

## **IFEAT Marrakech Conference**

### **Essential Oils Short Course by Brian Lawrence Wednesday September 29 2010**

Essential oils are the odoriferous principles that are found naturally occurring in specific glands within an aromatic plant. This short course has been designed to provide an exchange of information between scientists and business personnel so that those of us who have an interest in essential oils understand each other. The course is divided into eight sections.

**Section 1.** To converse internationally on the origin of a specific plant, a natural order, inventory and classification system has been established. The evolution of the system for the naming of aromatic plants and an up-date on their correct nomenclature will be presented.

**Section 2.** Essential oils are complex mixtures of secondary metabolic compounds comprised of monoterpenes, sesquiterpenes, aliphatic and aromatic compounds. These can exist as hydrocarbons, oxides/ethers, alcohols, acids, esters, aldehydes, ketones, lactones, phenols phenol ethers, etc. Typically, an oil contains between 50-300 components in amounts greater than 1ppm (0.0001%). A brief introduction to chemical/structural nomenclature as applied to oils will be given in combination with the evolution of trivial names. Also, the chirality or optical activity of oil constituents will be discussed along with its significance.

**Section 3.** It is estimated that about 17,500 plant species possess essential oil glands. The type of gland or secretory tissue is an important character of a plant family that in turn can affect the oil isolation procedure. Examples of the types of glands will be presented. Also, the historical evolution of essential oils in commerce and some influencing factors on their origin will be addressed.

**Section 4.** An essential oil is the aromatic isolate obtained from distinctive glands or secretory tissues found in a whole plant or plant part by physical means only. Extraction of an aromatic plant with a solvent results in the production of concretes, oleoresins, absolutes etc. The processes used to manufacture all of these natural isolates will be discussed. Also, the deterspenification processes will be explored. Finally the typical problems encountered in essential oil distillation will be addressed.

**Section 5.** The components or constituents of essential oils can overlap with those found in extracts (depending upon the extracting solvent) which means

they can be very similar or very different in composition. The similarities or differences found between the two types of isolates will be discussed.

**Section 6.** The isolates of essential oils can be used either as ingredients in the flavor and fragrance industries or as starting products for further synthesis. The isolation of sclareol from clary sage oil and menthol from cornmint oil will be discussed.

**Section 7.** As essential oils are produced from a wide variety of plants harvested from a variety of countries, a tour of some of these countries, their production statistics and some of the oils will be used to illustrate the diversity of origin and their ramifications.

**Section 8.** Extrinsic (external) and intrinsic (genetic and maturity) conditions affect the composition of an essential oil. The use of in-house, customer, national or international specifications for oil can have a marked effect on the value of the oil. The existence of oil standardization and adulteration can be found in the essential oil trade which in turn can affect the value of a so-called oil. As a result, the analytical methods that can assist the user of an oil to ensure the genuineness of the oil will be discussed along with their consequences.