

The Essential Oil Trade Association Meeting Report

By Christine Malcolm, Santa Fe Fragrance Research,
Santa Fe, New Mexico

The Second Symposium of the Essential Oil Trade Association was held on June 2, 1990 at Brunel University in Uxbridge, England. The topics covered essential oil research and their applications. The symposium was well attended by a diverse group which included perfumers, chemists, botanists, essential oil suppliers and aromatherapists.

Dr. Stanley G. Deans and Dr. Katerina Svoboda from the *West of Scotland College* presented a joint paper covering their present research and development work on volatile oil crops in Scotland. Their work involves research in antimicrobial and antioxidative properties of essential oils and their constituents that have been grown under organic controlled conditions. They maintain that the drying of plants at specific temperatures affects the quality of essential oil production. Fifty essential oils are currently being studied in detail. The most anti-bacteriocidal oils include thyme, cinnamon, clove, lovage, angelica, nutmeg, pimento leaf, bay and bitter almond oils.

The next speaker was **Mike Brook** from *Hambleton Herbs*, which does small scale production of 35 organically grown herbs, as well as importation of organic herbs. Mike made the point that organic cultivation of aromatic plants is virtually non-existent anywhere today. Total organic production in England is less than twenty acres and more than 50% goes to the culinary market. Why does the discrepancy between potential demand and production of organic herbs and oils exist? The "organic" definition in the dictionary states that it is something that contains carbon. Legally the definition means very little. The United Kingdom is trying to come up with a legal definition.

Organic sales in the UK exceeds organic production. That gives rise to a question of believability. Is an herb organic if the seed used was organic, or if organic manure was used as a fertilizer? These and other questions were discussed.

Organic farmers believe in working with, rather than

dominating, natural systems. They reject the use of synthetic fertilizers and sprays, relying on good husbandry to build soil fertility and protect crops. By combining the methods of traditional mixed farming with the appropriate scientific research, they have developed a system of agriculture which is efficient, sustainable and environmentally benign. Organic farming leads to:

1. Increased soil fertility.
2. More diverse habitats for wildlife.
3. Reduced water pollution (because of nitrate residues, aerial spraying, spray drift and pollution due to production of chemicals).
4. Minimal use of finite resources (it takes two tons of crude oil to make one ton of nitrogen).
5. Healthier food, herbs and essential oils.

One of the problems of wildcrafted herbs being considered organic is the fact that because they are collected from the wild, the background is unknown.

There is a 400% premium for organic herbs although the price increase is not nearly so much for organic essential oils, the very little that exists. Organic herb production is possible. The largest organic herb farm existing today is in Washington State where 25 plants are grown on 450 acres. When compared against regularly grown herbs, the quality is superior for nine out of ten of the dried herbs.

Dr. Keith Harkiss, from the *School of Pharmacy at the University of Bradford*, is currently involved in phytochemical research. His topic covered an investigation of terpenes produced by cell tissue cultures of lemons and oranges. The applications of plant cell tissue cultures include:

1. Asexual multiplication of plants and development of disease free strains of new varieties.
2. Biochemical and physiological research.
3. Genetic research.

4. Biosynthesis of valuable metabolites.
5. Biotransformation of chemicals.

Dr. Harkiss went over in detail the procedure for obtaining a plant tissue extract. Comparison studies were done to show the differences obtained from the essential oil of lemon through his methods and those obtained by traditional methods.

Anthony Humphrey from *Bush Boake Allen* addressed some aspects of the analysis of essential oils. How do you reliably quantify the composition of essential oils? One of the problems is that the composition may be completely different depending upon where the essential oil came from (i.e., nutmeg from Sri Lanka and the East Indies). How pure is the oil? Adulteration can occur at different levels. There may be cross contamination. How was it made? The juice from the lemon can affect the essential oil. How old is the sample? Has it oxidized or polymerized?

Essential oils are very suitable for gas chromatography. Even though most are volatile, in the act of distillation some parts become polymers and act as fixatives in the essential oil. Essential oils contain a wide range of compounds containing different volatilities. In 'Program Temperature Gas Chromatography', it starts at a low temperature and gradually increases.

The first application of chromatography was in 1902 and was used for studying flower pigments. One-third of a century passed before gas chromatography came into its own. The original GC work was published in an obscure Polish journal and very little early use of the GC was actualized for essential oil analysis.

The Analytical Methods Committee of the Royal Society of Chemistry has published methods for analysis of essential oils. The oils are tested and analyzed by all members of the committee and when a unanimous agreement is reached it becomes the standard fingerprint of the essential oil. There are so far, 15 monographs on analysis of essential oils. To guarantee authenticity of a genuine oil, a member had to be on site when the raw material was put into the still and be able to examine the aromatic material after processing. Mr. Humphrey briefly went through the different varieties of GC equipment and other ways of physically analyzing the oils.

The last technical speech of the morning session was given by **Dr. Karim B. Yaacob** from the *University of Lumpur* in Malaysia. He introduced a new essential oil called "Kesom Leaf" which is from the herb *Polygonum* species grown locally in Malaysia. Of the nine species available, only two are aromatic. The *P. minus* species is strongly aromatic and the *P. hydropiper* is milder. It grows well in a swampy environment. The oil is somewhat hot and can burn your lips. What is so interesting about this oil and what makes it very suitable for natural perfumery is that it contains 80% aliphatic aldehydes.

There are no other essential oils available that contain more than traces of the aliphatic aldehydes. Aldehydes C-10 and C-12 comprise 60.21% of the Kessom Leaf Oil.

Other constituents are aliphatic aldehydes C-9 and C-12, aldehyde C-10, C-12, aliphatic alcohols C-9 and C-12, and a small percentage of sesquiterpenoids that are responsible for the hot effect.

Hydroponic cultivation is being done in Malaysia and yields an oil that has less heat. All components in the Kesom Leaf Oil are included on the GRAS list. The yield of the oil is 0.3-0.4% from fresh leaves and 0.05-0.17 from the stem.

The afternoon session began with a more aesthetic approach to fragrance appreciation, "*Reaching Back to Nature through Fragrance*" by **Christine Malcolm**. She is the owner of *Santa Fe Fragrance Inc.* in the U.S. and a perfumer specializing in fragrances and products made solely from botanicals. Briefly, she went over some of the problems of obtaining authentic essential oils and the confusion that exists in the market as far as natural essential oil product claims are concerned. Natural ingredients appeal to ecology-minded individuals today. There seems to be a large untapped market of people who are not at present using perfumes because they do not consider them to be ecologically compatible with their environmental sensitivities.

Benefits connected with naturals come from the fact that they are extracted from the once living plants and flowers. Natural product seekers are not as concerned with the actual odor qualities as they are with the *source* of the aroma being natural. They also appreciate the aesthetics and subtleties that natural aromatics have to offer. People are yearning for things natural due to their dissatisfaction with things artificial in all areas of life today. At one time all fragrances were made of natural botanical materials but today most fragrance is artificially produced. Ways need to be cultivated to encourage the revitalization of sustainable essence extraction industries. Christine Malcolm hopes that educating about naturals can help to sustain the market for botanically derived essences and reverse the current trend of replacing botanicals with synthetic ingredients.

Dr. J.H.P. Tyman is a professor of chemistry at *Brunel University*. He has been researching the chemistry of natural products for the past thirty years. His background includes R&D in perfumery research and in the pharmaceutical industry. He spoke about various aspects of the medicinal use of essential oil components. Carrot seed oil has been attributed with anti-fungal qualities. There is a blanket panaceal activity attributed to all essential oils. He looked at some of the major ingredients contained in essential oils. Thyme has the potency of 13.2 times the antibacterial activity of phenol.

And, of course, what would a symposium be without an entirely different view of the proposed properties of essential oils and aromatherapy? **Dr. Steve Van Toller** from the Department of Psychology at the *University of Warwick* spoke next. He is currently involved in researching the psychological aspects of the sense of smell and correlating it with EEG data. His talk was entitled "Aromatherapy—Real or Imagined." He started off with a quote, "The foundations of a civilization rest not in the mind, but in the

senses..." He asserted that the nose is not the organ of smell, and that it is coincidental that smell is locked into a triangular area near the top of the chamber of the nose. The nose is for air filtration.

The development of the limbic system freed human beings. The neocortex enabled man to break away from using the sense of smell for survival. Emotions flowed up into the neomammalian cortex and man could then structure his emotions. The limbic system function seems to drive the other systems. You don't affect one part of the brain without affecting other parts of the brain. The brain is linked together by nerves. There are billions of brain cells in your head, more than there are people on the earth.

One of the problems Dr. Van Toller has with aromatherapy is that it is looked at metaphysically rather than scientifically. In the Pre-Newtonian stage, phrenologists made many claims about the bumps on the head. He said what is missing is the proof. He conjectured that aromatherapy claims are a metaphysical speculation, not scientifically true. He said "no" to smells acting as mood changers. The power of suggestion is great. We don't have great differentiation with our sense of smell. Vitalism has been dead for 100 years in reference to claims of an organic farmer about plants having a life force. Aromatherapists are doing *behavior therapy* and are biased by positive success. The negative result is explained away. We need to turn to statistics to get the real results.

Carlo De Paoli with the *Institute of Traditional Herbology and Aromatherapy*, where he teaches herbal medicine, aromatherapy and osteopathy, has been researching the antibiotic properties of essential oils. His talk covered different ailments and some of the oils used to treat them.

Lynn Johnson spoke about some aspects of aromatherapy. Several case studies were presented that showed the positive effects of aromatherapy. The last speaker was **Dr. Lyall Williams** from Australia. His specialty is *Malaleuca Alternifolia*, otherwise known as tea tree oil. When the tea tree oil meets Australian standards, that doesn't necessarily mean that it is a good quality. Every Australian producer must be asked to provide an analysis. Comparisons of tea tree to the antibiotic Nystatin showed positive results for yeast infections. Tea tree can actually be effective against bacteria and yeast that Nystatin fails at.

The Essential Oil Trade Association plans to offer a three-day symposium next year in Central London at Queen Elizabeth College. "Aroma 90" will be held September 13-16, 1991. All papers and inquiries are welcome. For more information, write to Jasbir S. Chana, Suite 14, Manor House, The Green, Southall, Middlesex UB2 4BJ, England.

Reference

Address correspondence to Christine Malcolm, Santa Fe Fragrance Research, P.O. Box 282, Santa Fe, N.M. 87504.