing child the least susceptible to any potential chemical “insults”.

One can suggest the use of an essential oil preparation to relieve the low back pain common in the last trimester containing a 10% concentration of Basil, Rosemary CT1 and other essential oils with complete safety, as an example.

Basil oil has not been shown to cause any skin allergic reactions, but can be mildly irritating to the skin when used neat or at high concentrations.

All in all, used intelligently, Basil oil is beneficial – not banned or bad!

See last page for references.

Real Rejuvenation – the Role of Essential Fatty Acids

Continued from Volume 17, December 2004 *Essential News*

Proper storage is important!

Vegetable oils rich in polyunsaturated fatty acids have an important characteristic that needs to be considered – they can oxidise (or go rancid) quickly if they are not kept properly. Oils and fats rich in saturated and monounsaturated fatty acids also oxidise, but at a much slower rate.

Why is preventing oxidation important?

The oxidation of fatty acids leads to the production of *free radicals*, molecules that now contain a ‘hungry’ unpaired electron. Free radicals are very reactive. In their search for another electron to pair with, they easily react with other molecules, breaking them apart and creating new compounds.

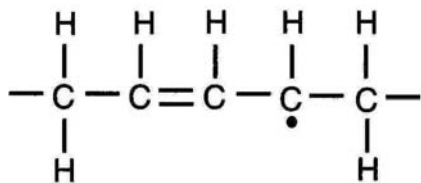


Fig. 3 A fragment of a fatty acid with an unpaired (free radical) electron

‘Free radical’ reactions are a normal and necessary part of many important chemical reactions in our cells, but they are *controlled* reactions. However, from 2% to 5% of these free radicals escape from control and it are these radicals that can damage important molecules in our cells and tissues, such as DNA. Present theories suggest many degenerative diseases and the processes of aging (including aging skin) are due to excessive free radical damage.

Hence, the ingestion of foods containing free radicals, as in rancid vegetable oils and fats, adds further to this burden of cellular damage. This is true as well for the topical application of rancid oils to the skin – we don’t want to add to free radical damage!

The process of oxidation in vegetable oils leads to the production of other compounds, such as hydroperoxides and aldehydes. Peroxide levels are used as a measurement of rancidity in oils. Such compounds give the bad taste and odour to rancid oils, and have various toxic properties. On the skin, such compounds are more likely to cause allergic sensitisation reactions.

What factors cause rancidity?

Rancidity means oxidation – the reaction of oxygen in the air reacting with fatty acids. Oxidation is sped up by three factors: exposure to air, light and heat.

Light is particularly damaging to polyunsaturated fatty acids. A photon (the basic ‘particle’ of light) can energise one electron on a fatty acid chain, causing it to take off with a hydrogen nucleus. This leaves behind an unpaired or ‘free radical’ electron on a carbon atom, now hungry to react with another molecule. This one reaction can now continue up to **30,000 times** before the original ‘excited’ electron loses its energy and comes back to its original energy state. In these reactions, any oxygen present will be drawn in to oxidise fatty acid molecules into other compounds.

Light will also excite oxygen, so that an electron exits, leaving behind the very reactive ‘singlet oxygen’ free radical, which easily reacts with the fatty acids.

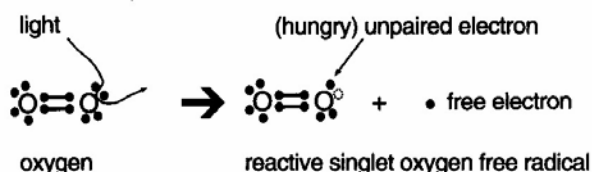
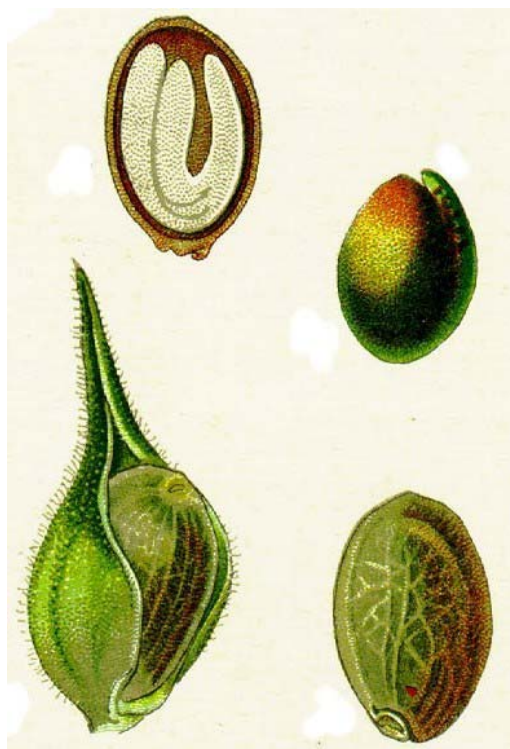


Fig. 4 Light creates reactive singlet oxygen.

Given the damage light can cause, it is amazing that many commercial vegetable oils are packaged in clear plastic! This is more for consumer acceptance than for cost savings. Even though the addition of synthetic antioxidants helps, light damage shortens the life of such oils.

The higher the temperature, the more quickly these oxidation reactions proceed. And if polyunsaturated vegetable oils are over-heated (as in cooking or in the hydrogenation process of making margarine), the fatty acids will also change their 'shape', from the normal 'bent' *cis*- form to the straightened *trans*-form, with toxic long-term results to health. It is only recently that moves are being made to demand that *trans*-fatty acid amounts be listed on food labels.

The oil expressed from **Hemp seeds** is very rich in essential fatty acids, like Rose Hip oil and contains 2% of *gamma*-linolenic acid (like Evening Primrose) in addition. Excellent for skin regeneration.



How to protect your oils

Look for polyunsaturated vegetable oils that have been stored under refrigeration and flushed with nitrogen gas, to remove oxygen. These oils are best packaged in either pharmaceutical amber glass or opaque metal containers. A realistic use by date is appropriately listed for all vegetable oils.

It is useful to remember that expiry dates are *approximate*. When an oil bottle is full, unopened and stored in cool, dark conditions (as in our warehouse), the expiry "clock" ticks very slowly. It is only when the bottle is opened and begins to be used that the "clock" begins to go much faster.

Therefore, the expiry date attempts to give a realistic figure under normal use conditions.

To get the longest life, when you purchase Essential Fatty Acid vegetable oils, it is then best to store them in a cool, dark place. And what is the coolest, darkest place? The freezer - or at least the refrigerator! EFA oils remain liquid even in the freezer. At that low temperature, oxidation of the oil will be greatly diminished, keeping fresh perhaps up to twice as long as compared to oil kept at room temperature.

If you purchase a larger bottle or container of the oil, you can look at decanting the oil into several smaller bottles filled to the top and tightly capped. If kept away from light, this will help to ensure freshness of the oil to at least any listed use by date, even kept at room temperature.

Lastly, you can add some of our *Amiox* antioxidant to any of your vegetable oils. *Amiox* is our unique Rosemary CO₂ extract that is a potent antioxidant, as strong as the common synthetic antioxidant, BHT. Antioxidants are helpful because these molecules 'mop up' oxygen and free radicals much more readily than the fatty acids in the oil.

By adding only two drops (or 0.05%) of *Amiox* to every 100mL of vegetable oil, the 'shelf life' of the oil can be extended for perhaps another 30% to 40% longer. With our Essential Fatty Acid oils, we recommend that you add four drops (or 0.1%) of *Amiox* for every 100mL of oil. Simply add the *Amiox* and shake the bottle until mixed.

Amiox is far superior to either Wheatgerm oil or Vitamin E in its antioxidant strength.

In summary, vegetable oils rich in essential fatty acids are excellent to prepare truly 'regenerative' cosmetics and to create therapeutic preparations for a wide variety of common skin disorders. Keep them fresh and you can be assured of the best results.

A sample formulation:

EFA Gel for sensitive skin

To make 100mL total:

Rose Hip or other EFA oil	7mL
St. Johns Wort Infused Oil	7mL
<i>Sensitive Skin Synergy</i>	2mL or 64 drops
Or: True Lavender	0.5mL or 16 drops
Calendula CO ₂ extract	0.5mL
German Chamomile CO ₂ extract	0.5mL
Australian Sandalwood	0.5mL

Amigel prepared gel to make 100mL (84mL or grams)

To prepare, simply blend the ingredients well into the Amigel. A ‘stick’ blender works best.

Apply a thin film 2 to 3 times per day, as needed.

With sensitive or irritated skin, always ‘patch test’ the formulation first.

Product News – Organic Lavender

Announcing a change to our really true, Organic True Lavender essential oil!

Essential Therapeutics was the first to offer a certified organic True Lavender essential oil to Australian customers. For over 14 years, we have offered a now ECOCERT certified French True Lavender oil.

We have just recently received a large batch of an ACO (Australian Certified Organic) certified True Lavender essential oil from Russia. It is a fully steam distilled oil (not a short ‘perfume’ distillation) with an excellent aroma and composition.

Given the quality of this oil AND the fact that it is of a very reasonable cost, we are will now be replacing the French organic with this Russian organic oil at a more attractive price.



ACO
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As always, we have a wealth of other Lavender essential oils to choose from:

True Lavender, wild harvested * True Lavender, French population * True Lavender, Bulgarian

True Lavender, Australian * Lavender Super Hybrid traditional (*L. intermedia* clone super linalyl acetate)

Wild Spike Lavender

Beneficial Basil References

1. Iyer LV et al. Glucuronidation of 1'-Hydroxyestragole (1'-HE) by Human UDP-Glucuronosyltransferases UGT2B7 and UGT1A9. *Toxicological Sciences* 73, 36-43
2. Caldwell J 1991 Basil & methyl chavicol – statement on new data. *International Journal of Aromatherapy* 3(1): 6
3. The Flavor and Fragrance High Production Volume Chemical Consortia - Robust Summaries for Estragole
4. Sangster, SA et al 1987 The metabolic disposition of {methoxy-14C}-labelled trans-anethole, estragole and p-propylanisole in human volunteers *Xenobiotica* Oct; 17(10):1223-1232
5. Sangster, SA et al 1987 *Ibid*
6. Final position paper on herbal medicinal products containing estragole. The European Agency for the Evaluation of Medicinal Products March 2004 p5
7. Aruna K, Sivaramkrishnan VM. Plant products as protective agents against cancer. *Indian Journal of Experimental Biology* 1994; 47 (11): 2063-2068
8. Mills S, Bone K. *Principles and Practice of Phytotherapy* Churchill Livingstone 2000, p157
9. Franchomme P, Pénöel D. *L'Aromatherapie Exactement* Roger Jollois Editeur 1990
10. Mills S, Bone K. *Ibid* p382
11. Wichtl M. *Herbal Drugs and Phytopharmaceuticals* CRC Press 1989, p105
12. Final position paper on herbal medicinal products containing estragole. *Ibid.* p5



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