

# The Essentials of Essential Oil

# Safety

How to Safely Use Aromatherapy Essential Oils with Confidence

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### **About the Author**

#### **Dorene Petersen**

#### ACHS President and Founder

I founded the college from humble beginnings. As a kid I learned about the power of plants from my grandmother as we gathered dandelion and yellow dock roots in the paddocks in New Zealand. While training as a Naturopath, and raising two kids, I realized the transformational power of



education. In 1978, I founded the college with a deep commitment to helping my community and friends live a life empowered by holistic health knowledge.

Today ACHS is an accredited college of higher education, has students in 80 different countries, an amazing, dedicated team of faculty, and academic support staff and continues to inspire and support individuals to live lives of wellness one successful ACHS graduate at a time.

### Introduction

Aromatherapy essential oils have a long history of use in perfumery. Their therapeutic benefits are also well-known and well-researched to support optimal health and wellness. Aromatherapy is becoming more popular by the day. We see essential oils advertised in storefront and online shops, as well as on websites and social media. But, is that recipe you found on Pinterest really safe to use? How can you find out?

This booklet will guide you through key topics in essential oil safety.

This eBook will guide you through key topics in essential oil safety.

#### You will learn...

- 5 key concepts for essential oil safety
- How to safely use essential oils in the bath
- How quality affects therapeutic value and safety
- Essential oil safety guidelines and common mistakes
- How to select quality organic sustainably-sourced oils
- What is photosensitivity?

Essential oils can enrich your personal health and wellness or your work with clients. But, safety is key! We hope you enjoy this introductory booklet on how to safely and effectively incorporate aromatherapy essential oils into your life.



# Practicing Aromatherapy with Caution

5 Key Safety Concepts That You Should Know as an Aromatherapist or Essential Oil Enthusiast

# Practicing Aromatherapy with Caution



If there's one topic that has caused a lot of discussion in the aromatherapy community, it's essential oil safety. And for good reason! There's an exceptional amount of misinformation out there around these highly concentrated plant substances. So, before we enjoy the wide range of uses for essential oils, it's important to discuss the major safety issues with aromatherapy.

There are many opinions about and approaches to how aromatherapy can be practiced safely and effectively. There've been heated debates over whether essential oils should ever be used neat (without dilution), whether they are safe to ingest, and even how they should be safely used in the bathtub.

#### 5 Key Safety Concepts That You Should Know as an Aromatherapist or Essential Oil Enthusiast



#### 1. Celebrate the Individual!

Aromatherapists honor the individual constitutions of their clients. As we often repeat in the integrative health industry, everyone is an individual. So, it's important to recognize that each person has a unique metabolism, vitality, physical makeup, and personal history.

For example, an acceptable dose for a 45-year-old female in good health may not be appropriate for her 75-year-old frail uncle or for her 20-year-old daughter.

Additionally, aromatherapists consider aroma memory. For example, if our 45-year-old female had a negative experience with lavender, in the past, and does not like the aroma, she may experience stress and anxiety rather than a sense of calm, even though we know lavender *Lavandula angustifolia* (Mill.) is traditionally calming.

Makes sense, right?

#### 2. Low Therapeutic Margin



Have you heard the saying "natural doesn't mean non-toxic," and "it's all in the dose?" These sayings are true. Plants are powerful, which is why it's important to know how much of an essential oil or herb is beneficial, and how much is toxic.

You'll hear the term "low therapeutic margin" used in both aromatherapy and herbal medicine. What this means is that the difference between a therapeutic dose and a harmful dose is a very small amount.

Even popular oils can have a low therapeutic margin, like basil *Ocimum basilicum* (L.) ct methyl chavicol and clove *Syzygium aromaticum* (L.), and they should be used with caution.

Basil's toxic constituent is a phenol called methyl chavicol or estragole. Basil essential oil should not be used at all if someone has a history of estrogen-dependent cancer due to the estragole content. Use no more than three drops in the bath and mix with a dispersant such as whole milk or a base oil, and add the mixture once the bath is full, giving it a good swish to mix, as it causes skin tingling and sensitivity. Because of this, a skin patch test is an important safety step if you plan to administer topically– be sure to check out the instructions further on in the book. It can also cause skin sensitization (check out #5), which is more of an immune response. It should not be used if you are pregnant or breastfeeding and only at the recommended dose and dilution at other times.

The toxic constituent in clove is also a phenol called eugenol. Clove *S. aromaticum* may also cause irritation in some people, both internally and externally, and a skin patch test is always recommended. If there is a reaction, reduce the dilution by half. This is another oil that should be used with caution in pregnancy (externally, only after the first trimester).

As a general rule, all essential oils containing phenols can overload the liver if the stated dose or dilution is exceeded or if it is administered longer than the recommended time.

Bottom line, if you're a beginner, build up some experience before venturing into using oils with low therapeutic margins. Finding alternatives is the key!

The important thing to remember about these plants: the difference between a helpful dose and a harmful dose can be mere drops! Don't make the mistake of increasing dosage to increase benefits– less is more.

#### 3. Toxicity

Understanding toxicity is key to practicing aromatherapy safely. Essential oils with a low therapeutic margin often have a high toxicity rating. This depends on the constituent profile (chemical makeup) of the oil. Most often, a toxic reaction is due to incorrect dosage or administration.

So, before you start using oils with a toxic rating, be sure to...

- Learn the therapeutic margin
- Check the Recommended Daily Dose (RDD)
- Perform a skin patch test
- Never use if pregnant or breastfeeding
- Never administer to children, infants, elderly, or those who are frail with weakened immunity

It's worth repeating: When it comes to aromatherapy, less is more!

There are a few ways that a toxic reaction can manifest in the body, and we'll define those below.

#### 4. Skin Irritation



Some oils can cause irritation if you use them undiluted.

Essentially, skin irritation is the result of contact with an abrasive substance. It is localized, and the extent of the irritation depends on how much of the substance was used.

As we mentioned, always confirm the RDD and follow those instructions when using essential oils. If you're a sensitive person or working with an essential oil with a low therapeutic margin, do a skin patch test to check for any irritation.

To avoid skin irritation, make sure your essential oils are correctly diluted with a carrier oil (also called a base oil). In general, we suggest avoiding using "neat" (direct/undiluted) essential oils on the skin. Start by erring on the side of caution. Begin with a high dilution ratio- we recommend 24 drops in four ounces of carrier oil (or 1%).

If your skin gets irritated, bathe the affected area with a carrier oil or full-fat milk. Remember, oil and water do not mix, so using a nonpolar substance like milk or oil is the best way to wash off the essential oil.

#### 5. Skin Sensitization

Sensitization is not irritation, although these terms are often confused. Let's look at the definition of sensitization.

Sensitization is a systemic response involving the immune system. This reaction happens once the culprit essential oil has absorbed into the skin, and has been flagged by the body's immune system. This reaction does not always occur on the first exposure to an essential oil, and it can develop over time.

Aromatherapists, massage therapists, natural product manufacturers, and anyone who works with essential oils are at a higher risk for these types of reactions and must be vigilant about their long-term exposure to essential oils.

In other words, even if you've never had a reaction before, your immune system may eventually "flag" a certain essential oil as potentially dangerous and then "sound the alarm" to your body. This presents as an allergic reaction.



There's a dangerous myth that claims essential oils do not cause allergic reactions because they do not contain larger molecules, such as amino acids and proteins; large molecules can be detected by B-cells, which is what triggers an immune response.

However, essential oils do contain smaller molecules that, once absorbed, bind to proteins. These are called haptenated proteins, and they can be detected by B-cells and may trigger an immune response. Thus, essential oils can absolutely cause allergic reactions and should be used with care. If an allergic reaction occurs, remove the essential oil with full-fat milk or a carrier oil, and stop using it.

Not all essential oils are created equal. While we might like to assume that all oils– beautifully and professionally packaged and sold in seemingly reputable stores– are of the same quality, we'd be doing ourselves (and potential clients!) a disservice.

In reality, many factors affect the quality of an essential oil. And quality, in turn, affects therapeutic value and the outcome of your desired result.

Spend some time learning about the different factors that can affect the quality of your essential oils so that you know what to look for when you're reading a label or talking to a potential new supplier.

# An Essential List of Factors that can Affect Essential Oil Quality

Ask These Vital Questions to Determine the Quality of Your Oils

### An Essential List of Factors that can Affect Essential Oil Quality



Like us, plants have preferences. Clary sage *Salvia sclarea* (L.), for example, is best harvested during the late flowering period, and it's best distilled resh, while rosemary Rosmarinus officinalis (L.) yields a greater volume of bornyl acetate– rich essential oil when you strip the leaves from the stem before distillation (the anti-inflammatory ester borny acetate is the good stuff that creates the strong, pleasant refreshing aroma typical of pine needles).

The quality of a packaged essential oil may be compromised if the following factors are not considered for the specific plant being harvested and processed into an essential oil.

#### Ask These Vital Questions to Determine the Quality of Your Oils

#### Where Was the Plant Grown?

Lavender *Lavandula angustifolia* (Mill.) is a great example. The higher the altitude (ideally above 1,200 meters), the greater the concentration of the linally acetate (another ester that packs a powerful anti-inflammatory punch).

### What Part of the Plant Was Used/Should Have Been Used to Distill the Oil?

The active constituents are usually concentrated in one part of the plant. If you are looking for specific results, don't use the leaf oil when the therapeutic constituents are concentrated in the bud. Clove *Syzygium aromaticum* (L.) is a great example.

#### How Was the Plant Grown?

Organically? Pesticide-free? As environmentally aware aromatherapists and essential oil enthusiasts, certified organic and pesticide-free areas are always preferred for people of the planet.

#### What Is the Climate of Where the Plant Was Grown?

Plants thrive where they like to grow... just like us. Ifr they are grown outside their comfort zone, the plant does not develop the full array of the chemical constituents at the level that is the most effective.

#### How Was the Plant Harvested?

Ethically? Sustainably? Ethical, sustainable harvesting adds to the power of the essential oil. After all, would you want to buy and use an essential oil that requires 50-year-old trees to be felled (like Indian sandalwood *Santalum album* (L.)) or that was gathered by women at 4 a.m. who are paid the equivalent of \$5 U.S. a month (like jasmine *Jasminum grandiflorum* (L.)).



#### When Was the Plant Harvested?

You would not harvest your carrots while they are still as thin as pencils; the same with essential oil plants. They are "ripe" when they have produced the most efficacious levels of the beneficial constituents.

#### How Was the Essential Oil Produced?

Some plants like jasmine J. grandiflorum will not yield their aromatic molecules to steam so are best not distilled. Jasmine J. grandiflorum should be a solvent extraction (also known as an absolute).

#### How Was the Essential Oil Stored Following its Production?

Essential oils are volatile and just like wine, they can become "corked." Oxygen will alter their chemical profile over time, as will heat and light. Protection is the key, including limiting their exposure to oxygen and high temperature. You know you are a convert when you open your refrigerator and the shelves are full of citrus oils and very little else. We can't live on great aromas alone, but a whiff of certified organic, steam-distilled neroli Citrus aurantium (L.) var amara each morning as you head for your freshly squeezed orange juice can transport you to the flowering orange groves in the Sicilian country-side.

# 7 Tips to Check if You're Getting High Quality Essential Oils

What Can You Do to Ensure the Essential Oils You Buy Are What They Say They Are and Safe to Use?

### 7 Tips to Check if You're Getting High Quality Essential Oils



So, What Can You Do To Ensure the Essential Oils You Buy Are What They Say They Are and Safe To Use? Well...

#### 1. Get to Know Your Supplier

Do your research. These days, almost all retail-related websites include a place for people to leave reviews. Spend a little time reading through these, and you'll get a sense for the overall vibe of the retailer. Then, when you've located someone you trust, work on developing a relationship.

You can start with a simple "get to know you" email or a quick phone call; ask your one

When you've located someone you trust, work on developing a relationship. or two "deal-breaker" questions about quality and see what kind of response you get.

Ideally, you want to purchase from a supplier who deals directly with reputable distillers (and can, therefore, easily answer your questions). Also, suppliers usually will provide a small sample of the oil for you to check before purchasing larger quantities.

#### 2. Latin Names Are Where It's At

Order your essential oils by their Latin name, not their common name. You can have multiple essential oils called "lavender," but *Lavandula angustifolia* (Mill.) is known for its soothing and relaxing qualities, while *Lavandula stoechas* (L.) is not typically used for medicinal purposes at all. Always check the oil's label for the correct botanical (i.e., Latin) name.

#### 3. Perform Your Own Tests

You can use organoleptic testing to help ensure your essential oils have not been extended or diluted (more on this below!).

Organoleptic testing uses all of your senses to evaluate an essential oil. You want to educate your olfactory senses to the smell, taste, feel, and look of different essential oil samples to help build your experience.



To carry out an organoleptic test, check out the smell, feel, taste, and look (i.e., color) of the oil. Educate your olfactory senses at every opportunity: smell, taste (only the safest oils), feel, and look at oils from as many different samples and sources to gain experience.

#### 4. The Price Tag Does Not Equal Quality

Just because an essential oil is pricey does not mean it's of higher quality. You should be assessing your oils (organoleptic testing, requesting GC/MS reports, asking about sourcing) regardless of the price tag. However, if a price is unusually low, this could be an indication that an oil is not what the label claims. This could mean it is diluted in a base oil or even more harmful diluents also called extenders. The two you may encounter are diethyl phthalate, also known as DEP, and dipropylene glycol. DEP is made from ethanol and phthalic acid, and is a nervous system depressant and possible carcinogen. If an oil you taste on the tip of your tongue makes your tongue numb, suspect DEP.

Dipropylene glycol has lower toxicity than DEP but is still and adulterant particularly if it is not on the label. If you detect a sweet taste in an oil, suspect dipropylene glycol.

Big-ticket oils such as rose *Rosa damascena* (Mill.), neroli *C. aurantium* var. *amara*, or sandalwood *S. album* are often sold diluted in a base oil, so it's even more important to assess these oils carefully and purchase from a distributor you trust.

#### 5. Build Your Experience

So, how can you start to assess the quality of essential oils for yourself? Start by sampling as many pure oils vs. synthetic oils as possible. Write down the differences. Keep an "aroma" journal, and over time, you'll start to notice the subtle (and sometimes, not so subtle) differences between pure, unadulterated oils and synthetic or adulterated fragrances.

If you are really serious about essential oil quality, develop relationships in the aromatherapy community and join the conversation. You might even seek out a mentor in the community to help guide you on your journey to developing a keen sense for quality oils.

#### 6. Know What's Lurking in Your Essential Oil



As we discussed, you want to make sure your bottle of essential oil contains only essential oil. Sometimes sellers will add cheaper substances to the essential oil to get more "bang for their buck."

There are a few kinds of adulterants. "Diluents" are substances (typically odorless) that are added to essential oils to dilute the product, saving the seller money on the real essential oil.

"Extenders" are often synthetic chemicals created in a lab to mimic the aromatic qualities of essential oils.

Other unsavory substances are often labeled as "nature identical," but there's nothing natural about them. This typically refers to a chemically synthesized version of a plant. Yet, plant substances have unique chemical properties and makeup that work together "synergistically" in the body and cannot be reproduced in a laboratory.

ACHS President Dorene Petersen discusses diluents, extenders, and synergy at length in a blog post here:

https://info.achs.edu/blog/essential-oils-diluents-extenders-synergy.

Adulterated oils are never suitable for clinical aromatherapy, and can be harmful to our bodies.

You can ask your supplier to provide you with a GC/MS test, which can (sometimes, not always) detect adulterants. A pesticide report is also helpful even if an essential oil is produced as a certified organic oil. Pesticide free is a vital quality issue. ACHS President Dorene Petersen discusses this type of testing in a blog post here: https://info.achs.edu/blog/essential-oil-guality.

#### 7. Remember: Essential Oil Quality Directly Relates to Safety

If you're wondering, "Quality is great, but what does it have to do with essential oil safety?"

The answer is: a lot!

Adulterants can harm the body as we mentioned above. For example, the diluent diethyl phthalate (DEP), often added to commercial fragrance products, may have cancer-causing properties. [1]

Extenders are even more difficult to detect since they are synthetically designed to mimic essential oils. The scary part is that

Certified organic oils are produced without the use of genetic engineering and artificial fertilizers-another big plus in the quality category.

they can produce negative effects that the natural essential oil would not produce, and can actually harm the body.

Lastly, not all adulterated oils are purposefully adulterated. Often, non-organic raw materials that are sprayed with harmful chemical pesticides bring these toxins with them into the essential oil. That is why choosing certified organic essential oil is paramount when looking for quality oils.

Pesticides can be extremely harmful to our bodies and have been linked to adverse effects on the nervous system, skin, eyes, and endocrine system. [2] Not to mention, they do incredible damage to our environment.

The recent surge in essential oil popularity is undeniable. A report published in Green Mountain Outlook projects that the organic essential oil market will continue to see strong growth through 2021. [3]

As any aromatherapist will tell you, the safe and appropriate use of essential oils can bring incredible benefits. From encouraging relaxed sleep to headache relief, essential oils are highly concentrated plant substances, and you should treat them with caution and care.

# Common and Dangerous Essential Oil Mistakes

**Incorrect Application of Essential Oils** 

### **Common and Dangerous Essential Oil Mistakes**



#### **Incorrect Application of Essential Oils**

You can use essential oils in many ways. They can be applied to the skin in a diluted form (e.g. with a base oil like sweet almond oil), or inhaled. Certain essential oils can also be taken internally for specific situations (e.g. in a capsule form or one drop on a lactose tablet or sugar cube).

Each application method has its own precautions.

#### Skin/Topical Use

Certain oils may cause irritation if used in too high a concentration. If you happen to be a highly sensitive person (HSP), try a skin patch test to determine any potential irritation before you use essential oils and always dilute appropriately. (See instructions for skin patch testing on following page).

Irritation from an essential oil is a direct result of contact with the oil. It's localized and does not involve the immune system. Once the offending essential oil is removed using a base oil or full-fat milk (or at least 2%), the skin can begin to recover. You can even use tepid water in a pinch, but it's not as effective as oil or milk.

For people with sensitive skin, essential oils can sometimes cause more damage, while other folks can withstand the same concentration of essential oil without a problem.

### **Skin Patch Test**

- 1 Wash and dry the forearm thoroughly with unscented soap.
- 2 Apply enough of the essential oil blend to moisten but not to saturate.
- **3** Cover with sterile gauze.
- Leave in place 24 hours, unless burning or irritation occurs.

For accuracy, conduct the skin patch test using the proposed concentration of essential oils.



Several essential oils like the ones bulleted below can cause skin or mucous membrane irritation:

- Steam distilled cinnamon bark and leaf Cinnamomum zeylanicum (Blume)
- Steam distilled clove bud, leaf, and stem *Syzygium aromaticum* (L.) (because of the eugenol content, which is an irritant and potential sensitizer)
- Steam distilled lemongrass leaf Cymbopogon citratus (Stapf)

**Recommended Dilutions** 

Be sure to check specific contraindications of the oils you choose.

Carrier Volume	1%	2%	4%	.5%	Children, elderly, and expectant mothers*
½ Ounce (1T)	3 drops	6 drops	12 drops	2%	Topical – whole body lotions and oils
1 Ounce (2T)	6 drops	12 drops	24 drops		
2 Ounces (4T)	12 drops	24 drops	48 drops	104	For concentrated
4 Ounces (1/2C)	24 drops	48 drops	96 drops	470	massage oil (local areas)
8 Ounces (1C)	48 drops	96 drops	192 drops	*ACHS does not generally recommend essential oil use with babies, young children, and expectant mothers except on a case-by-case basis. You may also choose to consult with a Registered Aromatherapist (RA) for each individual case of use.	
16 Ounces (2C)	96 drops	192 drops	384 drops		

#### Inhalation

Inhalation is arguably the safest means of administering essential oils, and it's the fastest way to get essential oils into your bloodstream.

However, it's still critical to use oils with caution... even when diffusing. When diffusing essential oils, always:

- 1. Diffuse in a well-ventilated area
- 2. Diffuse for 30-minute intervals and take regular breaks
- 3. Make sure pets (especially cats) have the option to leave the room
- 4. Follow dilution guidelines (shown above)



#### Internal/Oral Use

Only a few specific essential oils and situations call for oral administration. It's important to ask yourself if oral administration is actually necessary. Each client is a unique individual with a specific situation, which must be analyzed and critically assessed.

Once you've come to a decision, you must then consider:

- 1. Dose
- 2. Concentration
- 3. Duration

# Toxicity and Poisoning

The Result of Using a Dose Much Higher Than the Therapeutic Dose or Recommended Daily Dose (RDD)

### **Toxicity and Poisoning**



Toxicity or poisoning is often the result of using a dose much higher than the therapeutic dose or recommended daily dose (RDD).

The Martindale Extra Pharmacopoeia provides excellent guidelines for using essential oils orally and notes acceptable daily intakes per kilo of body weight.

Tea tea *Melaleuca alternifolia* (Cheel) and eucalyptus *Eucalyptus spp*. Are two common culprits for poisoning. This typically occurs when someone has ingested too much or a child drinks the oil in error. Always keep your oils out of reach of children. We even suggest purchasing child-proofed essential oil lids and a child lock for your essential oil cabinet.

#### Cooking

Essential oils are often used as flavoring agents in common products like toothpaste and beverages. If you want to experiment and get creative with using essential oils as flavoring agents, be sure to follow a recipe from a trusted source like ACHS or from a Registered Aromatherapist (RA).

Curious to explore? We have a free eBook on the subject: Top 10 Culinary Essential Oils

Bottom line: oral administration for therapeutic purposes is best left to those who are trained and have experience in clinical aromatherapy.

here: <u>https://contact.achs.edu/download-free-culinary-essential-oils-ebook</u>. But remember, after checking the cautions and contraindications for your oil of choice, dilute thoroughly with a carrier oil like olive or coconut oil. You can also check the U.S. Food and Drug Administration Generally Recognized as Safe list (GRAS) for oils that can be used in very minimal amounts in cooking.

Additionally, when it's available, it's always best to use certified organic and pesticide-free essential oils.

## Disregarding Contraindications and General Safety Recommendations

Ignorance or disregard of basic essential oil safety information can be one of the most dangerous mistakes to make with essential oils.

Essential oils can react with prescription drugs and supplements (a topic for another blog post), and they can cause adverse reactions when used in excess. They can react differently in children, the elderly, and those with weakened immunity. It's imperative to educate yourself on the cautions and contraindications surrounding essential oils.

For example, anise *Pimpinella anisum* (L.) essential oil contains the toxic constituents anethole and phenolic ether. When used in excessive doses (more than three drops,

three times per day, or with prolonged use over two to three weeks), anise has the potential to cause circulatory and nervous system disorders.

Also, a 2012 review study showed that anise *P. anisum* essential oil increases the effects of drugs that affect the central nervous system (CNS). It also showed anise lowered the antidepressant effect of some medication. [4]

Another example is fir *Abies balsamea* (L.), which has been shown to potentially inhibit certain metabolic pathways in the liver, which could potentially limit the effectiveness of some diabetes medication. [5]



Essential oil-drug interactions can be both positive and negative and a great example is eucalyptus *Eucalyptus globulus* (L.).

As a penetration enhancer, eucalyptus is one essential oil that can have both positive and negative reactions with pharmaceuticals, particularly with transdermal application. Skin is an important site of drug application for both local and systemic issues. Unfortunately, stratum corneum (the outermost layer of the epidermis consisting of dead cells) acts as a barrier that can prevent topical pharmaceuticals from reaching the bloodstream, decreasing the effectiveness of the medication, and limiting the use of transdermal patches. An older, but still relevant 1989 study showed that E. globulus caused a 30-fold increase in the ability of the drug 5- fluorouracil [6] to penetrate human epidermal membranes. Thus, the study concluded that essential oils could offer a useful selection of safe penetration enhancers to aid topical drug delivery. [7]

It was determined that 1,8 cineole, one of the major constituents of *E. globulus* essential oil was responsible for the penetration enhancement. [8] *E. globulus* was also shown to enhance penetration of other drugs, such as chlorhexidine digluconate. [9] Eucalyptus's ability to enhance absorption of pharmaceuticals is incredibly valuable to the pharmaceutical industry as a way to broaden topical application of pharmaceuticals.

However, given eucalyptus's powers as an absorption enhancer, professional aromatherapists must be extremely vigilant and aware of other interactions that can produce negative effects.

Enjoying aromatherapy safely should not be based in fear but with education. Essential oils can enhance and enrich your wellness practice. But, like all things in life, the more you are educated about what you're using, the better your outcomes will be.

## What is Photosensitivity?

It's Crucial to Have a Basic Understanding of a Key Safety Term: Photosensitivity

### What is Photosensitivity?



Sunshine, swimming, and botanical walks– vacations to sunny places are full of opportunity for outdoor adventures. But if you love essential oils and natural products, it's crucial to have a basic understanding of a key safety term: photosensitivity.

A number of drugs and skin products are photosensitive and are labeled with cautions

to avoid UV light from any source like sunshine or sun tanning beds. When you experience a photosensitive reaction, you could see redness, discoloration, or even blistering.

But did you know that quite a few essential oils are photosensitive? Certain essential oils, especially expressed citrus oils, can contain constituents such as furocoumarins, coumarins, and linalol/linalool, which are potential photosensitizers. Defined loosely, photosensitivity is a process where a given chemical absorbs ultraviolet (UV) light and initiates a reaction, typically on the skin. This means they can cause serious skin damage when exposed to the sun such as redness, itching, burns, blisters, and permanent skin discoloration. And that'll definitely put a damper on your fun in the sun.

Some reactions to photosensitivity may not occur until several hours after application. Repeated exposure can even lead to long-term issues such as basal cell and squamous cell skin cancers or even more malignant changes such as melanoma.

#### Body Care Products and Photosensitive Essential Oils



Here are nine essential oils that can potentially cause a photosensitive reaction if they are used in products that are intended to stay on the skin such as lotion, moisturizer, or sunscreen. While this list contains some oils you may not commonly use or see in products, it at least gives you an idea of which oils to leave behind if you're planning a beach day. So, read your body care labels carefully. And don't forget your SPF sunscreen! Protecting yourself from harmful rays is essential, whether you're using products with essential oils or not.

For body care products you make yourself (go DIYers!), make sure the use level in a leave-on-the-skin product (e.g. lotion or body butter) is within the recommended maximum dilution percentage required by the International Fragrance Association

(IFRA). We've listed the recommended maximum use level for some of the most common photosensitive essential oils below:

#### **Common Photosensitive Essential Oils**

- 1. Angelica root *Angelica archangelica* (L.) (absolute and CO2 extract): Maximum use level 0.8%
- Bergamot peel Citrus aurantium (L. var bergamia (note bergaptene-free or furocoumarin-free bergamot is not phototoxic; you see this listed as FCF or BF): Maximum use level 0.4%
- Bitter orange peel (expressed) Citrus sinensis (Osbeck): Maximum use level 1.25%
- 4. Cumin seed Cuminum cyminum (L.): Maximum use level 0.4%
- 5. Grapefruit peel (expressed) *Citrus paradisi* (Macfad.): Maximum use level 4%
- 6. Lemon peel (expressed) Citrus limonum (Risso.): Maximum use level 2%
- Lime peel (expressed) Citrus aurantifolia (Christm.): Maximum use level 2%
- Mandarin leaf (distilled) Citrus reticulata (Blanco) (mandarin leaf has a very low level of furocoumarins and IFRA does not give maximum use levels)
- 9. Rue leaf (essential oil and absolute) *Ruta graveolens* (L.): Maximum use level 15%



#### Tips to Avoid a Phototoxic Reaction From Essential Oils



- 1. Wait approximately 12 hours after application before exposing skin to full sun
- If venturing outside before the 12-hour period is up, wear full-coverage clothing like long pants and sleeves
- 3. Read the full label and its list of ingredients on your lotions, skincare products, and topical medications– many products contain photosensitive oils
- 4. If you experience a reaction, stop using the product and get out of the sun. Then, bathe the affected area with a carrier oil or full-fat milk. Remember, oil and water do not mix, so using a nonpolar substance like milk or oil is the best way to wash off the essential oil. If the skin irritation gets worse, contact your doctor immediately or go to the emergency room.

# How to Ensure Quality of Essential Oils

What to Ask For When Buying Essential Oils

# How to Ensure the Quality of Essential Oils



When buying larger quantities of essential oils use this list to know what documents to ask for:

- A lot-specific GC/MS
- A lot-specific pesticide free report
- The Latin name
- The country of origin
- The date of manufacture (we prefer it is distilled within one year of purchase as essential oils will oxidize)
- The method of manufacture
- Plant part, treatment if applicable (e.g. steam sterilization, CO2 treatment), and any test results that were done for the product (heavy metals, pesticides, microbial identity)
- The physical properties (such as refractive index, relative density, and optical rotation).

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# References and Recognition

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