

## **BOTANICAL RESOURCES OF SPONTANEOUS AND CULTIVATED FLORA, WITH APPLICATIONS IN THE COSMETICS INDUSTRY**

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### **Abstract**

As early as the ancient times, beauty has been the greatest gift to man, and the transformation of the appearance by using cosmetics products emerged as a necessity in man's desire for seduction, for power.

The virtues of medicinal herbs have been known by humans since ancient times.

Various compounds of biochemical importance are extracted from these plants, such as: essential volatile oils, fragrances, perfumes, tannins, resins, medicated substances, vegetal pigments etc. with the help of which cosmetics are obtained used either for the hygienic-cosmetic care of the face, eyes, hands, mouth, hair, feet and the body or for therapeutic purposes in order to treat various complexion disorders, general muscle relaxation, stimulate blood circulation, metabolism restoration, strengthen immunity etc.

The development of this industry over the past 30 years has witnessed an unprecedented level, unparalleled in human history.

The use of these cosmetic products in developed countries is no longer a luxury, but it entered the daily use from the earliest ages, starting from products for newborns, such as: creams, powders, special oils and shampoos for babies, culminating with a wide range of products for adults.

The purpose of this scientific paper is to perform a synthesis analytical study of the plant resources from the spontaneous and cultivated flora, gathered from the literature, in order to highlight the importance of using plant extracts in the cosmetic industry).

**Key words:** plant pigments, cosmetic industry, spontaneous flora, cultivated flora

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As early as the ancient times until the end of the XIXth century, nature was the most important source for odorants, fragrances and dyes.

The deficit of nutrient substances because of the XXIst century man's lifestyle, of daily stress, of the polluted environment, the excessive consumption of medicines, smoking and bad eating habits challenge out bodies very much.

Replacing synthetic biochemical compounds with natural compounds, extracted from plants or other natural resources and used in the cosmetic industry has become a major issue worldwide and whose solution is related largely to the health of the environment and consequently that of humans.

Hence, dye producers worldwide have focused their efforts into increasing the efficiency of obtaining these pigments from various sources, especially by a selection and cultivation of the species out of which these substances may be extracted, but also by cultivating plant tissues which are expected to lead to obtaining highly pigmented cultures (Galaction et al, 2006).

In the past, cosmetic products were exclusively made of natural substances, but they

were so expensive that only a certain social class, the privileged, could afford using them. Today, these products are still considered luxuries, but they are accessible to a much larger population category (Dascalu et al, 2009).

### **MATERIAL AND METHOD**

In order to write this paper, I consulted an extensive specialised literature, both national and international, as well as data bases in electronic format on the Internet from the field of aromatic, medicinal and tinctorial plants used in cosmetics.

### **RESULTS AND DISCUSSIONS**

Scientific progress obtained in the chemical, organic and analytical industry has lead to the separation and knowledge of the chemical structure of natural products. Moreover, by organic synthesis various chemical compounds identified in natural products have been obtained. This success gave a great impetus towards the synthesis of substances which would totally replace natural

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products. The so-called “identical natural products” have emerged with similar properties, but not identical to natural products.

For a long time, it has been believed that those major components from natural products are responsible for their quality. However, the qualities of the “identical natural products” have never matched those of the natural products submitted to reconstruction. That is because there are certain compounds in natural products, in small quantities, which nuance or enhance their quality. For example, in the patchouli volatile oil, the approximately 0,3% Norpatchoulenol greatly influences its quality. In the absolute jasmine flowers, jasmine is found in a maximum of 0,1%, but its smell is much influenced by this ketone (Bătiu et al, 1999).

Internally, one of the most used plants in producing cosmetics is aloe (*Aloe vera webb* and *Aloe ferox Mill*) whose gel (over 200 active biological products have been identified such as: Polysaccharides, anthraquinone derivatives, vitamins, minerals etc.) is used to produce a series of products namely: moisturizing face creams, hand and body lotions, sun block creams, pharmaceutical formulations etc.

Products obtained from all-saints'-wort (*Hypericum perforatum*) are used for slightly irritated, sensitive complexions, as well as for coarse and brittle hair.

The majority of the companies producing organic cosmetics produce various products which use marigold extract as active principle, such as moisturizing creams, creams with vitamin C, anti-cellulite, anti-wrinkle, nourishing creams, those for pigmented skin, cleansing milks and tonic lotions, beach soothing lotions and in the composition of complete protection toothpastes.

Marigold flowers (*Calendula officinalis*) contain proteic substances, essential oils, saponins, glycosides, carotenoids, xanthophylls, flavonoids, enzymes, mucilage, vitamin C, organic salts. These give marigold extract antiseptic, anti-inflammatory, calming, revitalizing, nourishing properties, speeding the epithelization and providing an aesthetic healing. It has special effects in toning and improving the general skin appearance and it is particularly recommended for sensitive skin. The marigold active principles stimulate blood flow at the level of the tissues determining their quicker regeneration. (Bătiu et al, 1999)

Arnica extract (*Arnica montana*) contains ethereal oils, flavonoids, colina, procyanidins, bitter principles, lactones sescviterpenice

(helenalin) etc. The ethereal oils give it antibacterial, anti-congestive and wound healing properties. Arnica extract is used in the composition of anti-acne cream and tonic lotions. (Bătiu et al, 1999).

Bayberry (*Hippophae rhamnoides*) is radio-protective, photo-protective (sun screen) and a strong scar healing agent. Bayberry oil is also used in the composition of creams (moisturizing, nourishing, anti-wrinkle, vitamin-C moisturizing, anti-acne, soothing foot creams and creams for pigmented skins), anti-cellulite cream, in cleansing and nourishing milks, in hair products (bayberry shampoo and conditioner), in homoeopath toothpaste and complete protection toothpaste, in sunscreen products (sunscreen emulsion and oil, after-sun balm and lotion) and in after-shave balm. (Bătiu et al, 1999).

The main components of chamomile extract (*Chamomilla recutita*) are: chamazulene, azulene, bisabolol, flavonoids (apigenin), coumarins, glycosides with spasmolytic action, vitamins (C and B1), mineral substances etc. Apigenin and azulene have protective action against radiation and their active principles have healing properties. Chamazulene and bisabolol ensure the anesthetic, anti-inflammatory, anti-allergic action and stimulate tissue regeneration. Chamomile extract normalizes skin metabolism, activate epithelization and granulation tissue after burns. It is recommended to use it for sensitive skin care, to treat gingivitis and hair health maintenance. Moreover, chamomile extract is used in the composition of complete protection toothpaste, in that of after-sun balm and calming lotion, as well as in that of shampoos.

In cosmetics, from the walnut (*Juglans regia*) the leaves are used to extract in alcohol a tincture useful in diabetes, as body oil for rickety and anemic children, in dermatitis, but also from the walnut seeds a walnut oil or even the pericarp is extracted out of which a persistent hair dye is made.

According to the data supplied by the Mintel Institute, approximately 3% of the cosmetics launched on the market in the period January 2007 – December 2009 in the United States of America, Great Britain, France, China and Japan, used elements of vegetal origin.

The following table presents some of the plants and their chemical composition (in pigments) and their uses are presented. (Pop et al, 2007, Marta, 2008, Tărăbășanu-Mihaela et al, 1997).

Table 1

Vegetable plants with cosmetic potential			
Scientific name	Popular name	Chemical composition (pigments)	Use
<i>Sophora japonica</i> (Fabaceae family)	Japanese acacia	Flavonoids (the flowers contain rutozide 10-15%)	Increases capillary wall resistance
<i>Alchemilla vulgaris</i> – Rosaceae family	Lady's Mantle	Flavonoids, Anthocyanins, tannins	haemostatic, astringent, anti-diarrhea, diuretic, anti-inflammatory, wound healing, anti-hemorrhagic
<i>Betulae folium</i> – Betulaceae family	birch	-flavonoids (Hyperoside, Quercetin-3-O-galactosid, Myricetin)	diuretic (does not irritate the renal parenchyma), eliminates uric acid (gout)
<i>Crataegus monogyna</i> , Rosaceae family	hawthorn	-flavonoids (rutoside, quercetin, kaempferol) - catechic tannins	Acts synergistically in the cardiovascular and central nervous systems
<i>Viola tricolor</i> L.– Violaceae family	pansy	- flavonoids (rutin, vitexin) - Anthocyanins - carotenoids	diuretic, expectorant, anti-allergic
<i>Carduus marianus</i> L. sin. <i>silybum marianum</i> – Asteraceae family	milk thistle	-flavonoids (flavanols – taxifolin, flavonols – quercetin, Flavonolignans – silibinin, silodosin, silicristin)	Hepatic protection (it protects the hepatic cell from intoxication with $\alpha$ – amantadine)
<i>Polygonum aviculare</i> – Polygonaceae family	knotgrass	-flavonoids (quercetin and kaempferol derivates) -tannin substances	- antioxidant effects
<i>Taraxacum officinalis</i> – Asteraceae family	dandelion	-flavonoids	cholagogue-choleretic, laxative, diuretic, cholesterol-lowering, glycaemia-lowering
<i>Fagopyrum esculentum</i> – Polygonaceae family	buckwheat	-flavonoids (rutin)	-antioxidant action
<i>Cynara scolymus</i> , Asteraceae family	artichoke	- polyphenols (cynarin); - flavonoids (cinaroside, scolymoside)	- antioxidant effects
<i>Aesculus hippocastanum</i> – Hippocastanaceae family	Horse-chestnut	-flavonoids derivates (quercetin and kaempferol derivates)	Anti-edematous, venotonic (peripheral circulation, varices, hemorrhoids, phlebitis)

In the context of a drop in the sale of cosmetics, because of the global economic crisis, an important segment of the market registered a slight growth: anti-aging cosmetics. New antioxidants were extracted, isolated and patented by the specific laboratories and introduced as revelations in cosmetics formulas.

The most expensive cosmetic products currently sold worldwide are composed only of natural colorants and essences, extracts from flowers, fruit or other parts of the plants.

The plants used for obtaining organic cosmetics come from ecological cultures, which means they are not genetically modified, they are cultivated without growth stimulators and they are not treated with pesticides. Moreover, when producing these products, one does not use any substances with toxic effects on the human body such as synthetic parabens or aluminum salts, found in ordinary cosmetics.

To preserve organic cosmetics, natural oils are mainly used, that's why the period of validity varies from three to six months after opening the container. In contrast, for ordinary cosmetics, paraoxybenzoates, as parabens are scientifically called, ensure a higher validity period, of over 12 months after opening the container, health risks being considerable.

## CONCLUSIONS

In modern industrial cosmetics, plant natural extracts are used on a large scale and are presented on the ingredients list as a true product advantage, a true recommendation regarding their beneficial effects;

In order for the plant effects to be beneficial, not all plants can be used to treat any skin problem. Some plants (chamomile, thyme, sage, juniper etc.) have astringent and antiseptic effects, and their

regular use for skin care leads to reduced skin pores. Mint, horsetail etc. have great tonic effects on the skin. Other medicinal plants (linden, high mallow roots, forest mallow) contain mucilaginous substances and have a calming and smoothing effect on the skin.

Active products are used, rich in mineral substances and bio-stimulants, which have a chemical structure similar to that of the skin, with the condition of obtaining a bio-chemical balance, because when the skin loses water it also loses mineral and complex organic substances.

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#### BIBLIOGRAPHY

- Bătiu, I., 1999** - *Ingineria separării produșilor naturali*, Ed. Universității "Babeș-Bolyai", Cluj-Napoca.
- Beceanu, D. et al, 2004** - *Les caractères chromatiques les quelques extraits de plantes aromatiques en provenant de la flore spontanée du département de Iași*, *Lucrări științifice, seria Horticultură*, vol. 47, USAMV Iași, pag. 905-910.

**Dascălu, M., 2009** - *Cercetări botanice, fiziologice și biochimice la plante aromatice din familia laminaceae utilizate în terapia naturistă, alimentație, cosmetică și parfumerie*, Teză de doctorat, USAMV Iași.

**Galaction, A.-I., 2006** - *Cașcaval, D., Metaboliți secundari cu aplicații farmaceutice, cosmetice și alimentare*, Ed. Casa de Editură Venus, Iași.

**Marta, A.-E., 2008** - *Cercetări fiziologice și biochimice la unele specii de plante aromatice și medicinale utilizate în cosmetică și parfumerie*, Teză de doctorat, USAMV Iași.

**Pop, M., Pop, O., 2007** - *Valoarea medicinală a plantelor tinctoriale și vopsitul ecologic*, Ed. Universității de Nord, Baia Mare.

**Tărăbășanu-Mihaela, C.N., Gorduza, V.-M. et al, 1997** - *Coloranți organici de interes alimentar, cosmetic și farmaceutic*, Ed. Uni-Press, București.

\*\*\* - <http://www.scribd.com/doc/50179925/Produce-cosmetice-cu-plante-medicinale-1>.

\*\*\* - <http://www.sciencedirect.com>.

\*\*\* - <http://www.scribd.com/doc/57445851/Fișa-speciei3>.