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ECHINACEA SPECIES OF MEDICINAL USE

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Abstract

L. S. MUNTEAN, D. VARBAN, S. MUNTEAN, M. TĂMAȘ, RODICA VARBAN, 1998, *Echinacea Species of Medicinal Use* (in Engl.) Not. Bot. Hort. Agrobot. Cluj, 1998, XXVIII. Echinacea species come from North America. Preparations of Echinacea pallida Nutt. and Echinacea purpurea (L.) Moench are used in healing many diseases owing to their immunostimulative, antiviral and antibacterial, scarifying and anti-inflammatory properties. Echinacea pallida Nutt. displays tap root, linear spear-shaped leaves; Echinacea purpurea (L.) Moench has fasciculate root and oval-lanceolate leaves. Seedling plantation with both species is performed in May and spacings of 50 cm between rows and 30 cm between plants per row. Harvest takes place in the 2-nd year of flowering.

Key words: Echinacea species of medicinal use

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The importance of Echinacea plant species proven by the Indians on the North American continent who had used them for medicinal purpose, was documented rather late by Gilmore in 1919 and Smith, in 1928 (Bauer et al., 1990). They refer mostly to the plants' use in healing wounds, burns, then in the treatment of the mumps, insect bites; then, as disinfectant of the mouth and pharynx and treatment of stomatitis and pharyngitis and as pain-killer in head- and stomach aches; also administered in coughs, colds, measles, and gonorrhoea; also, antidote in snake bites and intoxication. Mostly roots of Echinacea angustifolia & pallida, or juice or mash of fresh plants, or minced were used (Bauer et al., 1990).

The Lloyd Brothers of Cincinnati USA had started in 1894 producing and marketing a tincture of their own extracted from Echinacea pallida to be utilized in diatheses, syphilis, wounds, skin diseases; also, in diphtheria, typhus, cholera in children, septicaemia (Bauer et al., 1990).

Unruh first published in 1915 a detailed report on parental utilization of the tincture obtained from *Echinacea pallida* in TB by describing its effects on lymphocytes. Also, for first, he outlined a possible immunological mechanism (Bauer et al., 1990).

Once the efficacy of preparations from fresh plants established there took place the first attempts at introducing *Echinacea* species in cultivation in Europa and its first success obtained by Madaus in 1939, with *Echinacea purpurea* from seeds imported from America (Bauer et al., 1990).

Between 1950 and 1960 certain species of *Echinacea* were acclimatized and brought into culture in Central Europe and the former Soviet Union.

Species of *Echinacea* known as medicinal plants, i.e., *Echinacea angustifolia* (DC) Moench (n=11), *Echinacea purpurea* (L.) Moench (n=11), *Echinacea pallida* Nutt. (n=22) are used for treating various diseases owing to their immunostimulating, antiviral, antibacterial, scarifying and anti-inflammatory properties (Houghton, 1994). The application fields are multiple: TB, flue, bronchitis, rheumatism, polyarthritis; then, in gynaecology, surgery, dermatology. Thus, so far, fairly large numbers of preparations have been devised by numerous manufacturers and used as such or associated with others, both in allopathic and homeopathic medicine. Among those numerous preparations one can call up a new Romanian phytotherapeutic produce, i.e., NOVASTIM pills or gel based on dry extract from *Echinacea pallida*, obtained at the Faculty of Pharmacy Cluj and successfully used in the treatment of herpes, as well as immunostimulant in non-specific resistance of body to leucopessia following chemo- and radiotherapy to prevent infection by both virus and microbe (Tămaş et al., 1989).

Favourable results obtained in following the impact on the healing of lesions have led to obtaining several dermatologic and cosmetic products within RO-range, based on *Echinacea purpurea* (Hodişan et al., 1994). Also, species of *Echinacea* cultivated at Cluj-Napoca are raw material for tinctures in homeopathic preparations.

The classes of active substances in *Echinacea* species studied are: polysaccharides, essential oil, derivatives of caffeic acid, polyacetylene, flavonoids etc.

Botanically, genus *Echinacea* classes with Dicotyledonatae, Asteraceae (Compositae) family, Asteroidae (Tubuliflorae) subfamily, Heliantheae tribe and Ecliptinae subtribe. This genus includes nine species of several varieties; of these, the above mentioned three are used as medicinal plants (Muntean et al., 1990).

Controversies on the nomenclature of the species have led to the advent of synonymic names for the same species: *Echinacea angustifolia* (DC) Moench, synonymous with *Echinacea sanguinea* Nutt., *Brauneria angustifolia* (DC) Heller; *Echinacea purpurea* (L.) Moench - synonyms, *Rudbeckia purpurea* L., *Brauneria purpurea* Britt; *Echinacea pallida* Nutt. - synonyms, *Budbekia pallida* Nutt., *Echinacea angustifolia* Heok, *Brauneria pallida* Britt.

The name of the genus derives from the Greek 'echinos' meaning 'prickly', 'spiny' as the fruit ends on top in four prickles (Muntean, 1991).

Morphologically, *Echinacea pallida* Nutt. is a perennial plant of bush-like countenance with a tap root and linear spear-shaped leaves, with light-pink flowers. *Echinacea purpurea* (L.) Moench is also perennial and has fasciculate root, oval-lanceolate leaves and reddish-pinky flowers. Flowering takes place in July-August, and pollination is entomophilous. Fruits in both species possess akenes and the plants are prickly (Muntean, 1991).

In Romania, *Echinacea pallida* Nutt. and *Echinacea purpurea* (L.) Moench were taken into cultivation by the Medical School of Cluj in co-operation with the University of Agricultural Sciences and Veterinary Medicine Cluj where their acclimatization and cultivation from Italian seeds began in 1982. Both species were multiplied via hotbed seedlings in plastic bags (diameter 6 cm, 10 cm tall) filled with mixture of common soil, in nutrition pots. Seeds germinate after 7-10 days, at 20-30°C granted temperature.

In no more than two months seedlings are apt for planting: *Echinacea pallida* Nutt. 14-16 cm high, 3-4 leaves and, *Echinacea purpurea*, 15-18 cm and 5-8 leaves. Planting of seedlings is to be carried out in the first ten days in May thus the highest yield of herba - with 50 cm spacing between rows and 30 cm between plants per row - is obtainable.

During their first year of vegetation both species of *Echinacea* develop leaf rosettes. Harvesting is possible starting in the 2-nd year of vegetation. Herba in *Echinacea pallida* Nutt. is to be harvested yearly on flowering, in the 3-rd or 4-th year of the vegetation, on culture cease, and on the radix (Muntean, 1992). In *Echinacea purpurea* (L.) Moench one uses the herba harvested mainly year by year on flowering beginning in the 2-nd vegetative year and, on ceasing the crop one can dispose of roots as well as (Muntean, 1993).

Rezumat

L. S. MUNTEAN, D. VARBAN, S. MUNTEAN, M. TĂMAȘ, RODICA VARBAN, 1998, Specii de Echinacea cu utilizări medicinale Not. Bot. Hort. Agrobot. Cluj, 1998, XXVIII. Speciile de Echinacea sunt originare din America de Nord. Preparatele de Echinacea pallida Nutt. și Echinacea purpurea (L.) Moench se folosesc în tratamentul multor afecțiuni datorită proprietăților lor imunostimulente, antivirale, antibacteriene, cicatrizante, antiinflamatoare. Echinacea pallida Nutt. prezintă o rădăcină pivotantă, frunze liniar lanceolate, iar Echinacea purpurea (L.) Moench are o rădăcină fasciculată cu frunze oval lanceolate. La ambele specii plantarea răsădului se face în luna mai la 50 cm între rânduri și 30 cm între plante pe rând, iar recoltarea se face din anul II de vegetație la înflorire.

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LA PRISE EN CULTURE DES PLANTES MÉDICINALES ET AROMATIQUES EN ROUMANIE

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Abstract

S. MUNTEAN, L. S. MUNTEAN, 1998, Cultivation Start of Aromated and Medicinal Plants in Romania (in French.) Not. Bot. Hort. Agrobot. Cluj, 1998, XXVIII. The necessity of cultivating aromated and medicinal plants in Romania stems from the fact that spontaneous flora cannot face the ever rising demand for raw material. Then, some species take up at random vast areas within spontaneous flora, sometimes difficult to get at; thus spotting picking and transport become cumbersome, the rhythm hindered and production costs high. Certain medicinal plants do not grow spontaneously, others, though extant, are rareties; still others are highly poisonous, ousted from pastures and meadows. Thus, plant raw material from these species can be obtained only through cultivation. Grown aromated and medicinal plants offer the possibility of being harvested at the time when they are highest in active substances. Drying can be performed right on harvesting or, processing after, without drying and no need for implements. Some medicinal plants possess phytomeliorating importance - thus terrains less fit for the growth of such plants may be used. All such advantages have led to cultivation of aromated and medicinal plants and Romania cultivates nowadays over fifty species of such plants - let alone that the trend is climbing as demands are, mostly from the part of chemical and pharmaceutical industries and others too, both inner and outer customers.

Key words: Cultivation Start of Medicinal Plants

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En Roumanie il y a des documents qui attestent le métier d'utilisation des plantes dans le traitement des maladies dès la période des tribus géto-daces. La préoccupation concernant la valorisation des plantes médicinales et aromatiques de notre pays a reçu un support scientifique reconnu depuis le début du XX-e siècle. On mentionne le fait que la première station expérimentale du monde, spécialisée dans l'étude des plantes médicinales a été créée à Cluj (1, 4). Depuis cette année on a mis les bases de la recherche expérimentale dans le domaine des plantes médicinales et aromatiques de Roumanie.