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THE FIRST TRULY INDEPENDENT WATCHDOG FOR THOSE
WORKING WITH NATURAL AROMATIC MATERIALS

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MELISSA OIL - Cropwatch's Archive.

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§1. Extract from *Cropwatch Newsletter 4, July 2006.*

Melissa oil. IFRA have decided this minor essential oil (please note: which is actually derived from *Melissa officinalis* subsp. *officinalis* L. to distinguish it from *M. officinalis* oils of other subspecies which have different compositions) rests in the category of 'not to be used as or in perfumery/safe conditions of use have not established'. It was previously listed amongst 14 recommended essential oils (correct subspecies indicated) to generate income for developing countries in FAO's Agricultural Services Bulletin 94 *Minor Oil Crops*.

Baker (2006) comments that Melissa oil (subspecies not defined) is 'not used in perfumery', presumably based on IFRA's conclusions from a usage enquiry of trade organisation members. However its top-note profile was previously used in the creation of the perfume "Coeur-Joie" (Nina Ricci) who's launch date some put at late 1930's (e.g. Arctander 1961), others later at 1946. The comment quoting IFRA, saying that Melissa oil is not used in perfumery is different from saying that the ingredient is not used at all in the whole of perfumery (i.e. in natural perfumery or in artisan crafted cosmetics where it is used to fragrance creams & lotions etc.). If Corporate Perfumery has shown little current interest in the oil of *M. officinalis* subsp. *officinalis* – the use of which dates back to the Ancient Egyptians, and which has monographs in respected reference tomes like Arctander & Guenther - it may simply be because its' keeping qualities are poor, that it is difficult to find unadulterated & its fresh citrus note can be mimicked more cost effectively by alternative materials (i.e. it's over-expensive!). Estimates of annual production figures for *Melissa officinalis* subsp. *officinalis* L. vary widely, ranging from 2.5Kg/year (FAO), 40Kg/annum (Aqua-Oleum, undated). Cropwatch has 200Kg/annum for 2004 for *Melissa officinalis* subsp. *officinalis* L.*; but for the different oil *Melissa officinalis* subsp. *altissima* Dawson the annual output for 2004 was estimated at 30Kg (Cropwatch, unpublished information). RIFM would presumably be reluctant to spend valuable research funds on such a minor aroma material, and a request for a SCCP Opinion would not therefore be likely to materialise.

* N.B. This figure reflects an initiative by a number of UK farmers to grow medicinal crops on set-aside land. Unfortunately, much of the essential oil produced remained unsold and interest in growing *Melissa officinalis* (and production volumes) waned.

However, Melissa oil is a **flagship aromatherapy essential oil**, has useful properties in aromatherapy & herbal medicine, & any doubts about its' safety in a perfumery application would appear inconsistent with its widespread & fairly untroubled history of use in aromatherapy practice for the past several decades. There is something wrong when Corporate estimates of usage start to determine our attitudes to ingredients (although, of course, provided you are not a member of IFRA there is nothing to stop you using it in fragrances or cosmetics within the EU).

§2. IFRA Reveals its Toxicological “Evidence” against Melissa Oil.

(First published on *Aromaconnection* 24th May 2009).

Pre-amble.

It has always been something of a curiosity that IFRA has previously seen fit to prohibit melissa oil (lemon balm oil) which derives from *Melissa officinalis* L. ssp *officinalis*, as an ingredient of fragrances. The reasoning behind this, according to the published IFRA Standard for melissa oil, issued on 16-07-2008, was said to be:

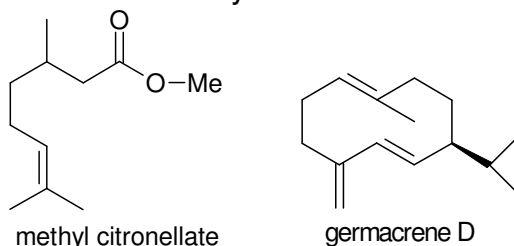
- 1) presence of structural alerts as defined in the Human Health Criteria Document (Ford *et al.*, 2000) and/or
- 2) adverse data on the material itself and/or
- 3) adverse data for a structurally related material based on toxicological concerns about its contained components from structural point of view.

Whilst melissa oil enjoys a considerable reputation in aromatherapy for its alleged beneficial properties, the usage volume of melissa oil in corporate perfumery nowadays has to be vanishingly small, perhaps running to no more than a few kilos per annum, since many perfumers consider the high cost of the ingredient is not justified by any contained unique notes, overall odour value, stability, or performance in product. In the days of early perfumery, the situation may have been different, for example *Melissa officinalis* was said to be an ingredient of the 17th Century cordial Eau des Carmes. Melissa extracts on the other hand contain classes of compounds not found in the essential oil, which may have acetylcholinesterase inhibiting, anti-oxidant, anti-viral (e.g. exhibit action against herpes simplex viruses: Wolbling & Leonhardt 1994). and other useful properties Melissa leaf (under 'lemon balm') is official in the European Pharmacopoeia.

The Composition / Authenticity of Melissa Oil.

There is a considerable amount of scientific literature on the composition & authenticity of melissa oil, and this brief review should only be taken as merely illustrative rather than fully comprehensive. Melissa oil rarely been commercially available in unadulterated form in the past, and was often a construct of citronella oil, litsea cubeba oil, lemon oil and various isolates & synthetics (Burfield 2008). Tisserand & Balacs (1995) had only identified possible

toxicological concerns for melissa oil via its citral content, which they maintained was in the range 35-55%, concerns which presumably also apply to other high-citral containing oils such as lemongrass oil & litsea cubeba oil. Previously Schultze (1992) had investigated melissa flower oil, and found the corolla oil (yield 0.002%) to be different from the calyx oil, the latter resembling more the oil of the leaves. The main constituents of melissa leaf oil (Schultze 1989) were found to be citronellal (36.2%), germacrene D (13.5%), β -caryophyllene (10.9%), geranial (7.6%), and methyl citronellate (4.9%). Clery (1992) drew up some pointers to distinguish authentic melissa oil (including estimation of the geranial: citronellol ratio), in order to distinguish it from lemon-scented catnip oil from *Nepeta cataria* var. *citriodora*; this same topic was subsequently re-investigated by Klimek *et al.* (2000). In addition Clery indicates that the β -caryophyllene: geranial ratio is also important for the verification of authenticity, and the author cites a checklist of components normally found in genuine melissa oil. The position is further complicated by the ratio of top leaves to bottom leaves gathered, as the neral / geranial content is higher in the top leaves, whereas the sesquiterpenes are relatively higher in the bottom leaves – a topic further investigated by Mrlanova *et al.* (2001), who investigated essential oil composition at various harvest cut heights. Further, oil produced from the dried herb is claimed to be higher in neral & geranial, and lower in β -caryophyllene & caryophyllene oxide, than the fresh herb (Salaby *et al.* 1995). Melissa plants grown near the equator usually only grown in vegetative (non-flowering) form and so slight compositional differences may also arise from this consideration.



The evaluation of criteria for melissa oil authenticity was also discussed by Hener (1995) who used enantioselective gas chromatography, isotope ratio mass spectroscopy on-line coupled with capillary gas chromatography. Soresen (2000) reviewed the analysis, composition and pharmacological uses of *Melissa officinalis* extracts. Later, Lawrence (2008) reviewed a number of publications on melissa essential oils showing differences in composition due to the effect of different geographical sourcing, differing stages of maturity etc. Other melissa oils produced commercially include *Melissa romana* Mill.

Melissa Oil under IFRA's 44th Amendment.

Under the draft proposals for IFRA's 44th Amendment, melissa oil (which they describe as 'genuine *Melissa officinalis* L.')

has been downgraded from an outright ban in fragrances, to a concentration restriction in the fragrance compound (as opposed to the finished cosmetic product). QRA data for melissa oil, which is categorised as a weak sensitiser, is presented by IFRA for the various established product categories, based on a No Expected Sensitization

Induction Level (NESIL) of 1400µg/cm². The problem for those of us who like to consider the robustness of the “evidence” supporting these proposed restrictions, is that it is alluded to in the form of 3 unpublished reports, not available in the public domain. These are as follows:

RIFM (Research Institute for Fragrance Materials, Inc.), 2001. Human repeated insult patch test. Unpublished study from Robertet, 21 February. Report number 36641. (RIFM, Woodcliff Lake, NJ, USA).

RIFM (Research Institute for Fragrance Materials, Inc.), 2008. Local Lymph Node Assay. Unpublished study from Robertet. (RIFM, Woodcliff Lake, NJ, USA).

RIFM (Research Institute for Fragrance Materials, Inc.), 2008. Human repeated insult patch test. Unpublished study from Robertet. (RIFM, Woodcliff Lake, NJ, USA).

Cropwatch has written to Robertet, Grasse, and to RIFM N.J., requesting that they make these reports publicly available, in the interests of transparency. We feel that this is particularly important in this case, in view of the devastating criticisms concerning the use of the QRA technique outlined in SCCP Opinion SCCP/1153/08, which directly related to the submitted RIFM / IFRA-generated data concerning citral as an alleged sensitiser (see feature on SCCP Opinion SCCP/1153/08 in *Cropwatch Newsletter August 2008*).

References.

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§3. Update on Melissa Oil

[First published on *Aromaconnection* 31st May 2009]

You may recall the recent Cropwatch posting to Aromaconnection on a proposed IFRA restriction for Melissa oil, and the non-availability of the relevant evidence in the public domain. Following separate Cropwatch requests to the holders of the privately-held information (Robertet & RIFM), Catherine Gadras, in charge of the regulatory and safety department of Robertet, Grasse, has mailed promising to forward a summary to Cropwatch by 15th June 2009, in respect of the LLNA and HRIPTs tests that have been conducted on behalf of Robertet, 'in order to allow the use of this EO for perfumery use'. This is a welcome development. RIFM have not, as yet, either replied or acknowledged the request.