

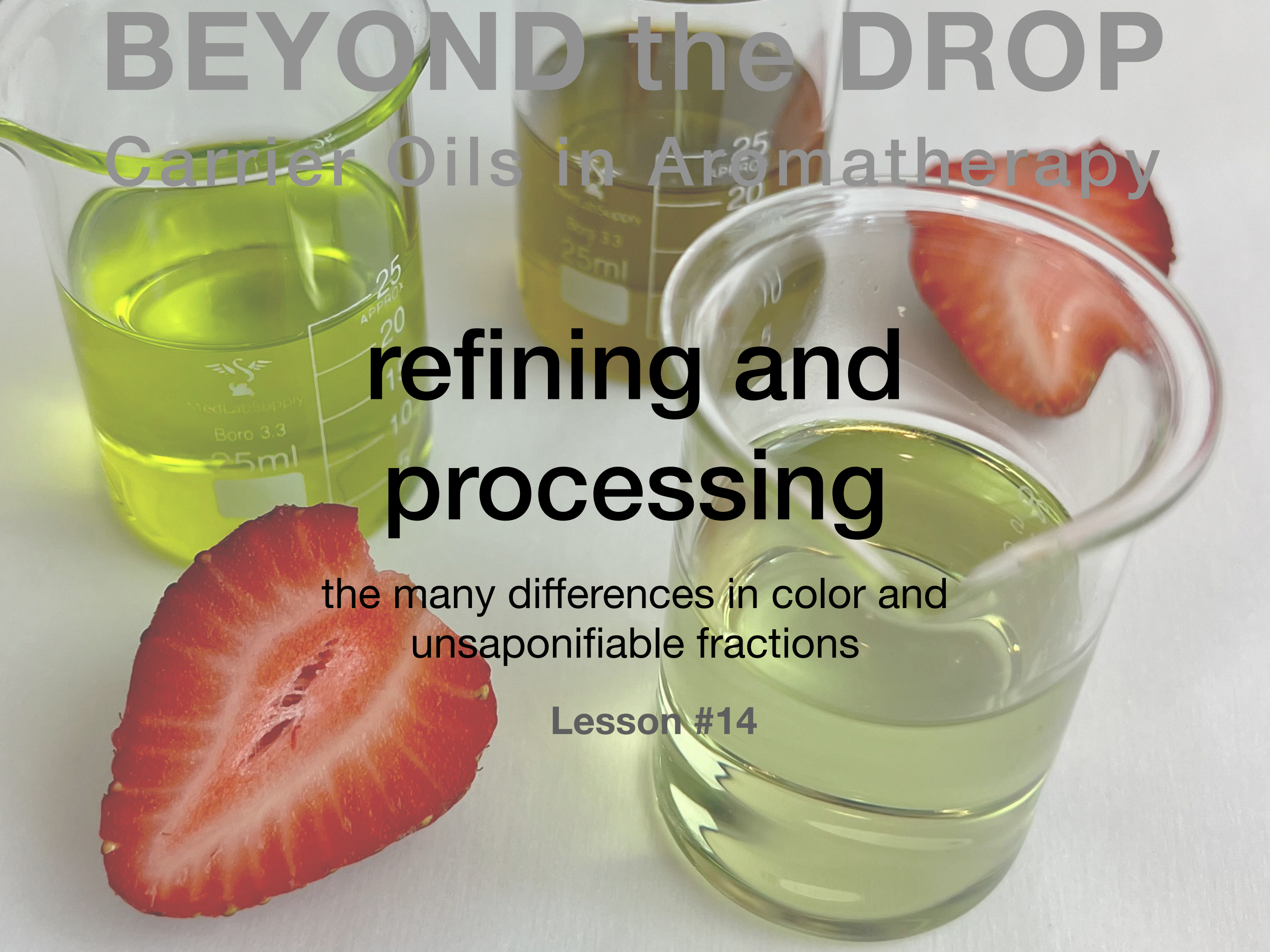
BEYOND the DROP

Carrier Oils in Aromatherapy

refining and processing

the many differences in color and
unsaponifiable fractions

Lesson #14



from nature to bottle

The lipid compounds generally form in the seed and reproductive parts of the plant; seeds, kernels, pulps, nuts, legumes, and grains are all sources for carrier oils.

Pressed from the seed part, the oils can be crude, need filtering, or need processing to ready them for the marketplace.

This is the phase of oil refining, and all oils undergo some processing, if only to prepare them for commercial use.

Some oils are broken apart, fractionated, to separate a range of fatty acids rather than the whole oil the plant produced.

Moringa seed oil and powder



crude to refined

Refined oils versus unrefined oils is a question I hear often, but refining, while there are specific standard processes, can vary considerably from supplier to supplier.

All oils will undergo some processing to prepare them for the market.

The degree of refining will depend on your supplier and the market they are supplying.

Refining can be as simple as filtering seed or husk material or as a complete removal of everything except the fatty acids.

Dattier du Desert oil from Africa



extraction

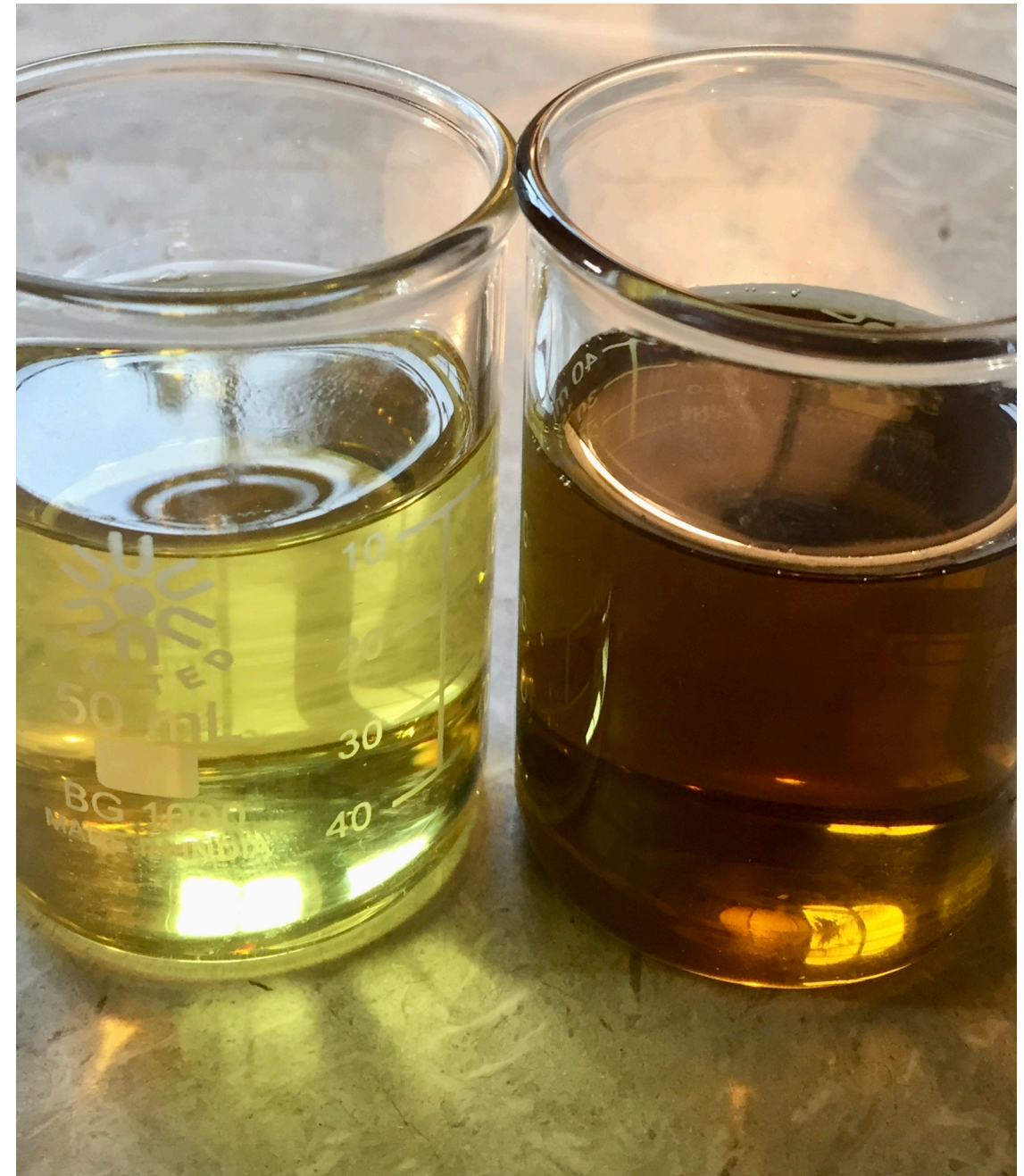
The method of extracting the oils will determine what refining is needed to bring the oil to market.

Oils can be cold-processed, a mechanical screw type process that maintains most of the nutritional elements in the oil as little heat occurs.

The oil yield is the lowest with this method, making the oil more expensive.

Expeller-pressed oils also use a mechanical press; however, more heat is generated during the process, which can degrade sensitive compounds.

Solvent extraction removes the most oil, but a more intensive cleanup is needed to remove solvent residues.



CO2 extractions

In addition to cold pressing, expeller pressing, and solvent extraction, there is CO2 extraction.

Carbon dioxide (CO2), under pressure, separates the same fatty acids from plant seeds as cold or expeller pressing, so that the fatty acid profile will be similar to oils from both methods.

From my limited experience comparing cold-pressed or expeller-pressed oils and their CO2 counterparts, the CO2 oils are waxier and more aromatic than their conventionally extracted counterparts.

The carbon dioxide extractions yield more unsaponifiable compounds, as well as waxes and aroma compounds.



The “raw” oil fresh from extracting typically contains not just the triglycerides but also free fatty acids, phospholipids, pigments, color, waxes, sterols, volatile compounds, impurities, and sometimes residual solvents if solvent extracted.

Refining the crude, just extracted oil, is a series of processes to remove or reduce the unwanted or unstable elements.

Producing oils with better color, stability, neutral odor, and more uniform properties is the goal of a good producer.

Baobab and Balanite oils
from Africa



unrefined

What we call unrefined oils are those that have *not* undergone the full suite of refining steps.

The aim is to preserve as much of the natural chemical complexity, including pigments, antioxidants, minor lipids, and volatile aromatics, as possible.

When ordering oils, you can choose between refined and unrefined oils, as well as a range of options in between.

When we begin working with the carriers, we often want the most wholesome and nutritionally dense unrefined oils and search for *unrefined*.

Nigella, Black seed oil



steps to refining

After pressing, the oil is *filtered* or *clarified* to remove particulates, seed bits, or suspended solids.

Some settling or decanting may also be necessary using fine mesh screens or gentle filtration processes.

Limited bleaching, deodorization, and further chemical treatments can also be done or not.

Unrefined oils often have a characteristic color, smell like a green or vegetal aroma, and the minor constituents like the tocopherols, phenolics, and carotenoids remain in the oil.

Unrefined oils can be less stable, and the stronger scents and colors contribute to difficulties in formulation.

Freshly extracted raspberry seed oil



botany is local

Oils from the same botanical plant can appear on your doorstep in various forms, varying in color, odor, and nutritional composition.

But they should not vary in fatty acid composition.

Depending on the intended use for the oil, it may be light and transparent or retain the dark colors characteristic of the crude oil.

More and more oils are arriving on grocery shelves, and I have noticed that oils intended for food preparation, such as avocado oil, are very light in color and have no scent.

Whereas ***Virgin*** avocado oils can be very dark green with a mild scent, they are typically unrefined.

Two avocado oil samples



wide variations

Pomegranate seed oil - crude version on the left and a standard processed version on the right.

Both are from reputable companies, but the refining process is significantly different and includes a strong, fruity scent in the crude version.

The darker version appears that the producer included a large amount of pulp in the pressing to obtain the darker oil.

In comparison, the lighter oil was extracted from the seed and pulp matter processed separately.

As I mentioned, these processes result in wide variations.

Pomegranate seed oil, crude and standard processes



terms of refining

The letters **R B W D** stand for the standardized refining processes that are done to most commercial oils as they come to market.

Not all refining steps apply to all oils; with some oils, only filtration is applied, while others are fully refined.

Some processes extend the shelf life, while others remove the beneficial properties of the oil.

A good supplier indicates what refining processes they use for each oil they process.

RBWD processes, in the next slide.

Photo of a cheap commodity soybean oil that is fully refined of everything interesting



R - Refining involves de-gumming to remove phospholipids, sterols, and waxes, which can cause cloudiness or instability.

B - Bleaching, the oil is passed over bleaching earths like clays, and activated carbon to remove pigments, oxidation products, to improve color and clarity.

W - Winterizing removes natural plant waxes or high-melting triglycerides by cooling and filtering to remove solids and fractions that can cloud the oil at lower temperatures, and so they don't freeze or harden in winter.

D - Deodorizing eliminates natural plant odors using a high-temperature steam distillation or vacuum process, which removes volatile odor compounds, residual soaps, aldehydes, ketones, and other off-gassing molecules.

r b w d



before, after

The image on the left shows freshly extracted raspberry seed oil, a few days after pressing, after it has been allowed to settle.

The particles and sludge on the bottom of the jar are the undesirable part of the pressing process.

Also note the cloudy nature above the sludge at the bottom, which, over time, could fall to the bottom, but some cloudiness would remain.

Next, the particulates at the bottom and the cloudy nature are filtered away, and the oil is clarified before being sold.

The photo on the right shows raspberry seed oil from the same source, ready for market. Note the clarity of the oil.

Raspberry seed oil



examples

The following slides illustrate several variations of oils from the same plant type that have been refined and processed differently.

Just as there are differences between our example of pomegranate seed oil and raspberry seed oil, you will find many variations between oils said to be from the same plant.

Photo of strawberry seed oil, unrefined and dark on the left, and light refined oil on the right.



blueberry

- Blueberry seed oil, *Vaccinium corymbosum*, refined, green and purple.
- This range of oils will include plant variations, as each variety of blueberry can produce different types of unsaponifiable fractions.
- The clear version of oil is fully refined in all colors.



strawberry

- With strawberry seed oils, *Fragaria ananassa*, we have three variations on the color green
- The plants tend to produce darker colors from older, more oxidized seeds, producing the olive green rather than the lighter greens



buriti oil

- Buriti, a palm oil from South America, *Mauritia flexuosa*, is one of my favorite oils for its dark red color of carotenoids.
- The oil on the right is less processed and from Brazil
- The oil on the left I bought as I saw it listed as a refined buriti and I was curious how much color was removed, some was removed but the signature of buriti is carotenoids so not completely.



meadowfoam

- Three presentations of meadowfoam seed oil *Limnanthes alba*
- Left to right, solvent extracted, expeller pressed,
- Far right, the amber oil is the cold-pressed version of meadowfoam.



next,

Aromas are more often associated with essential oils than with carrier oils.

However, all natural products have some measure of odor or aroma, good, bad, or indifferent.

These smells can be subtle or intense, and they can even tell us whether our oil is going off on us.

In the next lesson, I will discuss the range of smells you can encounter when working with carrier oils and natural butters.

Cocoa butter



