

FUNDAMENTALS OF AROMATHERAPY

AROMATHERAPY CERTIFICATION LEVEL 1

Lesson 2

Lesson: Essential Oils and Carrier Oils

Essential Oil Profile: Bergamot

Additional Topic: Buying and Storing Essential Oils and Carrier Oils

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Essential Oils and Carrier Oils

Essential Oils

Essential oils are poetically referred to as the essence or spirit of the plant. In fact, they are volatile, complex organic compounds produced by plants as secondary metabolites. There are over 3000 known essential oils with approximately 300 essential oils in commercial production today, however aromatherapy commonly uses between 50 and 100. Almost all of the commercial production is for the food, pharmaceutical and perfume industries.

Essential oils may be liquid, semi-solid, or solid, but most are liquid at room temperature. They dissolve in alcohol, fats, and other oils, but not in water. They are not oily to the touch, and evaporate on exposure to air. In their purest form, they leave no residue when they evaporate. They are also flammable.

	Used in Aromatherapy	Contains Synthetics
Essential Oil	Yes	No
Fragrance Oil	No	Yes
Perfume Oil	No	Yes

Perfume oils, also known as fragrance oils or "fragrances" are not the same as essential oils. These oils contain synthetic oils and/or chemicals from processing, and are not usable as therapeutic essential oils. Some are entirely synthetic and have absolutely no therapeutic value. The word perfume comes from the Latin *per* (through) and *fumum* (smoke). This gives us a clear picture of incense, which is the earliest known usage of essential oils as well as other plant products. The early scents were derived by various means. Today the word perfume implies one of more essential oils (natural or synthetic) dissolved in a solvent (usually alcohol) in a 25% solution [4 parts alcohol to one part essential oil]. *Eau de toilette* contains the same elements in a 5 percent ratio, and cologne is usually around three percent. These ratios are not fixed and will vary greatly.

One of the key properties of essential oils is their extreme volatility - which means that their molecules become vapor (become airborne) very easily. They are so volatile that the current word 'essential' oil comes from the Latin word *essentia* meaning liquid that becomes a gaseous essence. The old apothecaries used the word 'spirits'. These molecules produce aroma or odor impressions on our sense of smell. The volatility of essential oils comes in part from their size - they are very small. This fact also facilitates their therapeutic usefulness - since the tiny molecules pass easily through the nasal membranes, lung membranes, and skin. These chemical components are extremely complex. While the average essential oil contains over 100 known chemical compounds, some contain over 400. Once inhaled, they trigger neurochemical reactions in the nasal

cavity, where the signals are translated into emotional and physical information. If they travel to the lungs, they are absorbed into the blood stream and delivered throughout the body. Once in contact with the skin, they have immediate localized action, and disperse within minutes throughout the body.

Plants produce these specialized chemicals for two main purposes: reproduction and protection.

Protection : Some the essential oils are contained in the leaves and twigs. They make the leaves and stems unappetizing, even poisonous, to animals who would otherwise strip the plants of photosynthetic (food producing) or supportive (stem) surfaces. They may also inhibit the growth of neighboring plants when they are carried into the surrounding soil by water droplets. Some oils are produced to defend the plant against fungal attack.

Reproduction: Essential oils that are 'attractants' are part of the plant's pollination and seed dispersal mechanisms. The fragrance is specifically keyed to attract the correct animal. Flowers that need to attract bees and butterflies for pollination will have one particular character of sent, usually sweet and delicate. Flowers to attract bats produce a more musky or rotting fruit odor. Flowers that need to attract flies produce a putrid odor. Fruits that require animals to eat them in order to have the seeds widely dispersed also produce essential oils that are keyed to attract the animals that will accomplish the job.

Therapeutic essential oils are obtained from:

- Flowers - carnation, marigold, mimosa, jasmine, orange blossom,
rose, violet, ylang ylang
- Dried flower buds — clove
- Leaves - eucalyptus, petitgrain, basil, clary sage, rosemary, peppermint
- Roots and rhizomes - ginger, angelica, saffron, vetiver, calamus
- Bulbs – garlic, narcissus, onion
- Fruits - bergamot, lemon, orange
- Seeds - celery, bitter almond, anise, fennel, nutmeg
- Bark — cinnamon
- Gum - frankincense
- Grasses - lemongrass, palmarosa
- Flowers and leaves - lavender, rosemary, peppermint
- Leaves and stems — niaouli, tea tree, geranium, patchouli,
petitgrain, verbena, myrtle
- Wood —sandalwood, rosewood, cedarwood, cedar
- Nuts and berries -juniper, cypress, nutmeg

Some plants yield more than one essential oil. For example the orange yields three essential oils: Neroli from the blossoms, Petitgrain from the leaves and Orange from the fruit.

Plants also produce related chemicals that are not true essential oils. These include resins, oleo-resins and balsams. These are products which naturally exude from plants and trees which act as natural protection against attack from insects or pests.

Four animal substances are frequently associated with essential oils due to their history as part of the perfume industry. While not essential oils, you should be familiar with their origin and use. They have primarily been used as fixatives - since they have high molecular weight, which prevents loss of the molecules to the air. Thus extending the 'life' of the essential oils with which they are mixed.

Animal Derived Oils

Ambergris - Sperm whales feed on cuttle fish (a squid like animal with a sharp horny beak and one large skeletal type structure called the cuttlebone (used in bird cages to wear down the beaks of birds). These beaks and cuttlebones irritate the lining of the whale's digestive tract and the whale secretes a grayish-white fatty material to protect itself, called ambergris. Since it is fatty material, when expelled, this substance floats. Arab seamen started collecting these 'balls' and it was soon found to have fixative qualities - able to delay the rate of volatility of other oils when added to the mixture. Today a synthetic version is used in the perfume industry.

Castoreum or castor - Castoreum is an essence extracted from abdominal sacs in male and female Russian and Canadian beavers. Beavers use it to protect their coats. In extreme dilutions, it may be used as a scenting agent, but it is usually used as a fixative.

Civet - Civet is an essence extracted from the male and female East African cat *Viverra civetta*. It has a strong (most say revolting) faecal odor but when blended is an exceptionally strong fixative

Musk- Musk comes from the male Chinese musk deer (*Moschus moschiferus*). These small deer are killed to remove the sac, which is dried and sold for the perfume industry.

Methods of Extraction/Production of Essential Oils

Distillation - In this process, low heat process vaporizes the essential oil from the plant tissue, which is then carried by steam into a collector and condensed by cooling. Steam and water must readily penetrate the plant parts. Flowers and leaves do not need any special treatment, but woody materials are generally ground, and seeds are usually cracked or crushed.

The process of distillation may be accomplished in two methods.

1. Steam distillation passes steam through the plant material - evaporating the oils. The steam is collected and passed through a coil (usually cooled by running water). The steam condenses and the essential oil rises to the top. The remaining water contains traces of the essential oil molecules and may produce a useful byproduct now called a hydrosol.

2. In water distillation, the plant material is covered with water and brought to a boil. This technique is used to protect oils that are more heat sensitive, such as rose. An example of the remaining water providing an important product is in the water distillation process of rose petals, which rose water as a secondary product. It must be noted here that there are many products which may use the term "rose water". Look on the shelf at a shop and you may find a product called Rose Water with ingredients listed as: aqueous extract of rose, methyl paraben, carmine, and rose essence concentrate. This is NOT the secondary product of rose petal distillation, and is not part of aromatherapy.

The selection of the form of distillation requires knowledge of the character of the essential oil components. For example, oils with high percentage of esters (such as Lavender) cannot take the long contact with the water, and are best suited to steam distillation.

The process of distillation is relatively simple in concept, but when it comes to essential oils, the cost can vary widely - depending on the unique properties of each plant part being processed, their specific needs (such as steam temperature), and the amount of essential oils contained within that plant part. It takes 4,000 pounds of rose petals to produce one pound of rose essential oil. It takes 6,000 pounds of jasmine pedals to produce one pound of jasmine essential oil. In addition, Jasmine can only be picked 3 months out of the year, and must be picked between 2 a.m. and 5 a.m.

Expression - Expression is used to obtain essential oils from citrus fruits such as orange, lemon, or bergamot. These fruits have oil glands on their surface. If you have ever peeled an orange, you have likely seen a spray released from the skin. Oils are pressed out of the peel of almost ripe fruit for aromatherapy work [Note: the same fruit oils are distilled from the peel for use in the flavoring and fragrance industry.] Since the pressing method works without heat, the aroma and chemical composition of the essential oil will be almost identical to the oils contained in the skin of the fruit. Expressed essential oils will often contain non-volatile substances such as waxes.

Extraction - treating with solvents selected to dissolve the oils from the plant parts.

Enfleurage is the oldest known method of extracting essential oils. The selected plant part (example: flower petals) is soaked in fat (lard or vegetable oil) and exposed to the sun for several weeks in a glass jar or between sheets of glass. The fat is strained and fresh materials added until a concentration of essential oils is achieved. The resulting fat is known as pomade. Egyptian paintings depict ladies with cones of scented fat on their heads. The heat of the day would melt the fat and lavish their heads and bodies with the scent.

Maceration (used for acacia, rose, violet and neroli) also uses oils or lard. The fat is placed in enameled iron pots and heated to roughly 40 degrees Celsius. The flowers are added to the warm fat (usually in large linen bags - looking like oversized tea bags) and the mix is stirred for one or two days. The flowers are removed and fresh flowers added until the fat is saturated. This again produces a pomade. The essential oil is then extracted using alcohol to separate the essential oils from the fats. The alcohol is then removed by low temperature distillation.

Another form of solvent extraction is the use of hydrocarbon solvents such as petroleum

or hexane. These solvents dissolve the aromatic material and the remaining residue is known as a concrete (and is usually sold in solid form). Additional processing with a solvent extracts using ethanol (an alcohol), and the results are sold as absolutes.

Carbon Dioxide (CO₂) Extraction –

Introduced in the 1980's, this extraction takes place at low temperatures. Carbon dioxide gas at very high pressures is used to dissolve the essential oil from plant material. When the pressure is allowed to fall, the oils form a mist and are collected. The equipment is massive and expensive. Oils produced this way will be labeled CO₂.

Adulteration of Essential Oils

Adulteration of essential oils is done for a variety of reasons, but primarily economic. Usually, it is a modification of the processing technique designed to speed the process, obtain the last oils out of plant materials, or stretch the final product. In these cases, it is strictly an economic decision. Adulterated oils may or may not have the therapeutic qualities necessary for use in aromatherapy, and are therefore usually used by the fragrance industry. Be aware that some of the products on store shelves, claiming to be aromatherapy products, are simply scented products. They may be mixed essential oils and synthetics, or simply synthetic products.

Adulteration by adding alcohol (common in the perfume industry) extends the essential oil (alcohol does not change the scent of the oil). The alcohol mixes with the essential oils but also with water. Adding water reduces the price per gallon - and also is desirable in the perfume industry since it prolongs the persistence of the perfume on the skin. Again, this form of adulteration usually makes the product unusable for aromatherapy.

Rectified essential oils are processed oils where a filtering process is used to remove traces of residue. It may be accomplished by physical filtration, or by secondary distillation. It is especially valuable when pesticides or herbicides are present (or suspected). It is also used to describe oils that have had specific organic compounds removed by chemical methods. This method is used for aromatherapy oils, but will be carefully labeled as such. The most frequently seen essential oil that is rectified for a purpose is Bergamot, where chemicals that produce photosensitivity are removed.

Analysis

There are several testing methods employed to establish identity, origin, purity, and consistency in essential oils. The two most commonly used methods of analysis are gas chromatography and mass spectroscopy. Both methods are routinely used by high quality producers of essential oils. However, chromatography methods are completely dependent on the individual machines, flow rates, temperatures, etc. This means the results cannot be compared from one manufacturer to another. The chromatographic method separates the components of an essential oil and produces a printout with a series of peaks. This printout does not identify the elements that produce the peaks. In order to do that, the machine uses a set of known 'standards'. Claims of purity and quality have

led to a virtually meaningless set of claims on various labels.

This subject is covered in more depth in the Level 2 course.

Research and references

When researching essential oils it is important to carefully look at the material the author has used as reference. Frequently the inappropriate combination of herbal lore and essential oils information is found within a single source. Herbal information concerning source materials used to produce essential oils must be clearly identified as separate from the essential oil data. Herbal and essential oil descriptions that blur the line between the two produces conflicting information and will cause great confusion. Take the example of the diuretic affect of fennel and juniper. Traditional water or alcohol extracts (tinctures) of these herbs, taken internally, have been shown to stimulate and irritate the kidney thus causing the release of more urine. There are no studies that indicate the diluted essential oils applied to the skin will have any diuretic action. However it is common to find this effect listed in the aromatherapy reference books. The herbs are usually whole plant, or whole parts (whole leaves, roots, etc.). Essential oils are very highly concentrated extracts from very specific glandular cells, or reservoirs contained within plants. Herbal knowledge has much to teach us, but it must not be confused with essential oil information.

Over reliance on phytochemical information has caused many unsubstantiated claims concerning uses and hazards of certain essential oils. It is easy to say that since linalool is a known sedative, that essential oils containing linalool (Lavender for example) are sedative. While this may hold true for one (or twelve) essential oils containing linalool, there are many others which are not sedatives. Single chemical constituents may lead to grouping or understanding groups of essential oils that may have similar affects. Such groupings may be used as a guide for studying, sorting and perhaps point the way to the selection of appropriate essential oils for a given condition. It is inappropriate however to attribute the entire effect of any essential oil on one single chemical component. They are far too complex. Many essential oils contain large amounts of unidentified chemicals, and between 100 and 400 known chemicals, therefore the synergistic affects are not taken into account when making decisions based on single chemical constituents. There are two exceptions to this statement:

Wintergreen can contain up to 99 percent methyl salicylate (potentially very hazardous)
Mustard may contain up to 95 percent allyl isothiocyanate (potentially very hazardous)

The greatest expertise in the production and chemistry of essential oils currently rests in the flavor, fragrance, and cosmetics industries. In these industries trade secrets are held closely. Most of the research that these industries have invested in is unavailable to the aromatherapy practitioners. Their research and practical knowledge will eventually add to the science of aromatherapy. It is also hoped that their experience will also add to the art of aromatherapy.

Natural essential oils may have great variation in their chemical composition and yet there may be very little difference in their fragrance. This is due to the fragrance of an

essential oil being caused by minute traces of odiferous chemicals. The odiferous chemical may not be a major component of the essential oil by composition. The food and flavor industries are well aware of this and most use fractions containing only the most potent fragrance or flavor molecules. These molecules may represent as little as 0.5 percent of the whole oil.

It is the trace chemicals which frequently contain the most active fragrance and flavor molecules. It is a fair assumption that many highly active therapeutic substances also occur only in minute or trace amounts. While the fragrance of many essential oils may be synthetically reproduced, the synthetic product does not contain the hundreds of trace chemicals which are part of the naturally occurring essential oil. Synthetic oils are never used in aromatherapy.

Poor or prolonged storage of essential oils causes degradation. This degradation may cause lessening of the sensible aroma. However, it is more likely to cause reduction or elimination of the therapeutic properties of the oil. At worst it can create more hazardous compounds (example: terpene degradation may lead to the oil being potentially more skin sensitizing). Most degradation is caused by oxidation - atmospheric oxygen combining with the oils' chemical compounds, creating new compounds. Storage containers with tight fitting lids, and a small volume of air is important (never leave a very small amount of oil in a large bottle - transfer it to a smaller bottle). Containers made of plastic may experience chemical interaction between the plastic material and the essential oil. Glass is the preferred storage medium for essential oils. Heat and light also cause the chemical compounds to undergo degradation. Storing oils in dark glass bottles in a cool environment will provide the best lifetime for the essential oils. Amber and cobalt blue are traditionally used for essential oils. Storing oils in the refrigerator may cause certain oils to become too viscous to pour, but it may significantly extend the life of the essential oil. As a general rule, essential oils should be used within 6 months of purchase — 12 months if refrigerated. Never use an unlabeled container.

Hydrosols

While not a focus of this course, you should be aware that the use of hydrosols in aromatherapy is growing. A hydrosol is the secondary product of steam distillation of a plant. When the steam is cooled and collected, the essential oil rises to the top and the remaining water contains traces of essential oil and other compounds released by the plant during the distillation process. Hydrosols are not distilled or spring water with essential oils added. Every liter of hydrosol contains between 0.05 and 0.2 ml of dissolved essential oils depending on the plant used and the precise form of distillation. The chemical composition of a hydrosol is different from that of the essential oil because certain compounds are hydrophilic (water loving) and will remain in the condensed water and not rise to the top as do most of the essential oil components. The study, research, and reference books concerning hydrosols are in an exciting phase of development. No doubt, aromatherapy will adopt hydrosols as an important resource.

Hydrosols will be covered in more detail in the Level 2 course.

Carrier Oils

Essential oils must be diluted prior to use. Carrier oils (also known as Base oils) used to dilute the essential oils are pure nut or seed oils (never petroleum or animal). These oils allow the essential oils to be spread over large areas of skin. The thicker the carrier oil, the less essential oil is absorbed into the skin. The thinner the carrier oil, the more essential oil is absorbed into the skin. Most of the carrier oils have therapeutic properties of their own. For therapeutic uses, the selection of carrier oils will be as important as the selection of the essential oils.

Vegetable oils are primarily produced by the plant for nutrient purposes. In aromatherapy, only cold pressed oils are used. These are extracted without the use of heat. While grocery store oils have been used in an emergency situation, they are not ideal for aromatherapy since most have been processed at too high a temperature and some with chemical agents.

Certain oils are not used on their own due to thickness or expense, but are added to other carrier oils to take advantage of their own skin nourishing qualities (example: avocado oil). They are still classified as carrier oils.

The selection of carrier oil is made based on proposed use of the product (examples: face cream, massage oil), the proposed shelf life of the product (one time use vs. preparing a quantity to use for a week or month), and the specific concerns of the individual (allergies, dry skin, oil skin, etc.).

Allergies are the first and most major concern when selecting a carrier oil. Since there is a wide variety of carrier oils from which to select. There is seldom a problem finding alternatives. As with essential oils, it is important to do a patch skin test before applying carrier oils.

Other Carriers

A carrier's primary purpose is to dilute the essential oil and make the application easier. As such you may use unscented creams, gels, lotions, and shampoo bases. As always, by adding synthetic or 'perfumed' components, you may degrade the therapeutic quality of the final product. Other products are occasionally mixed with vegetable bases, such as honey or beeswax for their healing or textural qualities. Although rare, you will occasionally hear a reference to other carriers for the essential oils. These may include alcohol, water or even vinegar.

A further discussion of aromatherapy products and recipes is included in Level 2.

Sources:

Catty, Suzanne - Hydrosols, The Next Aromatherapy

Howard, George - Principles and Practice of Perfumery and Cosmetics

Lawless, Julia – The Illustrated Encyclopedia of Essential Oils

Tisserand and Balacs – Essential Oil Safety – A Guide for Health Care Professionals

Von Marksfeld-Fuhrherr, Beverly, West Coast Institute of Aromatherapy, Personal
Communications

Worwood, The Complete Book of Essential Oils and Aromatherapy

Common Essential Oils		
Common Name	Latin Name	Family
Angelica Root	Angelica archangelica	Apiaceae (Umbelliferae)
Anise	Pimpinella anisum	Apiaceae (Umbelliferae)
Anise, Star	Illicium verum	Illiciaceae
Balsam (Canadian)	Abies balsamea	Pinaceae
Balsam (Copaiba or Jesuit's)	Copaifera officinalis	Fabaceae (Leguminosae)
Balsam (Peru)	Myroxylon pereirae	Fabaceae (Leguminosae)
Balsam (Tolu)	Myroxylon balsamum var. balsamum	Fabaceae (Leguminosae)
Basil, Exotic (Reunion Basil)	Ocimum basilicum	Lamiaceae (Labiatae)
Basil, French (Common or European Basil)	Ocimum basilicum	Lamiaceae (Labiatae)
Bay Laurel	Laurus nobilis	Lauraceae
Bay, West Indian	Pimenta racemosa	Myrtaceae
Benzoin	Styrax tonkinensis (Styrax benzoin)	Styracaceae
Bergamot	Citrus bergamia	Rutaceae
Bergamot Mint	Mentha citrata	Lamiaceae (Labiatae)
Birch, White	Betula alba	Betulaceae
Bois-de-rose (Rosewood)	Aniba roseodora	Lauraceae
Borneol	Dryobalanops aromatica	Dipterocarpaceae
Boronia	Boronia megastigma	Rutaceae
Cajeput	Melaleuca leucadendron (Melaleuca cajeputi)	Myrtaceae
Calamus	Acorus calamus var. angustatus	Araceae
Cardamum (Cardomon)	Elettaria cardamomum	Zingiberaceae
Carrot Seed	Daucus carota	Apiaceae (Umbelliferae)
Cassia	Cinnamomum cassia	Lauraceae
Cassie	Acacia farnesiana	Mimosaceae
Cedarwood (Atlas)	Cedrus atlantica	Pinaceae
Cedarwood (Texas)	Juniperus ashei	Cupressaceae
Cedarwood (Virginian)	Juniperus virginiana	Cupressaceae
Chamomile (German)	Matricaria chamomilla (Matricaria recutita)	Asteraceae (Compositae)
Chamomile (Maroc)	Ormenis multicaulis	Asteraceae (Compositae)
Chamomile (Roman)	Anthemis nobilis (Chamaemelum nobile)	Asteraceae (Compositae)
Cinnamon	Cinnamomum zeylanicum	Lamiaceae (Labiatae)
Cistus (Labdanum)	Cistus ladanifer	Cistaceae
Citronella	Cymbopogon nardus	Poaceae (Gramineae)
Clary Sage	Salvia sclarea	Lamiaceae (Labiatae)
Clove Bud	Eugenia caryophyllata (Syzygium aromaticum)	Myrtaceae
Coriander	Coriandrum sativum	Apiaceae (Umbelliferae)
Cypress	Cupressus sempervirens	Cupressaceae
Davana	Artemisia pallens	Asteraceae (Compositae)
Dill	Anethum graveolens	Apiaceae (Umbelliferae)
Douglas Fir	Pseudotsuga menziesii (taxifolia)	Pinaceae
Elemi	Canarium luzonicum	Burseraceae
Eucalyptus	Eucalyptus globulus	Myrtaceae
Eucalyptus (Broad Leaved)	Eucalyptus dives var. Type	Myrtaceae
Eucalyptus (Lemon)	Eucalyptus citriodora	Myrtaceae
Eucalyptus (Radiata)	Eucalyptus radiata	Myrtaceae
Everlasting	Helichrysum angustifolium	Asteraceae (Compositae)
Fennel	Foeniculum vulgare	Apiaceae (Umbelliferae)
Fir Needle	Abies alba	Pinaceae
Frankincense	Boswellia carteri	Burseraceae
Galbanum	Ferula galbaniflua	Apiaceae (Umbelliferae)
Gardenia	Gardenia jasminoides	Rubiaceae
Geranium	Pelargonium graveolens	Geraniaceae
Geranium (Rose)	Pelargonium roseum	Geraniaceae
Ginger	Zingiber officinale	Zingiberaceae
Grapefruit	Citrus paradisi	Rutaceae
Helichrysum	Helichrysum angustifolium	Asteraceae (Compositae)
Hyssop	Hyssopus officinalis	Lamiaceae (Labiatae)
Immortelle	Helichrysum angustifolium	Asteraceae (Compositae)
Jasmine	Jasminum officinalis	Oleaceae
Juniper Berry	Juniperus communis	Cupressaceae

Kanuka	<i>Leptospermum ericoides</i>	Myrtaceae
Labdanum	<i>Cistus landanifer</i>	Cistaceae
Lavender	<i>Lavandula officinalis</i>	Lamiaceae (Labiatae)
Lavender, Spike	<i>Lavandula latifolia</i>	Lamiaceae (Labiatae)
Lavandin	<i>Lavandula hybrida</i>	Lamiaceae (Labiatae)
Lemon	<i>Citrus limon</i>	Rutaceae
Lemon Balm	<i>Melissa officinalis</i>	Lamiaceae
Lemongrass	<i>Cymbopogon citratus</i>	Poaceae (Gramineae)
Lime	<i>Citrus aurantifolia</i>	Rutaceae
Linden Blossom	<i>Tilia vulgaris</i>	Tiliaceae
Litsea cubeba	<i>Litsea citrata</i>	Lauraceae
Mandarin	<i>Citrus reticulata</i>	Rutaceae
Manuka	<i>Leptospermum scoparium</i>	Myrtaceae
Marjoram	<i>Origanum majorana</i>	Lamiaceae (Labiatae)
May Chang	<i>Litsea citrata</i>	Lauraceae
Melissa	<i>Melissa officinalis</i>	Labiatae (Lamiaceae)
Mimosa	<i>Acacia dealbata</i>	Mimosaceae
Myrrh	<i>Commiphora myrrha</i>	Burseraceae
Myrtle	<i>Myrtus communis</i>	Myrtaceae
Narcissus	<i>Narcissus poeticus</i>	Amaryllidaceae
Neroli Orange Blossom)	<i>Citrus aurantium</i>	Rutaceae
Niaouli	<i>Melaleuca quinquenervia (viridiflora)</i>	Myrtaceae
Nutmeg	<i>Myristica fragrans</i>	Myristicaceae
Orange (Bitter)	<i>Citrus aurantium var. amara</i>	Rutaceae
Orange (Sweet)	<i>Citrus sinensis</i>	Rutaceae
Oregano	<i>Oreganum vulgare</i>	Laminaceae (Labiatae)
Palmarosa	<i>Cymbopogon martini</i>	Graminaceae
Parsley	<i>Petroselinum sativum</i>	Apiaceae (Umbelliferae)
Patchouli	<i>Pogostemon cablin</i>	Lamiaceae (Labiatae)
Pepper (Black)	<i>Piper nigrum</i>	Piperaceae
Peppermint	<i>Mentha piperita</i>	Laminaceae (Labiatae)
Petitgrain	<i>Citrus aurantium var. amara</i>	Rutaceae
Pine (Scotch)	<i>Pinus sylvestris</i>	Pinaceae
Ravensara	<i>Ravensara aromatica</i>	Lauraceae
Rose, Cabbage (Maroc)	<i>Rosa centifolia</i>	Rosaceae
Rose, Damask	<i>Rosa damascena</i>	Rosaceae
Rosemary	<i>Rosmarinus officinalis</i>	Lamiaceae (Labiatae)
Rosewood	<i>Aniba roseodora</i>	Lauraceae
Sage, Common	<i>Salvia officinalis</i>	Lamiaceae (Labiatae)
Sage, Spanish	<i>Salvia lavandulifolia</i>	Lamiaceae (Labiatae)
Sandalwood	<i>Santalum album</i>	Santalaceae
Spanish Broom	<i>Spartium junceum</i>	Fabaceae (Leguminosae)
Spearmint	<i>Mentha spicata</i>	Lamiaceae (Labiatae)
Spikenard	<i>Nardostachys jatamansi</i>	Valerianaceae
Spruce	<i>Picea mariana</i>	Pinaceae
Tagetes	<i>Tagetes minuta (Tagetes glandulifera)</i>	Asteraceae (Compositae)
Tangerine	<i>Citrus reticulata</i>	Rutaceae
Tansy, Blue	<i>Tanacetum annuum</i>	Asteraceae (Compositae)
Tansy, Idaho	<i>Tanacetum vulgare</i>	Asteraceae (Compositae)
Tarragon	<i>Artemisia dracunculus</i>	Asteraceae (Compositae)
Tea Tree	<i>Melaleuca alternifolia</i>	Myrtaceae
Thyme	<i>Thymus vulgaris</i>	Lamiaceae (Labiatae)
Tuberose	<i>Polyanthes tuberosa</i>	Agavaceae
Valerian	<i>Valeriana fauriei</i>	Valerianaceae
Vanilla	<i>Vanilla planifolia</i>	Orchidaceae
Verbena	<i>Aloysia triphylla</i>	Verbenaceae
Vetiver	<i>Vetiveria zizanioides</i>	Poaceae (Gramineae)
Violet Leaf	<i>Viola odorata</i>	Violaceae
White Fir	<i>Abies grandis (picea abies)</i>	Pinaceae
Winter Savory	<i>Satureja montana</i>	Lamiaceae (Labiatae)
Wormwood	<i>Artemisia absinthium</i>	Asteraceae (Compositae)
Yarrow	<i>Achillea millefolium</i>	Asteraceae (Compositae)
Ylang Ylang	<i>Canarium odorata forma genuina</i>	Annonaceae

Bergamot

Latin Name: Citrus bergamia (Citrus aurantium subsp. bergamia) and is also known as Bergamot orange.

Family Name: Rutaceae

The Rutaceae family is extremely large covering over 30 genera. Citrus Bergamia is a small tree about 4.5m high with smooth oval leaves. It belongs to the same family as the orange tree. The essential oil comes from the small round fruits which ripen from green to yellow, similar to oranges in appearance.

Color: Pale greenish yellow liquid. With age the oil turns to a brownish olive color.

Viscosity: watery

Aroma: sweet and fruity, uplifting citrus aroma, balsamic overtones with a warm spicy floral quality

Note: Top

Countries of production: Native to Morocco and tropical Asia it is grown commercially in the Ivory Coast, Morocco, Tunisia and Algeria and is extensively cultivated in Calabria in Southern Italy. It was first cultivated around Bergamo in Lombardy, Italy, from whence it takes its name.

Parts Used: The peel of the nearly ripe fruit

Extraction Method: Cold expression. Although there have been many oils produce by mechanical processes the best quality oil remains that which is produced by hand.

Yield: about 0.5%

Main Chemical Components: The oil is known to have about 300 components the main being linalyl acetate 30-60%; linalol 11-22%, d- limonene, gamma terpenene, bergaptene and dipentene, and other alcohols, sesquiterpenes, terpenes, alkanes, and furocoumarins 0.3-0.39%

Warnings and Contraindications: Bergapten (a prominent chemical component of Bergamot), is photo toxic on human skin. This causes sensitivity and skin pigmentation when exposed to sunlight. Use caution when using Bergamot in sunny weather. Even when the ingredient Bergaptene (Furocoumarin) is removed from the oil to minimize photo toxicity, it is still advisable to keep treated skin out of the sun.

May irritate skin

Bergamot should never be used undiluted on the skin. Severe burning may result.

Therapeutic Properties: antiseptic, antibiotic, anti-spasmodic, stomachic, calmative, and a febrifuge.

Therapeutic Applications:

Emotional: frequently used to relieve helplessness, hopelessness, emptiness and grief. Most valuable for its uplifting, refreshing, and relaxing effects. Traditionally used for tension, anxiety or depression. Encourages cheerful emotions and ideal for depression. Its delicate, sweet aroma can also be used to freshen and uplift a room. It's cooling and refreshing quality seems to soothe anger and frustration.

Helpful in treating SAD (Seasonal Affective Disorder), PMS (Pre Menstrual Syndrome) or generally feeling just a bit off, lacking in self-confidence or feel shy. Also used in general convalescence.

Digestive: can be used in the treatment of stress related dietary problems such as over and under eating.

Genito-Urinary: Bergamot oil has a strong affinity for the urinary tract and is valuable in the treatment of cystitis and urethritis. It should be used in the bath or as a local wash at a 1% dilution (or less).

Respiratory: used for respiratory tract infections such as tonsillitis, bronchitis and tuberculosis.

Skin: The antiseptic qualities of Bergamot make it ideal for the treatment of skin complaints such as acne, oily skin and all infections of the skin, including athlete's foot fungus. Bergamot has an inhibiting effect on certain viruses in particular Herpes simplex 1 which causes cold sores. Bergamot will also reduce the pain of shingles and chicken pox.

Other: Bergamot is cooling in feverish conditions and has effective insect repellent properties

Blends Well With: Blends with: Lavender, Neroli, Jasmine, Coriander, Juniper,

Chamomile, Lemon, Geranium, Cypress, Eucalyptus, Jasmine, Marjoram, Palmarosa, Patchouli, Ylang Ylang Black Pepper, Clary Sage, Frankincense, Mandarin, Nutmeg, Orange, Rosemary, Sandalwood, Vetiver.

Herbal Tradition: Bergamot oil is documented in old herbal texts. Some traditional

uses: balancing nervous system, relieving anxiety and stress, lifting melancholy, for restful sleep, antiviral, cold sores, psoriasis, eczema and insect repellent.

The fruit has been used for hundreds of years in Italian folk medicine however the fruit was unknown outside Italy and the fruit was not exported until recent times. The oil was primarily used for the treatment of fever and intestinal worms.

Aerosol applications

In vapor therapy Bergamot oil is traditionally used for depression, feeling fed-up, colds and flu, PMS and SAD.

Bath / Foot Bath applications

Bath applications include stress, tension, SAD, PMS, skin problems (including athlete's foot), compulsive eating, postnatal depression, colds and flu, anxiety, depression, feeling fed-up and anorexia nervosa

Cream / Massage oil applications

Bergamot oil can be used in blended massage oil, or cream for skin conditions or for emotional support for stress, tension, SAD, PMS, compulsive eating, postnatal depression, colds and flu, anxiety, depression, feeling fed-up and anorexia nervosa.

As part of a blended base cream, Bergamot oil can be used for wounds and cuts, psoriasis, oily skin, diaper rash, scabies, eczema, acne and cold sores.

Notes or Comments: Bergamot is used extensively as a fragrance and is also found in toiletries and cologne.

Together with Neroli and Lavender, Bergamot is the main ingredient for the classical 4711 Eau-de-cologne fragrance, and is used to flavor Earl Grey tea.

Should not be confused with the herb Bergamot (*Monarda didyma*)

Buying and Storing Essential Oils

Where to buy

You will find aromatherapy products are widely available. You will also find 'aromatherapy' is an often misused word. With the growth of popularity in the healing, comfort and beauty aspects of aromatherapy, everyone has jumped in and offers products with 'aromatherapy' properties. Shampoos, bubble baths, room sprays and candles are scented with synthetic chemicals and sold as 'genuine aromatherapy' products in almost every gift shop and grocery store. Specialty shops have sprung up in every mall offering bottles of 'perfume oils', promising all of the benefits of aromatherapy at a bargain price. Since real aromatherapy products are relatively expensive, it quickly lures some unethical individuals into the high cost (high potential profit), low regulation business. There is no regulatory body out there to help you. You are on your own when selecting the manufacturers and distributors of these precious products.

For the first time buyer of essential oils, you will most likely start with small quantities of a few essential oils. There are many reputable companies that offer such packaging at the local retail level. Your first task is to find the potential sources of essential oils in your area. For this, try using your local phone directory and internet directories with the following key words:

- Aromatherapy
- Botanicals
- Essential oils
- Health food stores
- Herbs
- Nature or natural ingredients
- Perfumes
- Pharmacies, natural or homeopathic

This should provide a good starting point. There are many mail order companies, internet companies and even multi-level marketing companies that specialize in essential oils. As you learn of these sources make a point to request their catalogs. They may have sample kits for you to experience the quality of their oils. By all means, collect this information. However, until you have some experience in the quantity and variety of essential oils that you will need, it is best to start with a very small quantity from a local source. You will learn quickly which oils you like, which work well for your family, and how much you need for specific uses.

As a general rule of thumb, health stores will have therapeutic essential oils, while gift, grocery, perfume or body product stores will have adulterated or synthetic oils.

Not all ready-made 'aromatherapy' products are pure and natural. There is no regulation concerning the use of the word aromatherapy on packaging. If a product is inexpensive, you can almost be assured the product is adulterated if not synthetic. As a general rule-

of-thumb, be wary of products that do not list their ingredients or that list their ingredients as herbal names. The words 'Essential Oil' are important. Some reputable sellers of aromatherapy products are reluctant to label their blends for fear someone will steal their formula. Any good supplier should be happy to tell you the ingredients when asked, since there are certain oils that must be avoided by individuals with certain health conditions. In general, anyone practicing aromatherapy will prefer to make their own blends to suit their specific needs. However, if you find a pre-made blend that is appropriate to your needs, it may be more cost effective to purchase the blend, rather than purchasing each individual component to create your own blend.

Professional aromatherapists almost always purchase from mail-order companies. The quality is consistently higher, the turnover rate insures freshness, and the cost is usually lower. It is important to understand your rate of usage before placing orders. Having too much oil simply puts you in danger of letting it age, going past its most effective therapeutic value.

What to buy



Please note – this grouping of essential oils is shown to give you an example of the range of sizes you will encounter when purchasing essential oils. It is not intended to be a recommendation or endorsement of any specific brand.

Essential oils come in a variety of sizes and qualities. For aromatherapy, only pure therapeutic grade essential oils are used. This may be confusing. Some manufacturers deliberately try to mislead you into believing their products are suitable for aromatherapy. Some store managers are simply ignorant. Here is a list of things to keep in mind during as you begin to explore this world:

1. Purchase essential oils from reputable companies. The local health food store may have a supply from well known companies, or oils supplied from local re-packagers. Ask questions. It is particularly important to understand the shelf life is limited. If your health food store does not do a brisk business in essential oils, enough to have a good 'turn over' in products, do they send 'leftovers' back to the company, have a 'sale', or just keep them on the shelves?
2. Essential oils should vary greatly in price. A bottle of Jasmine Essential Oil should cost 100 times more than the same size bottle of Grapefruit Essential Oil. If you see a display where all of their 'essential oils' of the same size are priced the same – you know something is wrong. Jasmine and Rose are the most expensive essential oils. Lavender, Eucalyptus and Tea Tree essential oils should be among the least expensive.
3. Only purchase essential oils in dark glass bottles. Amber (golden brown) and cobalt (dark blue) bottles are typical. Green glass is less common, but occasionally used. The

darker the color, the better in preventing deterioration of the essential oil.

4. The label of an essential oil should include:

- Manufacturers name
- Common name
- Botanical name of plant
- Part of the plant used (when relevant)
- Country of origin of the essential oil (oils are often re-packaged in other countries)

5. Do not buy essential oils with:

- Cap dispensers with rubber top on glass droppers
- Clear glass bottles
- Plastic bottles

6. Avoid any products labeled as:

- Reconstitutions
- Nature Identicals
- Isolates
- Perfume compounds
- Aromas

7. Methods of adulteration

Additional chemicals are added to an essential oil to “stretch” it

Oils from cheaper plants are added (Example: Citronella may be added to Melissa)

Synthetic aromatic oils may be added (these may lead to allergic reactions)

Some chemical components may be removed. Note: There is one case where this is acceptable. Bergamot is frequently sold as ‘rectified’ where one component is removed. This is done to lessen the sun sensitizing effect. It should be clearly marked as such.

8. Essential oils are most often sold in 5ml, 10ml and 15 ml (1/2 ounce) sizes. More expensive oils may be sold in 2ml and 1 dram sizes. Most essential oils are sold in a bottle with a flow limiter (or orifice reducer), which allows for dispensing one drop at a time.

9. Essential oils are not ‘graded’ by any government body. If a package says it is ‘Grade A’, it is simply written by an advertising person. Some countries grade milk, eggs, and meat – but none currently grade essential oils. Within a particular manufacturer’s product line, they may sell better and lesser qualities. Always feel free to inquire of a manufacturer about their sources, processes, and methods of quality assurance. If a manufacturer can not answer simple questions about their products – buy elsewhere.

10. The highest quality essential oil comes from the first distillation – or first pressing. Some plant parts are subjected to multiple distillations (due to the cost of raw materials, and an effort to make the production profitable). Within the first distillation

– there is even a difference between the oils produced in the first part or later part of the distillation. The first part of the first distillation will contain the broadest range of natural chemical components, and is therefore usually thought to be the finest for use in aromatherapy as a natural healing therapy. If your goal is to produce a pleasant aroma in the house, a lesser quality will suffice.

Vocabulary

Essences - a catch all term with no specific meaning

Essential oils - the natural volatile oils collected (as appropriate for each plant and plant part) from plant sources.

Extenders - some producers extend their oils by adding alcohol, propylene glycol or acetate after the distillation process.

Flow limiter – Flow restrictor – Reducer – small insert on the top of a bottle that allows the oil to be dispensed as drops.

Folded oil – in the perfume and food industry, multiple re-distillations are used to remove specific chemical constituents. Folded oils are not appropriate for aromatherapy

Hydrosol - the secondary product of steam distillation of essential oils. Has therapeutic uses.

Perfume Oils – synthetic or natural oils that are for pretty smells – not therapy

Poly cap – a bottle cap for essential oil and blends with a small plastic cone inside the cap to provide an air tight seal and further protect the oil

Pure essential oil - this only means that no chemicals or additives (such as vegetable oil) has been added - it does not mean it has a high therapeutic value. Usually when they say 'pure oil' it is an indicator that it is not of high therapeutic value and they are trying to disguise that fact.

Solvents - certain plants do not yield their essential oils easily. To make the yield higher during the steam distillation process - some producers use chemical solvents to break down some of the plant tissues, making it easier for them to release their oils in the distillation process, and raising the yield.

Therapeutic Essential Oil - essential oil produced to the highest therapeutic standards

Add your own words to this list as you see new terms and learn their meaning.

Measuring and Mixing Utensils



You will find for home use, it is easy to use a few bottles of essential oils, a few bottles of carrier oils, perhaps a few dark glass bottles, and a spray bottle.

Typical home use of essential oils involves very few special supplies. Almost all of your items will be found in a local health food store and perhaps the grocery store. In a professional aromatherapy preparation area, specialized measuring, mixing, storage and labeling may become more sophisticated.



Graduated cylinders, beakers, and pipettes are very useful when preparing aromatherapy products on a professional level. Glass and stainless steel are the most practical materials.

Record keeping

A form and/or notebook should record each essential oil you have the opportunity to experience. The record should include:

- name of product
- date and location of test
- manufacturer
- country of origin
- how obtained
- smell
- personal opinion
- personal reaction
- comments
- weight or sizes available
- cost

If you simply make this a habit, it is a very quick and easy process. This is the hardest step for a newcomer to aromatherapy to take. Since everything is fresh and new, you believe you will always remember the Lavender at Shop 1, and the Bergamot at Shop 2. The subtlety of the variations in high quality essential oils are amazing. Even more important is the discovery of poor quality oils, or rancid oils. If you intend to use aromatherapy as a one time use for one individual, the record keeping is unnecessary. If you intend to use aromatherapy as an accent to your life for many years, the record keeping will save you time and money in the long run.

Experiencing Essential Oils – While shopping

To experience an essential oil at a local shop or trade show:

- Place one drop on a sample paper (usually blotter paper).
- Gently fan the paper under your nose - then inhale slowly.
- Put the paper down and enter all details in your record book or form
- Do not try to take a long deep breath while your nose is over the bottle.
- Gently fan the paper under your nose again.
- Immediately open your notebook and write your impressions.

The 'essential' property of the essential oil is its evaporation characteristics - the molecules becoming airborne. By gently fanning the paper - you release the molecules into the air. Take a canister of coffee beans with you when sampling essential oils. Take time, and a whiff of the coffee beans between sampling oils. If necessary, go outside and breathe fresh air occasionally.

Pure essential oils when dropped on blotting paper will impregnate it, then evaporate completely leaving no oily residue. Please note there are some exceptions to this rule (example: vetiver). Adulterated oils will usually leave a residue.

Storing Essential Oils

Essential oils are volatile natural compounds. There are a few special considerations in their storage:

- They must be stored in a dark place (do not place them on a windowsill).

- They must not be stored near heat or heat sources (do not place them in the cupboard over the oven).

- The caps must be kept securely tightened immediately after each use (walk away and forget the cap is off and you may come back to an empty bottle).

- They are flammable and must be stored and used with great care.

- They are enticing since they smell so good. Keep them away from children.

Medicine cabinets are not usually appropriate places to store your essential oils. Most bathrooms cycle with steamy heat at some time each day. It is best to store your essential oils in a cool dark place, in their own container (for example a wooden box), where they are undisturbed until needed. You may find there are one or two essential oils (like Lavender and Tea Tree oil) that you will keep in a bathroom cabinet or in a kitchen cupboard, for the day to day first aid uses. These oils are not expensive, and will be used quickly, so that their environment is not a problem. However, expensive oils and those you use less often should be stored carefully to ensure maximum effective life. Essential oils should not be stored close to homeopathic remedies as this may affect their properties.