ECHINACEA – FROM ETHNOBOTANY TO MODERN PHYTOPHARMACEUTICS

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Medicinal herbs play an important role in health care throughout the world, especially in non-industrialized continents such as South America, Africa and parts of Asia.

In The manufactured drugs are hardly accessible to populations of the non-industrialized countries, the phytotheraphy (in modern medicine) of the overpowering industrialized ones will differ quantitatively and qualitatively being determined by the traditions and regionalisms of various cultures. Today, in Japan, 40% of medical practitioners usually prescribe phytotherapeutical preparations, and in Germany, almost 32% of the commercial medicines are the phytotherapeutical ones. (Hansel, 1986, quoted by Ursula Stănescu, 2002).

Some of the most popular european phytopharmaceutical preparations contain an American herb called *Echinacea* and the first commercial European preparation of this plant was made over 50 years ago by Gerhard Madaus, under the name of Echinacin.

Since then this plant has been intensively. Studied, but what is the most important thing is its traditional use given by Native American people, as a remedy for colds, flu and other infections.

The plant s name, *Rudbeckia purpurea* (1753) was given by Linnaeus, the famous Swedish botanist and physician, after Olaf Rudbeckia, a name that one can occasionally find it in botanical and horticultural literature even today.

Echinacea has a few common names in English, but the most widely encountered name is that of Purple Cone – flower, the other ones being: Blak Sampson, Red Sunflower, Comb Flower, Cock Up Hat, Missouri Snakeroot and Indian Head.

As one reviews the articles written between 1850 and 1900 on the medicine of the Native Americans well find out that some authors refer to the use of *Echinacea* by some tribes such as: Cheyenne (sore mouth, gums), Choctans (cough, dyspepsia), Crow (colds, tooth – aches, colic like comb), Daware (gonorrhea), Omaha (septic diseases), Hidatsa (stimulant).

The Eclectics, a group of doctors who depended on botanical medicine in their practice and who were famous from the 1830 s to the 1930 s. They brought *Echinacea* to the fore front of herbal medicine. The Lloyd Brothers made of Specific Medicine Echinacea and Echafolta, the most famous preparations.

J. King and John Uri Lloyd introduced *Echinacea* to the medical profession.

King provides some botanical information and some uses of the species of *Echinacea purpurea*, writing that the root has a very pungent taste and it has proved to be effective in treating the syphilis.

Echinacea angustifolia has been quoted in John Lloyd s History of *Echinacea angustifolia* and the Lloyd Brothers a Treatise on *Echinacea*, both works being still available.

Around 1870, H.C.F. Meyer began producing a patent medicine which contained *Echinacea angustifolia*, (identified by Lloyd) Hops and Wormwood. Initially, king and Lloyd did not recognize this preparation Meyer mentioned that *Echinacea* proved to be efficient in healing the wounds made by poisonous serpents.

In 1912, in a study made by Lloyd regarding the popularity of vegetable drugs among medical practitioners of the day, *Echinacea* was ranked 11th. Meanwhile, King Began interested in the plant, using it in a preparation (made by Lloyd) for his wife who had cancer at the time and he found out that *Echinacea* retarded the progress of the disease and provided improvement in the pain.

In 1898, King added new materials to his work American Dispensatory and Felter published a monograph about Echinacea in the Eclectic Medical Journal under the title The Newer Materia Medica: I. *Echinacea*. Felter referred to the pharmacological action of *Echinacea* calling it antiseptic, alternative and a corrector of the capillary circulation.

While the Eclectics were convinced by the miraculous properties of the plant, the Regulars, or allopaths were critical about it.

In 1915, V. von Unruh, M.D. Wrote an article on the tuberculosis treatment, using a preparation of *Echinacea angustifolia* and *Inula helenium*, seeing the importance of the plant in stimulating the immune system and underlying the fact that his compound did not contain an excess of alcohol, comparatively to Lloyds one.

During a period of three years of study, he has noticed that *Echinacea* stimulates the process of phagocytosis and produces in the blood, effects similar to those produced by the vaccines.

Today, after H. Wagner s study, it is known that *Echinacea* contains water – soluble polysaccharides, that strongly affect the immune system.

The first published report (1897) on the chemical constituents of *Echinacea* was by John Uri Lloydand it referred to its root which was at first sweet and then acrid to taste.

Lloyd s study on *Echinacea angustifolia* was continued by one of his students, S. H. Culter, in his doctoral thesis, published in 1931. Other notable research was carried out by Heyl and Staley, Heyl and Hart who also added the insecticidal activity of the essential oil.

After the prolific amount of material Written about *Echinacea* over a 50 years period, it seems outstanding that after 1937 the marketing of *Echinacea* preparations ceased in the U.S. for a long period of time. Meanwhile, the German researchers became interested in testing the plant s properties and Gerhard – Madaus published many studies over the next 50 years.

Echinacea s taxonomy: Division *Spermatophyta*; Subdivision *Angiospermae*; Class *Dicotiledonate*; Subclass *Asteridae*; Classification *Asterales*; Family *Asteraceae* (*Compositae*); Genre *Echinacea*

After some cariologic studies it has been established that the vegetal material of cultures, in Europe belongs to the species of *Echinacea angustifolia* and *E. pallida* and not to *Echinacea purpurea* and E. p. as it was believed for a long time. (Hodisan V. et Tămaş M., 1984).

The three species differ morphologically, histo-anatomically and biochemically, hence the different quality of the response on the level of the immune system. These are herbaceous plants with veroucous leaves; the flowers are a rich purple to pink and the florets are seated round a high cone: seeds, four-sided achenes.

The name of *Echinacea* comes from the Greek hedgehog, i.e. hedgehog, referring to the sharp bractes of the receptacles. The roots, i.e. the rhizomes are shaped as some fragments of different thickness being cylindrical, slightly spiral and hawing a slight hot – burning taste, at the beginning hawing and the a sweetish – bitter one. It seems that the hot taste disappears because of the degradation of isobutyl amides, thus, diminishing also – the immune stimulative effect of the medicinal preparations.

The main active principles of *Echinacea* belong to the group of immunostimulators and they are identified to *Echinacea herba* and *E. radix*. To *E. radix*, the active biologic principle having a immunostimulative activity, derived from E.p. is the cicaienic acid (it stimulates the phagocytosis).

Echinacea herba, from *Echinacea purpurea* contains much more active principles, which chemically speahing they belong to a different structure: polythalosides, isobutyl amides and polyphenoly.

In their studies Moench, Wagner H. and colab. isolated D polyhalosidic fractions, on the upper parts of the plant of *Echinacea purpurea*: – 4 – 0 – metilglucoranoarabinoxylan and arabinorhamnogalactan acid which had the capacity to stimulate in vitro the phagocitary activity of the granulocytes (Wagner et. al. 1988).

Among the there species of *Echinacea*, *Echinacea purpurea* is the most important one for therapeutics, being followed by *Echinacea angustifolia* (Stănescu et. al, 2002). Depending on the pharmacological effects induced by the active principles, *Echinacea* has been used for its ante inflammatory effects: (for polyhalozidic fractions), antibacterial and antiviral (for the esthers of the caffeic acid), bacteriostatic and fungi static (for polyacetylenic fractions), insecticidal ones (for isobutyl amides).

The use of *Echinacea* preparations in healing the infections is provided simultaneously with the administration of antibiotics and chemotherapy.

Considering the fact that these species have been known all over the world as medicinal herbs but not in Romania, there were introduced in Cluj, in 1982, in cultures 2 species of the same genre, *Echinacea pallida* and *Echinacea purpurea* Moench by the researchers of the Faculty of Agronomy from Cluj Napoca who established the sintable methods for each species. (Oniga Ilioara, 1997)

Today, *Echinacea* is a widely sold plant especially on U.S. and Europe s market. The chemical and pharmacological researches demonstrate that the plant is a stimulant of the immune system; therefore the future of *Echinacea* in the international phytopharmaceutics has been assured.

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