

# Immortelle Essential Oil and Extract: Are Two Preparations Better than One?

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The plant commonly called “immortelle” has another, more historic and enchanting name: helichrysum<sup>1</sup>. The word “helichrysum” draws its roots from the Greek *helios*, meaning “sun,” and *chryos*, meaning “gold.” So the “sun gold” plant was named for its vibrant golden flower, but also because the ball-shaped blossoms do not wither.

First-century Roman naturalist Pliny the Elder said the small golden flower was used for crowning the gods:

It has small white branches, with leaves of a whitish colour, and the flowers, which grow in clusters, glisten like the gold in the rays of the sun. They are never known to fade, hence it is that they make chaplets of it for the gods, a custom which is most faithfully observed by Ptolemy, the King of Egypt (Newberry 430-431).

In the language of flowers, *Helichrysum* spp. (immortelle) symbolizes eternal or endless love (Seaton 180). Both ethereal uses speak to the power and prestige of this plant, which has also been praised by herbalists for centuries.

Historically, immortelle was used for all scrofula ailments, especially those dealing with the skin. Traditionally, herbalists have used the herb as a tincture or fluid extract for its anti-inflammatory and antibacterial properties, specifically for wounds, cuts, abrasions, and scars, which remain some of its most common applications today. But it

is also a popular and highly effective essential oil—especially when used for its antibacterial, anti-inflammatory, and antioxidant properties. Combining both the essential oil and herbal extracts provides an even more powerful and effective remedy, and this is primarily what this article about the healing “sun gold” plant will address.

## Botanical Sources for Immortelle

Several varieties of *Helichrysum* spp. are commercially available. Some estimate as many as 600 species worldwide, with more than 20 of those species native to the Mediterranean area (eight of these species belong to the Italian flora) (Pignatti 1982). Some of the most common species of immortelle used for aromatherapy essential oils include: *H. angustifolium*, *H. italicum*, *H. stoechas*<sup>2</sup>, *H. gymnocephalum*, *H. plicatum*, *H. arenarium*, *H. decumbens*, and *H. graveolens*.

A member of the Asteraceae family, immortelle is a perennial plant that grows approximately eight inches high. It has whitish lanceolate leaves covered with short, dense, matted hairs. The “sun gold” flowers are small and grow in clusters called cymes appearing at the pinnacle of the plant (Davis 1997, Wichtl 2004).

Immortelle is native to central and southern Europe, the Mediterranean region, North Africa, Poland, Turkey, and the former U.S.S.R. It is cultivated in Italy, Croatia, Corsica, in the Camargue and Provence areas of France, and most recently farmed in Serbia.



*Helichrysum italicum* ssp. *italicum* in its natural habitat, the Adriatic coastal region. Image reproduced with permission from Ana Rangus' *Essential oil and Flavour/Fragrance Sector in Western Balkan Countries*, a PowerPoint presentation delivered at the 2014 International Federation of Essential Oils and Aroma Trades (IFEAT) Conference in Rome.

But as previously mentioned, *Helichrysum* is a large, widespread genus, aided by its xerophyte nature (adaptation to survive in a dry environment). Much like fellow Asteraceae family member *Helianthus annuus* (sunflower), immortelle will grow in poor-quality soil so long as it receives enough sun, though the plant prefers sandy soil. In fact, *Helichrysum* spp. are dispersed from the lower-intermediate Mediterranean, growing at a wide range of altitudes from sea level up to 1,700 meters (approximately 5,570 feet) above sea level, preferably in sandy or loamy soils (Perrini, Morone-Fortunato et al, 2009).

### Immortelle Essential Oil Background

Immortelle essential oil is distilled from the flowering tops of the plant. The plants should be distilled when the flowers are fresh, as the

flowers begin to ferment 24 hours after being harvested, which can impact the constituent profile and reduce the therapeutic efficacy of the essential oil. Since the yield is low, *H. angustifolium* is often distilled with other varieties, like *H. orientale*. While this typically will improve the quantity of the yield, it will also impact the constituent profile and create a very different end product. Ideally, immortelle essential oil that is used for clinical therapeutic aromatherapy is distilled from a single species.

Immortelle absolute, which is solvent-extracted, is also available commercially.

The solvent extraction method is frequently used to extract volatiles from flowers particularly if the aromatic molecules within the flower cannot be extracted via steam.

In solvent extraction, the flower petals are first mixed into a volatile solvent (such as petroleum, ether, benzene, or hexane) until the volatile components are completely dissolved. The solution is then filtered and the solvent is evaporated out at reduced pressure.

The initial result of solvent extraction is called a "concrete." The concrete still contains insoluble vegetable wax and pigments, so it is further processed by solvents and freezing to separate out the waxes. The final product is the absolute. Most of the solvent is removed from the absolute by vacuum pressure without using heat. However, there is usually a small amount of solvent

Dorene Petersen distilling immortelle essential oil in Greece.

Image by American College of Healthcare Sciences. © 2012



remaining in an absolute (up to 1-2%). For this reason, many aromatherapists prefer not to use absolutes for essential oil therapy.

For clinical therapeutic aromatherapy, the preferred material is a wildcrafted or organic steam-distilled essential oil sourced from a single species. Essential oils in this “family” will range in color from pale yellow to red. (A slightly reddish color is preferred, but most oil is usually a pale yellow color.) The color of the oil is said to indicate the region in which it was grown and gathered. Italian oil is emerald due to micro traces of azulene, Corsican oil is light yellow, and the oil from Eastern Europe, formerly Yugoslavia, is orange-red.

### Active Constituents in Immortelle Preparations

The “sun gold” yellow flowers of immortelle get their vibrant color from arenol and homoarenol, unique flavonoid constituents known as pyranone derivatives (Wichtl 2004). The flowers from the immortelle varieties *H. decumbens*, *H. stoechas*, and *H. italicum* also have a group of complex constituents (phloroglucinol and acetophenone derivatives) related to arenol in the flowers. These constituents have shown activity against Gram-positive bacteria such as *Staphylococcus aureus*, and to a lesser extent, Gram-negative bacteria such as *Escherichia coli*, and fungi (Tomas-Barberan, Iniesta-Sanmartin et al 1990). Note, the flavonoid constituents (i.e., the

pyranone derivatives) present in the flowers are not carried over into the distilled essential oil. They are, however, found in the tincture or fluid extract. Even though the distilled essential oil does not contain flavonoids, the essential oil is chemically complex and powerful. In general, it contains the following active constituents:

- Terpenes (including limonene, pinene, and gamma-curcumene)
- Alcohols (including nerol, geraniol, linalool, and furfurool)
- An ester (neryl acetate)
- A phenol (eugenol)
- Ketones

It is important to note, however, that the specific active constituents will vary depending on the plant variety and where it is grown. Table 1 represents the current data (Mastelic, Politeo et al 2008; Morone-Fortunatto, Montemurro et al 2010).

### Two Preparations are Better than One: The Magnifying Effect of Immortelle Essential Oil and Extract Used Simultaneously

Using different forms of one botanical simultaneously—such as the herbal extract and the essential oil—can magnify the overall effectiveness of both. As herbalists, we know different solvents result in extraction of different constituents. Thus, administering an essential oil and tincture or fluid extract simultaneously

**Table 1:**  
Active Constituents by  
Helichrysum Variety  
and Source

Predominant Constituents	Latin Name	Origin
Nerol, neryl acetate	<i>H. italicum</i> ssp. <i>italicum</i> and <i>H. italicum</i> ssp. <i>microphyllum</i>	Corsica (France), North America, South Croatia
Alpha-pinene, best-caryophyllene, alpha- and best-selinene	<i>H. italicum</i> ssp. <i>italicum</i>	Tuscany (Italy)
Sesquiterpenes	<i>Helichrysum italicum</i> (Roth) Don ssp. <i>italicum</i>	Wild harvested, Southern Italy
Geraniol, geranyl acetate	<i>Helichrysum amorginum</i> (Boiss. & Orph.) and <i>H. italicum</i>	Greece
Beta-diketones	<i>H. italicum</i>	Bari, Foggia (Italy)

results in a more complex holistic protocol.

To illustrate this point, Table 2 outlines the primary preparation methods and their corresponding primary active constituents.

For our purposes, it's important to note that a fluid extract of immortelle will primarily contain active constituents like alkaloids, carotenes, flavonoids, and tannins, which are expected to exhibit the following primary therapeutic actions: anti-inflammatory, vulnerary (Süntar, Küpeli Akkol et al 2013; Orhan, Hoccbacc et al 2014)<sup>3,4</sup> astringent, antioxidant, and antimicrobial (Albayrak, Aksoy et al 2010; Barroso, Barros et al 2014). The composition and medicinal benefits of a fluid extract are comparable to tinctures, but fluid extracts are more concentrated due to the higher solubility of constituents in heated solvents. Due to the presence of concentrated flavonoids and carotenes, the application of a fluid extract may also reduce inflammation because of the strong antioxidant effect.

In contrast, the distilled essential oil exhibits a much stronger antimicrobial action than the fluid extract. By comparison, the essential oil will primarily include monoterpenes, sesquiterpenes,

monoterpenoids, and phenolic compounds. These constituents could exhibit several primary therapeutic actions, including: anti-inflammatory, antiseptic, antiviral, bactericidal, disinfectant, stimulant, and vulnerary.

Therefore, the concurrent use of the fluid extract and the essential oil can be extremely beneficial, such as in the case of wound-healing.

### Uses for Immortelle Herbal Extract and Essential Oil

Most herbalists are familiar with using immortelle as an extract for its wound-healing, anti-inflammatory, and antioxidant effects.

A 2013 animal study showed that in vivo tests using extracts of *H. graveolens* on mice demonstrated significant wound-healing and anti-inflammatory actions. In vivo tests demonstrated a methanol extract also has significant antioxidant action; this is attributed to the primary active constituent isolated, flavone apigenin (Süntar, Küpeli Akkol et al 2013).

Support for the antioxidant property of *H. stoechas* comes in a 2014 in vitro study (Barroso, Barros et al 2014) where researchers assessed the

**TABLE 2**

**Primary Preparation Methods and the Primary Active Constituents They Extract**

Type of Preparation	Extraction Technique	Solvent	Concentrated	Active Constituents
Essential Oil	Distillation or expression	Pure	Yes	Monoterpenes, sesquiterpenes, monoterpenoids, phenolic compounds
Absolute	Solvent extraction or enfleurage	May contain traces of solvent used	Yes	Monoterpenes, sesquiterpenes, monoterpenoids, phenolic compounds, carotenes
Hydrosol	Distillation	Water	No	Monoterpenoids, sesquiterpenoids, phenolic compounds
Vegetable Oil	Maceration	Vegetable Oil	No	Monoterpenes, sesquiterpenes, monoterpenoids, phenolic compounds, carotenes
Tincture	Maceration	Alcohol	Yes	Alkaloids, carotenes, flavonoids, tannins
Fluid Extracts	Hot percolation	Alcohol	Yes	Alkaloids, carotenes, flavonoids, tannins



antioxidant properties of a hydroalcoholic extract of *H. stoechas* versus a decoction. Results indicated the hydroalcoholic extract has greater antioxidant activity than the decoction, which is expected due to the larger amount of polyphenolic content in this preparation. In this study, a double emulsion/evaporation microencapsulation technique was applied to prepare microspheres containing *H. stoechas* extract. These microspheres were then incorporated into a moisturizer. This study presents an opportunity to utilize the extract in the cosmetic industry where the essential oil is already widely used.

Immortelle essential oil is also a useful addition to a holistic first aid kit, as it is commonly used topically for its wound-healing properties, such as with bumps and bruises. For example, the variety *H. plicatum* is endemic to Turkey and traditionally used for wound-healing, specifically with burns, as well as with otitis and nephritis. The primary constituents said to be responsible for these actions are fatty acids (hexadecanoic acid, tetradecanoic acid, dodecanoic acid, decanoic acid, and octanoic acid), sesquiterpenes (T-cadinol, (E)-nerolidol, and beta-eudesmol), and monoterpenes (alpha-pinene and alpha-fenchene) (Ozturk, Ozek et al 2014). Note, while fatty acids are not usually found in essential oils there are a few reports indicating the presence of fatty acids (occasionally in large quantities) in essential oil distilled from *Helichrysum* spp. The author speculates that the fatty acids are byproducts of de-esterification during the hydrodistillation process.

### More Reasons to Incorporate Immortelle into Your Practice

#### Antibacterial and Antimicrobial Potential

Multi-drug resistant (MDR) bacteria are an increasing problem. While the Centers for Disease Control and Prevention (CDC) published a recent study in the *Journal of the American Medical Association Internal Medicine* stating that invasive (life-threatening) MRSA infections in healthcare settings are declining, they still present a considerable concern and need for vigilance (CDC 2014).

Antibacterial essential oils like immortelle

can help. A French study showed Corsican *H. italicum* essential oil to be very effective in reducing the multi-drug resistance of *Enterobacter aerogenes*, *E. coli*, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* (Kamicker, Sweeney et al 2008). *H. italicum* essential oil used at a concentration of 2.5% resulted in an eightfold reduction of the lowest concentration of the antibiotic chloramphenicol necessary to inhibit the growth of the *E. aerogenes* MDR strain EA27 (Kamicker, Sweeney et al 2008).

Because *H. italicum* essential oil significantly reduced the resistance of MDR Gram-negative bacteria, researchers believe the oil contains an efflux pump inhibitor (EPI; i.e., inhibition of a mechanism many pathogens have developed in order to reduce their susceptibility to antibiotic drugs) (Kamicker, Sweeney et al 2008). Research confirms that the essential oil's high geraniol content provides this EPI action (Lorenzi, Muselli et al 2009). Natural sources of efflux pump inhibitors are important in the quest to solve the challenge of treating multi-drug resistant pathogens (Stavri, Piddock et al 2007).

An earlier Italian study evaluated the effect of diethyl ether extract of *H. italicum* on the growth of penicillin and methicillin-resistant strains of *Staphylococcus aureus* (Nostro, Bisignano et al 2001). The results indicate that *H. italicum* extract

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A helichrysum oil plantation in southeast Serbia. Immortelle essential oil has traditionally been distilled from wild harvested plant material containing mixed species resulting in inconsistent constituent essential oil profiles. Recent plantings such as this one in Serbia addresses this problem. Image reproduced with permission from Ana Rangus' *Essential oil and Flavour/Fragrance Sector in Western Balkan Countries*, a PowerPoint presentation delivered at the 2014 International Federation of Essential Oils and Aroma Trades (IFEAT) Conference in Rome.



has an inhibitory effect on not only strains of *S. aureus*, but also on the enzymes that enable *S. aureus* to colonize surrounding cells. This shows that *H. italicum* (immortelle) extract may be an effective antibacterial agent (Nostro, Bisignano et al 2001).

#### **Antioxidant Potential of the Water Extract of Helichrysum Flowers**

The following study was conducted on the water extract of helichrysum flowers. As previously noted, very different constituents are found in essential oils and water extracts. So while the following results do not directly apply to immortelle essential oil, they are promising and are likely to promote more research on the antioxidant properties of the essential oil.

*H. arenarium* flowers have been known for a long time in traditional Hungarian herbal medicine as choleric, hepatoprotective, and detoxifying. A Hungarian team examined the antioxidant properties of both a tincture and freeze-dried extracts. A high content of antioxidant compounds (such as caffeic and chlorogenic acids, flavonols, flavones, and flavonones) was found. In addition, the freeze-dried extracts exhibited radical scavenging activity, an activity comparable to that of silibinin (an active constituent of *Silybum marianum*, milk thistle), an effective antihepatotoxic largely due to its strong antioxidant activity.

#### **Arzanol Anti-Inflammatory and Antioxidant Compound Potential**

A 2011 Italian study investigating the compound arzanol found in *H. italicum* extract for its anti-inflammatory actions determined that this compound demonstrated the ability to inhibit the production of pro-inflammatory products (Bauer, Koeberle et al 2011).

A second Italian study also examined arzanol's anti-inflammatory and antioxidant properties. This study found in vitro evidence of arzanol's ability to prevent oxidation of human low-density lipoprotein (LDL). Arzanol was also found to provide protection when oxidative damage was induced in both human intestinal epithelial cells and in fibroblasts from monkey kidneys using tert-butyl hydroperoxide (also known as TBH, a potent

oxidant commonly used in animal studies to induce oxidative stress). Further testing showed arzanol could pass through the intestinal epithelial cells via a passive diffusion pathway (Rosa, Pollastro et al 2011). It should be noted that arzanol was isolated in *H. italicum* extract and it has not been found in the essential oil.

#### **Immortelle Essential Oil Cautions and Contraindications**

*H. angustifolium* essential oil is listed on the U.S. Food and Drug Administration's Generally Recognized as Safe (GRAS) list (FDA 2014). However, as with any preparation, particularly essential oils, it's prudent to evaluate the health history and presenting differential signs of each individual client.

Immortelle absolute and essential oil should be used with caution topically as they may cause skin irritation in some individuals. The maximum use level for topical application is 0.5%. The 0.5% maximum dermal use level is based on the Bouhlal et al (1988b) data, to avoid skin irritation. The oil is non-phototoxic (Opdyke 1979a).

#### **Herbalists' Growing Interest in Essential Oils**

Current market research shows the aromatherapy and essential oil industry is consistently and steadily growing. Retail consumers (i.e., integrative medicine clients) want to know more about essential oils' healing potential and how they can use aromatherapy for personal health and wellness. That means aromatherapy and essential oils play an important and valuable role in the herbal medicine and healthcare industry at large.

A review of the U.S. natural products retail sector for aromatherapy and body oils over the three years 2012–2014 shows this steady growth, +26.8% between 2012 and 2013 and +22.2% between 2013 and 2014 (Petersen D 2014). Further, organic essential oils' growth outpaced non-organic oils, posting an excess of 34.6% over a 52-week period ending in April 2014 (Petersen D 2014).

With these trends in mind, incorporating viable and effective essential oils such as immortelle into an herbalist's practice allows for a more "wholistic" approach that is able to harness the healing potential of the whole plant. ■

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## NOTES

- 1.** Helichrysum: In popular literature, you might also see immortal called everlasting flower, yellow chaste weed, St. John's weed, Italian straw flower, Herbe de St. Jean, immortel, and curry plant (the leaves smell like curry when they are crushed).
- 2.** The difference between *H. angustifolium* and *H. italicum* is purely nomenclature; *H. angustifolium* and *H. italicum* are the same according to Guenther (Guenther 1948). *H. stoechas*, however, is a distinct variety, and when *H. angustifolium* and *H. stoechas* are distilled together, this is referred to as "oil of helichrysum."
- 3.** In a 2013 study, extracts of *H. graveolens*, a species used for traditional wound-healing in Turkey, exhibited anti-inflammatory activity and may be beneficial for the support of diabetic patients. The flavone apigenin was isolated as the major active compound and believed to be responsible for the effect (Süntar, Küpeli Akkol et al 2013).
- 4.** In a 2014 study, hydro-alcoholic extracts were prepared by maceration of powdered material in ethanol (80%) to determine if the inhibition of the enzymes involved in the digestion of carbohydrates can significantly reduce the post-prandial increase of blood glucose, making *H. graveolens* beneficial in diabetic patients. Results showed a particularly high inhibitory action for *H. graveolens* (Orhan, Hoccbaç et al 2014).
- 5.** It is not clear what constituents were extracted into the solvent extract.

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