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Natural Extracts and Herbal Oils:
Concentrated Benefits for the Skin
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n today's "green" age, we who formulate and market
skin care products must all turn our thoughts to econ-
omizing in packaging. "Big being beautiful" should be
changed to "precious provides perfection." Our prod-
uct's effect on the environment is an issue that can no
longer be avoided. We must give the consumer better
value in smaller packages. Combining natural skin care
ingredients in concentrated formulations is one way to
market skin care products for a "green" age.

This approach draws on solutions of the past and ap-
plies modern technology to make those solutions useful
in current times. It also incorporates brainstorming and
lateral thinking to help us find real innovation in related
sciences.

Using Extracts

Our search for a "green" concept utilizes the author's
extensive database on natural and medicinal plant ex-
tracts compiled from literature obtained from all over
the world. (A general reference list of the major volumes
has been included for further reading.)

We draw, for example, on the extensive knowledge of
Ayurvedic medicine. Chinese herbal medicine, ancient
Egyptian herbal knowledge, American Indian herbology,
European folklore, aromatherapy and the experience of
herbalists and phytotherapists.

The extracts recommended in this paper have been
fully investigated, but the enormous volume of data does
not permit a full reference listing. The ultimate objective
must be safety, with products that not only maintain, but
also improve the skin, while remaining in the confines of
cosmetic and medicinal legislation.

The product benefits sought in this paper will come
from selected plant materials, which must be profession-
ally extracted from high quality sources in order to pre-
sure the trace elements present in them. Aqueous,
hydroglycolic, alcoholic and distilled extracts will be em-
ployed, as well as the essential oils.

In use, these products will need to be applied sparingly
and consistently over a considerable period of time. Un-
like physicians’ potent drugs, which act almost im-
mEDIATELY, herbal extracts used in cosmetic preparations
work slowly but effectively over a period of weeks or
even months. Those who doubt the efficacy of plant ex-

Definitions

Natural—available from nature without chemi-
cal modification or intermediate synthesis. If we
were to be pedantic, then "nature identical" does
not satisfy this criteria—though for reasons of cost,
some may allow this extension of the definition.

Green—kind to the environment, conserving re-
sources and not adding detrimental elements to the
sea, land or air. It must not disturb the natural bal-
ance or equilibrium. It should be recyclable or
completely biodegradable within a defined time
span. The process to produce the entire product
should be energy conscious and every element of
the final result should serve a practical purpose.

Ethical—the finished product or blend of ingredi-
ents should not be tested on animals. Wherever
possible, ingredients with a long history of safe use
should be employed. Any testing should be “in
vitro” as opposed to “in vivo.” Dermatologists and
ophthalmologists should be consulted in order to
avoid the use of known irritants and allergens.
Products should be tested on human volunteers
using patch testing techniques.
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Using Concentrated Products

In order to reduce product volume and thus also packaging, the major component to target in most formulations would be water. Most formulators (myself included) throw their hands up in horror at this stage! Non-aqueous products are normally heavy to apply, occlusive and sticky— or at least they have been so, historically.

It certainly is not a new concept, however. The use of unguents was well understood and documented by the ancient Egyptians, who were not familiar with emulsion technology (apart from the use of animal milk). Furthermore, use of salves and ointments is quite normal in the pharmaceutical industry where small quantities of applied product pack a heavy punch of benefit.

Skin Cleansers

For Sensitive or Delicate Skin:
A blend of natural oils can offer better possibilities than a detergent-based skin cleanser for sensitive skin. There are so many carrier and essential oils available that one is spoiled with choices. Obviously, the higher the degree of saturation, the less chance there is of oxidation and subsequent rancidity.

The main criteria for selection of carrier oils should be maximum lubricity, pale color and low odor. To this blended carrier, one can add the essential oil(s). Typical choices for the carrier oil are shown in Figure 1. One could select a variety of themes, such as seed oils, nut oils or grain oils.

The addition of wheat germ oil (fortified with additional vitamin E) will not only provide antioxidant properties, but will also give free-radical-scavenging properties that are beneficial to the skin.

The inclusion of an essential oil such as lavender oil provides fragrance, along with other proven skin
benefits. There are many other aromatherapy oils and fine oils that could be considered.

**For Normal Skin:** To wash normal skin, either a detergent-based skin cleanser or a cleanser based on natural oils would be appropriate.

Nature does provide a cleanser in saponin. The most common sources would be quillaja bark (*Quillaja saponaria*) or soapwort (*Saponaria officinalis*). Additionally one might consider wild yam (* Dioscorea villosa*). The latter was frequently used as a natural source of dioxigen—a starting point for the synthesis of hydrocortisone. However, despite these materials having been used in the past for foam baths and shampoos, the surveyed literature presents too much conflicting evidence for one to be certain of each material’s safety.

Once introduced into the blood stream, saponin can cause hemolysis of the red blood cells. An open wound could, therefore, bring the possibility of complications that would far outweigh any benefits. In addition, all of these saponins are toxic to fish and therefore—though natural—they are not environmentally friendly. A few typical saponin-bearing plants are shown in Figure 2.

The compromise would be to use a good quality detergent blend of betaine and sodium laureth ether sulphate at high concentration, with a coconut diethanolamide alternative* as a thickener. The criteria of mildness and biodegradability coupled with these ingredients’ ability to produce a concentrated product far outweigh any benefits that could be achieved using saponins.

Essential oils of the type shown in Figure 3 offer the benefit of fragrance. Although some users might find that an oil is too greasy, using exceptionally ‘light’ natural oils blended with the volatile silicone oils now available should give a product that is acceptable to most people.

**For Oily Skin:** A detergent cleanser is essential for oily skin, and there are a number of interesting natural options that could be considered. Deep-penetrating cleansing coupled with sebum regulation is essential.

Extracts that would be suitable for the treatment of oily skin appear in Figure 4. Skin sloughing is an important consideration for this skin type, and has been advocated by many learned authorities.

**For Combination Skin:** Most users with combination skin would likely prefer a detergent-based cleanser, so follow the suggestions made above for normal skin types. The extract selected must not be too aggressive for the dry skin areas of the facial tissue, yet it should offer some solutions for the classic “T” zone of greasy skin. Examples of suitable extracts are shown in Figure 5.

**For Problem Skin:** Problem skin needs the same skin cleanser used for oily skin, but in this case we choose extracts that are specific not only for sebum regulation, but also have antiseptic and skin-healing properties and are renowned for their use in skin problems. Our objective

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*Such as Arlapyon F, from Henkel

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<td>Prunus persica</td>
<td>Peach</td>
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<tr>
<td>Witch Hazel</td>
<td>Hamamelis virginiana</td>
<td>Prunus dulcis</td>
<td>Sapindus</td>
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should be prevention rather than cure. Examples of these extracts are shown in Figure 6.

There is insufficient space to give a full treatise on all possible oils that have bacteriostatic, bactericidal or weak antibiotic action. The extracts chosen are particularly respected for skin healing and for help in clearing eczema, psoriasis and acne.

These oils are very strong in their action, and care should be exercised in their use. They should never be applied at full strength to the skin, but should always be diluted with the carrier oil. Arnica in particular, though a very effective remedy, should always be diluted before use in order to eliminate the risk of photosensitization.

The Toner

Avoid using perfume oils in toners. In their place we would advocate the use of hydroessential oils. These are water-soluble alcoholic extracts obtained by extracting oils in ethanol. Generally, they have a powerful aroma with short skin-life. Only a few are commercially available.

For Dry, Sensitive or Delicate Skin: We are in trouble from the start with a toner, since the last thing that we want on dry skin is the astringency of alcohol. Most of the products on the market today are alcohol-free, predominantly water with appreciable levels of humectant.

In order to provide a concentrated benefit, we would prescribe a blend of aqueous extracts blended in pure humectant, which could be applied as a few drops to the face. The end product would be sold in a reagent or eye-dropper capped bottle.

The extracts that we recommend for dry or sensitive skin concentrate on skin healing and moisturizing, as shown in Figure 7.

Honey and aloe vera are exceptional in their action; the medicinal data relating to their effectiveness is prolific. Indeed, concentrated aloe vera gel could be used as the sole component to excellent effect.

The incorporation of glycerin (nonaminal source), sodium PCA, sorbitol, propylene glycol, one of the Glucam range, or Lubragel (which has an excellent emolliency and skin feel) would contribute to the maintenance of skin moisture.

The addition of comfrey would give a natural source of allantoin, for which significant substantiation exists of its skin-healing action.

For Normal Skin: A degree of astringency in the toner is important here, in order to obtain a refreshing, skin-tightening effect while removing the last vestiges of cleanser.

It is difficult to generalize on the total alcohol content, since this varies enormously in acceptability from country to country. However, the blending of witch hazel (Hamamelis virginiana) with naturally-fermented and -distilled alcohol would achieve the desired level.

It is difficult to see how one could reduce the overall volume of this product. However, one could certainly increase the effectiveness and potency of the product by adding skin-beneficial ingredients from the list in Figure 8.

For Oily Skin: In a toner for oily skin, we are looking for a high degree of astringency. In addition to natural fermentation grades of alcohol, we should consider plant materials containing high tannin levels. These extracts will give a skin-tightening effect without stripping skin of its natural oils. The objective should be to reduce the activity of overactive sebum glands to control excess oiliness.

It should be recognized that hyperactive sebum glands can lead to major skin problems such as spots, pimples, carbuncles and furuncles. When pores become blocked, then the possibility of blackheads arises, with the associated possibility of skin infection and subsequent inflammation. The addition of mildly antiseptic extracts to maintain a healthy skin flora of bacteria and to supply healing agents helps provide a balanced product.

Again, it is difficult to determine savings on package volume, but the potency of the product can be increased using the extracts of Figure 9.

For Problem Skin: There are many causes for problem skin, including adolescence or puberty in young people. As cosmetic chemists, we can only target prevention, since some skin conditions require either orthodox medicinal treatment or strong herbal preparations that lie outside of our legal jurisdiction.

In addition to tackling the effects of excessive sebum production, we need to educate the consumer on the importance of hygiene and regular cleansing.

The product needs to have a high alcohol content to remove excess sebum from the skin. At the same time, it needs to have the astringency that can be obtained using natural tannins. The toner extracts advocated for oily skin would apply here.

In addition to the antiseptic/clearing agents, a number of problem skin extracts has been selected. Known heal-
ing (vulnerary) and reputed scar-healing (cicatrizing) agents should be included. (See Figure 10 for examples.) It must be stressed that some of these extracts are extremely powerful and should not be used directly (i.e., undiluted) on the skin.

In order to discourage continual touching of the facial area, a bitter agent such as quassia (*Picraena excelsa*) or Bitrex should be included.

Finally, to discourage the spread of infection through minor skin abrasions and openings (such as pustules and spots), we would recommend the inclusion of natural materials (such as those in Figure 9) that have an antiseptic action.

The inclusion of homeopathic tinctures with skin benefits might also be considered for balancing of skin cell function.

**Moisturizer and Night Cream**

The reduction of packaging size for moisturizers and night creams could be achieved by the use of oils and salves for dry skin, and by the use of concentrated gels for the normal-to-greasy/problem skin variants as discussed before.

The use of pure aloe vera gel or Lubralgel with added aqueous or hydrolytic extracts should also be considered. The extracts for the various skin types are the same as those used in toners (Figures 7-9).

These alternatives will never achieve the smooth textual application of a well-formulated emulsion, but one may use additives (such as corn starch, volatile silicone oil or one of the new breed of silky esters) to get a fairly good result.

Under the heading of moisturizers, one should not overlook the special area of the eye. The very sensitive and delicate orbital area is an especially difficult area for which to formulate. Products must not be heavy, uncomfortable or too occlusive.

There are a number of natural extracts that are specific for use around the eye (Figure 11); indeed many of them have been used as remedies for conjunctivitis, soreness and irritation.

**Face Masks**

No range of skin care products would be complete without the inclusion of a treatment product that can be applied once a week, preferably while the user languishes in a hot bath.

There are a number of options for a face pack. These products may be developed as powders or concentrated pastes, to which the consumer adds warm water in order to blend a product that has exactly the right consistency. Indeed, the application of a warm product may offer greater comfort and benefit, since it opens the pores to allow greater product penetration.

**For Oily Skin:** Face packs for oily skin suggest a product that gently removes excess oils from facial tissue to leave a clean, revitalized and refreshed feeling. This could be accomplished by using Fuller's Earth, natural

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clay and Dead Sea salts (or some of the excellent salts from Utah) combined with some of the extracts and oils mentioned previously (Figures 4 and 5). The inclusion of a small amount of menthol, magnesium sulphate or zinc sulphate would have beneficial effects for skin with problems caused by excessive oiliness.

For Normal Skin: Face packs for normal skin should maintain and possibly boost the moisture content of the skin. The alginates obtained from seaweed can be combined with the formulator's favorite humectants to give products that do not dry, but remain in contact with the skin to plump and firm the tissue. Once again, the product can include the oils and extracts mentioned previously (Figure 8) for this skin type.

For Dry Skin: Face packs containing oat bran or flour (Avena sativa), barley, wheat, or any of the grain products will provide a gentle base with which to replenish dry skin. The addition of rice bran—and its oil-containing γ-oryzanol—can only give benefit. The inclusion of royal jelly, evening primrose oil or rosehip oil would add graphic and marketing appeal.

Conclusion

An attempt has been made to reduce the packaging requirements for a range of skin care products. There is not a great deal of scope, since the product sizes are already quite small. For this reason, we focused on herbal oils and extracts, in order to provide a gentle but consistent benefit. In a future article, attention shall be focused on toiletry products, where some real packaging benefits can be realized.

Acknowledgments

The illustrations are taken from Dr. Malcom Stuart’s excellent book Herbs and Herbalism and also from Rudolph Fritz Weiss’s absorbing book Herbal Medicine.

References

Address correspondence to Anthony Dweck, Peter Black Toiletries, Cradle Bridge Mortimer Street, Trowbridge, Wiltshire BA14 8BB, UK.

It is impractical to give a detailed reference list for each extract recommended. However, here is a list of some of the more important reference sources used.

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