VEGETATION FEATURES OF SĂLAJ COUNTY

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Abstract: Field research, carried out in recent years, has revealed some 166 plant associations in Sălaj County.

In general, the vegetation cover of this territory has some similarities with the vegetation of the Transylvanian Basin, which is characterized by the presence of fewer pond and swamp associations. The most common associations are thermophilous, encountered mainly in the hilly areas. There are also associations of mountainous regions, with forest types being more prevalent.

Keywords: Sălaj County, vegetation.

Introduction

The geographical features of Sălaj County are not very diverse. Lowland land surfaces are present only in the larger river corridors. The northern branches of the Apuseni Mountains (Plopiș and Meseș Mountains) penetrate the south-western and central territories, but in general the county is dominated by hills and valleys. This geographical configuration determines the prior character of the vegetation in the region [21].

The first studies on the vegetation in this region were made in the middle of the 20th century. Until now, most of the studies were carried out in the mountain regions. F. Balázs [1] investigated the Meseș Mountains, while G. Coldea [3, 4, 5, 7, 8, 9, 10, 13, 14] carried out research in the Plopiș Mountains. The Călata region, located in the southern part of the county, is another area with well-studied vegetation [34, 32, 28, 29, 24, 31]. A few studies were carried out in other territories of the county [23, 25]: the surroundings of Sărmășag [22], Hida [27] and the Almaș Valley [26], the Babii Gorge [15], the surroundings of Hereclean [33], some locations in the Silvanian Hills and Ciceu Hills [12], and the Tășnad Hills [17, 18, 19, 20].

Materials and Methods

Below we present the most common plant associations found in the region of Sălaj County. The plant associations were analyzed in the field, based on the specialized literature [29, 30]. The field research was conducted between 2012 and 2017.

Results and Discussions

The wetland areas occupy relatively small land surfaces. The vegetation of lakes and ponds is best represented in the Vârșolț Lake area, where the following plant associations are

dominant: *Lemnetum minoris* Oberdorfer ex Müller & Görs 1960, *Potametum lucentis* Hueck 1931 and *Polygonetum amphibii* Soó 1927. *Potametum crispum* Soó 1927 is present in the waters of the Glod Lake in the Someş Valley.

In the marshes of the region, and especially at the margins of Vârşolţ Lake and in the Someş Valley, are several locations where the associations *Scirpo-Phragmitetum* Koch 1926, *Typhaetum angustifoliae* Pignatti 1953 and *Glycerietum maximae* Hueck 1931 are dominant. *Catabrosetum aquaticae* Rübel 1912 was identified only at the border of Adalin village.

Tall sedges are represented in many places by: *Caricetum acutiformis-ripariae* Soó (1927) 1938, *Caricetum gracilis* Almquist 1927 and *Caricetum vulpinae* Nowinski 1927. In the Poicului Valley, at higher altitudes, are clumps of vegetation known as "popândaci", populated by *Caricetum elatae* Koch 1926 and *Caricetum appropinquatae* Soó in Aszód 1953.

Spring vegetation is present in the Meseş [1] and Plopiş Mountains [4, 7]: *Cardamineto-Chrysosplenietum alternifolii* Mass. 1958, with: *Cardamine amara*, *Chrysosplenium alternifolium*, *Carex remota*, *Oxalis acetosella*, etc.

Among the wetland associations located at higher altitudes, the most characteristic is *Carici echinatae-Sphagnetum* (Balázs 1942) Soó 1955, which was reported both in the Meseş [1] and Plopiş Mountains [2]. In these associations are mentioned plants such as: *Carex echinata*, *Calamagrostis canescens* and *Drosera rotundifolia*, as well as several species of *Sphagnum* [1]. Remarkable is the presence of *Caricetum diandrae* (Jonas 1932) Oberd. 1957 in the Poicului Valley, where species such as *Parnassia palustris*, *Epipactis palustris* and *Eriophorum angustifolium* occur.

Fig. 1: A. *Vaccinio-Callunetum* Büker 1912 at Negreni, Gârbou Hills (August 2016). B. *Serratulo tinctoriae-Sanguisorbetum officinalis* Karácsonyi 2011 at Poarta Sălajului (August 2016).

In the cracks of the limestone rocks near Tusa village in Piatra Ciutii, the association *Asplenietum ruta-murariae-trichomanis* R. Tüxen 1937 is present. The two *Asplenium* species are accompanied by *Moehringia muscosa* and *Cystopteris fragilis*.

The acidophilic mountain meadows are characterized by the presence of *Polygalo-Nardetum* (Preising 1953) Oberd. 1957. This is more widespread in the Cizer-Tusa area and in the Meseş Mountains; having in its composition the following species: *Polygala comosa*, *Nardus stricta* (dominant), *Antennaria dioica*, *Hypochoeris maculata* and *Hieracium pilosella*. The *Vaccinio-Callunetum* Büker 1912 plant association is fairly common in the foothills regions of

Sălaj mountains, the most widespread occurrence being in the "Stanii Clițului" area (Fig.1A). Characteristic species of this association are: *Calluna vulgaris*, *Vaccinium myrtillus*, *Vaccinium vitis-idaea* and *Achillea distans*, and at Cizer an important component is *Dianthus deltoides*.

Meso-hygrophile meadows are well represented in Sălaj. We noted the presence of the following plant associations: *Serratulo tinctoriae-Sanguisorbetum officinalis* Karácsonyi 2011 (Fig.1B), at Carastelec and Halmășd, *Filipendulo-Geranium palustre* Koch 1926 at Cuieșd, as well as *Junco effusi-Molinietum caeruleae* R. Tx. 1954 at Cizer (with *Gentiana pneumonanthe*). Remarkably, at the locality Cristur-Crișeni, the association is growing on a hillside with groundwater located above waterproof clays encountered near the surface. This explains the co-presence of both hygrophile (*Sanguisorba officinalis*, *Succisa pratensis*) and mesophile species (*Melampyrum barbatum*, *Trifolium pannonicum*, *Euphorbia salicifolia*).

The most common plant associations of meso-hygrophile sites are: *Agrostetum stoloniferae* (Ujvárosi 1941) Burduja et al. 1956, *Ranunculo repenti-Alopecuretum pratensis* Ellmayer & Mucina in Mucina et al. 1993 and *Cirsio cani-Alopecuretum pratensis* Májovski et Ruzičková. On the highest peak of the Plopiș Mountains in Sălaj (Merișor - 882 m), we remarked the presence of *Deschampsietum flexuosae* Issler 1942 em. Borza 1946, that had completely invaded the deforested lands occupied before by other grasses. The association contains species such as: *Arnica montana*, *Hieracium aurantiacum* and *Vaccinium myrtillus*.

Fig. 2: C. *Festuco drymejae-Fagetum* Morariu et al. 1968 in the Plopiș Mountains (May 2015). D. *Corno-Quercetum pubescentis* Jakucs & Zólyomi ex Máthe & Kovács 1962 on Puguior Hill, Ortelec Valley (July 2015). E. *Geranio-Dictamnenum* Wendelbg 1954 at Buciumi, Meseș Mountains (May 2014).

Meso-xerophile meadows are more widespread in the investigated region, characterized by a very diverse floristic composition. Among the representatives of this type of vegetation, the most common are *Agrostio-Festucetum rupicolae* M. Csűrös-Káptalan (1962) 1964, and *Agrostio-Festucetum valesiacae* Borislavljevici & al. 1955. Rarely, in the hilly areas, *Pulsatillo montanae-Festucetum rupicolae* (Dostál 1933) Soó 1964 corr. Borhidi 1997 was identified. In the limestone areas the association *Phleo montani-Seslerietum heuflerianae* (Soó 1927) Coldea

2012 is frequent, which, apart from the Ríszeg Hill by Stana, Piatra Ciutii by Tusa, and the Cozla Plateau, is the most abundant on the Prisnel Hill from Vălișoara (Fig.3F). Here, within the composition of the phytocoenosis, grow *Sedum album*, *Asperula tinctoria*, *Thymus comosus* and *Viola jooi*. In the south-eastern part of Sălaj County, near the perimeter of the Cluj Hills, and especially in the Călata region, we identified a number of remarkable associations such as: *Gypsophilo collinae-Brachypodietum pinnati* Szabó 1983 corr. Coldea 2012 (on the gypsums from Sfăraș-Jebucu), *Jurineo transylvanicae-Stipetum pulcherrimae* (Soó 1942) Coldea 2012 (particularly at Hida), *Carici humilis-Brachypodietum pinnati* Soó (1942) 1947 (more prevalent), as well as the *Artemisia alba* coenosis – recently identified at the toponym called "Pad" near Jebucu. In the thermophilic areas of the southern territories, populated by the associations mentioned above, we identified a number of remarkable species: *Oxytropis pilosa*, *Jurinea transylvanica*, *Salvia nutans*, *Onosma pseudoarenaria*, etc. The association *Danthonio alpinae-Stipetum stenophyllae* Ghișa 1941 was found in a relatively few places, at Stoboru in the south and Moigrad. *Polygalo majoris-Brachypodietum pinnati* Wagner 1941, is well known from the thermophilous areas on the foothills of the Meseș Mountains and also on Prisnel Ridge. *Festuco rupicola-Danthonietum provincialis* Csűrös et al. 1961, with *Trinia ramosissima*, *Aster linosyris*, *Dianthus pontederæ*, etc., is more widespread from the lowlands to the hills. Instead, in the mountainous regions, more usually the association *Festuco rubrae-Danthonietum* Csűrös et al. 1968 occurs.

On stony soils, and also in some ruderal places, the association *Filagini-Vulpietum* Oberd. 1938 occurs, with species such as: *Vulpia myuros*, *Bromus hordeaceus*, *Hieracium bauhinii*, etc. At Bozna small patches of *Vulpio-Airetum capillaris* Paucă 1941 were discovered.

Almost 50 ruderal and weedy associations have been identified in Sălaj County. On arable land and in gardens, the following plant associations are frequently encountered: *Stachyo annuae-Setarietum pumilae* Felföldy 1942 emend. Mucina 1993, *Amarantho-Chenopodietum albi* Morariu 1943, and one association described from this region: *Plantagini lanceolatae-Medicaginetum* (Balázs 1944) Soó & Timár 1954. On ruderal steep slopes the association *Xeranthemo cylindræi-Brometum arvensis* G. Popescu 1962 was encountered. The most common nitrophilous associations are: *Lolio-Plantaginetum majoris* (Linkola 1921) Beger 1930 emend. Sissingh 1969, as well as *Sclerochloo-Polygonetum avicularis* (Gams 1927) Soó 1940, the last especially on heavy soils. The perennial ruderal vegetation of roadsides, abandoned places and the periphery of human settlements is represented by: *Onopordetum acanthii* Br.-Bl. et al. 1936, *Arctietum lappae* Felföldy 1942 and *Tanaceto-Artemisietum vulgaris* Sissingh 1950. Among the tall nitrophilous vegetation, in the hills we found *Sambucetum ebuli* Felföldy 1942, and sporadically in the mountain valleys *Telekio-Petasitetum hybridi* (Morariu 1967) Resmeriță & Rațiu 1974. Another tall-growing association is *Calamagrostetum epigei* Jurasek 1928, especially common in the western and north-western regions.

In the deforested areas and on the forest edges thrives especially the association *Clinopodio-Pteridietum aquilinii* Dihoru 1974, which is present in several areas of the researched territory. In the thermophilous areas [e.g. Camăr, Zalău-Ortelec (Puguior Hill), Buciumi], the association *Inulo ensifoliae-Peucedanetum cervariae* Kozl. 1925 emend. Gils & Kovács 1977 is dominant, with the following species: *Inula ensifolia*, *Anthericum ramosum*, *Rosa gallica* and *Lathyrus lacteus*. The plant association *Geranio-Dictamnietum* Wendelbg 1954, appears only in patches near the border of the village of Buciumi (Fig.2E).

Willows are most commonly represented by *Salicetum triandrae* Malcuit 1929, which has been found in most river beds and near the water courses. Sometimes this is replaced by the *Saponario-Salicetum purpureae* (Br.-Bl. 1930) Tscou 1946 association. Remarkable is the presence in Sălaj County of the *Salici purpureae-Myricarietum* Moor 1958 association, at the Năpradea, Buciumi and Treznea localities. Alluvial forests with willows are represented by *Salicetum albae* Issler 1927 s.l., which occupies the flooded beds of the rivers in spring. These communities are best represented along the Someș River.

The alder forests on the perimeter of the wetlands from Iaz are represented by *Carici elongatae-Alnetum* Koch 1926. Along the rivers of the Meseș and Plopiș Mountains, we have often observed the association *Stellario nemori-Alnetum glutinose* (Kästner 1938), which can be encountered also at relatively low altitudes.

Fig. 3: F. *Phleo montani-Seslerietum heuflerianae* (Soó 1927) Coldea 2012 at Prisnel Hill, Vălișoara (May 2014). G. *Roso caninae-Rubetum canescentis* Karácsonyi 2011 at Derșida (June 2013).

Beech forests occupy the higher altitudes of the Meseș and Plopiș Mountains on the northern slopes, represented by *Symphyto cordati-Fagetum* Vida 1963, with the species: *Symphytum cordatum*, *Aconitum moldavicum*, *Helleborus purpurascens*, *Cardamine glanduligera* and *Carex pendula*. In some places (e.g. Treznea and Vălișoara), the *Phyllitidi-Fagetum* Vida (1959) 1963 association was found, with the following species: *Asplenium scolopendrium*, *Acer pseudoplatanus*, *Lunaria rediviva* and *Polystichum setiferum*. In the mountainous areas of Sălaj there occurs the association *Festuco drymejae-Fagetum* Morariu et al. 1968, which sometimes reaches lower altitudes (Fig.2C).

Hornbeam forests, also well represented in Sălaj County by *Querco robori-Carpinetum* Soó & Pócs (1932) 1957, growing in the valleys of the hilly areas, are *Querco petraeae-Carpinetum* Soó et Pócs 1957 and *Carpino-Quercetum cerris* Klika 1938 respectively. *Lathyro hallersteinii-Carpinetum* Coldea 1975, appears in the south-western part of the county. *Melampyro bihariensi-Carpinetum* (Borza 1941) Soó emend. Coldea 1975, inhabits the slightly inclined slopes. *Carpino-Tilietum platyphylli* Täuber 1968 was reported in some hills of Sălaj County [6], and *Potentillo albae-Quercetum petraeae* Libbert 1933, only from the border of Racâș village [16]. The *Genisto germanicae-Quercetum petraeae* Klika 1932 plant association was reported from the north-western part of the territory [18], but the composition of the Lapiș

forest is somewhat similar [11]. The association *Populeto-Betuletum pendulae* Coldea 1972 has expanded in some parts of the Plopiș Mountains, especially in the Făget village border area, after some anthropogenic activities.

In the thermophilous areas of the county are encountered thermophilous forests. At the forest edges, in several places, the *Cytiso nigricantis-Quercetum petraeae* Paucă 1941 association has been formed. The largest areas are occupied by *Quercetum petraeae-cerris* Soó 1963, which sometimes is accompanied by clusters of *Tilio argenteae-Quercetum petraeae-cerris* Soó 1957. In these types of forests, the following species are frequent: *Cornus mas*, *Potentilla alba*, *Buglossoides purpureocaerulea*, *Melittis melisophyllum*, etc. On the border of the village of Ortelec near Zalău (Puguior Hill), we encountered a downy oak forest, dominated by the association *Corno-Quercetum pubescentis* Jakucs & Zólyomi ex Máthe & Kovács 1962, which houses a large number of thermophilous floristic elements such as: *Dictamnus albus*, *Staphylea pinnata*, *Carex michelii*, *Anthericum ramosum*, etc. (Fig.2D). The black locust association, *Bromo sterilis-Robinetum pseudacaciae* (Pócs 1954) Soó 1964, is represented here by a few plantations, as in the lowlands that border Sălaj County.

Among the thickets that extend particularly after deforestation, in most places we found *Pruno spinosae-Crataegetum* (Soó 1927) Hueck 1931. In the western part of the county, the low-growing *Roso caninae-Rubetum canescentis* Karácsonyi 2011 plant association invades the hills covered with grassy vegetation (Fig.3G).

Conclusions

In Sălaj County, based on the prevailing landform, the characteristic vegetation is predominantly that of hilly areas. Because of the different geographical areas, some local microclimates have contributed to the diversification of these plant associations. We have also remarked that, in the natural and semi-natural areas, there were preserved a remarkable series of primordial plant associations.

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ASPECTE ALE VEGETAȚIEI DIN JUDEȚUL SĂLAJ

(Rezumat)

În urma cercetărilor de teren efectuate pe teritoriul județului, în special în ultimii ani, s-au înregistrat 166 de

asociații vegetale. În general, covorul vegetal al acestui teritoriu prezintă o serie de asemănări cu vegetația Bazinului Transilvan și se caracterizează prin prezența unui număr redus de asociații acvatice și palustre. În schimb, predomină asociațiile care populează stațiunile termofile din zona dealurilor. De asemenea, sunt prezente și asociații caracteristice regiunilor montane, în special cele de pădure.

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