

## ***POPULAR CULTURE AND ETHNOBOTANICAL USE OF BASIL***

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*Abstract: In popular culture, the use of plants for medical purposes is known from ancient times. Many of their properties are already proven by scientific studies. Belonging to this category of plants is the basil, with known antiseptic, aromatic and culinary properties. In the past, the use of basil in various popular practices was done regularly through customs and traditions without any scientific basis. Our study aims to correlate the properties of basil in popular culture with recent scientific studies. Some of them have confirmed the antimicrobial quality of essential oil extracts from basil, thus confirming popular beliefs.*

**Key words:** *popular culture, basil, ethnobotany, medicinal plants, aromatherapy.*

### **INTRODUCTION**

According to a recent survey, the people from developed countries of the European Union are turning to the use of traditional medicinal systems that involve the use of herbal drugs and remedies. In recent years approximately 1400 herbal mixtures are used widely (Hoareau and DaSilva et al., 1999). Many of these (eg. plant-derived pharmaceuticals, multicomponent botanical drugs, dietary supplements, functional foods and plant-produced recombinant proteins) will soon complement conventional pharmaceuticals in the treatment, prevention and diagnosis of diseases, while at the same time adding value to agriculture (Raskin et al, 2002).

In literature, there are reported various relationships between plants and human, such as: traditional use of medicinal plants, the use of plants to make tattoos, body paints and dyes, clothes and tools etc. Also there is an increased incidence of diabetes, hypercholesterolaemia and obesity among people that had a traditional diet containing plants and changed to a Western diet (Balik and Cox, 1996).

Studies regarding relationships between the population's health state and medicinal plants in general, and the individual's health state and plants in particular are various and complex (Paney et al., 2014; Nuomi et al., 2011; Butura, 1979).

In Romanian popular culture, plants "were a source of inspiration for the rich domain of the folk and the artistic creations" (Butură, 1979: 9). In the spiritual culture they are assigned with different meanings being evoked in traditional songs "doine", legends, fairy tales, and they even received supernatural powers. In the traditional community life they were used in alimentation, esthetical purposes, to embellish life and decorate the house, (vegetable motifs being sewn on costumes and carved doors, gates etc.) but also for treatment purposes.

## **BASIL – General Considerations and Chemical Composition**

### **General Considerations**

Originating from tropical and subtropical regions of Asia, Africa and South America around the year 800 B.C., basil was brought in countries like Russia, France, Italy and Spain in the sixteenth century and in America in the seventeenth century, and today is spread in almost all countries around the world.

Some of the common names of basil are: basic, basileac, biesnioc, bizilioc, basioc, busioc garden mălăcină, mătăcină, mejioran, vāsileac (in Romanian), basil (Engl.), basil (Franc.), basil (Germ.), Ogorodâi basilica (Russian) (Pârvu, 2002). Its etymology comes from the Greek term “basileus” that means “king”. The taxonomy of the genus *Ocimum* is quite complex, due to interspecific hybridization and its polyploidy in particular. For this reason, some scientists used chromosomal and essential oil analysis, along with morphological descriptions to establish a standard taxonomy for basil (Grayer, 1996; Carovic'-Stanko et al., 2009).

Basil is an herbaceous annual plant, allogamous, with  $2n = 48$ , cultivated around the globe. Among the most common cultivated varieties we can mention: *Ocimum basilicum* L. f. Minimum (low port, very small leaves and strong flavour), f. Bullatum (spoon-shaped leaves), f. comosum (dwarf and very dense bush). *Ocimum basilicum* is often confused with *Ocimum americanum* and *Ocimum africanum*, but they can still be distinguished based on the distribution and size of the flowers and hairs. Lemon scented varieties are usually the result of crosses between *O. basilicum* and *O. africanum*. In Romania, the local variety cultivated since 1975 is De Radoveanu (Pârvu, 2002; Zamfirache et al., 2008).

### **Chemical Composition**

In practice, the aerial organs of plants from the genus *Ocimum* are used to extract essential oil, at the maximum flowering period. The leaves contain volatile oils between 0.1 and 1%, (composed mainly of eugenol, carvacrol, methyl chavicol, linalool, caryophyllene) (Zheljakov et al., 2008)., tannins, saponins, estragol, rosmarinic acid, anthocyanin pigments, flavones, carotenes, vitamins (ascorbic acid, niacin, riboflavin) phenols, amino acids (Burzo, 2015). The seed consists of fatty acids oil of sitosterol, and mucilage is made up of xylose, and polysaccharides such as glucomannan (Western et al., 2000).

The mucilage produced by the seeds of the plant has been used since ancient times for their medicinal properties and as a source of food. Natural mucilage possesses a number of properties that enable their use as bonding agents, thickening and stabilization (Gupte et al., 2012), so they are widely used in pharmaceutical excipients for the formulation of drugs. It is known that synthetic polymers used in the pharmaceutical industry present a number of disadvantages: high production cost, toxicity, environmental pollution by synthetic process, are produced from non-renewable sources and can sometimes cause side effects. Instead, natural polymers such as mucilage have reduced production cost, are not toxic and are biodegradable (Lakshmanraj et al., 2009). Mucilage produced by some species of the genus *Ocimum sp.* has been used successfully in the formulation of some medications. At the same time, the mucilage possesses the ability to absorb certain polluting substances such as heavy metals from aqueous solutions. (Lakshmanraj et al., 2009).

Products based on basil were used by ancient populations in their diet food and today it is known that they contain Omega 3 and Omega 6 fats, mucilage fibers, various antioxidants and vitamins (for more information, see Gupte et al, 2012)

## **TRADITIONAL AND MODERN USES OF BASIL**

### **Traditional Uses of Basil**

In Romanian popular culture, the inherited knowledge about ethnobotany is known primarily through the lexical fund where we have terms that describe both the morphology and also the popular names of useful species of plants, frequently used in common vocabulary. Some terms are native Dacian while others have a Mediterranean origin, from the Greek and Roman worlds. Besides the names of plants, also the knowledge on their uses was passed down by word of mouth from one generation to another (information concerning cultivation, agro-processing, customs, magic practices and popular beliefs). Most of these practices/rituals were driven by man's desire to invoke nature for rich crops and pest removal, practices considered reminiscences of some old pre-Christian agricultural rites (Butura, 1992). In parts of the Mediterranean region the leaves are used to make an insecticide that can protect crops from pest insects.

Basil is widely used in traditional medicine, in particular for the treatment of disorders of the digestive tract, such as stomach pains and diarrhea and renal infections. In Africa, for example, it is used for the treatment of various types of whooping cough and fever (Bilal et al., 2012). The active principles act as intestinal, lung and kidney antiseptic, antifungal, febrifuge, carminative, antiemetic, diuretic, stimulates digestion, kill pathogenic bacteria in the body - especially the gut, cure the lungs and bronchial tree, kidney and urinary tract, relieve kidney inflammation and bowels. Also, they help to combat fungi and yeasts, release abdominal pain and vomiting sensations, increase the secretion and excretion of urine, stimulate the secretion of milk in lactating period for women, stimulate gastric and intestinal digestion (Pârvu, 2002; Stankeva et al., 2014).

The basil is also used for its nutritional value. It can be used fresh or dried, both in traditional and modern recipes in various cooked dishes, salads, snacks, refreshments and cocktails.

### **Modern Uses of Basil**

#### ***Pharmacological Studies***

Caffeic acid, rosmarinic acid, phenols, flavonoids, essential oil etc. from plant extracts of basil constitute active compounds against cancer. Cut et al., in 2010, found that the use of bio fertilizers in crops of basil may increase the amount of these constituents. Also basil, thyme and mint, commonly used as culinary and curative herbs, besides essential oil and flavonoids, contain luteolin and ursolic acid, which can be used in oral cavity cancer (Amri, 2014). Other studies have shown the effectiveness of the herbs in the treatment and prevention of various types of cancer and various other diseases. For example, Pandey et al., 2014, found that betulinic acid derived from basil callus is another compound that is effective against cancer and HIV, and Nuomi and Manga (2011), have shown that basil and other herbs traditionally

used by the people of North West Cameroon, have the ability to eliminate symptoms of skin cancer and HIV.

Studies on rats have shown that basil may reduce blood pressure, the methanolic extracts of basil contribute to the reduction of haematotoxicity produced by benzene (Umar et al., 2010; Saha et al., 2012) and aqueous extracts of basil have immunoregulatory effect due to the presence of caffeic acid and p-coumaric acids. This has been proven studying the blood cells by lymphocytic proliferation assays using ELISA and expression of mRNA (Tsai et al., 2011).

Similar studies come to consolidate more research results mentioned before: Laughter and Akhtar (2011) formulated a basil based emulsion, which has anti-aging effects; Noumi and Ebwelle (2011) showed that basil, along with other herbs in Cameroon, can be used in treating urinary disorders; De Almeida et al., (2007), showed that 300 mg / ml linalool has 100% mortality effect on intestinal parasite *Giardia lamblia*. Also, studies on rats have demonstrated the protective role of basil extracts against electromagnetic radiation. This contributes in reducing infertility caused by industrial activities (Khaki et al., 2011) and treatment with aqueous extracts of basil improves the rats' testicular tissue affected by lead and cadmium toxicity (Sakr et al., 2013 Ainehchi et al., 2014).

### ***Antibacterial Activity***

Since ancient times, aromatic plants, among which is the basil, were used for flavouring and preservation of food. Those plants present antimicrobial activity against some of the most common bacteria and fungi species that contaminate food (*Listeria spp.*, *Staphylococcus spp.*, *Salmonella spp.*, *Escherichia spp.*, *Pseudomonas spp.*, *Aspergillus spp.*, *Cladosporium spp.*, etc.) (Škrinjar and Nemet, 2009; Stefan et al., 2013). Studies on gram-negative bacteria *Escherichia coli*, *Pseudomonas aeruginosa*, and gram-positive bacteria *Bacillus cereus*, *Staphylococcus aureus*, have demonstrated that the essential oil from basil plants have a more pronounced antimicrobial activity against gram-negative ones (Moghaddam et al., 2011). By scanning microscopy imaging studies, it was found that some bacteria (*Pseudomonas aeruginosa*, *Shigella sp.*, *Listeria monocytogenes*, *Staphylococcus aureus* and two strains of *Escherichia coli*) treated with methanolic extract from basil leaves were damaged compared with the untreated ones (Kaya et al., 2008). The ursolic acid and apigenin found in raw and purified extracts from basil plants present antiviral activity against adenovirus (ADV), herpes virus (HSV) and hepatitis B (Lien-Chai et al., 2005).

## **TRADITIONAL RITUALS AND MAGICAL PRACTICES**

In Romanian popular culture, plants with medicinal value are also used in various rituals. The collection of medicinal plants was performed only at certain times and circumstances, accompanied or preceded by incantations, songs and various rituals (Butură, 1992). According to Butura, the medicinal plants were primarily picked on celebration days, (e.g. on Sânzâiene Day, June 24), when most of them were in blooming times, "at dawn, with clean clothes and an empty stomach" (1992:221). Elderly people always had knowledge of the curative properties and their uses in the treatment of chronic conditions, and they were

effectively the local doctors for centuries, and their existence in rural areas can be confirmed even today.

Basil is used in some religious rituals where the water is blessed and becomes holy water. The holy water plays an important role in the forgiveness of sins, the clearing of the possessed minds, and in many other magical practices with protective attributes. Depending on the ethnographic region, basil is used in various manifestations or traditional events, such as those related to family life habits like baptism and the sacrament of matrimony. Basil is placed in the child's bathing waters to protect him from evil and diseases. Also, the bride and groom, before the wedding, have a bouquet of basil to bring them happiness and wellbeing. The young single girls put basil under the pillow to dream their future groom (Pârvu, 2002).

As a magical plant, basil is considered to bring luck and love, and drive away evil spirits, loneliness and poverty. To avoid losing money, dried basil flowers are put in the money box. Elders place basil next to religious icons considering that this plant is holy and the presence of basil was believed to purify negative energies.

## CONCLUSIONS

The many traditional uses of basil triggered the attention of scientists to detailed studies of its properties. The popularity of this plant is driven especially by its chemical composition, the aerial parts of basil producing essential oil and substances with antioxidant activity, mucilage etc. Also, the large number of varieties with diverse colors and fragrances increase the attractiveness of this plant.

From an economical point of view, the basil (*Ocimum basilicum* L.) is a very important crop around the world due to its multiple uses in: culinary arts, refreshing drinks, traditional and modern medicine, perfumery and aromatherapy and also in traditional rituals and magical practices.

Recent research demonstrates the possibility of using some basil extracts for the amelioration of cancer and AIDS and even to cure some other chronic diseases. Also the antimicrobial capacity of basil, supported by the scientific studies, is very useful for the preservation of foods and combating some pathogenic fungi and bacteria.

Altogether, the traditional utilizations in medicinal household practices are confirmed by recent research and support the meaning of its etymology that the basil is the king of the plants.

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