



# Natural Raw Materials for Natural WONF Flavors

Clary sage and patchouli oils can be highly useful tools in flavorists' repertoire.

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Natural raw materials are extremely useful practical tools, especially when formulating natural WONF flavors. They can provide three useful benefits.

- They may contain notes that are not provided by single chemicals.
- They can add complexity to flavors that are too simplistic.
- They often make the flavor much harder to match.

The following ingredients, in my experience, can be useful in a wide range of different flavor types. They are more than a little off the beaten track and may not be on every flavorist's shelf, but that only makes them more interesting and more difficult for your competitors to identify and duplicate.

The essential oil components have been selected either because they are present in significant quantities or because they contribute significantly to the odor of the raw material. The quantities given are all typical rather than specific and often vary widely in practice, even in genuine oils. All the use rates suggested for these natural raw materials are expressed as parts per million (ppm) in a finished flavor intended for use at 0.05% in a ready-to-drink beverage.

## Clary Sage Oil

Linalyl acetate (FEMA# 2636, CAS# 115-95-7; bergamot)—68%

Linalool (FEMA# 2635, CAS# 78-70-6; lavender)—13%  
 α-Terpineol (FEMA# 3045, CAS# 98-55-5; lilac)—4%

Geranyl acetate (FEMA# 2509, CAS# 105-87-3; fruity, rose)—3%

Sclareol (FEMA# 4502, CAS# 515-03-7; tea, woody)—2%

Neryl acetate (FEMA# 2773, CAS# 141-12-8; fruity, rose)—2%

Myrcene (FEMA# 2762, CAS# 123-35-3; mango)—0.5%

Clary sage oil (FEMA# 2321, CAS# 8016-63-5; *Salvia sclarea* L.)

is much more than just an interesting source of natural linalyl acetate. Even though the relative quantities of the main ingredients vary with country of origin, all of the significant ingredients provide useful nuances in a wide range of finished flavors and combine well to form an unusually balanced and attractive essential oil. Sclareol, especially, is very interesting in tea flavors. The level of sclareol in essential oils varies depending on the source, and in tea applications it may be preferable to use either a carefully selected oil or even the absolute, which generally contains higher levels of sclareol, irrespective of the country of origin.

**Tea:** Levels of use in Earl Grey tea flavors can be quite high, and this raw material blends very attractively with bergamot oil. Even in tea without an overtly Earl Grey character clary sage oil is useful, freshening the tea character, at around 500 ppm.

**Cherry:** Quite high levels of clary sage oil can be incorporated into cherry flavors, typically around 400 ppm. At this level the simplistic fruit and bitter almond notes are made more complex, and the level of brightness



Clary sage

and impact is notably improved.

**Grape:** The bright, floral note of this essential oil fits very harmoniously within the complex aroma profiles of both normal and Concord grape flavors. Use levels can vary dramatically, but 50 ppm is a good place to start.

**Peach:** Linalool is arguably more useful in peach flavors than linalyl acetate, but clary sage oil can be an attractive secondary component of natural WONF peach flavors at around 50 ppm.

**Rum:** Clary sage oil is an effective contrast to the simple ester notes that all too often dominate commercial rum flavors. Fifty ppm is a good starting level.

**Apricot:** The same argument applies equally to apricot flavors, and the best effects are achieved by using this ingredient at around 40 ppm in addition to another natural source of

linalool such as coriander oil.

**Blueberry:** Levels of use of clary sage oil in blueberry flavors can vary, depending on the level of floral character required in the finished flavor. On one side, extreme levels as low as 2 ppm can be effective, but at the other extreme, levels of use can be as high as 40 ppm.

**Blackcurrant:** Only quite low levels are needed to achieve a useful result, and 2 ppm is a good starting point. Clary sage oil lifts blackcurrant flavors and adds authenticity.

## Patchouli Oil

Patchouli alcohol (CAS# 5986-55-0; musty, earthy)—35%

$\alpha$ -Guaiene (CAS# 3691-12-1; woody, sandalwood)—15%

$\alpha$ -Bulnesene (CAS# 3691-11-0; woody)—15%

Caryophyllene (FEMA# 2252, CAS# 13877-93-5; carrot)—10%

1-Octene-3-ol (FEMA# 2805, CAS# 3391-86-4; mushroom)—0.1%

Patchouli oil (FEMA# 2838, CAS# 8014-09-3; *Pogostemon cablin*) is primarily used as a fragrance ingredient, and its flavor usage is extremely restricted. This is really just the result of an unconscious perfumer/flavorist bias because the oil has an interesting and unique character. That said, patchouli oil should be used in flavors with some caution in respect to levels because a significant minority of consumers have higher than normal sensitivity to the profile.

**Kewra:** This is an unusual but regionally important flavor type. Most kewra flavors are very simplistic, often relying on little more than one ingredient. Patchouli oil adds realism and enhances impact at a variety of levels from 10 ppm up.

**Malt:** Adding complexity and realism to the top notes of malt flavors is quite difficult and a subtle level of patchouli oil, around 5 ppm, works extremely well.

**Caramel:** Caramel flavors can easily become overly sweet and cloying, and this ingredient can add a welcoming lift and interesting element of contrast at around 2 ppm.

**Maple:** Realistic maple flavors need a level of dry, powdery character

that cannot be achieved using the normal flavor ingredients. Patchouli oil can realistically achieve this effect. The level of use will vary considerably depending on the other ingredients in the flavor but it should likely be in the range from 1 to 5 ppm.

**Cola:** At first sight patchouli oil might seem an extremely strange ingredient in cola flavors. Nevertheless, it can play an interesting and useful part in this highly complex profile. At low levels, around 1 ppm, it can add something of the dryness and astringency provided by good

quality cola nut extract.

**Condensed milk:** Another interesting and unusual use for patchouli oil. Levels should be quite low, 1 ppm in the flavor or even less, but the effect can be a quite noticeable increase in authenticity.

**Apple:** Very low levels, well below 1 ppm, should be added to apple flavors to give a hint of apple skin character and also lift the flavor impact and add subtlety.

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