

Regional and sustainable – hemp, evening primrose, marigold & co.

published in *Beauty Forum medical* 2022 (2), 13-15

Exotic natural substances are still the bestsellers in cosmetics. But in terms of effectiveness, domestic extracts, essential and fatty oils do not have to hide. The overview shows examples of which natural substances are not only ecological, but also sustainable in terms of treatments.

Seeds, leaves, flowers, roots, barks and resins of European nature are rich in highly effective components that are used in medicine and cosmetics. Their history reaches far back into the beginnings of folk medicine, whose recipes have been passed on from generation to generation and adapted to the respective findings. This also applies to the techniques of their extraction and enrichment.

Extraction and pressing

Solvents such as water and alcohol in a cold to hot state are predominant in the extraction of plant components. A disadvantage of aqueous extracts is their short shelf life, which is why the aqueous phases are either preserved or the water is removed by evaporation, spray or freeze drying. Preservation and concentration – the latter presupposes the thermal stability of the active ingredients – are increasingly being dispensed with today in favour of extractions with liquid carbon dioxide (CO₂). These result in dry extracts that are stable in storage.

Essential oils usually have (steam) distillation behind them, while fatty oils are used directly after the cold pressing of the plant material or undergo a more or less complex refining process after pressing. Extractions with solvents, such as acetone, which are later removed, are also not uncommon with fatty oils.

Both the total extracts with their numerous components and individual substances isolated from them are used in the later preparations. Both approaches have their advantages: The components of the total extracts sometimes have a synergistic effect, while individual substances can naturally be dosed higher. The standardisation of total extracts is sometimes difficult due to seasonal and origin-typical differences. In these cases, the focus is on lead substances whose concentration is kept constant. Depending on the extraction processes, specific compositions result. The following examples of hemp, marigold and evening primrose may illustrate this.

Hemp – Cannabis

Hemp (*Cannabis sativa*) is a plant that is used in many ways. In addition to the resistant fibres still used today for the production of hemp ropes and twine, it provides both extracts and an essential and a fatty oil. The most important raw material for cosmetics is the oil pressed from the seeds. Hemp oil belongs to the drying oils and contains high proportions of polyunsaturated essential fatty acids, mainly linoleic acid (about 50-60%), α -linolenic acid (about 10-20%) and some percentages of γ -linolenic acid.

It is only surpassed in this respect by a few oils, such as rosehip seed oil, linseed oil and kiwi seed oil. All these oils have anti-inflammatory properties and, for example, in nano-disperse form, can largely reduce the formation of blisters after touching hot objects. When handling highly unsaturated oils, it should be noted that they can self-ignite when finely dispersed, e.g. on fabric remnants and paper fleeces, as they are easily oxidised by atmospheric oxygen. The formation of a rancid smell is due to the same cause.

Contrary to older sources, hemp oil does not contain intoxicating tetrahydrocannabinol (THC), but it does contain appreciable amounts (about 10 mg/kg) of its presumed precursor cannabidiol (CBD). Synthetic, THC-free CBD is approved as a cosmetic ingredient without restrictions and is described in the CosIng database of the EU as sebum-reducing, antioxidant, skin-conditioning and skin-protecting. However, CBD does not offer any advantages over active agents with comparable properties.

An essential oil is extracted from the aerial parts of the hemp plant by steam distillation. It contains over 90% mono- and sesquiterpenes in varying proportions with a characteristic odour. Fields of application are aromatherapy, perfume production and mixing with massage oils.

Resin extracted from the female flowers (hashish) contains THC, CBD and other can-

nabinoids. The dried flowers are called marijuana. The contents of psychotropic substances vary among the individual hemp varieties. The non-psychotropic CBD is, among other things, processed into medicinal products with sometimes esoteric claims.

Marigold – Calendula

Calendula (*Calendula officinalis*) has a long history as a medicinal herb. The main focus is on topical, anti-inflammatory treatments, which were carried out early on in the form of extracts of the dried inflorescences:

- Infusions with hot water
- Alcoholic and alcoholic-aqueous extracts
- Macerates – using fatty oils such as sunflower and olive oil.
- Oils from CO₂ extraction

Depending on the solvent and the process, the contents and structures of the active substances differ. The anti-inflammatory effect is mainly due to pentacyclic triterpenes such as faradiol and taraxasterol and especially their lipophilic esters with acids such as acetic acid (acetates), palmitic acid (palmitates) and myristic acid (myristates). In addition, there are smaller concentrations of flavonoids such as quercetin and carotenoids, which correspond to the colour spectrum of marigolds from yellow to orange.

The predominant acid in seed extracts are esters of calendula acid (C₁₈H₃₀O₂), a triple unsaturated trans- ω -6 acid – with conjugated double bonds in contrast to γ -linolenic acid (see evening primrose oil). Seed extracts have no significance for dermatology and cosmetics. The gastrointestinal teas and calendula ointment made from flower extracts are widely used.

Evening Primrose – Oenothera

Evening primrose belongs to the nightshade family. A fatty oil is obtained from its seed by cold pressing, the triglycerides of which contain a high proportion of linoleic acid as well as considerable amounts of γ -linolenic acid (about 10%). The γ -linolenic acid content is only surpassed by borage oil, which is also fatty, at about 20%. Evening primrose oil, like other oils rich in essential fatty acids, has an anti-inflammatory effect topically. It is traditionally used on atopic skin. Atopics with a deficiency of the enzyme delta-6-desaturase particularly benefit from it, as they lack the body's own synthesis of γ -linolenic acid from linoleic acid. γ -linolenic acid is an essential link in the syn-

thesis of arachidonic acid, whose metabolites such as prostacyclin, prostaglandins and thromboxanes have local and hormone-like effects. The efficacy of the oil is limited to topical application. Orally, in the form of capsules, the oil shows virtually no effect on neurodermitic skin.

Great regional diversity

Regional oils and extracts are offered in great variety, with fatty oils, especially as food, leading the way in terms of volume. Essential oils occupy a smaller space and tend to be imported from warmer regions. Resins, alias balsams, such as larch resin, are among the rarities here, but are no less interesting in terms of their spectrum of effects compared to the exotic variants.

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