

RESEARCH REGARDING THE VALORIZATION OF MEDICINAL PLANTS IN THE LUGOJ AREA (TIMIS COUNTY)

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Abstract: The use of spontaneous plants for food or therapeutic purposes has been carried out since ancient times, with humans coming to know the beneficial or toxic properties of plants through personal experience. This knowledge has been passed down from generation to generation, although much has been lost over time. The research aimed to identify the main medicinal and aromatic plants of interest from the areas surrounding Lugoj, to establish the main species used by the local population, and to determine how these plants are utilized. Knowing all the species of interest could open perspectives for the inhabitants of the area in the sense of the possibilities of capitalization. Based on floristic studies, a summary of medicinal species was compiled according to taxonomic criteria. The irrational exploitation of medicinal plants, without taking into account the need to restore plant material, has negative consequences, potentially favoring the spread of invasive species, leading to ecological imbalances. The main medicinal and aromatic plants used by the inhabitants of the analyzed area are discussed in terms of their importance and methods of use. The analyzed area has favorable climatic conditions for a large number of medicinal and aromatic species, increasing the value of the region, with the largest share being species used in popular tradition.

Keywords: medicinal plants, economical potential, traditional use

INTRODUCTION

Nature represents a rich source of floristic and faunal resources, offering us numerous possibilities of capitalization. The wild flora represents a valuable source of plant-based raw materials, thanks to the considerable floristic biodiversity that our country enjoys. Wild plants, as well as cultivated ones, are rich in biologically active compounds, which determine the phytotherapeutic properties. Phytotherapy, or therapy through medicinal plants, offers suitable solutions for maintaining health and preventing diseases. Due to the side effects of synthetic drugs and the well-known issues of antibiotic resistance, the use of natural medicinal plant sources offers a viable and effective alternative (FIERASCU *et al.*, 2017, SCHAAL *et al.*, 2018).

In popular tradition, plant resources are both phytopharmaceutical and food sources, all vegetative organs being used: root, leaves, fruits, flowers, seeds. (JAMSHIDI-Kia, *et al.*, 2018). Plants represent the oldest forms of care human and animal health (Yuan *et al.*, 2016).

Romania presents a remarkable floristic diversity, with over 3.000 angiosperms, approximately 30% of European floristic species being found here. It is estimated that, over 350 species of medicinal and aromatic plants are used in Romania (KATHE *et al.*, 2003).

MATERIAL AND METHODS

The outline of the vascular flora was drawn up based on field studies carried out throughout the vegetation period, during the years 2022-2024. Floristic surveys were drawn up, which allowed the identification of cormophytes in the area, including species of phytotherapeutic interest. The identification was made on the basis of specialized determinants (*Flora of R.P.R. vol. I-XIII*, 1952-1976; *Illustrated Flora of Romania*, CÎCĂRLAN, 2009; *Vascular plants from Romania*, SĂRBU *et al.*, 2013; <https://europlusmed.org/>).

In order to identify the main species used medicinally as well as the way of capitalizing on them by the inhabitants of the researched area, a questionnaire was drawn up, which included

several relevant questions in this sense. The questionnaire was applied to people from the localities: Lugoș, Știuța, Darova, Dragomirești, Pogănești, Jurești, Petroasa Mare, Herendești.

RESULTS AND DISCUSSIONS

The analyzed area is located in the South-West of the country, on the banks of the river Timiș (HORAȚIU, 2009). The climate is continental, with sub-Mediterranean influences. Winters are not frosty, summers are warm, and springs and autumns are short (ACHIM *et al.*, 2020). The coldest months are January and February, the warmest months are July and August. The frequency of late frosts and frosts is higher than early ones. The average temperature in the growing season is 16°C. The average monthly precipitation is very varied, it registers a maximum in June and a minimum in February. The average precipitation in the growing season is 499.7 mm. The driest season is winter, and the rainiest season is summer (ACHIM *et al.*, 2020; VICOL, 1974; PINCA, 2013).

Following the floristic study, 176 medicinal and aromatic plants belonging to 49 botanical families were identified. The best represented botanical families are: Asteraceae representing 16%, Lamiaceae representing 15%, Rosaceae representing 11%, Ranunculaceae representing 6%, Fabaceae and Fagaceae representing 5%; with percentages between 1% and 5% we mention Polygonaceae, Brassicaceae, Asparagaceae, Aristolochiaceae, Apiaceae, Malvaceae.

The following species were identified from the Asteraceae (Compositae) family: *Achillea millefolium*, *Achillea salicifolia*, *Achillea setacea*, *Arctium lappa*, *Arctium minus*, *Artemisia absinthium*, *Artemisia vulgaris*, *Bellis perennis*, *Cichorium intybus*, *Cirsium vulgare*, *Centaurea calcitrapa*, *Centaurea cyanus*, *Centaurea jacea*, *Centaurea scabiosa*, *Conyza canadensis*, *Erigeron annuus*, *Eupatorium cannabinum*, *Hieracium pilosella*, *Inula helenium*, *Lapsana communis*, *Matricaria chamomilla*, *Mycelis muralis*, *Senecio vulgaris*, *Solidago virgaurea*, *Tanacetum corymbosum*, *Tanacetum vulgare*, *Tussilago farfara*, *Taraxacum officinale*.

From the Lamiaceae (Labiatae) family we mention: *Ajuga reptans*, *Clinopodium vulgare*, *Glechoma hederacea*, *Lamium album*, *Lamium galeobdolon*, *Lamium purpureum*, *Leonurus cardiaca*, *Lycopus europaeus*, *Marrubium vulgare*, *Mentha aquatica*, *Mentha longifolia*, *Mentha pulegium*, *Melittis melissophyllum*, *Melissa officinalis*, *Origanum vulgare*, *Prunella vulgaris*, *Prunella grandiflora*, *Salvia glutinosa*, *Salvia pratensis*, *Stachys germanica*, *Stachys officinalis*, *Teucrium chamaedrys*, *Thymus glabrescens*, *Thymus pannonicus*, *Thymus pulegioides ssp montanus*, *Thymus pulegioides ssp chamaedrys*.

Among the representatives of the Rosaceae family we mention: *Agrimonia eupatoria*, *Aremonia agrimonoides*, *Crataegus monogyna*, *Filipendula ulmaria*, *Fragaria vesca*, *Fragaria viridis*, *Geum urbanum*, *Malus sylvestris*, *Potentilla anserina*, *Potentilla erecta*, *Prunus avium*, *Prunus cerasifera*, *Prunus spinosa*, *Pyrus pyraster*, *Rosa canina*, *Rosa gallica*, *Rubus caesius*, *Rubus idaeus*, *Sorbus torminali*, *Sorbus aucuparia*.

From the Ranunculaceae family we mention: *Anemone nemorosa*, *Anemone ranunculoides*, *Clematis vitalba*, *Clematis recta*, *Consolida regalis*, *Hepatica nobilis*, *Ranunculus acris*, *Ranunculus bulbosus*, *Ranunculus ficaria*, *Ranunculus repens*.

Among the Fabaceae we mention: *Cytisus nigricans*, *Galega officinalis*, *Genista tinctoria*, *Genista sagittalis*, *Lotus corniculatus*, *Melilotus officinalis*, *Robinia pseudoacacia*, *Trifolium pratense*, *Trifolium repens*.

From the Polygonaceae family we mention: *Polygonum aviculare*, *Polygonum bistorta*, *Polygonum hydropiper*, *Polygonum persicaria*, *Polygala vulgaris*, *Rumex acetosa*, *Rumex acetosella*, *Rumex crispus*.

The questionnaires were used to identify the main medicinal and aromatic species used and to obtain information on how they are used. The questionnaires were administered to people aged 55-75 years.

The main species of interest are presented below. The description of the species and their medicinal properties has been derived from various bibliographical sources (ALEXAN *et al.*, 1991; BOJOR, 2003; GURITA *et al.*, 2019; IMBREA, 2016; ION, 2023; Pârvu, 2000; SÂRBU *et al.*, 2013; SANDA *et al.*, 2004; TEMELIE, 2017).

Achillea millefolium L. (common yarrow), is a herbaceous plant, the stem is slightly hairy, it reaches a height of 80 cm. The leaves are alternate, slightly hairy and 30 cm long; the flowers of the plant are white, rarely pink. The genus groups more than 20 species in the flora of Romania, few valuable from a medicinal point of view, due to their content in proazulene. Among the spontaneous species in the studied area, *A. collina* is the most valuable, from this point of view. Medicinally, the corymb-type inflorescences with calathids (*Millefolli flos*) or the entire flowering above-ground part (*Millefolli herba*) are used. Locals from Herendesti harvest the aerial part of the species at the beginning of flowering in June-July and use it to treat allergies, bronchitis, gastritis, eczema, burns.

Allium ursinum L. (wild garlic), is a perennial plant with a tunicate bulb and fascicular roots; the stem is straight, reaches a height of 10-20 cm. The leaves of the plant have the smell of garlic, they are ovate-lanceolate in shape, the flowers are grouped in cymes having the appearance of umbels. The villagers of Știuca and Dragomirești harvest the wild garlic leaves (*Alii ursini folium*) in the spring, using them in food and to treat hypertension, intestinal worms. Bulbs (*Alii ursini bulbos*) are harvested and used as food, similar to onion bulbs.

Arctium lappa L. (burdock), is a biennial, ruderal, taproot medicinal plant; the stem is tomentose, tall, over 150 cm, appears in the second year. The leaves of this plant are large arranged in the form of a rosette, wide-ovate, tomentose on the lower epidermis, and the flowers are grouped in violet calathides; fruits are achenes. Locals from Pogănești harvest the roots of the species (*Bardanae radix*) in March-April and use them to treat burns, colds, flu, herpes, diabetes, hypersecretion and hyposecretion.

Aristolochia clematitis L. (birthwort), is a perennial plant with an erect rhizome and stem, up to 80 cm. The plant shows simple, ovate-triangular leaves, obviously cordate at the base and zygomorphic, greenish-yellow flowers; the fruit is a capsule. This species is toxic, but is used in folk tradition. External use is recommended with caution due to toxicity, while internal use is prohibited, the plant being carcinogenic and causing irreversible renal failure (CRISTEA *et al.*, 2010). Villagers from Pogănești and Petroasa Mare use the above-ground part of the plant (*Aristolochiae herba*) to treat various types of wounds, leg ulcers, in the form of poultices.

Armoracia rusticana P. Gaertn. (horseradish), is a perennial plant with a thick taproot with a spicy taste. The erect, fistulous stem reaches up to 150 cm in height. The leaves are simple and the flowers are small, grouped in raceme inflorescences and have a white corolla. The fruit is silique type. The locals use the fresh roots directly in their diet, or add them to various culinary preparations. Some people grate the fresh roots and mix them with honey, consuming the resulting mixture for vitaminizing or seasoning purposes. It is recommended in anemia, appetite stimulation, colds, flu conditions, kidney diseases (diuretic). Externally, it is used in the form of poultices, for joint pain, abdominal colic.

Capsella bursa-pastoris (L.) Medik. (shepherd's purse), is an annual or biennial plant, with a taproot and a solitary stem up to 50 cm high. The leaves are simple, pinnatisected in the form of a basal rosette, white racemes and the fruit siliculate cordate. Locals from Jurești, Lugoș and Darova harvest the above-ground part (*Bursae pastoris herba*) of the plant when it

blooms, for teas. It is recommended for treating hypertension, stomach pains, superficial wounds.

Chelidonium majus L. (greater celandine) is a perennial plant with a rhizome and adventitious roots, with a branched stem, reaching a height of 80 cm. The plants has imparipinnate-sected leaves, flowers with yellow petals; the fruit is a valvical capsule. It is a toxic species used medicinally since ancient times. The organs of the plant contain an orange colored latex. Villagers from Dragomirești harvest the above-ground part (*Chelidonii herba*) in April-May and the rhizome in autumn. The herb is used internally to treat liver diseases, whooping cough, spasms, liver cirrhosis, but also externally to treat warts and wounds. The rhizome is used externally, in the form of poultices for warts. Some locals use the dried plant making infusions. Other locals make an alcoholic maceration by steeping the green plant in alcohol.

Galium mollugo L. (false baby's breath) is a perennial plant with a tetramucite stem, it is branched and 25-80 cm tall. The plant has leaves linear, whorled leaves and white flowers, grouped in cymes. Locals from Lugoj and Darova harvest the above-ground part during flowering (*Galii herba*), usually in June-July to treat impotence, calm nervousness, antirheumatic. The may plant is also used for milk coagulation and cheese production.

Humulus lupulus (hops) is a dioecious liana, with a flexible stem, up to 5 m long. The leaves are palmate-lobed, with serrate-toothed lobe margins. The flowers are unisexually dioecious: the male ones are small and greenish; the female ones are grouped in two pairs at the base of some bracts forming a conical inflorescence.. The bracts have bristles that secrete essential oils and oleoresins and are used in brewing. The fruits are achenes. Residents of Pogănești and Jurești harvest the female inflorescences (*Lupuli flos*) in the months of August-September. Use dry cones in the form of an infusion either externally to relieve vaginitis and other urogenital conditions, or internally to treat kidney, digestive, gout or to calm nervousness.

Hypericum perforatum L. (*St. John's wort*) is a perennial herbaceous species with a stem of up to 90 cm. The leaves are simple, sessile with pockets secreting volatile oils with a translucent appearance; the flowers are yellow, grouped in cyme inflorescences. The fruit is an ovoid capsule. Locals from Petroasa Mare, Lugoj and Jurești harvest the above-ground parts (*Hyperici herba*) of the plant, in the months of June-September, for internal use in the form of infusion, for the treatment of digestive ailments, gastric ulcers, depression, but also externally for the treatment of burns, eczema, in the form of infusion poultices.

Matricaria chamomilla L. (chamomile), is an annual plant, pleasantly smelling, with a taproot and branched stem up to 50 cm. It has simple, pinnatisected leaves, the flowers are grouped in convex calathides, the ligulate ones are white, and the tubular ones are golden-yellow; the fruit achene. Although frequently cultivated medicinally, it is found spontaneously in the researched area and is harvested by the locals and directly from the spontaneous flora. It is used as an infusion to treat abdominal pain, stomach ailments, respiratory ailments; externally it is used in the treatment of mouth ulcers, wounds, burns as a disinfectant and analgesic.

Mentha sp. (mint), groups perennial herbaceous species, with rhizome and adventitious roots; above-ground stems can reach up to 1 m in height, depending on the species. The leaves of the species are simple, petiolate with serrated edges, arranged decussate-opposite; the flowers are grouped in whorls, the color of the corolla differs according to the species. Most of the locals in the Lugoj area use the different species of spontaneous mint (*M. longifolia*, *M. pulegium*, *M. aquatica*), similar to cultivated mint. Spontaneous species either do not contain menthol or contain very little menthol. The locals make infusions from the above-

ground part, or just from the leaves, which they use to treat digestive, intestinal diseases or colds.

Rosa canina L. (rosehip), is a thorny shrub with imparipinnate-compound, stipitate leaves, with pink flowers and polyachene-type fruit. The locals in the analyzed area, from all areas, harvest the fruits (*Cynosbati fructus*) in autumn, in the months of September-October. Jams and syrups are made from the fresh fruits, being recommended for their vitaminizing properties. They also make infusions from the dried fruits, sometimes mixed with other species (mint, lime). They are used in the treatment of colds, flu, as a preventive measure to increase immunity, in digestive disorders (astringent), in kidney disorders (diuretic).

Sambucus nigra L. (elder) is a mesophyllous shrub with an irregularly branched stem up to 3 m tall. The species has imparipinnate-compound leaves and flowers with a white corolla, pleasantly smelling, grouped in cymes; the fruits are glossy, black. Locals from the villages of Herendești, Pogănești, Jurești harvest the inflorescences of the elder (*Sambuci flos*), during flowering, in the months of June-August. In the past, the inhabitants also used the ripe fruits for the preparation of jams or externally, in the form of poultices, to treat wounds, leg ulcers. The inflorescences are currently often used fresh, through natural fermentation to obtain elderberry or prepare elderberry syrup. The dried inflorescences are used for teas, in the treatment of flu conditions, colds, respiratory and renal ailments, for immunity.

Taraxacum officinale F.H. Wigg. (dandelion), is a perennial herbaceous plant with rhizome and taproot; scapiform above-ground stem, 10-15 cm high. The organs of the plant secrete white latex. The leaves are pinnatisected arranged in a basal rosette. Calatides have yellow ligulate flowers; fruit achene with white pappus. Locals collect especially the young leaves, the young stems, in the spring and use them directly as food, for the slightly bitter taste, in order to stimulate the appetite, vitaminizing, stimulating the stomach and liver activity (adjuvant in hepato-biliary diseases). The genus groups several species, difficult to determine between them, all used in the same way. The pharmaceutical product also refers to the use of the root (*Taraxaci radix cum herba*), but the locals use the above-ground part (the herb).

Thymus sp. (thyme) is a herbaceous plant with a pleasant citrus smell, it has taproots, suberect and ascending stem, up to 15 cm high. The leaves are simple and the flowers are purple-pink in terminal whorls. The genus *Thymus* groups 18 spontaneous species in Romania (SĂRBU *et al.*, 2013), among the most common species are: *T. marchallianus*, *T. austriacus*, *T. glabrescens*, *T. pulegioides*, *T. zygoides* (BEICU *et al.*, 2019; BEICU *et al.*, 2023). Locals from the analyzed area harvest the above-ground vegetative part (herb) during flowering and use it to treat mild respiratory ailments, colds, flu, gastric ailments, flatulence, in the form of an infusion. Externally it is used in dermatitis. The herb is also used directly for its aromatic properties, in various culinary preparations, similar to cultivated thyme.

Tilia tomentosa Moench (white linden, silver linden) is a deciduous tree, the stem is straight and cylindrical, the height of this species can reach up to 30 m. The silver linden has cordiform leaves of 5-12 cm, covered with stellate hairs on the lower epidermis, hence the name *tomentosa*. The flowers are grouped in dichazias, accompanied by silvery-white, tomentose bracts. Fruit an acheniform capsule. Most of the locals harvest the inflorescences (*Tiliae flos*) during the flowering months (June-July) and use them as an infusion to treat pharyngitis, laryngitis, colds, flu, or for the calming effect. For the same purpose, the other linden species present in the area are also harvested, namely *Tilia platyphyllos* Scop. (big-leaved linden, summer linden) and *Tilia cordata* Miller (forest linden, sooty linden). The forest linden has a leaf with obviously cordate bases, it is the smallest morphologically and has rusty bristles only in the angles between the ribs. It blooms first, followed by the big leaf lime and

then the silver lime. The large-leaved linden has an asymmetrical leaf base, and whitish hairs are found on the lower epidermis in the angles between the veins.

Urtica dioica L. (big nettle) a perennial species with rhizome and above-ground stems up to 150 cm. The species has simple, lanceolate leaves with a toothed edge, unisexual-dioecious flowers, with sepaloid perigon; the fruit is an achene. The entire plant is covered with unicellular stinging hairs. It is a plant valued both for food and medicine, being used since early spring when the first leaves appear. Leaves and herba (*Urticae folium*, *Urticae herba*) are used to combat anemia as a vitaminizer, in respiratory conditions (cough), diuretic, detoxifier. Externally, the whole plant is used to treat rheumatic conditions, hair loss, wounds, dermatitis, superficial burns of the skin for healing purposes.

CONCLUSIONS

As a result of the floristic research, it is found that the analyzed area stands out for its appreciable floristic biodiversity, the spontaneous flora representing a valuable source of raw material of plant origin. Wild plants, as well as cultivated ones, contain biologically active compounds, which determine their phytotherapeutic properties.

The locals in the analyzed area directly harvest medicinal and aromatic species from the spontaneous flora and rely on phytotherapeutic remedies in the treatment of various ailments. Due to the side effects of synthetic drugs as well as the well-known problems of antibiotic resistance, the use of medicinal plants offers a viable and effective alternative.

It is necessary to preserve and promote these ways of using spontaneous species, of course also taking into account the need to restore plant material, in the context of the sustainable use of spontaneous resources.

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