

Herbal Extracts in Cosmetics. Are They Effective?

We are all aware that the cosmetic industry sells dreams. Latest fashions dictate the cosmetic industry to incorporate natural or herbal extracts derived from plant sources in personal care product formulations to sell. Modern advertisements imply that herbal extracts added have near magical properties that conjures images of it being exotic far better than the current.

Herbal cosmetics, however, are not an invention of modern times. Early civilizations made use of herbal cosmetics, as our ancient books, the *Vedas*, the *Epics*, and *Samhitas* make mention of many herbal concoctions prevalent in olden times.

However, it is also a fact that herbal extracts have become popular only in the late 1960's in cosmetic product applications after lying dormant for many years, largely due to the advent of the allopathic or modern system of medicine.

Today, scientific researchers are using the latest techniques to unravel age-old mysteries of herbs to make its effective use in cosmetic preparations. The study of the herbal system of medicine is on the rise. Although more than 400,000 plant species grow on earth, only 2000 odd ones are commercially exploited to provide herbal extracts to the cosmetic industry.

The extraction process and plant part used for oil extraction varies from herb to herb and so the various compounds extracted. Medicinal value of the extract and the experience gained by the herbalists decides the selection of the plant part. It also depends on the easy availability of the plant species, either harvested or growing wild.

Herbal extraction is invariably carried out from stored dried herbs, as they are not prone to fermentation or fungal growth. However, when herbs are dried you cannot rule out the possibility of chemical changes that might have occurred during the drying process. It is quite possible that the final extract obtained from a dried herb will be completely different from what you are likely to get from a fresh herb.

The extraction process

The very first stage in an herbal extraction process consists of leaching out the impurities or the not-so-useful portion of the herb by use of a suitable solvent. We have to do this to eliminate the unusable matter namely, cellulose and lignin present in the cell wall of the plant membrane.

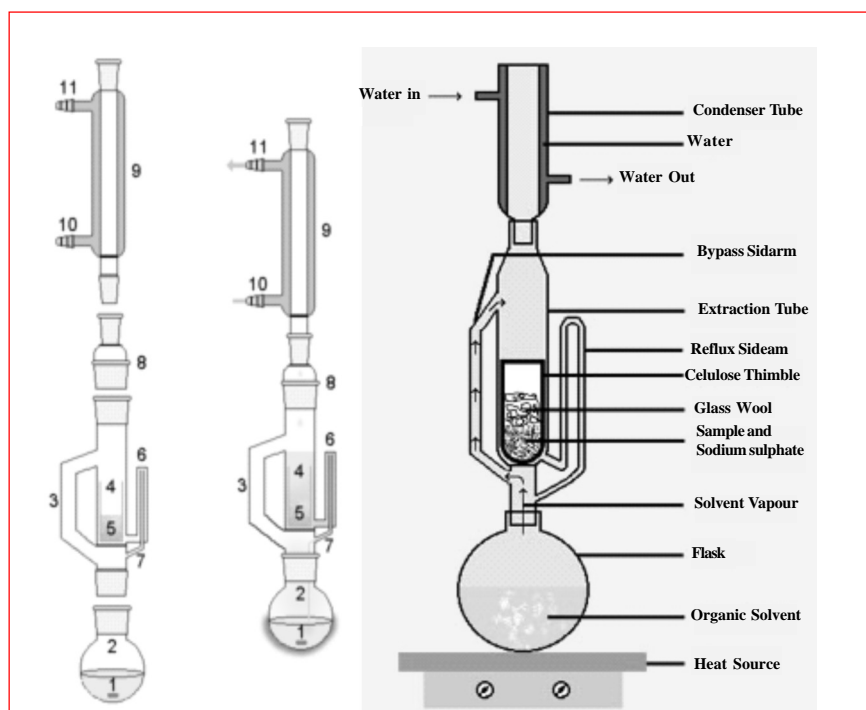
All herbs, whether dry or fresh, have to undergo a comminution stage,

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wherein the herb is broken into smaller particles before extraction. This increases the surface area of the herbal matter, and ruptures the plant cell walls, making extraction easy. Treat the comminuted herb first with a suitable solvent, and stir it for a prolonged period. We can, otherwise, also percolate the solvent through the herb mass. Alternatively, we can also use a Soxhlet apparatus for extraction. (See the diagrammatic photo of the Soxhlet assembly.)

Place the herbal sample inside a cellulose thimble (made from thick filter paper), and load it into the main chamber of the Soxhlet extractor. Place the Soxhlet extractor onto a flask containing the extraction solvent. Attach the condenser above the Soxhlet ex-



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tractor. Heat the solvent and reflux. The solvent vapour travels up a distillation arm and floods into the chamber housing the thimble containing the herb.

The water condenser above ensures cooling of any solvent vapours that escapes higher, to drip back down into the chamber housing the herbal material. The central chamber containing the herb slowly fills with the warm solvent. Some of the desired compound will then dissolve in the warm solvent. When the Soxhlet chamber is almost full, the chamber automatically empties by a siphon side arm, with the solvent running back down to the distillation flask. This cycle repeats many times, over for many hours or days as required.

In every cycle, a portion of the non-volatile compound dissolves in the solvent taken. After many cycles, the desired compound is concentrated in the distillation flask. The advantage of this system is that one need not pass many portions of solvent through the sample, and instead just one batch of warm solvent is recycled. After complete extraction, remove the solvent, typically by means of a rotary evaporator, yielding the extracted compound. Discard the non-soluble portion of the extracted solid that remains in the thimble.

Solvent used in extractions

The solvent selected for extraction depends on the active you have to extract and this can range right from water, ethanol, polyglycol or their various mixtures. When water is used (*mixing the sample with sodium sulphate is not required*), it extracts sugar, saponins and mineral salts.

Ethanol extracts chlorophyll, essential oils, fatty materials and other organic matter. First, centrifuge the

pre-extract obtained and then filter or concentrate it by evaporation to get a clarified dark syrupy liquid extract. We can also dry the extract by spray drying, along with sugar or inorganic phosphate. Finish the herbal extract so obtained by diluting with a suitable solvent, or by further clarification and addition of a suitable preservative.

This yields a product suitable for use as an additive in cosmetics and personal care preparations. The second clarification is required and becomes necessary depending on the solvent selected to carry out the first clarification.

Every solvent used have their positive and negative qualities

1. Herbal water extract is suitable only for cosmetics that have high water content. It is not compatible with cosmetics that have a higher proportion of oils, fats, ethanol or other organic matter.
2. Water extract can harbour fungal growth and so use of water-soluble preservatives is necessary.
3. Water glycol herbal extracts suits most types of personal care cosmetics, both alcohol- or oil-based ones.
4. Ethanol-water extracts are suitable for alcoholic preparations, as clarification following dilution will eliminate all alcohol water-soluble material.
5. It is important to note that during the pre-clarification stage, precipitation of dissolved solids present in the herb will take place in case of glycol and ethanol as solvents.
6. If we wish to have a fixed amount of herbal liquids in the final

product, it is advisable to adjust it during the clarification stage itself, instead of making a dilution to the product obtained.

7. The amount of plant solids present in the herbal extract (or strength) is the most reliable method to decide on the quality of the final product.

Manufacturers of cosmetics and personal care products normally add herbal extracts during the final stage of manufacture, along with colour and fragrance. Herbal extracts normally darkens at high pH.

In case of light coloured products, adjust pH in a manner that the extract does not encounter alkalis or high pH during manufacture. Add the herbal extract only after the neutralisations reaction is completed and the product reaches neutral pH levels. (e.g., while making Carbopol gel)

Claims

Natural cosmetics are high on the agenda of marketers for some years and advertising campaigns by FMCG companies for the past several years have praised the merits obtained due to the presence of natural ingredients in cosmetic and toiletries. Terms like 'Bio', 'Natural', 'Eco', 'Herbal', 'Wonder Ingredient' etc., have become common in promising natural goodness. The claims made by herbal products for a herbs topical effect rarely mentions the amount to be applied or any conclusive clinical studies carried out with it.

So are the herbs effective in achieving the claim? We all need to reflect and find answers.

The advertisements often imply, rather subtly, that all naturals are good and so synthetic chemicals must be

bad, conjuring up contrasting images of black and white or good and evil. Marketers use advertisements very cleverly, without making specific claims, but at the same time making people believe the wonder ingredient works magic on you. If we read personal care advertisements very carefully, we will find that advertisers only extol the virtues of the ingredients added, without actually claiming its effectiveness. It is like my marketer friend who said, "If you cannot honestly beat competition then join them and beat the public together."

Effectiveness

The question that one needs to answer is whether herbs are effective as claimed.

There are instances when claims of herbal actives have proven to be true. Morphine from poppy, mescaline from cactus, digitalis from foxglove and caffeine from coffee has proved to be effective on internal consumption. We know that natural products contain natural plant extracts and ingredients that claim to deliver benefits. In case of cosmetic actives the claims made are for products that are topically applied on skin and hair. Are these claims true?

How much of them are truly natural and beneficial? Anything natural is good, is a statement we have to take with a pinch of salt. The appearance of natural cosmetics and toiletries as a mass-market product initially was a short-term marketing strategy to sell on an emotive platform than the accrued benefits by the actives added; however, the brands selling under the natural and herbal umbrella having continued are popular and likely to stay.

Ancient civilisations have proven their skills to cure illness and enhance the well being of consumers using

herbal ingredients and this was possible without any help of modern science and technology we have now at our disposal. At the same time, let there be no doubt that in today's, competitive, market-place manufacturers making efforts to reduce consumer cynicism by scientifically demonstrating the benefits that one can derive by using natural ingredients will only succeed.

The question we need to answer is: "Can we morally glorify the goodness of herbal ingredients in a cosmetic, when it is available in quantities possibly not enough to have any effect?"

In most cases, "Products are selling only dreams!" and one should not rush to buy cosmetics only because it incorporates some herbal or natural materials!

Future

The consumer, who now leads a hectic way of life, is no longer satisfied with purely aesthetic gains, but seeks additional properties and benefits. The last 15 to 20 years has seen a plethora of personal care products claiming to use herbal ingredients for consumer benefit. However, the claims rarely mention any details of conclusive clinical studies carried out. Are the herbal ingredients in these products available in quantities enough to have any effect? We never know!

It is also possible that the promise made by clever advertising only makes the consumer feel that a special wonder ingredient is more effective, when in fact it only has a placebo effect.

A product will taste success only if the therapeutic benefits they claim to offer are realised by the consumer during use. Natural product ranges are certain to be a major force in personal care products in the future. Earlier it

was alright to call a product "herbal" by adding small amounts of natural ingredients and sell. In recent times, consumers are knowledgeable. They read ingredients listing and scrutinise, to determine the utility of the natural ingredients added during product use.

Blends of fruits and flowers will continue to be stuff of the modern day and companies will exploit it, either as such or in a refined way, blending biotechnology and other so-called advanced techniques to isolate specifically beneficial materials and use it in personal care cosmetics to impress upon the modern sophisticated consumers.

It is however important not to forget that some natural products have inherent toxic effects and can become dangerous and harmful when abused. Moreover, if all formulations prefer to use only naturals, instead of synthetics, there will not be enough plant material to meet consumer demand. In the rush toward naturalism we should not forget the fact that synthetics often render a product more stable, affordable and attractively safe. We have to use nature with discretion.

Finale

We all know that a good formulated functional product will make the skin better, more comfortable and protect it from the hostile environment. It is also possible that the promise made by clever advertising only makes the consumer feel that a special wonder herbal ingredient is more effective, when in fact it only has a placebo effect. The world of natural ingredient is huge and exciting; we have to use it suitably for our benefit.

It is for all of us, as consumers, to question and understand the rationale behind its usage in a product, so that, in reality, it enables us lead a better quality of life.