

MEDICINAL PLANT RESOURCES USED IN OBTAINING PHARMACEUTICALS AND COSMETICS PRODUCTS

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ABSTRACT: The work shows aspects of medicinal plants as raw material utilized in pharmaceutical and cosmetic products. Romania has all the favorable conditions of spontaneous development many species of medicinal plants, with biochemical characteristics valued in plant protection purposes. Medicinal plants are presented, whose oils, extracts and tinctures contain active basic principles of plant protection preparations. Also it is playing a case study on the complexity of the chemical composition of sea buckthorn fruit and might be used for obtaining pharmaceuticals and cosmetics products.

KEY WORDS: herbs, medicinal, pharmaceuticals, cosmetics

1. INTRODUCTION

From geographically, Romania is located at the contact of the three sub-regions: euro-siberian, central asian and mediterranean-pontic. Due to its geographical position, a varied landscape, climatic conditions favorable to the development of a rich vegetation, Romania is the first 6 european countries in terms of biodiversity of plant species, the possible emergence and development of a diverse spontaneous extremely valuable, which includes about 3630 species of medicinal plants higher and bushes, of which 10-12% were physical-biological exploited for pharmaceutical and cosmetic products.

Its proximity to the county in the south-west of the country, Gorj county has a temperate continental climate with mediterranean influences. Annual average temperature of 10.2 degrees Celsius, annual average amount of precipitation different depending on the area, lower the plains (500-600 mm) and higher in the mountains (over 1500 mm), the predominant direction of winds from the north, in the mountains and south and

southeast in depression areas, and relief ordered in three steps which descend from north to south (mountains, hills and subcarpathians), favors the development of a rich vegetation, constituting the unique medicinal plant resources in terms of active principles contained and used in pharmaceuticals and cosmetics.

2. CHARACTERISTICS OF MEDICINAL PLANTS

Herbs are used in pharmaceutical and cosmetic industry for extracting **active ingredients**, due to their vitamins, oils, sugars, phenolic heterosides, coumarin, flavonosids, anthocyanin, derivatives of fatty polyphenolcarboxylic, heterosides sterol, heterosides triterpenoid, lipids, resins (resin), bitter, alkaloids and other active ingredients of plant properties.

Obtaining the **raw material** for pharmaceutical and cosmetic products, is the different parts of plants (plant resources):

- the aerial entirely = herba

- groundwater bodies: root = radix, rhizoma = rhizome, tuber = tuber, bulb = bulbos
- leaf = folium
- buds = turiones, gemmae
- flower = flores
- fruit = fructus
- semen seed = semen
- bark on the trunk or the root = cortex

Plant product represents a particular organ or part / component of the plant, dried and processed, which can be used for the preparation of pharmaceuticals or cosmetics.

The therapeutic action may be due to:

- a single active ingredient organic substances = active principle
- a group of substances with the same basic structure, distinguished by the nature of radicals
- a complex phytochemical = phytocomplex, made up of a governing principle and principles side (synergistic effect)

3. HERBS USED IN OBTAINING PHARMACEUTICAL AND COSMETIC PRODUCTS

The concept of **active principle** occurred after 1570, when the scholar and practitioner Paracelsus showed that medicinal plants, only a certain part of their composition (0.5g / 1 kg) shows therapeutic effects on the body.

Knowledge of biologically active substances contained in plants is important for assessing the therapeutic value and how extraction or isolation of these principles so the action in pharmaceuticals and cosmetics to be more efficient. For example, *Hypericum perforatum* contains hypericin, effective for lowering the acidity of gastric juice, sedative, soothing the pain, and antidepressant.

Classification of herbs depending on the chemical structure of the active principles:

✓ **Herbs containing volatile oils**

Volatile oils (essential oils or essential oils) = aromatic volatile compounds whose chemical composition is formed from mixtures of aromatic hydrocarbons, aliphatic aldehydes, alcohols, organic acids, esters and terpenoids.

Characteristic aromatic smell and most are soluble in alcohol. Volatile oils are used as stomachic, antispasmodic, carminative, expectorant, sedative, aromatic.

✓ **Herbs containing alkaloids**

Alkaloids = organic compounds, characterized by the presence of nitrogen in their molecule and an alkaline reaction, with formation of salts. Alkaloids are formed in the subterranean parts of the plant which migrate to other organs, during the growing season. At celandine and poppy, alkaloids found in milky juice. Depending on the amino acid precursor may be derived from alkaloids glicolol, tryptophan, phenylalanine, lysine - ornithine or via acetyl - coenzyme A. Meet more frequently in families: Ranunculaceae, Papaveraceae and Solanaceae.

✓ **Herbs containing bitter**

Bitter = plant compounds structurally glycosides, alkaloids, ternary, bitter, which causes increased gastric secretion. Dosage bitter principles is by organoleptic method. Especially meet the families Gentianaceae and Asteraceae.

✓ **Herbs containing carbohydrates**

Carbohydrates (carbohydrates, heterosides and glycosides) = natural organic compounds, resulting directly in the process of photosynthesis and divided into ounces and ozide (Licorice).

✓ **Herbs containing flavonoids**

Flavonoids = yellow pigments identified in species of the Compositae family, in the form of flavones (*Matricaria chamomilla*, *Milefolium achillea*, *Calendula officinalis*) or in the form of flavonols to the species of the family Leguminosae (*Sophora japonica*).

✓ **Herbs containing antocyanosides**

Anthocyanosides = soluble pigments, are in the cell juice which gives flowers, foliage and fruit fall, red, violet, blue.

✓ **Herbs containing tannins**

Tannins = natural compounds nitrates, polyphenols structure

In tables 1, 2 and 3 are examples of medicinal plants whose oils, extracts and tinctures are used in obtaining pharmaceutical and cosmetic products, as well as effects and mode of action.

Table 1. Herbs whose oils are used in the production of pharmaceuticals and cosmetics and effects

<i>The herb</i>	<i>Image</i>	<i>Effect / Action</i>
<u>underbrush</u> (<i>Hippophae rhamnoides</i>)		<u>nutritious</u> <u>vitaminizant</u> <u>healing</u> <u>epithelissant</u> <u>sun screen</u>
<u>beach nut</u> (<i>Fagus sylvatica</i>)		<u>nutritious</u> <u>vitaminizant</u>
<u>thyme</u> (<i>Thymus serpyllum</i>)		<u>antiseptic</u> <u>antimicrobial</u> <u>antifungal</u> <u>deodorant effect</u>
<u>varrow</u> (<i>Achillea millefolium</i>)		<u>antiinflammatory</u> <u>soothing</u> <u>antiseborrheic</u> <u>anti acne</u>
<u>pine</u> (<i>Pinus montana</i>)		<u>tonic</u> <u>stimulating</u> the <u>peripheral circulation</u>
<u>juniper</u> (<i>Juniperus communis</i>)		<u>te</u> <u>stimulating</u> the <u>peripheral circulation</u> <u>cellulite</u>

Table 2. Medicinal plants whose extracts are used in the production of pharmaceuticals and cosmetics and effects

<i>The herb</i>	<i>Image</i>	<i>Effect / Action</i>
<u>brier</u> (<i>Rosa canina</i>)		<u>nutritious</u> <u>vitaminizant</u>
<u>cranberry</u> (<i>Vaccinium vitisidaea</i>)		<u>nutritious</u> <u>vitaminizant</u>
<u>moss fir</u> (<i>Usnea barbata</i>)		<u>antiseptic</u> <u>antimicrobial</u> <u>antifungal</u> <u>deodorant effect</u>
<u>bennet</u> (<i>Geum urbanum</i>)		<u>astrigent</u>
<u>hellebore</u> (<i>Heleborus purpureus</i>)		<u>antiinflammatory</u> <u>calming</u> <u>cardiotonic</u>
<u>echinacea</u> (<i>Echinacea purpurea</i>)		<u>antiinflammatory</u> <u>soothing</u> <u>immunomodulatory</u> <u>antifungal</u>
<u>marigold</u> (<i>Calendula officinalis</i>)		<u>healing</u> <u>epithelissant</u> <u>antiseborrheic</u> <u>acne</u>
<u>plantain</u> (<i>Plantago lanceolata</i>)		<u>healing</u> <u>epitelizant</u> <u>emollient</u> <u>moisturizing</u>
<u>rattle</u> (<i>Hypericum perforatum</i>)		<u>healing</u> <u>epitelizant</u>
<u>coltsfoot</u> (<i>Tussilago farfara</i>)		<u>emollient</u> <u>moisturizing</u> <u>immunomodulatory</u> <u>antifungal</u>
<u>three stained brothers</u> (<i>Viola tricolor</i>)		<u>emollient</u> <u>moisturizing</u>
<u>ivy</u> (<i>Hedera helix</i>)		<u>c</u> <u>ite</u> <u>emollient</u> <u>antiedematous</u> <u>antixudativa</u> <u>activation</u> of <u>peripheral circulation</u>

thorn (<i>Ruscus aculeatus</i>)		cellulite
burdock (<i>Arctium lappa</i>)		seborrhea acne
mistletoe (<i>Viscum album</i>)		immunomodulator antimitotic
thumb (<i>Digitalis lanata</i>)		cardiotonic

Table 3. Herbs whose dyes are used in the production of pharmaceuticals and cosmetics and effects

The herb	Image	Effect/ Action
arnica (<i>Arnica montana</i>)		tonic stimulating the peripheral circulation antiinflammatory soothing
hawthorn (<i>Crataegus monogyna</i>)		hypotensive
valerian (<i>Valeriana officinalis</i>)		sedative

4. CASE STUDY: USING BUCKTHORN FRUIT IN OBTAINING PHARMACEUTICALS AND COSMETICS PRODUCTS

Sea buckthorn, also known as sea buckthorn river or simply buckthorn (*Hippophaë rhamnoides* L.) is a highly branched and thorny shrub that grows in the sands and gravels in Romania to coastal and mountain regions, forming groves and bushes pretty stretched (fig. 1.).



Fig. 1. *Hippophaë rhamnoides* L.

This fruit is characterized by a very rich and complex chemical content, consisting of:

- vitamins, minerals, micronutrients, antioxidants, phyto-hormones
- vitamin C at a rate of two times the rosehip and ten times higher than citrus
- vitamins A, B1, B2, B6, B9, E, K, P and F
- β -carotene in greater proportion than the carrot
- trace elements P, Ca, Mg, K, Fe, Mo, B
- cellulose
- proteins with high content of essential amino acids (lysine)
- complex oils (saturated and unsaturated fatty acids, sterols)
- organic acids (malic acid, succinic acid, ursolic acid)
- flavonoids identical from Ginkgo biloba
- citric and cafeilchinici (directly involved in mitochondrial metabolic processes)
- substances with hormonal effects (serotonin, a substance with physiological effects related to the central nervous system and protein synthesis)

In table 4 are the content of fat, protein, carbohydrate and energy value of sea buckthorn fruit and in table 5, the main content of bioactive compounds.

Table 4. The content of fat, protein, carbohydrate and energy value of sea buckthorn fruit [Hyppophae Rhamnoides]

<u>The compound contained in sea buckthorn fruits</u>	<u>Water (%)</u>	<u>Protein (%)</u>	<u>Fats (%)</u>	<u>Carbohydrates (%)</u>	<u>Energetic value (kcal)</u>
<u>The value obtained</u>	87,5	1,2	0,7	10,14	49

Table 5. Content in main bioactive compounds of sea buckthorn fruit [Hyppophae Rhamnoides]

<u>Bioactive compound content in the underbrush fruits</u>	<u>The value obtained</u>
pH	2,7-3,3
C vitamina	200-1500 mg
E vitamina (mixed tocopherols)	up to 180 mg
folic acid	up to 80 µg
Carotenoids (β-carotene, lycopene, zeaxanthin)	30-40 mg
Unsaturated fatty acids (oleic, palmitoleic, linoleic)	3-18%
Organic acids (enolic acid, citric acid, tartaric acid)	2,82-6,08%
Flavonoid	100 - 1000 mg
Potassium	6,44 -22 mg/kg
Calcium	0,9 – 1,48 mg/kg
Magnesium	0,47 -73 mg/kg
Iron	22 – 33 mg/kg
Selenium	5,02 mg/kg
Zinc	8,8-27 mg/kg
Manganese	8,7 -15 mg/kg

Due to the high in bioactive product, underbrush and particular fruit, are the raw material plant in pharmaceuticals and cosmetics, in order to obtain complex products (medicines, vitamins and minerals, nutritional supplements, beverages tonics, creams, oils, soaps medicinal oils moisturizing or protective, moisturizing soaps or antibacterial).

CONCLUSION

- Due to its geographical position, a varied landscape, climatic conditions favorable to the development of a rich vegetation, Romania are 3630 species of medicinal plants, of which 10-12% were physical-biological exploited for pharmaceutical and cosmetic products.
- Herbs are used in pharmaceutical and cosmetic industry for extracting active ingredients.

- There are presented the medicinal plants, whose oils, extracts and tinctures contain active basic principles to obtaining pharmaceuticals and cosmetics products,
- Due to the high in bioactive product, underbrush and particular fruit, are the raw material plant in pharmaceuticals and cosmetics, in order to obtain complex products

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