# Natural Products – satisfying the consumer dream

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## Introduction

It is staggering how many hours are wasted in brainstorming new ideas and concepts, when in many cases the new product may have been invented decades or even centuries earlier. Often all that is required is a modern scientific application and technical modernization of the concept.

## History

The further one delves back into history, the greater the use of natural materials. Emulsions were normally achieved by the use of milk, be it from cows, goats or asses. The use of milk by Cleopatra for bathing is well documented in folklore. However, one has to go back even further in history to the time of the great Pharaoh herbalist Imhotep to find the real medicinal plants used at that time and to the surviving papyrus texts such as those of Edwin Smith and Eber.

The use of dung and other faecal material may make the reader somewhat squeamish, however, who are we to judge without the basis of scientific evidence to the contrary to question this practice. Likewise, the use of animal parts may also cause us concern, and yet the practice continues to this day in many traditional Chinese Herbal remedies.

On a happier note we find the use of essential oils imported at great expense from surrounding countries to be a major employment in embalming, religious ritual and medicinal practice. Amazingly, they had no knowledge of the art of distillation, but relied on the techniques of enflourage, decoction, concoction, alcoholic extraction and cold expression.

The use of skin salves, colour cosmetics, ointments and poultices were well known, although some of the materials would be deemed toxic by today's standards. The Egyptians had wigs and even deodorants which they placed on top of them, although the idea of sticking a cone of low melting maxes on top of the head and allowing them to melt over the whole body might be a little too messy to contemplate.

Many of the excellent extraction methods and brewing techniques found their origin in ancient Egypt and the wall paintings are full of the methods for purifying honey and fermenting grapes.

## Cultural influences

The cosmetic and toiletry industry has been heavily influenced by different cultures. The immaculate preparation of the Japanese geisha is legendary and the attention to detail shown by the Japanese lady has been adopted in today's society. Today we are looking intently at Kampo medicine and Japanese herbs to see whether how we can use them in our own skin care products.

The Indian culture has many systems of traditional medicine, including Ayurvedic, Unani and Siddha. One cosmetic company has already taken a part of the name for this medicinal practice and has exploited many of the excellent herbs used. The latest craze of Henna tattoos comes directly from the Indian culture of hand painting in wedding ceremonies.

**Herbalists**

It was Pliny the Elder who first documented the use of rosewater (in combination with lion fat!) as a facial moisturizer. Dioscorides, who was the physician to the Roman army, noted many of the medicinal plants used at the time, many of which are still used in today's herbalism, however, it is those which have fallen into disuse that are of greatest interest for the future.

Galen is remembered in the term *galenical* and for his contribution to pharmaceutical science. Abbess Hildegarde von Bingen, the German herbalist and stateswoman, had many herbal remedies that are being sold today in modern guise as skin care products. The Welsh Physicians of Myddvai (also from the 12$^{th}$ century) are celebrated in the brand new National Botanic Gardens of Wales with a new toiletry range based on their herbal teachings.

Culpeper and Gerard also have companies of the same name and ranges based on these two herbalists. The 15$^{th}$ century herbalist Paracelsus (Theophrastus Bombastus von Hohenheim) seems to have been overlooked by the marketers and yet his theory on the *Doctrine of Signatures* is an ideal concept for our industry and over the centuries many of his theories have come to light and surprisingly have been found to work in many cases.

**History**

Aromatherapy was never a new idea, it has already been revealed that the Egyptians were fully conversant with the properties of many essential oils. A number of the oils revered by the ancients would not be much appreciated by today's standards, e.g. valerian smells of old socks or dirty underwear! It is the modern scientific investigation that has proved the worth of essential oils in their psychosomatic benefits.

History also documents the use of spa treatments and this is a trend that the marketers have picked up and exploited extensively recently.

**Victoriana**

The interest in nostalgia seems to have only been in the packaging and design and yet examination of many of the old advertisements of the time shows that the Victorians had an excellent command of herbal materials and their benefits. They also had a very generous attitude to the truth when it came to pack copy, since very few of these product descriptions would be allowed in today's markets! Typical ingredients included olive oil (Palmolive was based on palm and olive oils), glycerine, honey, oatmeal, eucalyptus (a relatively new discovery), pine tar, cucumber, lemon juice, dairy cream and milk, etc.

There is also mention of Quillaja bark for cleaning textiles and leather goods, which is one of the “Holy Grails” in natural chemistry. However, the major cleansing material was soap and this was available as tallow based soap or glycerine soap. Clear glycerine soap was perfected by Pears in 1886, so do not let any marketer convince you that it is a modern invention, but that it is merely a technological improvement of an old idea.

One idea that seems to be totally sensible and useful is to have a floating soap (as in Ivy soap of around 1890). The use of an antibacterial soap was never more aggressively pursued than by Lifebuoy (1894) where it was claimed to be anti-contagion and anti-infection.

**20th Century**

Throughout the early part of this period one starts to see the realization that geauty can be influenced by internal preparations, with none better than bile beans *for inner health and a lovely figure*.

The idea of using a special sulphur-based soap in combination with an internal preparation to combat spots and pimples was a clever idea of its time, although some of the ingredients were quite toxic.

It was in 1928 that Brylcream was launched. This beeswax/borax based emulsion replaced the old traditional macassar oil, which was extremely oily and ruined many a chair back – hence the use of anti-macassar cloths on the back of chairs and sofas.

Many hair preparations of the time used natural ingredients that would have been exceptionally effective, such as chamomile for blond hair and henna for dark. The use of jaborandi was good for dandruff.

The 1930s saw the launch of bath cubes, which in those days were seen as a treat and a treatment rather than a cheap way to fill out a gift box. The portfolio of natural ingredients had also expanded, such as sphagnol (a peat), Californian poppy, lavender, and beeswax based creams.

In the 1940s Phillips Magnesia decried the adverse effects of an acid skin, referring to it as *acid waste*! Crookes was promoting lactic acid based products with calamine, a route that has been proven to be astute with modern science.

The 1950s saw the introduction of hair dyes and though not natural, they are too important a development in the industry to omit from our history. By the 1960s products were starting to become sophisticated and would be something that even the youngest member of the team would recognize.

Fragrances were also starting to develop large market sectors.

**Modern Cosmetics and Toiletries**

The industry today is characterized by an impressive array of products and a seemingly exhaustive choice of herbal materials. It would seem that the way forward

for innovation is severely limited. The growth in the CTFA ingredient dictionary would confirm that our industry is desperate for new ideas and new directions. In particular, the growth in botanicals and natural derivatives has shown how the 'green' consumer has had a major influence.

**The Future Direction**

The consumer is unlikely to be duped for much longer by the *natural* product that contains an ineffective 'whiff' of botanic extract. There is a strong move towards active chemicals derived from or found in nature.

The ethics of using plants from deprived areas is also gathering momentum, since the Body Shop developed the programme of Community Traded plants. In this scenario the community is encouraged to grow specialist premium crops and form cooperatives in return for economic incentives. Rather than destroy the rainforests it is potentially more profitable to farm and harvest from them.

The study of ethnopharmacy and ethnobotany from different cultures gives us an insight into our understanding of plant chemistry (phytochemistry). The pooling of knowledge has not only expanded our understanding of more plant species, but also revealed the way in which specific classes of plant molecule behave on the skin. The explosion in the number of books published on herbal medicine, aromatherapy and natural products at the *man in the street* level would seem to confirm that this is an active area of public interest.

It is this continued scientific examination and validation of plant materials that not only favours our own industry, but also offers third world countries a cheaper alternative to the expensive western medicines. The work of the World Health Organisation (WHO) has been a great force in this area and more monographs are being published each year.

All of this activity has slowly led to a new category being needed within our industry (UK based), which is for an OTC or quasi-drug sector. This category is often referred to as the meaningless "cosmeceutical" – neither cosmetic nor pharmaceutical.

**Predictions for the Future Major Botanicals**

There will also be a place for the trusted stalwarts like chamomile, aloe vera, honey and in the scheme of things a newcomer like tea tree oil.

The largest growth category has been in the algae or seaweeds. Bladderwrack (*Fucus vesiculosis*) has made an impressive entry into the market, but now other varieties like *Laminaria digitata, Ulva lactuca* and *Palmaria digitata* are showing tremendous potential.

**Oils**

Jojoba (*Simmondsia chinensis* formerly *Buxus chinensis*) has made huge inroads into the hair and skin care market. The number of vegetable oils is enormous, but with the studies done on Evening Primrose oil (*Oenothera biennis*) and the importance of

*gamma*-linolenic acid on the skin, these oils are assured of a long-term future. The interest in the South American rainforest and the romance of this area has led to the successful launch of oils like Brazil nut oil (*Bertholettia excelsa*).

Consumers also trust ingredients that they can eat, and so the introduction of oils like Sunflower oil (*Helianthus annuus*), Sesame oil (*Sesamum indicum*) and Olive oil (*olea euopaea*) have also been well received. Mediterranean cuisine has been identified as beneficial to health and this trend for healthy foods or supplements to cross the boundary from food to cosmetics is another trend worthy of note.

The link between extreme climates and locally used ingredients has meant that the consumer can draw a parallel between the native use of a plant and the use of that material in their skin care regime. Oils like Babassu (*Orbignya oleifera*) and Rosehip (*Rosa rubiginosa*) fall into this category.

**Astringent**

There is a mixed feeling about alcohol (despite it being a natural fermentation product). Many consumers are aware that this material can be very drying and astringent to the skin and eagerly seek an alternative. The choices are limited, but certainly Witch Hazel (*Hamamelis virginiana*) is a good choice, but do ensure that the supplier has not added additional alcohol to preserve the clarity!

**Natural Cleansers**

Nature has only one class of natural foaming agent and that is the triterpenoidal saponin, such as that found in Quillaja (*Quillaia saponaria*), Soapwort (*Saponaria officinalis*) or Indian Soapnut (*Sapindus indica*).

There is also a foam stabilizer that is a quaternary compound called betaine extracted from Beet (*Beta vulgaris*), which has been shown to improve skin hydration and also has skin conditioning effects.

**Functional Additives**

There is insufficient space to discuss the full list, which would be quite considerable, and so a cross-section of additives has been chosen.

Mucilaginous plants are numerous and include seaweeds, *Aloe barbadensis*, plantains (*Plantago* spp), Mallow (*Malva sylvestris*) and many others. These mucilages are polysaccharides and starches such as inulin. It only has to be a matter of time before an enterprising company finds a way to extract and dry these delicate chemicals from an abundant plant source.

**Healing Plants**

Healing plants are well documented across the globe and many of these have received a great deal of scientific interest and scrutiny. These plants include Gotu Kola (*Centella asiatica*) Purslane (*Portulaca oleracea*), Self Heal (*Prunella vulgaris*) the

only way to legally use the word “heal” in your label and *Ginkgo biloba*. There are dozens more that could be mentioned given time.

**Products for Cellulite**

A growth area in the industry has been the products aimed the treatment and prevention of cellulite, these plants are Horse Chestnut (*Aesculus hippocastanum*), Butcher’s Broom (*Ruscus aculeatus*) and Ivy (*Hedera helix*).

**Natural Preservatives**

The *Holy Grail* remains the discovery of broad spectrum preservatives and this is satisfied by products like Old Man’s Beard Lichen (*Usnea barbata*) a source of usnic acid, Japanese Honeysuckle (*Lonicera japonica*) a source of p-hydroxy benzoate and *Citrus* species which are a source of hesperidin and naringenin. Other areas of interest are levulenic acid and anisic acid which are derived from essential oils and declared as *parfum*.

**Eye Products**

Eye products are always in need of safe and trusted, but nonetheless effective natural raw materials, the favourite are materials like Cornflower (*Centaurea cyanus*), Eyebright (*Euphrasia officinalis*) and Fennel (*Foeniculum vulgare*).

**Natural Colours**

The presence of natural colours in plant materials has not gone unnoticed by the food industry and these materials are replacing synthetic derivatives at a very fast rate. The major difficulty for the formulator is the lack of stability in certain formulae, however, the problems are not insurmountable with care and attention. Many of them bring skin benefits as a bonus, e.g. the proanthocyanidins are also potent free radical scavengers. The use of mordants may extend the range of colour tints achievable on the hair.

**Hair Care**

The search for hair darkening ingredients is at the top of most formulators’ lists and ethnic solutions include *Emblica officinalis* or Amla from India, *Citrullus colocynthis* seed oil from the Middle East, *Sterculia platanifolia* from China, the Lotus Tree of *Zizyphus spina-Christi* from the Far East.

Hair loss is another problem where *Serenoa repens* or Saw Palmetto, *Eclipta alba* or Bhringaraj and *Hibiscus* spp have shown initial promise.

There is always a need for setting lotions and volumisers, which pose quite a problem for the natural chemist, however, the search is active for sources of some of the old traditional solutions like Quince (*Cydonia oblonga*), the polymeric gums present in Iceland Moss (*Cetraria islandica*) and Irish Moss (*Chondrus crispus*).

The oldest resin used in hair sprays always used to be shellac and this could well return in the future.

**Active Molecules**

Though plants generally work best as a total blend, there are a number of isolated molecules that work well on their own. It is reasonable to expect that the number of these active molecules will increase.

**Modified Naturals**

The use of naturally derived materials will increase greatly and the number of derivative prepared from feedstocks such as castor oil, meadowfoam oil and other sources is already adding greatly to the arsenal of natural derivatives.

**Conclusions**

The art of predicting the future is never an exact science, it is hindsight that has this property! One thing is for certain – the growth in natural products will continue and the search for scientific data and standardized botanicals will undoubtedly increase. The raw material industry is prepared for this future and the prognosis is excellent for the formulator.