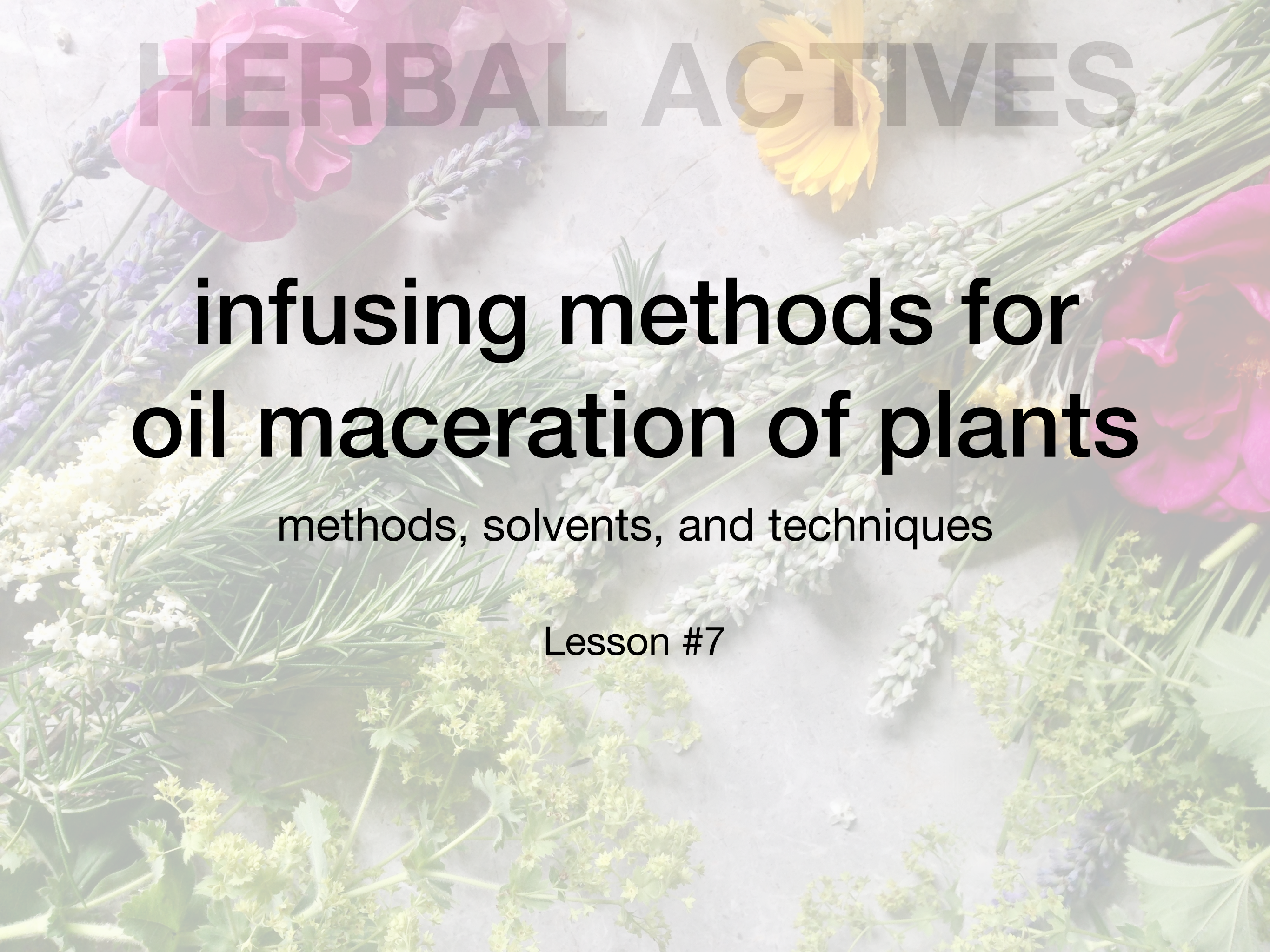


HERBAL ACTIVES



infusing methods for oil maceration of plants

methods, solvents, and techniques

Lesson #7

The process of macerating herbs, flowers, and roots into oils for healing and nourishing formulations is a time-honored practice that dates back thousands of years.

Infused oils can benefit your products by infusing carrier oils with herbal compounds and applying them to the skin.

The compounds that transfer from plant to oil will vary widely, depending on the plant, growing method, and the infusing process.

As I am often asked what transfers from plant to oil and in what quantities, I am beginning the study of the plant world's healing compounds with this course.

The unsaponifiable fractions of plant carrier oils provide a familiar entry point into this topic.

In this lesson, we'll cover the basics of the methodology of plant-to-oil infusions.

infusing herbs, flowers, ...



the plants

Choosing the plants you want to infuse will depend on availability, season, and ultimately what you want the infusion to offer your formulations.

The plants can be dried or fresh, and there are strong opinions on both methods.

Flowers are wonderful to infuse, and while the scents do not transfer strongly, other beneficial compounds will transfer to the oil.

There are no limits to what botanicals can be infused into oil.

If it's from a botanical source, it is worth giving it a try: leaves, flowers, roots, rhizomes, coffee from the kitchen, purchased dried herbs, and evergreen boughs for example.

Let your imagination guide you.

Fresh calendula flowers wilting



dry plant matter

Dry plant matter is the easiest to work with and minimizes the chance of mold growing during the infusing process. Moisture is what fosters the growth of mold.

Some plants and plant constituents infuse better from fresh wilted material, so plan to use your judgment or intuition for the best approach.

One plant, St John's wort, only extracts the characteristic red hypericin from the flowers and leaf margins of fresh flowering plant tops.

When using dried material, you'll use less volume of plant to oil, about 1/3 to half of the jar, compared to filling the whole jar with fresh leaves or flowers.

Then pour oil onto the herbs to cover. To keep the plant material below the surface of the oil, you can place a piece of paper to hold the plant parts down.

Purchased dry rose buds



using fresh plants

Fresh plants need more attention for a successful infusion.

Wilting the fresh leaves or flowers minimizes excess moisture that can cause mold to grow.

Pick the plants in the morning after the dew has evaporated from the surfaces of the leaves or flowers.

Place them in a basket or on a screen where they can spread out, and the air can circulate and leave undisturbed in a shady place under cover overnight or for a few days.

This method helps evaporate excess moisture while still facilitating the transfer of beneficial hydrophilic compounds to the oil.

Keep in mind that very juicy springtime plants may need a longer wilting process than leaves and flowers harvested on drier summer days to achieve the right moisture content.

Fresh lavender, white and purple



into the infusing jar

After the wilting process, place the plant parts in your jar loosely, not tightly packed,

Pour the oil over the plants to the shoulder of the jar. Keep the oil under the rim; oils can expand in warm temperatures and wick up from the jar and become very messy.

Place a circle of a coffee filter over the plant material on oil surface to force the plant stems and parts down under the oil. This will avoid mold that often happens on parts that protrude from the oil.

Allow the oil to fill the jar fully and the air bubbles to escape. Close the jar with a lid and shake it to settle the infusing plants fully.

Fresh roses with a coffee filter to keep botanicals below the oil's surface



oil infusing

Now that the botanicals are in the jar and ready, there are different methods to infuse.

We can use only oil, and we can use a solvent before adding oil to help release hydrophilic compounds ready to transfer to the oil. Briefly, they are:

- Cold/time method with only oil
- Heat method with oil
- Solar method
- Solvent methods
 - Ethanol, alcohol and oil
 - Glycerin and oil



slow, time infusing

Time infusing at room temperature is the most basic method of allowing the migration of plant compounds into the oil.

Easy to do and takes roughly six weeks at room temperature.

The jars are kept indoors in a cupboard where they are out of the way and shaken periodically to encourage the movement of both lipophilic and hydrophilic compounds.

When oils heat up on very warm days the oils expand and can wick out of the top of the jar. Place your jars on a tray to minimize the potential for an oily mess.

The pros are its gentle temperatures that preserve heat-sensitive compounds, but can leave behind some heavier triterpenes or waxes.



warm, heat infusing

Heat and warmth shorten the infusing time to a few days, and our only solvent is the oil we choose to receive the plant compounds.

The heat needs to be gentle and controlled as we are not cooking the herbs, only moderately warming the oil to help facilitate the migration of plant compounds into the infusing oil.

Temperatures need to remain low (38–50°C/100–122°F) for several hours to several days.

The pros of this method are the faster extraction of waxy or resinous compounds, triterpenes, phytosterols, and chlorophylls.

An Aga cooker with steady heat is a perfect type of warmth for infusing



solar infusing

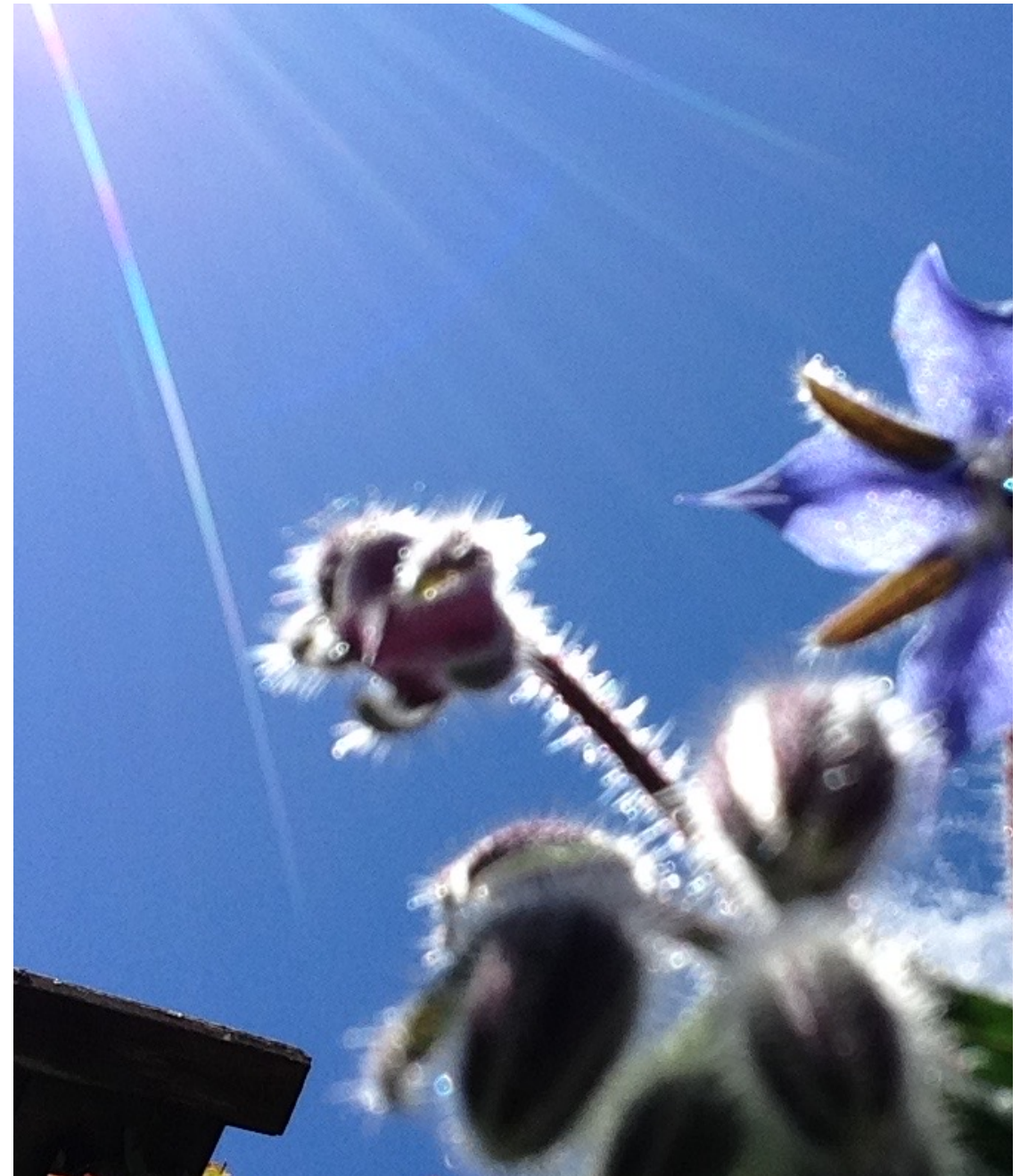
Solar or Sun infusing involves placing the infusing jars outside in sunlight for 2 to 4 weeks.

Your location and the intensity of the sun and heat will determine how long the jars remain exposed to the sunlight. In some places, indirect light may be preferable.

St. John's wort is one plant for which this method is necessary if you want to migrate the red color from the hypericin in the flowers and leaves into the infusing oil.

It is also a valuable method for pigment-rich herbs like calendula and dandelion flowers, and aromatic herbs.

This method can help migrate some hydrophilic compounds, and the warmth accelerates infusion and may deepen pigment extraction.



solvent infusing

Solvent infusion involves the use of food-grade ethanol followed by a carrier oil.

This method, known as the alcohol-intermediary method, washes the plant material with alcohol to help extract compounds that do not easily migrate into oil.

In this process, the plant is macerated in ethanol, which allows both polar and non-polar compounds to be released.

Afterward, the alcohol is evaporated before the carrier oil is added.

Alternatively, if only small amounts of alcohol were used, evaporation can be performed at the end of the infusion process.

The advantages of this method include the ability to release a broader spectrum of compounds, such as flavonoids, alkaloids, and phenolics, from the plant tissues into the oil.



glycerin to oil

Glycerite to oil infusing, using glycerin as a solvent, can be used to help release hydrophilic compounds.

Vegetable glycerin, combined with oil and gently heated, is another method of helping extract hydrophilic compounds, along with bonding with polysaccharides that may not dissolve but can bind to encourage release into the oil.

The pros of this method are especially good for polyphenol transference.

I would not use very much glycerin, well under 5% mixed with the oil.

Glycerin will not dissolve into the oil, but it can be stirred and mixed well.

A glycerite of red roses
in 100% glycerin



choosing infusing oils

Oil choices to infuse plant matter can include any oil, but some are better than others.

Olive is the herbal standard, but other oils work as well, and I often recommend oils with a dominant oleic acid percentage for their longer shelf life.

To ensure a relatively long shelf life, it is advisable to select predominantly monounsaturated oils. Some examples of oleic acid-rich oils include almond oil, apricot kernel oil, camellia oil, hazelnut oil, high-oleic sunflower oil, and safflower oil.

In our discussion of amphiphilic phospholipids in lesson four, some oils naturally offer phospholipids to help migrate compounds that don't migrate naturally.

The following slide is repeated from that lesson.



amphiphilic oils

Phospholipids are often refined out of oils which is why the unrefined version is preferable for infusing polar compounds into oil.

Soybean oil, unrefined	1 - 3%
Sunflower oil, unrefined	1 - 3%
Wheat germ oil	2 - 5%
Rice bran oil	1 - 2%
Pumpkin seed, unrefined	1 - 2%
Corn oil, unrefined	1 - 2%
Hazelnut oil	0 .05 - 1%
Sacha inchi oil, unrefined	1%
Sesame oil, unrefined	0 .05 - 1%





decanting your oil

Decanting is pretty straight forward. You'll need a sieve, a bowl to catch the oil, and jars to store your finished oil in.

Infusing plants in oil takes a certain amount of oil that is thrown away with the plant matter.

I often would leave the plant in the sieve to drain for hours so that as much oil can be captured as possible.

The oil can also be pressed to remove as much oil as possible, so find a way that works for you.

When finished make sure you label the jars with the plant, oil and date so that you can keep track of the age of your infusion.



a little bit of history

I found the following references to historical practices interesting and valuable as ideas we can adopt today.

Ancient Egypt: The macerations were often in sesame or moringa oil, done in sun-warmed vessels to extract pigments from flowers.

Medieval Europe: Hildegard of Bingen, known for her healing work, described sun-infused oils of violet and calendula for skin ailments.

Ayurveda: “Taila paka” This slow cooking of herbs in oil and aqueous decoctions to merge both polar and non-polar fractions answered questions I have been asked about the ability of oil to withstand prolonged cooking as is done in India.



