

Essential Oils for Aromatherapy

How the essential oil industry can better serve the aromatherapy market.

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The aromatherapy boom has created a strong market for the sale of essential oils, though the industry's ingredient needs may vary from those of conventional fragrance and cosmetic manufacturers. Here, Lora Ruppert, a chemist and certified aromatherapist, discusses the aromatherapy market, its ingredient and information needs, and the market's dynamics. —Editor in Chief

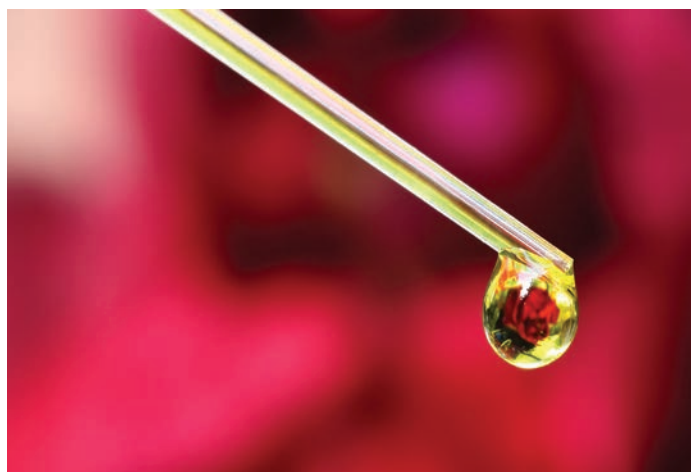
The aroma of essential oils and their complexity is what first attracted me to the study of aromatherapy, a continually growing sector of the health and beauty industry. Before I began my aromatherapy education, my impression of essential oils did not go much further than either liking the aroma of the oil or not. Also, my knowledge of the science behind aromatherapy was virtually nonexistent. I became extremely curious to learn why these essential oils were connected to their corresponding therapeutic actions.

Once I began the aromatherapy education process, I was pleasantly surprised at how much focus was placed on essential oil chemistry when formulating. Aromatherapy, I began to realize, is not just about selecting an essential oil to use because of the historic documented therapeutic actions associated with that oil, but in fact the selection process goes much deeper, by also taking the chemistry of that oil into consideration. Being a chemist, I found myself at home with my two converging passions.

Essential Oil Quality

Two of the most important elements in the study and application of aromatherapy are to know one's essential oils and their quality. Aromatherapy begins with the quality and authenticity of the essential oils being used.¹ The term "pure and natural" used by many suppliers of essential oils, simply indicates that no synthetic materials have been added. Essential oils used in aromatherapy must be genuine and authentic. This means that the botanical purity of the essential oil should be known, and that the oil is unaltered in any way. For an essential oil to be genuine and authentic, the following information should be readily available: botanical specificity, morphological specificity, country of origin and the extraction process.² Optimal therapeutic and safe applications can only be derived from the use of whole, genuine, authentic essential oils. The use of low-quality, cheap, adulterated essential oils increases the likelihood of an adverse response and/or reduced therapeutic activity.¹

When searching for which essential oils to purchase and from what company, there are a number of factors to consider. For instance, companies selling essential oils to the aromatherapy sector should provide uniform information on each essential oil they sell. This information should include the following:³



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- **Common name:** The most widely accepted name for a given plant species within a given culture or regional area.
- **Latin binomial/botanical specificity:** Refers to one kind of plant, critically distinguished from all others, and identifies a biological species name consisting of two terms, genus and species.
- **Country of origin:** The country in which the essential oil is either indigenous, or where it is cultivated or harvested in the wild.
- **Morphological specificity:** The part of the plant used to produce the respective essential oil.
- **Biochemical specificity:** The identification of a chemotype of a specific essential oil. Not all essential oils have chemotypes, nor are all chemotypes available on the market. Rosemary (*Rosmarinus officinalis*) and thyme (*Thymus vulgaris*) are the most common chemotypes available within the aromatherapy industry.
- **Method of cultivation:** Is the essential oil ethically wild-crafted (plants have been responsibly and sustainably collected in the wild or in their native environment), cultivated (plants that have been grown with the use of pesticides, chemical fertilizers, etc.) or organic (plants that have been grown without the use of pesticides and typically fulfill organic guidelines set out by an independent agency).
- **Method of extraction:** Expression or steam distillation.
- **Purity certification:** Nothing added or removed from the essential oil, no carriers, etc.

The above technical information allows the aromatherapist to be more successful in their essential oil search and resolves any possible uncertainty. Readily obtaining this information also confirms the supplier's depth of knowledge, which is a crucial first step in building trust in a source. Finally, this information can assist the aromatherapist in their essential oil selection process with regards to particular oils.

The Selection Process

Let's begin by examining how knowledge of botanical specificity, biochemical specificity, morphological specificity and method of extraction contributes to choosing the optimal and safest oil for one's desired application.

To understand the importance of botanical specificity in the selection process, one can look at the eucalyptus species. There are more than 600 species of eucalyptus genus, of which six to eight are commonly found within the aromatherapy industry. These may include *Eucalyptus globulus*, *Eucalyptus dives*, *Eucalyptus citriodora*, *Eucalyptus smithii*, *Eucalyptus polybractea* and *Eucalyptus radiata*. Although there are many common therapeutic benefits to all eucalyptus species, each one also has its own unique chemistry and, therefore, unique therapeutic applications. Another example of a genus with numerous species is the chamomile plant.⁴

To understand the importance of biochemical specificity in the selection process, one can look at rosemary oil (*Rosmarinus officinalis*). *Rosmarinus officinalis* can produce three unique essential oils (i.e. chemotypes), which have different chemical constituents: rosemary ct. camphor, rosemary ct. 1,8-cineole and rosemary ct. verbenone.⁵ Certain cautions are associated with specific rosemary chemotypes, so it is very valuable to know which chemotype one is working with. Thyme oil (*Thymus vulgaris*) is another example of an oil with various chemotypes that is used in aromatherapy.

To understand the importance of morphological specificity in the selection process, one can look at angelica oil (*Angelica archangelica*). Angelica oil can either be produced from the seeds or the roots, hence there is angelica root oil and angelica seed oil. In this case, the morphological specificity is usually denoted in the oil's common name, but this oil is used as an example due to the fact that even though these two oils do come from the same plant, angelica root oil is a known photosensitizer, while angelica seed is not. Therefore, additional cautions need to be exercised if using angelica root versus angelica seed.

The same point made about morphological specificity holds true regarding the method of extraction for certain oils. For instance, grapefruit oil can either be produced by methods of expression or distillation. Expressed grapefruit oil is a known photosensitizing oil, while the distilled version is considered a non-phototoxic citrus oil.

In all the previous examples, it is clear how increased knowledge of the essential oils being utilized is in direct correlation with, most importantly, product safety and efficacy.

How does some of this technical information contribute to the essential oil selection process for designing an aromatherapy product to achieve a specific goal?

The selection of an essential oil for use in an aromatherapy product traditionally begins with looking at what therapeutic properties are associated with each oil. For example, there are

numerous essential oils associated with anti-inflammatory, analgesic and calming therapeutic action. While this is the correct way to begin one's essential oil selection process for a specific purpose, it can yield a lengthy list of oils to choose from. So, how can the aromatherapist narrow down that list and select the essential oils that will be most effective and appropriate for a specific product goal?

Numerous things have to be taken into consideration when selecting which oils are most suitable for an aromatherapy product, including for whom the product is being formulated, method of application, amount of product needed, cost and chemistry. For the purposes of this article, however, I will focus on optimal oil selection based solely on essential oil chemistry.

A good grasp of the basics of essential oil chemistry adds a new dimension to aromatherapy skills. Becoming familiar with the actions of chemical constituents and chemical families found in the essential oils will help the aromatherapist use the oils more effectively because they will better understand why and how the essential oils work. Aromatherapy pioneer Daniel Penoel and researcher Pierre Franchomme first introduced the following approach to aromatic chemistry to aromatherapy students in France. Chemist and educator Kurt Schnaubelt brought the concept to a wider audience in the United States in the late 1980s.⁶

The main chemical families that are of greatest interest to the aromatherapist are monoterpenes, sesquiterpenes, alcohols, esters, aldehydes, ketones, phenols, phenylpropanoids, oxides, sesquiterpene lactones and furanocoumarins.

This approach begins by looking at what key chemical constituents are in each oil, the quantity of these chemical constituents, and the total amount of each major chemical family within the essential oil. The main chemical families that are of greatest interest to the aromatherapist are monoterpenes, sesquiterpenes, alcohols, esters, aldehydes, ketones, phenols, phenylpropanoids, oxides, sesquiterpene lactones and furanocoumarins. Knowledge of the Latin binomial and country of origin of a specific oil can help the aromatherapist locate a general chemical composition profile corresponding to that oil. Resourcing this information can give the aromatherapist a more complete picture, improves formulation, product effectiveness, and product safety.

Information Wish List

There are some information particulars an aromatherapist hopes to have at his or her fingertips when searching for an essential oil. With only a small percentage of the essential oils produced in the world being used for aromatherapy (most essential oils are used for food flavorings, perfumery, pharmaceutical preparations and chemical manufacturing), it is not surprising that sometimes this technical information is not immediately available on a company's website.⁷ Further some of the essential

oils on the market, while still being considered pure or natural, possibly lack the sought-after authenticity. As a result of the numerous essential oil versions available on the market, it would be valuable to have the designation of an essential oil's Latin binomial, morphological specificity, country of origin and the extraction process available during one's search, if an essential oil is marketed for aromatherapy applications. This level of detail is essential and timesaving.

Finally, I would like to share this statement from aromatherapy expert Kurt Schnaubelt: "If we really intend to learn from nature, in our case from essential oils, resolving the issue of purity and authenticity is the pivot that determines whether or not we will indeed be able to learn."⁸

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