

Article for Cosmetics and Toiletries
Natural Elixirs and potions - for concentrated benefits
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Introduction

In today's "Green" age, we must all turn our thoughts to making economies on packaging and give the consumer better value for money in smaller sizes. The effect of our product on the environment is no longer an issue that can be avoided.

The time of 'big being beautiful' should be replaced with 'precious provides perfection'. The era of gigantic bottles and excessive packaging is slowly fading.

Background and objectives

Experience has shown, that many solutions to the problems of today, have been solved at some time in the past. The technique of applying modern technology to those ideas that were excellent in their time, but which were subsequently superseded and made redundant, often proves fruitful in new developments.

A second technique involves brainstorming and lateral thinking. We need to look at related sciences in order to find real innovation, yet at the same time harness benefits that are perceivable by the consumer.

Our search for a green concept therefore utilises the author's extensive data base on natural and medicinal plant extracts compiled from literature obtained from all over the world.

We must draw, for example, on the extensive knowledge of Ayurvedic medicine, Chinese herbal medicine, the ancient Egyptian herbal knowledge, American Indian herbarology, European Folk Lore, Aromatherapy and the experience of herbalists and phytotherapists in order to produce effective products.

The recommended extracts given in this paper have been fully investigated, but the enormous volume of data does not permit a full reference listing. A general reference list of the major volumes has been included for further reading.

The ultimate objective must be safety, with products that not only maintain, but also improve the skin, whilst remaining in the confines of cosmetic and medicinal legislation.

Definitions

Let us consider a few definitions, in order to establish a framework within which to work.

(i) **Natural** - available from nature without chemical 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 turn a blind eye and allow this category for fragrance.

(ii) **Green** - kind to the environment, conserving resources and not adding detrimental elements to the sea, land or air. It must not disturb the natural balance 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.

(iii) **Ethical** - the finished product or blend of ingredients 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. Finally, all complaints on existing products should be frequently monitored, correlated and potential minor irritants highlighted, so that they can be avoided in future developments.

SKIN CARE

There are a number of different skin types, which would fall into a spectrum ranging from delicate through to dry, normal, combination, greasy, problem and finally skin with a medical condition (e.g. acne, dermatitis, eczema or psoriasis etc). We can only deal with the latter type as a case of prevention.

In addition to the variety of skin types, there would need to be considered the basic range of skin products. These would include a cleanser, toner, moisturiser, night cream, facial wash and a treatment product.

A skin care regime alone, is unlikely to be as successful as a total skin care philosophy. The Japanese are the undoubted masters of this philosophy recommending relaxation, deep and thorough cleansing, facial massage and the importance of sleep.

Finally, the skin is an organ of the body and perfectly reflects the body's state of health, which in turn, is influenced by a structured and properly balanced diet.

It would seem that most of the Marketeers seem to concentrate only on the outer beauty and mostly ignore the benefits that can be achieved through inner vitamin, mineral, herbal or homoeopathic supplementation.

Product attributes

In order to save on product volume and so reduce 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 have been so, historically.

It certainly is not a new concept, 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).

The employment of salves and ointments in the pharmaceutical industry is quite normal, where small quantities of applied product pack a heavy punch of benefit.

The product benefits sought in this paper will come from selected plant materials, which must be professionally extracted from high quality sources in order to preserve the trace elements present in them. Aqueous, hydroglycolic, alcoholic and distilled extracts will be employed, as well as the essential oils.

The last factor in the equation, is that of education, since these products will need to be used sparingly for a consistent period by the user. Unlike the potent drugs used by physicians, which act almost immediately, the 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 extracts are normally using the wrong yardstick against which to measure and assess their performance. It should not be forgotten that the foundation of modern medicine (200 years old) was built on that of herbalism (6000 years old).

SKIN CARE PRODUCTS

The Cleanser

Sensitive or delicate skin

We will avoid possible complications of irritation, that might be caused by a composition of blended perfume oils and consider only adding essential oil for its fragrance (which will give an added skin benefit).

The use of a detergent based product might be considered, but a blend of natural oils offers better possibilities. There are so many oils available that one is spoilt for choice. Obviously, the higher the degree of saturation, the less chance there is of oxidation and subsequent rancidity.

The choice of good quality carrier oils, that have maximum lubricity, pale colour and low odour should be the main criteria for selection. It is to this blended carrier that one can add the essential oil(s).

Typical choices for the carrier oil are shown in Fig.1. The possibility of themes can be employed, e.g. seed oils, nut oils or grain oils.

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

The inclusion of an essential oil such as lavender oil would provide the fragrance, whilst giving other proven skin improvements. There are many other Aromatherapy oils and fine oils that could be considered, though it must be said that they tend to be quite costly.

Normal skin

A detergent based product or a product based on natural oils would both be appropriate.

Detergent product

Nature does provide a natural in the form of saponin. The most common sources would be Quillaja bark (**Quillaja saponaria**) or Soapwort (**Saponaria officinalis**), additionally one might consider Wild Yam (**Dioscorea villea**). The latter was frequently used as a natural source of Diosgenin - a starting point for the synthesis of hydrocortisone.

However, despite the 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 the material's safety.

Saponin, once introduced into the blood stream, can cause haemolysis of the red blood cells. An open wound could, therefore, increase the chance of complications that would far outweigh any of the benefits. In addition, all of these saponins are toxic to fish and therefore (though natural) are not environmentally friendly.

A few typical saponin bearing plants are shown in Fig.2.

The compromise would be to use a good quality detergent blend of betaine and sodium lauryl ether sulphate at high concentration, with a coconut diethanolamide alternative (such as Arlypon F, ex Henkel) as a thickener. The criteria of mildness and biodegradability, coupled with the ability to produce a concentrated product far outweigh any benefits that could be achieved using saponins.

Oil based product

Some normal skin users might find that the use of an oil is too greasy, nonetheless, the choice of exceptionally 'light' natural oils, blended with the volatile silicon oils now available, should give a product that is acceptable to the majority.

The use of essential oils of the type shown in Fig.3 would offer the benefit of fragrance.

Oily skin

A detergent product is essential, 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 Fig.4.

Skin sloughing is an important consideration for this skin type, and has been advocated by many learned authorities.

Combination skin

Most users would likely prefer a detergent based product, and so the comments made under normal skin would apply. The extract selected should not be too aggressive for the dry skin areas of the facial tissue, whilst it should offer some solutions for the classic "T" zone of greasy skin.

Examples of these extracts are shown in Fig.5.

Problem skin

The same comments apply as for oily skin, but in this case we choose extracts that are specific not only for sebum regulation, but also have antiseptic, skin healing and are renowned for their use in skin problems. Our objective should be of prevention rather than cure.

Examples of these extracts are shown in Fig.6.

There is insufficient space to give a full treatise on all the possible oils that have bacteriostatic, bactericidal or weak antibiotic action. The extracts chosen are particularly respected for their skin healing, 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 neat 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 photosensitisation.

The Toner

The use of perfume oils will be avoided in the toners, and in their place we would advocate the use of hydroessential oils. These are the alcoholic extracts obtained by extracting the oil in ethanol. Generally, they have a powerful, short skin life aroma which is water soluble, though only a limited number are commercially available.

Dry, sensitive or delicate skin

Immediately we are in trouble, 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, and predominantly water, but 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 type bottle.

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

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

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

The addition of comfrey would give a natural source of allantoin, which has significant substantiation evidence as a skin healing agent.

It was mentioned earlier, that external application could be combined with internal supplementation, there is no better choice than an elderflower cordial (or better still elderflower wine!). Aloe vera is also available as a tonic drink, and the benefits of honey requires no comment. The use of comfrey as a supplement has come under considerable scrutiny recently, and though many of the reported cases were due to excessive ingestion, it would be best to avoid this material until further data is available. **Normal skin**

A degree of astringency is important here, in order to obtain the refreshing skin tightening effect, whilst being capable of removing the last vestiges of cleanser.

It is difficult to generalise 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 the addition of skin beneficial

ingredients shown in Fig.8.

Oily skin

In this category we are looking for a high degree of astringency and in addition to natural fermentation grades of alcohol, we should consider plant materials containing high tannin levels. These extracts will give the skin taughtening effect, without stripping it of the natural oils.

The objective should be to reduce the activity of the sebum glands that are overactive in producing excess oiliness.

It should be recognised 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 together with healing agents helps provide a balanced product.

Again, the saving on pack volume seems difficult, but the potency of the product can be increased using the extracts of Fig.9.

Problem skin

There are many causes for problem skin, the most common in young people being adolescence or puberty. 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, and at the same time, needs to have the astringency that can be obtained using natural tannins. The extracts advocated for oily skin would apply here.

In addition to the antiseptic/clearing agents, a number of problem skin extracts have been selected.

The need for known healing (vulnerary) and reputed scar healing (cicatrising) agents should be included. See Fig.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*) should be included (though there may be some who would prefer to use the synthetic Bitrex).

Finally, to discourage the spread of infection through minor skin abrasions and openings (e.g. pustules, spots, etc.), we would recommend the inclusion of natural materials that have an antiseptic action.

The inclusion of homoeopathic tinctures with skin benefit might also be considered for the balancing of skin cell function.

Moisturiser and Night cream

The reduction of packaging size 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 lubrajel with added aqueous or hydroglycollic extracts should also be considered. The extracts for the various skin types have been illustrated.

The alternatives will never achieve the smooth textural application of a well-formulated emulsion, but with the use of additives such as corn starch, volatile silicon oil or one of the new breed of silky esters, a fairly good result is achievable.

Under the heading of moisturisers, one should not overlook the very special area of the eye. The very sensitive and delicate orbital area is especially difficult to formulate, and there is no place for any product that is heavy, uncomfortable or too occlusive.

There are a number of natural extracts that are specific for use around the eye, indeed many of them have been used as a remedy for conjunctivitis, soreness and irritation. A list of these extracts is shown in Fig.11.

FACE MASKS

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

There are a number of options for a face pack.

(i) **Oily skin** - In this category we would look for a product that would gently remove the excess oils from the facial tissue, to leave it feeling clean, revitalised and refreshed.

The use of Fuller's Earth, Natural clay, Dead Sea Salts (or some of the excellent salts from Utah) combined with some of the extracts and oils mentioned previously would satisfy the requirement.

The inclusion of a small amount of menthol, magnesium sulphate or zinc sulphate, would have beneficial effects on skin that had problems because of excessive oiliness.

(ii) **Normal skin** - In this area we would look to maintain and possibly boost the moisture content of the skin. The alginates obtained from seaweed can be combined with favourite 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 for this skin type.

(iii) **Dry skin** - 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 gamma-oryzanol can only give benefit. The inclusion of Royal Jelly, Evening Primrose oil or Rosehip oil would add graphic and marketing appeal.

There is no reason why any of these products could not 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 would likely offer greater comfort and benefit, since it would open the pores to allow greater product penetration.

CONCLUSION

An attempt has been made to reduce the packaging requirement for a skin care range. There is not a great deal of scope, since the product sizes are already quite small. For this reason, the natural concentration has been on herbal oils and extracts, in order to provide a gentle but consistent benefit.

In a future article, the attention shall be focussed on toiletry products, where some real packaging benefits can be realised.

It is impractical to give a detailed reference list for each extract recommended, however, a list of some of the more important reference sources used has been included.

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".