

**MESO-XEROPHILOUS GRASSLAND AND FRINGE COMMUNITIES
IN THE EASTERN PART OF THE TRANSYLVANIAN BASIN**

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Abstract

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The work is dealing with the study of coenological conditions and the distribution of some characteristic units of the grassland and saum vegetation in the hilly region of eastern Transylvania (Romania). The long term observations and field investigations concluded an evident trend of the sub-continental climate (xero-thermophilous) influences (from the central part of Transylvania to the East), reflected in the structure of vegetation in the „subcarpathian” region. The fragmentary hilly area, the extensive land use, the particular habitats contribute to the maintenance of various previously less known or new plant communities, especially from the alliances *Cirsio-Brachypodium* and *Geranion sanguinei* like: *Cariceto humilis-Brachypodietum pinnati*, *Dorycnio herbacei-Seslerietum heuflerianae* nova ass., *Festuco rupicolae-Danthonietum*, *Inulo ensifoliae-Peucedanietum cervariae*, *Clematido recti-Laserpitiolum latifoliae* and *Stachyo-Melampyretum bihariensis*.

The meso-xerophilous grassland and fringe communities maintain and protect also interesting floral elements for the transitional subcarpathian region: *Astragalus austriacus*, *A. monspessulanus*, *Asyneuma canescens*, *Artemisia pontica*, *Carlina acaulis*, *Cephalaria radiata*, *Cleistogenes serotina*, *Echium maculatum*, *Gentiana cruciata*, *Inula bifrons*, *Jurinea mollis*, *Linum hirsutum*, *Phlomis tuberosa*, *Peucedanum officinale*, *Salvia nutans* etc. Keeping and applying the traditional land use, the extensive animal husbandry can insure the maintenance of these natural inheritance.

Key words: Eastern Transylvania, subcarpathian, *Cirsio-Brachypodium*, *Geranion sanguinei*, plant communities, *Dorycnio herbacei-Seslerietum heuflerianae* nova ass., chorology.

Introduction

At the contact of the Transylvanian Depression with the East Carpathian Mountain especially between the rivers Maros (Mures) and Olt, there is a high hilly region with "subcarpathian" characteristics (MAC 1972). Geomorphologically this area represented the eastern part of the Küküllő-menti dombság (Dealurile Tirnaveilor, Dealurile estice) delimited in East from the strictly Carpathian mountains by a series of hill tops like: Bekecs (Bichici) 1080 m, Siklódi-kő (Piatra Siclodului) 1028, Firtos (Firtus) 1060 m, Rez-tető (Vf. Aramei) 932 metre a.s.l. In the West, the territory is delimited by the line between Erdőszentgyörgy (Singeorgiu de Padure) - Erked (Archita) -

Homoród (Homorod), more or less circumscribed the south-western area of the former Udvarhely county, Székelyföld (Székely Land).

The hilly region is geologically represented by sedimentary deposits consisting mainly by Pliocene and sarmatian sandstone, gravel, clay, marls and other sedimentary rocks with an interesting landscape differentiation locally named: Sóvidéki-dombság (Dealurile Praidului), Udvarhelyi-dombság (Dealurile Odorheiului), Homoródi-dombság (Dealurile Homoroadelor), Kis- és Nagyküküllő közti dombság (Dealurile dintre Tîrnava Mica și Tîrnava Mare). The main rivers of the hydrographic system have an E- to W orientation, which determine the formation of parallel valleys, between that the relief are very diversified and dominated by steep slopes in the S and W-exposition and gently sloping in the N and E-exposition. The average temperature is 6 to 7 °C in the area of high hilly tops and 8 to 9 °C in the the rest. The annual precipitation varying between 600 to 750 mm.

The widespread natural vegetation are represented by oak-hornbeam and beech forests and mesophilous grasslands, but the sub-continental climate influences which coming from the central part of the Transylvanian Basin significantly promote the propagation an adequate, meso-xerophilous grassland and saum vegetation (GILS and KOVÁCS 1977, KOVÁCS 1974, 2002a). The fragmentary hilly area, the diversity of biotopes, the extensive land use contribute to the maintenance of various plant communities and floral elements from the alliances *Cirsio-Brachypodium*, *Danthonio-Brachypodium*, *Geranium sanguinei*, *Trifolium medii* with characteristic structure.

The botanical investigation and field studies elaborated by us during the last decades in this area have demonstrated the intensification of the thermo-xerophilous influences in the composition and dynamic of the herbaceous vegetation. The meso-xerophilous grassland and some fringe communities are occupying large area and determine the actually landscape structures. Abundancy of the meso-xerophilous species are conspicuous and can be often observed. The field and the comparative coenological studies haver shown unknown or less known plant communities for the region: *Cariceto humilis-Brachypodietum pinnati*, *Dorycnio herbacei-Seslerietum heufferianae* nova ass., *Festuco rupicola-Danthonietum*, *Inulo ensifoliae-Peucedanietum cervariae*, *Clematido recti-Laserpittietum latifolii*, *Stachyo-Melampyretum bihariensis* (SOÓ 1944, KOVÁCS 1974, 2002a).

In the coenological analysis we have used the concept of the coeno-ecological species groups (KOVÁCS and DIHÓRU 1982, KOVÁCS 1994a,b, 2002a), and the standard procedures of the Braun-Blanquet method. The relevés size of plots ranged between 4 and 25 m², most often between 4 and 16 m². The individual relevés was analysed in synoptic tables, using the constancy-class (K%) values (BRAUN-BLANQUET 1964). For the A-D values registration in the field we used the more common notation in Europe, the following modified BRAUN-BLANQUET scale:

- + = cover < 1%, individuals 1-5
- 1 = cover < 5%, individuals 6-50
- 2m = cover < 5%, individuals > 50
- 2a = cover 5-12%, various individuals
- 2b = cover 12-25%, various individuals
- 3 = cover 25-50%, various individuals
- 4 = cover 50-75%, various individuals
- 5 = cover 75-100%, various individuals

The nomenclature of species follows CIOCIRLAN (2000) and SIMON (2000). The classification of the vegetation and the community description was made in accordance with the Code of phytosociological nomenclature translated by BORHIDI and B. THURY (2003).

Related to the coenological researches, it was possible to record a series of less known floristic data for the region, rare-, protected- and site-indicator species like: *Aster amellus*, *A. linoxyris*, *Astragalus monspessulanus*, *Asyneuma canescens*, *Artemisia pontica*, *Carlina acaulis*, *Cephalaria radiata*, *Chamaecytisus albus*, *Cleistogenes serotina*, *Echium maculatum*, *Gentiana cruciata*, *Inula ensifolia*, *I. bifrons*, *Iris variegata*, *I. graminea*, *I. ruthenica*, *Jurinea mollis*, *Linum austriacum*, *L. hirsutum*, *L. tenuifolium*, *Phlomis tuberosa*, *Peucedanum officinale*, *Pulsatilla montana*, *Salvia nutans*, *S. hetoni-cifolia*. The maintenance and protection of these floristic values can be made only by protecting the regional diversity of biotopes, keeping and applying the traditional land use on the grassland communities.

Syntaxonomic ordering

FESTUCO-BROMETEA Br.-Bl. et R. Tx. in Br.-Bl. 1949

BROMETALIA ERECTI Br.-Bl. 1936

Cirsio pannonicae-Brachypodion pinnati Hadac et Klika 1944

1. *Cariceto humilis-Brachypodietum pinnati* Soó (1942) 1947

2. *Dorycnio herbacei-Seslerietum heflerianae* **ass. nova**

Danthonio alpinae-Brachypodion pinnati Boscaiu 1970

3. *Festuco rupicolae-Danthonietum* Csűrös et al. 1961

TRIFOLIO-GERANIETEA SANGUINEI Th. Müller 1961

ORIGANETALIA VULGARIS Th. Müller 1961

Geranion sanguinei R. Tüxen in Th. Müller 1961

4. *Inulo ensifoliae-Peucedanietum cervariae* Kozłowska 1925 em. Gils et Kovács 1977

5. *Clematido recti-Peucedanietum latifoliae* Schneider-Binder 1984

Trifolion medii

6. *Stachyo-Melampyretum bihariensis* Coldea et Pop 1992

Description and short characterisation of the communities

1. *Cariceto humilis-Brachypodietum pinnati* Soó (1942) 1947 (Table 1.)

It is the widespread type of grassland vegetation in the fragmentary hilly region of the eastern part of Transylvanian Basin (Transylvanian Subcarpathian). The extensive stands developed on various substrate like loess, gravel and especially on soft, easily sliding marly and sandy soils on slopes of different exposition, ridges of hills, resulted after the old historical deforestation and grassland utilisation of the studied hilly area of Küküllő- (Timava), Nyárád- (Niraj) and Fehér-Nyikó (Nico-Alba) valleys.

The *Cariceto humilis-Brachypodietum pinnati* as original community initially was described in the neighbourhood of Cluj (Soó 1942, 1947) on the contact of the Transylvanian Plain and Hills of Cluj in complex with other meso-xerophilous coenoses on xerothermal substrate (*Brachypodio pinnati-Caricetum montanae*, *Pediculari campestris-Caricetum montanae*, *Danthoniae-Brachypodietum pinnatae*). The basic plant community later was supplemented with several infra-units (subassociation) like: *transsilvanicum*, *festucetosum sulcatae*, *Ephedrosium depauperatae*, *Kochietosum*, *Salvietosum* etc. and even with other community description (Ass. *Brachypodium pinna-tum-Dorycnium herbaceum*) (CSÜRÖS-KÁPTALAN 1970).

The analysis of large grassland territories (KOVÁCS 2002a) has demonstrated that in the central part of the Transylvanian Basin, the community composition are dominated mainly by xero-thermophilous species belonging to the alliance „*Cirsio-Brachypodion*” resp. „*Bromus erectus*” coeno-ecological species group (KOVÁCS 1994a, 2002a, KOVÁCS – DIHORU 1982), but in eastern Transylvania the composition characteristics pointed especially by the meso-xerophilous taxa. The specific botanical structure are evidenced by the subcontinental-pannonic alliance of *Cirsio-Brachypodion* and the ord. *Brometalia*. Nowadays these grassland are continued to be used for hay making and partly for pasture, so there is in an ecological and coenological equilibrium. In the studied area the group of species for community recognition and diagnosis are represented by *Brachypodium rupestre*, *Carex humilis*, *Securigera varia*, *Jurinea mollis*, *Linum flavum*, *L. hirsutum*, *Onobrychis viciifolia*. Besides the dominant and characteristic species in the hilly region of eastern Transylvania the species with important constancy (K) are the following: *Dorycnium herbaceum*, *Cirsium pannonicum*, *Carlina vulgaris*, *Bromus erectus*, *Medicago falcata*, *Plantago media*, *Leontodon asper*, *Festuca rupicola*, *Bothriochloa ischaemum*. The overgrazed territories and the disturbed sites are dominated by the natural weeds: *Cirsium vulgare*, *Ononis arvensis*, *Dipsacus laciniatus*, *Mentha longifolia*, *Artemisia campestris*.

The naturalness value of this grassland community and the dynamic relations with the other valuable natural grassland are expressed by the presence of rare-, protected- and site-indicator species like: *Cephalaria radiata*, *Asyneuma canescens*, *Pulsatilla montana*, *Astragalus monspessulanus*, *Jurinea mollis*, *Inula ensifolia*, *Carlina acaulis*, *Gentiana cruciata*.

The habitat differentiation, the domination of forests and grasslands, the hilly slopes etc. constitute favourable condition for the development of *Festuco-Brometea*, *Trifolio-Geranietea* and *Molinio-Arrhenatheretea* species, which also participate at a high per cent in the structure of the meso-xerophilous grassland community: *Seseli annuum*, *Anthericum ramosum*, *Dactylis glomerata*, *Briza media*, *Filipendula vulgaris*.

Chorology: Újszékely (Secuieni), Alsóboldogfalva (Bodogaia), Székelykeresztúr (Cristuru-Secuiesc), Betfalva (Betești), Nagygalamfalva (Porumbenii Mari), Bögöz (Mugeni), Derzs (Dîrjiu), Felsőboldogfalva (Feliceni), Székelyudvarhely (Odorheiu-Secuiesc), Székelydála (Daia), Bágy (Bădeni), Kányád (Ulieș), Petek (Petecu), Farcád (Forțeni), Vágás (Tăietura), Rugonfalva (Ruganești), Siménfalva (Șimonesti), Kobátfalva (Cobatești), Bencéd (Bențid), Tarcsafalva (Tarcești), Nagymedesér (Medișoru Mare), Nagy Kede (Chedia Mare), Kis Kede (Chedia Mica), Csekefalva (Cechești), Szentábrahám (Avramești), Gagy (Geoagiu), Nagysolymos (Șoimoșu Mare), Kissolymos (Șoimoșu Mic), Székelyszenterzsébet (Eliseni), Székelyandrásfalva (Săcel), Székelyhidegkút (Vidacut), Etéd (Atid), Küsmőd (Cușmed), Siklód (Șiclod), Bözöd (Bezid), Székelyvécke (Vetca), Balavásár (Balaușer), Nagykend (Chendiu Mare), Havadtó (Viforeasa), Erdőszentgyörgy (Singeorgiu de Pădure), Makfalva (Ghindari), Kibéd (Chibed), Szolokma (Solocma), Vadasd (Vadaș), Havad (Neaua), Rigmány (Rigmani), Abod (Székelyabod), Ákosfalva (Acașari), Backamardaras (Pasareni), Nyárádszereda (Miercurea Nirajului), Székelybere (Bereni).

2. *Dorycnio herbacei-Seslerietum heuflerianae* ass. nova

(Table 2.)

The species *Sesleria heufleriana* as a Carpathian floral element realise an interesting montane and perimontane distribution in Transylvania. The mountainous populations generally preferred the thermic calcareous sites with neutro-basiphilous soils, the hilly populations appear mostly on marl substrate in the easily slide habitats.

The phytocoenoses edifying by *Sesleria heufleriana* in Transylvania initially was considered as geographical communities and included into the associations: *Seslerietum heuflerianae biharicum*, *S. h. praerossicum*, *S. h. siculum*, *S. h. austrohungaricum* (Soó 1944, 1947, GERGELY 1957, BORZA 1959). Later some of the regional rocky calcareous grassland communities have been described like: *Festuco saxatilis-Seslerietum* (Soó 1959), *Seslerio heuflerianae-Caricetum sempervirentis* (COLDEA 1984), *Helianthemo cani-Seslerietum heuflerianae* (POPESCU – SANDA 1992) belonging to the alliance *Diantho-Seslerion albicantis* and the ord. *Stipo pulcherrimae-Festucetalia palentis*, the class *Festuco-Brometea*. In the Hungarian calcareous open grassland vegetation also has been perceived a community *Seslerietum heuflerianae-hungaricae* (ZÓLYOMI 1966).

After detailed studies on the *Sesleria heufleriana*-type vegetation in the Transylvanian plateau, SCHNEIDER (1994) recognised that the xerothermophilous hilly coenoses edified by *Sesleria heufleriana* with different coenotic and ecological behaviour

can be assigned in southern Transylvania in some particular communities like: *Genisto spatulathae-Seslerietum*, *Stipo pulcherrimae-Seslerietum heuflerianae*, *Orchido-Seslerietum heuflerianae*, *Festuco-Seslerietum heuflerianae* and included in the alliance of *Cirsio-Brachypodion*.

Our studies on the grassland vegetation of the „subcarpathian” region of the eastern Transylvanian Basin (KOVÁCS 1974, 1994, 2002a, 2002b, KOVÁCS - DIHORU 1982) justify and confirm also the distribution of the meso-xerophilous grassland vegetation in the eastern perimontane zone and completed the series of communities with the analysis and description of the association *Dorycnio herbacei-Seslerietum heuflerianae* nova ass. (Table 2. relevé number 3 as holotype). The coenoses dominated by the species *Sesleria heufleriana* in this area initially was indicated under the name of the main regional indicator species group for hilly grasslands of sliding marly substrate (Gr. *Sesleria heufleriana-Dorycnium herbaceum*, KOVÁCS 1994a) and later as a community, respectively with relevés from the studied area (*Dorycnio herbacei-Seslerietum heuflerianae* KOVÁCS (1994) 2002; KOVÁCS 2002a, 2002b). The grassland stands dominated by *Sesleria heufleriana* and used mainly for extensive pasture, has a large distribution occurring especially in the hilly region between the valleys of Nagyküküllő (Tirnavă Mare) and Kisküküllő (Tirnavă Mica) at the 500-700 metres a.s.l., occupied the abrupt and easily sliding slopes, ridges, open hilly places with moderate dry character insured by the N, NW and NE exposition. In the community structure, the meso-xerophilous species of the subcontinental-pannonic alliance (*Cirsio-Brachypodion*) realise a specific combination with the species of *Brometalia*, *Festuco-Brometea* and *Trifolio-Geranietea*. They also conserve various xero-thermophilous elements of grasslands from central Transylvania and, mesophilous submontane elements of Transylvanian subcarpathians: *Aster amellus*, *Cephalaria radiata*, *Linum hirsutum*, *Astragalus monspessulanus*, *Carlina acaulis*, *Eryngium planum*, *Helleborus purpurascens* etc. The missing or the low frequency of some differential species (*Anemone sylvestris*, *Adonis vernalis*, *Crepis praemorsa*, *Valeriana officinalis*, *Stipa tirma*, *Orchis militaris*, *Thalictrum aquilegifolium*) emphasise the coenotic differences from the association *Orchido-Seslerietum heuflerianae* (SCHNEIDER 1994).

The meso-xerophilous grasslands of *Dorycnio-Seslerietum* are localised and separated in the northern part of the hilly slopes, given a particular aspect to the hilly landscape of eastern Transylvanian region.

Chorology: Újszékely (Secuieni), Felsőbún (Boiu), Székelyszenterzsébet (Eliseni), Székelyhidegkút (Vidacut), Nagysolymos (Șoimoșu Mare), Kissolymos (Șoimoșu Mic), Alsóboldogfalva (Bodogaia), Székelykeresztúr (Cristuru-Secuiesc), Rugonfalva (Rugănești), Nagy Kede (Chedia Mare), Kis Kede (Chedia Mica), Csekefalva (Cechești), Szentábrahám (Avramești), Medesér (Medisoru Mare), Siménfalva (Simonești), Nagykadács (Cadaciu Mare), Tarcsafalva (Tărcești).

3. *Festuco rupicolae-Danthonietum* Csűrös et al. 1961

(Table 3.)

The species *Danthonia alpina* as a submediterranean-balkanica floral element has a large distribution in Banat and the Mezőség (Transylvanian Plain), forming diversified coenopopulations with *Chrysopogon gryllus*, *Stipa tirma*, *Festuca valesiaca*, *F. rupicola* and *Brachypodium rupestre*.

In the studied area the grasslands dominated by *Danthonia alpina* have been registered in ridge of hills, small plateaux, moderate slopes with thermophilous soils, habitats resulted after the old deforestation, distributed in the valleys of the rivers like Küküllő (Tirnava), Fehér-Nyikó (Nico-Alba), Gagy (Geoagiu), Küsmöd (Cusmed), Homoród (Homorodu) from eastern part of the Transylvanian Basin (alt. 450-650 metres a.s.l.). Alongside the large river valleys, sometime the coenopopulations of *Danthonia alpina* can arrive to the true mountain zone of the Eastern Carpathian, contributed to the diversity of mountain grasslands with *Festuca rubra* like in surrounding of Oroszhegy (Dealu) from the 900- to the 1050 metres a.s.l. (Görgényi-havasok, Muntii Gurghiului).

The grasslands edified and characterised by *Danthonia alpina* and *Festuca rupicola* previously have been used more as hayfields, but in the last decades the more common usage is the pasturing by sheeps and cattles. This situation influenced locally the botanical composition, being favourable to the species with resistance to the defoliation. In the hilly habitats of the eastern Transylvanian region the community is characterised by the following diagnostic, differential and character species: *Danthonia alpina*, *Festuca rupicola*, *Potentilla alba*, *Pseudolysimachion spicatum*, *Chamaecytisus albus*, *Linum tenuifolium*, *Inula salicina*. Other species which realise significance frequency or covering value in the structures of different stands can be evidenced: *Brachypodium rupestre*, *Dorycnium herbaceum*, *Bromus erectus*, *Briza media*, *Dactylis glomerata*, *Elymus hispidus*, *Medicago falcata*, *Asperula cynanchica* etc.

In comparison with other plant communities of ord. *Brometalia* from the zone, the botanical composition of the grasslands with *Danthonia alpina* can be considered slightly uniform, where the xerothermal species (*Astragalus mosnepessulanus*, *Linum hirsutum*, *Salvia nutans*, *Aster linosyris*) has a less manifestation.

Chorology: Székelykeresztúr (Cristuru-Secuiesc), Betfalva (Betesti), Farcád (Forțeni), Székelyudvarhely (Odorheiu-Secuiesc), Kissolyos (Șoimoșu Mic), Medesér (Medisoru Mare), Rugonfalva (Rugănești), Siménfalva (Șimonești), Tarcsafalva (Tarcesti), Bogárfalva (Bulgareni), Oroszhegy (Dealu), Etéd (Atid), Erdőszentgyörgy (Sîngeorgiu de Pădure).

4. *Inula ensifoliae-Peucedanietum cervariae* Kozłowska 1925 em. Gils et Kovács 1977 (Table 4.)

The drought-tolerant, meso-xerophilous fringe vegetation is largely represented in the region by several phytocoenoses dominated by *Inula ensifolia* and *Peucedanum cervaria*. The representative stands can be found on the large grassland area on sunny steep slopes, ridges of hills especially in biotopes with nitrobasiphilous soils on the S,

SW and W- exposition. They can be found also in woodland margins (*Melampyro bihari-nesi-Carpinetum*) on marly and calcareous soils.

In central Europe and in the predinaric-submediterranean region has been described several nearer plant communities (*Geranio-Peucedanietum cervariae*, *Coronillo coronatae-Peucedanietum cervariae*, *Peucedanietum cervariae*) but our stands are more related to the meso-xerophilous grasslands and has several differential species. In the hilly eastern Transylvanian area both two dominant species (*Inula ensifolia*, *Peucedanum cervariae*) has a good coenotic and indicator value, which is complemented by other diagnostic species like: *Galium glaucum*, *Artemisia pontica*, *Aster linosyris* and other characteristics for higher syntaxa: *Anthericum ramosum*, *Inula hirta*, *Thalictrum minus*, *Vincetoxicum officinale*, *Veronica teucrium* etc. This occurrence was marked in our early work (GILS and KOVÁCS 1977), confirmed for other region of Transylvania by COLDEA and POP (1994) in contrast with central-European and sub-mediterranean regions (POTT 1992, CARNI 1997).

The *Inula ensifoliae-Peucedanietum cervariae* community from the eastern Transylvanian hilly region also conserve a series of thermophilous elements, specific for central part of Transylvania: *Linum flavum*, *Astragalus mosnepsulanus*, *Salvia nutans*, *S. betonicifolia*, *Phlomis tuberosa*, *Echium maculatum*, *Asyneuma canescens*, *Peucedanum officinale*, *Iris variegata* etc. which give for this type of saum vegetation a special value.

Chorology: Rugonfalva (Rugănești), Siménfalva (Șimonești), Nagy Kede (Chedia Mare), Kis Kede (Chedia Mica), Medesér (Medisoru Mare), Nagykadács (Cădăciu Mare), Kobátfalva (Cobatești), Bencéd (Bențid), Tarcsafalva (Tarcești), Szentábrahám (Avramești), Csekefalva (Cechești), Székelykeresztúr (Cristuru-Secuiască), Alsóboldogfalva (Bodogaia), Újszékely (Secuieni), Székelyszenterzsébet (Eliseni), Székelyandrásfalva (Săcel), Székelyhidegkút (Vidacut), Nagysolymos (Șoimoșu Mare), Kissolymos (Șoimoșu Mic), Kelemenelke (Călimanești), Erdőszentgyörgy (Șingeorgiu de Pădure), Vadasd (Vadaș), Havadtő (Viforoasa), Székelyabod (Abod), Makfalva (Ghindari).

5. *Clematido recti-Laserpitietum latifolii* Schneider-Binder 1984 (Table 5.)

The community determined and edified by the species *Laserpitium latifolium* as an European floral element is localised mainly in the shadow of shrubs and forests with moderate moist and cooler climate of the habitats ensured by slopes with N-, NE- and NW exposition. The coenopopulations prefer lands with a specific, narrow ecological niche: fresh microclimate, damply biotopes, woody- and mesophilous grassland environment.

This type of the saum vegetation initially was described from southern Transylvania (SCHNEIDER 1984) and also analysed by COLDEA and POP (1994). This vegetation unit can be considered a regional fringe community, which diverged from the central European plant community (*Bupleuro longifolii-Laserpitietum latifolii*) by differential species and succession.

In our field exploration, we identified this type of phytocoenoses in a large area of the eastern Transylvanian hilly region, but everywhere relatively in small plots (2-16 m²) where *Laserpitium latifolium* as dominant species achieve a high frequency and a coverage from the 40% to 75%. The other character and indicator species *Clematis recta* presented a less frequency (20%) and low abundance. Other species with saum character which are shown a significance participation of the constancy (K) are: *Polygonatum odoratum*, *Anthericum ramosum*, *Peucedanum oreoselinum*, *Stachys officinalis*, *Thalictrum minus*, *Calamintha vulgare*. The community structure is characterised also by the participation of several meso-xerophilous grassland and woody elements: *Brachypodium rupestre*, *Dorycnium herbaceum*, *Onobrychis viciifolia*, *Centaurea scabiosa*, *Dactylis glomerata*, *Festuca pratensis*, *Heraclium sphondylium*. It is a distinct mark, that the coenopopulations are very rich in herbaceous forest elements like: *Lilium martagon*, *Primula veris*, *Convallaria majalis*, *Astrantia major*, *Helleborus purpurascens*, *Gentiana asclepiadea* etc. which confirm the dynamic relations and the origin of saum vegetation.

Chorology: Nagysolymos (Șoimoșu Mare), Kissolymos (Șoimoșu Mic), Székelykeresztúr (Cristuru-Secuiesc), Alsóboldogfalva (Bodogaia), Csekefalva (Cechești), Szentábrahám (Avramești), Siménfalva (Șimonești), Nagy Kede (Chedia Mare), Siklód (Șiclod), Székelydóbo (Dobeni), Kobátfalva (Cobatești), Bogárfalva (Bulgăreni), Oroszhegy (Dealu), Székelyhidegkút (Vidacut), Székelyszenterzsébet (Eliseni), Szolokma (Solocma).

6. *Stachyo-Melampyretum bihariensi* Coldea and Pop 1992

(Table 6.)

A part of the fringe vegetation in the eastern Transylvanian hilly area, like the coenoses of this community appear as a border of the oak-hornbeam tree forests (*Melampyro bihariensi-Carpinetum*), achieving special biotope favourable for meso-xerophilous herbage species which can be marked like a long streak alongside the zonal forests territories.

The plant community has been described by COLDEA and POP (1994) with a pregnant dacic-balkan character, differentiated from the central European association *Stachyo-Melampyretum nemorosi* (PASSARGE 1967, POTT 1992). In some new synthesis, other Romanian authors (SANDA and POPESCU 1999) suborder this community to the association *Trifolio-Agrimonetum*. The relatively high A-D values realised by the dominant and character species *Melampyrum bihariensis*, *Stachys officinalis* in every plots, the presence of the *Inula bifrons* in these coenopopulations, can be a point of view to maintaining the initial community.

In the studied area, the syntaxonomic ordering is helped by the presence of *Trifolium medium*, *Vincetoxicum officinale*, *Origanum vulgare*, *Agrimonia eupatoria*, *Polygonatum odoratum* etc. but in the floristic composition can be recognised a mixture of the grassland and woody elements. From the mesophilous grassland frequently are present: *Agrostis capillaris*, *Briza media*, *Trifolium pratense* and from the woody com-

munity can be remark species like: *Clematis vitalba*, *Stellaria holostea*, *Brachypodium sylvaticum*, *Pulmonaria officinalis*.

Chorology: Csekefalva (Cechesti), Szentábrahám (Avrameşti), Gagy (Geoagiu), Hidegkút (Vidacut), Székelyszenterzsébet (Eliseni), Alsóboldogfalva (Bodogaia), Székelykeresztúr (Cristuru-Secuiesc), Kissolymos (Şoimoşu Mic), Rugonfalva (Ruganesti), Medesér (Medisoru Mare), Betfalva (Beteşti), Nagyalambfalva (Porumbenii Mari), Bögöz (Mugeni), Béta (Beta), Balavásár (Balauşer), Erdőszentgyörgy (Sîngeorgiu de Pădure).

Syntaxonomic tables

Table 1. *Cariceto humilis-Brachypodietum pinnati*

Number of relevé	1	2	3	4	5	K
<i>Diagnostic species</i>						
<i>Brachypodium rupestre</i>	5	4	5	5	4	V
<i>Carex humilis</i>	2a	2b	2m	2a	2b	V
<i>Securigera varia</i>	+	-	+	+	1	IV
<i>Jurinea mollis</i>	+	+	+	-	+	IV
<i>Linum flavum</i>	+	+	+	-	+	IV
<i>Linum hirsutum</i>	-	+	+	+	+	IV
<i>Onobrychis viciifolia</i>	+	2m	+	+	-	IV
<i>Cirsio-Brachypodion</i>						
<i>Dorycnium herbaceum</i>	+	2m	2a	2m	1	V
<i>Plantago media</i>	+	+	+	+	+	V
<i>Cirsium pannonicum</i>	+	+	+	+	+	V
<i>Bupleurum falcatum</i>	+	+	+	+	+	V
<i>Carlina vulgaris</i>	+	+	+	+	+	V
<i>Thesium linophyllum</i>	-	+	+	+	+	IV
<i>Fragaria viridis</i>	-	1	-	+	+	III
<i>Inula ensifolia</i>	1	-	1	+	-	III
<i>Prunella grandiflora</i>	-	+	+	-	+	III
<i>Inula hirta</i>	-	+	-	1	+	III
<i>Polygala major</i>	+	-	+	-	+	III
<i>Inula salicina</i>	+	-	+	+	-	III
<i>Elymus hispidus</i>	+	+	-	-	+	III
<i>Ononis arvensis</i>	+	1	-	+	.	III
<i>Carlina acaulis</i>	-	+	+	+	-	III
<i>Cephalaria radiata</i>	-	-	+	+	-	II
<i>Pulsatilla montana</i>	+	-	+	-	-	II
<i>Ferulago sylvatica</i>	-	+	+	-	-	II
<i>Cephalaria radiata</i>	+	-	-	+	-	II
<i>Scorzonera purpurea</i>	-	+	+	-	-	II
<i>Senecio integrifolius</i>	+	+	-	-	-	II



Fig. 1. Population of *Aster amellus* as a component of the *Inulo ensifoliae*-*Peucedanietum cervariae* fringe community (Székelykeresztúr, Cristuru-Secuiesc, 1999)



Fig. 2. Summer-time aspect in a stand of *Inulo ensifoliae*-*Peucedanietum cervariae* (Rugonfalva, Rugănești, 2002)



Fig. 3. Large area of *Dorycnio herbacei-Seslerietum heuflerianae* grassland community on the northern slopes (Csekefalva, Csechești, 2001)



Fig. 4. Details of *Dorycnio herbacei-Seslerietum heuflerianae* on the marly substrate (Nagy Kede, Chedia Mare, 2000)

Brometalia erecti/Festucetalia valesiacae

Bromus erectus	1	+	1	1	+	V
Medicago falcata	+	+	+	+	+	V
Leontodon asper	+	+	+	+	+	V
Festuca rupicola	+	2m	+	1	1	V
Astragalus monspessulanus	+	+	+	+	-	IV
Scabiosa ochroleuca	+	-	+	+	+	IV
Helianthemum nummulariaum	-	+	+	+	+	IV
Centaurea biebersteinii	+	+	-	+	+	IV
Pimpinella saxifraga	-	+	+	+	+	IV
Dianthus carthusianorum	+	+	+	+	-	IV
Euphrasia rostkoviana	+	-	+	+	+	IV
Hypericum perforatum	-	+	+	+	+	IV
Anthyllis vulneraria	+	-	+	-	+	III
Campanula glomerata	-	+	+	+	-	III
Teucrium chamaedrys	+	-	+	-	1	III
Carex tomentosa	-	+	+	+	-	III
Aster amellus	+	-	+	-	-	II
Campanula sibirica	-	+	-	-	+	II
Artemisia campestris	+	-	-	-	+	II
Sanguisorba minor	+	-	+	-	-	II
Eryngium planum	-	+	-	+	-	II
Asyncuma canescens	-	+	+	-	-	II
Thymus pannonicus	-	+	-	-	+	II
Potentilla arenaria	-	+	-	-	+	II
Gentiana cruciata	-	-	+	+	-	II
Teucrium montanum	-	-	-	+	+	II
Galium glaucum	-	-	+	-	+	II
<i>Festuco-Brometea</i>						
Poa angustifolia	+	+	+	+	+	V
Seseli annuum	+	+	+	+	+	V
Euphorbia cyparissias	+	+	+	+	+	V
Agrimonia eupatoria	+	+	1	+	-	IV
Salvia verticillata	-	1	+	+	+	IV
Stachys officinalis	-	+	+	1	+	IV
Centaurea scabiosa	+	+	+	+	-	IV
Galium verum	+	-	+	+	+	IV
Salvia pratensis	+	+	-	+	+	IV
Chamaecytisus austriacus	+	+	+	-	-	III
Bothriochloa ischaemum	-	-	+	+	1	III
Filipendula vulgaris	-	+	+	+	-	III
Asperula cynanchica	+	-	+	+	-	III
Eryngium campestre	-	+	+	+	-	III
Cirsium vulgare	-	+	+	-	+	III
Stachys germanica	+	-	-	+	+	III
Pimpinella saxifraga	-	+	+	+	-	III
Silene bupleuroides	+	+	-	-	-	II

Koeleria cristata	-	-	+	+	-	II
Pseudolisimachion spicatum	+	-	+	-	-	II
Asyneuma canescens	-	+	+	-	-	II
Salvia nutans	+	-	+	-	-	II
Achillea collina	+	+	-	-	-	II
<i>Molinio-Arrhenatheretea</i>						
Dactylis glomerata	+	1	+	+	+	V
Briza media	+	+	+	+	+	V
Leucanthemella vulgare	+	+	-	+	+	IV
Lotus corniculatus	-	+	+	+	+	IV
Plantago lanceolata	+	+	+	+	-	IV
Prunella vulgaris	-	+	+	+	+	IV
Achillea millefolium	+	+	+	-	+	IV
Knautia arvensis	+	+	+	-	-	III
Trifolium pratense	-	-	+	+	+	III
Taraxacum officinale	-	+	+	-	+	III
Arrhenatherum elatius	+	+	+	-	-	III
Festuca pratensis	+	+	+	-	-	III
Heracleum sphondylium	-	+	+	+	-	III
Avenula pubescens	-	-	+	+	+	III
Cichorium intybus	-	-	+	+	-	II
Dianthus deltoides	-	+	+	-	-	II
<i>Trifolio-Geranietea</i>						
Peucedanum cervaria	+	1	+	+	-	IV
Anthericum ramosum	+	+	+	-	+	IV
Clinopodium vulgare	+	-	+	+	-	III
Origanum vulgare	+	+	+	-	-	III
Centaurea jacea	-	+	+	+	-	III
Polygonatum odoratum	-	+	+	+	-	III
Trifolium medium	-	+	+	+	-	III
Laserpitium latifolium	+	+	+	-	-	III
Vincetoxicum officinale	-	+	+	-	+	III
Hieracium umbellatum	-	-	+	+	-	II
Veronica teucrium	+	-	-	-	+	II
Campanula rapunculoides	-	+	+	-	-	II
Peucedanum oreoselinum	-	-	+	+	-	II
Calamintha sylvatica	+	+	-	-	-	II
Verbascum lychnitis	-	-	-	+	+	II
Hieracium sabaudum	-	-	+	-	+	II
Echinops sphacerocephalos	+	+	-	-	-	II
Lembotropis nigricans	-	+	+	-	-	II
Helleborus purpurascens	-	+	+	-	-	II
Thalictrum minus	+	+	-	-	-	II
Ferulago sylvatica	-	+	+	-	-	II
Solidago virgaurea	-	-	+	+	-	II

The place and data of relevés: 1: Szentersébet (Eliseni), 16 m², cover 100%, W, alt. 515 m, 11.08.2002; 2: Nagysolymos (Şoimoşu Mare), 16 m², 95%, S-W, 580 m, 14.08.2002; 3: Nagykedde (Chedia Mare), 25 m², cover 100%, S-W, alt. 560 m, 10.08. 2002; 4: Nagymedesér (Medişoru Mare), 25 m², cover 95%, W, alt. 605 m, 29.07. 2001; 5: Bikafalva (Tăureni), 16 m², cover 95%, S, alt. 470 m, 25.07.2001.

Table 2. *Dorycnio herbacei-Seslerietum heuflerianae*

Number of relevé	1	2	3	4	5	K
<i>Diagnostic species</i>						
<i>Sesleria heufleriana</i>	5	4	5	5	5	V
<i>Dorycnium herbaceum</i>	1	2a	2m	1	2m	V
<i>Carlina acaulis</i>	+	-	+	+	+	IV
<i>Aster amellus</i>	-	+	+	-	+	III
<i>Cephalaria radiata</i>	-	+	+	+	-	III
<i>Astragalus monspessulanus</i>	-	+	+	+	-	III
<i>Linum hirsutum</i>	+	+	+	-	-	III
<i>Helleborus purpurascens</i>	-	+	+	+	-	III
<i>Cirsio-Brachypodium</i>						
<i>Brachypodium rupestre</i>	1	2a	2m	2m	2a	V
<i>Bupleurum falcatum</i>	+	1	+	+	1	V
<i>Carlina vulgaris</i>	+	-	+	+	+	IV
<i>Polygala major</i>	-	+	+	+	+	IV
<i>Cirsium pannonicum</i>	+	+	+	+	-	IV
<i>Thesium linophyllum</i>	+	+	+	+	-	IV
<i>Securigera varia</i>	-	+	+	+	+	IV
<i>Fragaria viridis</i>	-	+	+	+	+	IV
<i>Onobrychis vicifolia</i>	-	2m	-	+	+	III
<i>Ononis arvensis</i>	+	-	+	+	+	IV
<i>Plantago media</i>	-	-	+	+	+	III
<i>Inula ensifolia</i>	-	+	+	+	-	III
<i>Prunella grandiflora</i>	+	-	+	-	+	III
<i>Eryngium planum</i>	-	-	+	+	+	III
<i>Inula salicina</i>	-	-	+	+	-	II
<i>Linum flavum</i>	-	+	-	+	-	II
<i>Pulsatilla montana</i>	-	-	+	+	-	II
<i>Elymus hirsutus</i>	-	+	-	+	-	II
<i>Brometalia erecti/Festucetalia valesiacae</i>						
<i>Bromus erectus</i>	1	2m	+	1	1	V
<i>Carex humilis</i>	+	2m	2m	2m	1	V
<i>Scabiosa ochroleuca</i>	+	+	+	+	+	V
<i>Stachys recta</i>	+	+	+	+	+	V
<i>Euphorbia cyparissias</i>	+	-	+	+	1	IV
<i>Centaurea biebersteinii</i>	-	+	+	+	+	IV
<i>Medicago falcata</i>	-	+	+	+	-	III
<i>Festuca rupicola</i>	+	-	+	+	1	III

Artemisia campestris	-	+	+	+	-	III
Leontodon asper	-	+	-	+	+	III
Helianthemum nummularium	+	+	+	-	-	III
Hypericum perforatum	-	-	+	+	+	III
Euphrasia rostkoviana	+	-	+	+	-	III
Anthyllis vulneraria	-	-	-	+	+	II
Pimpinella saxifraga	+	-	-	+	-	II
Thymus pannonicus	-	+	+	-	-	II
Potentilla arenaria	-	+	-	+	-	II
Campanula glomerata	+	-	+	-	-	II
Carex tomentosa	-	+	-	+	-	II
Teucrium chamaedrys	-	-	+	1	-	II
Gentiana cruciata	-	+	-	+	-	II
Hypochoeris radicata	-	+	+	-	-	II
<i>Festuco-Brometea</i>						
Poa angustifolia	1	+	+	+	1	V
Salvia verticillata	+	+	1	1	+	V
Koeleria cristata	-	+	+	+	+	IV
Agrimonia eupatoria	+	-	+	+	+	IV
Phleum phleoides	-	+	+	+	+	IV
Centaurea scabiosa	+	-	+	+	-	III
Salvia pratensis	-	+	-	+	+	III
Stachys officinalis	+	-	+	+	-	III
Asperula cynanchica	-	+	-	+	+	III
Galium verum	-	+	-	+	+	III
Chamaecytisus austriacus	-	+	+	+	-	III
Prunella laciniata	+	-	-	+	+	III
Bothriochloa ischaemum	+	1	-	1	-	III
Filipendula vulgaris	-	-	+	-	+	II
<i>Molinio-Arrhenatheretea</i>						
Briza media	+	+	+	+	+	V
Dactylis glomerata	+	+	+	+	+	V
Achillea millefolium	-	+	+	+	+	IV
Leucantherella vulgare	-	+	+	+	+	IV
Festuca arundinacea	-	+	1	1	-	III
Arrhenatherum elatius	-	+	+	+	-	III
Lotus corniculatus	+	-	-	+	+	III
Festuca pratensis	-	+	+	+	-	III
Heracleum sphondylium	-	+	+	-	-	II
Rhinanthus minor	+	-	-	-	+	II
Elymus repens	-	+	+	-	-	II
Leontodon autumnale	+	-	-	-	+	II
Trifolium pratense	-	+	-	-	+	II
<i>Trifolio-Geranietea</i>						
Anthericum ramosum	+	-	1	+	+	IV
Clinopodium vulgare	-	+	+	+	+	IV
Oryganum vulgare	-	+	+	+	-	III

Peucedanum cervaria	-	+	+	-	+	III
Centaurea jacea	+	+	+	-	-	III
Vincetoxicum officinale	-	-	-	+	+	II
Polygonatum odoratum	-	+	-	-	+	II
Campanula bononiensis	+	-	+	-	-	II
Thalictrum minus	-	-	+	+	-	II
Hypericum elegans	+	-	-	-	+	II
Hieracium umbellatum	-	-	-	+	+	II

The place and data of relevés: 1: Újszékely (Secuieni), 25 m², cover 95%, N, alt. 510 m, 8.08.2002; 2: Nagysoly mos (Șoimoșu Mare), 16 m², cover 95%, NW, alt. 580 m, 11.08.2002; 3: Székelykeresztúr (Cristuru-Secuiesc), 25 m², cover 100%, N, alt. 605 m, 14.08.2002; 4: Nagy Kede (Chedia Mare), 16 m², cover 90%, NW, alt. 575 m, 08.08.2002; 5: Tarcsafalva (Târcești), 16 m², cover 95%, NW, alt. 635 m, 15. 05. 2001.

Table 3. *Festuco rupicolae-Danthonietum*

Number of relevé	1	2	3	4	5	K
<i>Diagnostic species group</i>						
Danthonia alpina	3	5	5	4	5	V
Festuca rupicola	2m	2a	2a	1	1	V
Potentilla alba	+	+	+	+	-	IV
Pseudolisimachion spicatum	+	+	+	-	+	IV
Chamaecytisus albus	+	+	+	-	-	III
Linum tenuifolium	+	+	+	-	-	III
Inula salicina	-	+	+	-	-	II
<i>Danthonio-Brachypodion/Cirsio-Brachypodion</i>						
Brachypodium rupestre	2a	1	1	1	+	V
Dorycnium herbaceum	2m	1	2m	+	+	V
Plantago media	+	+	+	+	+	V
Polygala májor	+	+	+	+	-	IV
Fragaria viridis	+	+	-	+	+	IV
Elymus hispidus	+	-	+	+	-	III
Ferulago sylvatica	-	+	+	+	-	III
Thesium linophyllum	+	+	+	-	-	III
Polygala comosa	-	+	+	-	-	II
Chamaecytisus austriacus	-	+	+	-	-	II
Orchis tridentata	-	+	+	-	-	II
Prunella laciniata	+	-	-	+	-	II
Securigera varia	-	+	+	-	-	II
<i>Brometalia erecti/Festucetalia valesiacae</i>						
Bromus erectus	1	2m	2m	-	+	V
Helianthemum nummularium	+	+	+	+	-	IV
Leontodon asper	+	+	+	-	+	IV
Hypericum perforatum	-	+	+	+	+	IV
Scabiosa ocreoleuca	+	+	+	+	-	IV

Medicago falcata	+	+	+	-	+	IV
Astragalus monspessulanus	+	+	+	-	-	III
Euphrasia rostkoviana	-	+	+	+	-	III
Teucrium chamaedrys	+	2m	-	-	1	III
Campanula glomerata	-	-	+	+	+	III
Eryngium planum	-	+	+	+	-	III
Thymus pannonicus	1	+	+	-	-	III
Anthyllis vulneraria	-	-	-	+	+	II
Aster amellus	+	+	-	-	-	II
Jurinea mollis	+	+	-	-	-	II
Potentilla arenaria	+	-	+	-	-	II
<i>Festuco-Brometea</i>						
Poa angustifolia	+	+	+	+	-	IV
Euphorbia cyparissias	+	+	-	+	+	IV
Seseli annuum	+	+	+	-	+	IV
Asperula cynanchica	+	-	+	+	+	IV
Bothriochloa ischaemum	1	+	+	-	-	III
Salvia pratensis	+	-	+	+	-	III
Eryngium campestre	-	-	+	+	+	III
Pimpinella saxifraga	+	+	+	-	-	III
Koeleria cristata	1	+	+	-	-	III
Filipendula vulgaris	-	-	+	+	+	III
Galium verum	-	+	+	-	+	III
Stachys germanica	+	-	+	-	-	II
<i>Molinio-Arrhenatheretea</i>						
Dactylis glomerata	+	+	-	+	+	IV
Briza media	-	+	+	+	+	IV
Lotus corniculatus	-	+	+	+	+	IV
Achillea millefolium	-	+	+	+	+	IV
Leucanthemella vulgare	-	+	+	+	+	IV
Agrostis capillaris	-	-	-	+	1	III
Plantago lanceolata	+	-	+	+	-	III
Taraxacum officinale	-	-	+	+	+	III
Prunella vulgaris	-	-	+	+	+	III
Genista tinctoria	-	-	+	+	+	III
Knautia arvensis	-	-	-	+	+	II
Trifolium montanum	-	+	+	-	-	II
Galium mollugo	-	+	+	-	-	II
Linum catharticum	-	-	-	+	+	II
Gentiana cruciata	+	-	+	-	-	II
Trifolium pratense	-	-	-	+	+	II
Carex tomentosa	-	-	+	+	-	II
<i>Trifolio-Geranietea</i>						
Peucedanum cervaria	+	+	+	-	-	III
Anthericum ramosum	1	+	+	-	-	III
Centaurea jacea	-	-	+	+	+	III
Orygamum vulgare	-	+	-	+	+	III

Peucedanum oreoselinum	-	-	+	-	+	II
Solidago virgaurea	-	-	+	+	-	II
Vincetoxicum officinale	-	+	+	-	-	II
Hieracium umbellatum	-	-	-	+	+	II
Astragalus glycyphyllos	-	-	+	+	-	II
Tanacetum corymbosum	+	+	-	-	-	II

The place and data of relevés: 1: Székelykeresztúr (Cristuru-Secuiesc), 16 m², cover 95%, W, alt. 470 m, 07.08. 2001; 2: Betfalva (Betești), 25 m², cover 100%, W, alt. 520 m, 11.08. 2002; 3: Siménfalva (Șimonesti), 25 m², cover 100%, W, 460 m, 06.08.2002; 4: Bogarfalva (Bulgăreni), 16 m², cover 95%, SW, alt. 610 m, 05.08.2001; 5. Oroszhegy (Dealu), 25 m², cover 100%, SW, alt. 810 m, 05.08.2001.

Table 4. *Inula ensifoliae*-*Peucedanietum cervariae*

Number of relevé:	1	2	3	4	5	K
<i>Diagnostic species group</i>						
<i>Inula ensifolia</i>	3	4	3	2b	2b	V
<i>Peucedanum cervaria</i>	2b	2a	2b	3	3	V
<i>Galium glaucum</i>	+	+	+	+	+	V
<i>Artemisia pontica</i>	1	2m	+	-	-	III
<i>Aster linosyris</i>	2m	2m	+	-	-	III
<i>Geranion sanguinei</i>						
<i>Anthericum ramosum</i>	2a	2m	1	+	+	V
<i>Inula hirta</i>	2a	2m	1	+	+	V
<i>Vincetoxicum officinale</i>	+	+	+	+	+	V
<i>Teucrium chamaedrys</i>	2m	+	2m	-	+	IV
<i>Polygonatum odoratum</i>	-	+	+	+	+	IV
<i>Veronica teucrium</i>	+	+	+	+	-	IV
<i>Campanula rapunculoides</i>	+	+	-	+	+	IV
<i>Lembotropis nigricans</i>	-	-	+	+	+	III
<i>Peucedanum oreoselinum</i>	+	1	+	-	-	III
<i>Trifolium alpestre</i>	-	+	+	-	-	II
<i>Tanacetum corymbosum</i>	+	+	-	-	-	II
<i>Geranium sanguineum</i>	-	+	-	+	-	II
<i>Hieracium bauhini</i>	-	+	+	-	-	II
<i>Origanietalia, Trifolio-Geranietea</i>						
<i>Calamintha vulgare</i>	-	+	+	+	+	IV
<i>Origanum vulgare</i>	+	+	+	-	+	IV
<i>Agrimonia eupatoria</i>	-	+	+	+	+	IV
<i>Viola hirta</i>	-	-	+	+	+	III
<i>Cruciata glabra</i>	-	+	.	+	+	III
<i>Astragalus glycyphyllos</i>	-	-	+	+	+	III
<i>Verbascum lychnitis</i>	-	-	+	+	-	II
<i>Lathyrus sylvestris</i>	-	-	-	+	+	II
<i>Digitalis grandiflora</i>	-	-	+	-	+	II

Laserpitium latifolium	-	+	+	-	-	II
Centaurea jacea	-	+	+	-	-	II
<i>Cirsio-Brachypodium</i>						
Brachypodium rupestre	1	+	-	+	+	IV
Carex humilis	+	1	+	-	+	IV
Dorycnium herbaceum	-	+	+	+	+	IV
Bupleurum falcatum	+	+	+	+	-	IV
Fragaria viridis	-	+	+	+	+	IV
Onobrychis viciifolia	-	+	+	+	-	III
Elymus hispidus	1	+	-	-	+	III
Linum hirsutum	+	-	+	-	-	II
Cephalaria radiata	-	-	+	+	-	II
Securigera varia	-	+	+	-	-	II
Potentilla alba	-	+	+	-	-	II
Eryngium planum	-	+	-	-	+	II
Ferulago sylvatica	-	-	-	+	+	II
<i>Festucion rupicola, Festucetalia, Festuco-Brometea</i>						
Festuca rupicola	1	+	+	1	+	V
Bothriochloa ischaemum	1	1	+	+	+	V
Phleum phleoides	-	+	+	+	+	IV
Centaurea biebersteinii	+	+	+	+	-	IV
Asperula cynanchica	+	+	+	-	+	IV
Medicago falcata	+	+	-	+	+	IV
Salvia verticillata	1	-	1	-	+	III
Stachys germanica	+	+	-	+	-	III
Bromus erectus	+	1	-	+	-	III
Artemisia campestris	-	-	+	+	+	III
Jurinea mollis	+	+	+	-	-	III
Astragalus monspessulanus	+	+	-	+	-	III
Campanula sibirica	+	+	-	+	-	III
Echium maculatum	+	+	-	-	-	II
Iris variegata	-	-	+	+	-	II
Cleistogenes serotina	+	+	-	-	-	II
Teucrium montanum	1	+	-	-	-	II
Salvia nutans	-	+	+	-	-	II
Salvia betonicifolia	+	+	-	-	-	II
Linum flavum	-	+	+	-	-	II
Linum austriacum	-	+	+	-	-	II
Phlomis tuberosa	-	+	+	-	-	II
Peucedanum officinale	+	+	-	-	-	II
Asyneuma canescens	+	+	-	-	-	II
Seseli annuum	-	-	+	+	-	II
Filipendula vulgaris	-	+	-	+	-	II
Stachys recta	+	-	-	-	+	II
Scabiosa ocreoleuca	-	+	+	-	-	II
Stipa capillata	+	+	-	-	-	II
Silene bupleuroides	-	+	-	+	-	II



Fig. 5. Stand of the *Festuco rupicolae-Danthonietum* on the moderate slopes (Siménfalva, Simonești, 2002)

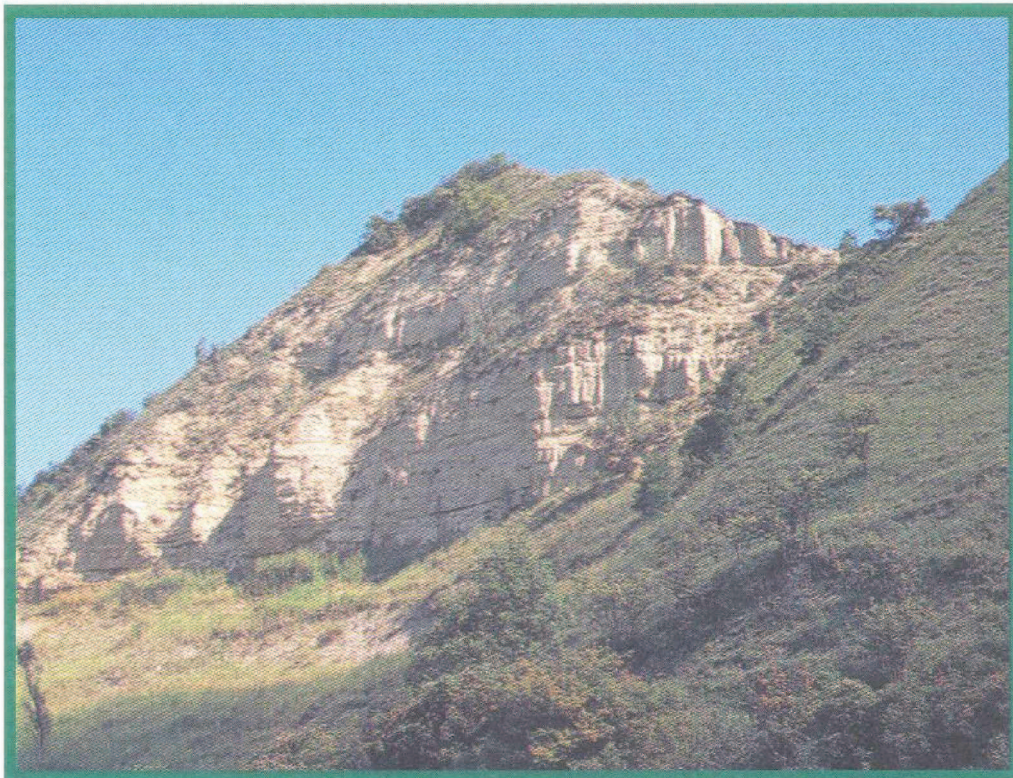


Fig. 6. Population of *Gentiana cruciata* as a component of the *Cariceto humilis-Brachypodietum pinnati* community (Medesér, Medisoru Mare, 2002)



Fig. 7. The fringe community *Clematido recti-Laserpitietum latifoliae* bordering the zonal forest vegetation (Kissolymsos, Şoimosu Mic, 2002)



Fig. 8. Sliding slopes with *Cariceto humilis-Brachypodietum pinnati* in the fragmentary hilly area (Székelyhidegkút, Vidacut, 2000)

Potentilla arenaria	+	-	+	-	-	II
Thymus pannonicus	-	-	+	+	-	II
Astragalus austriacus	-	+	+	-	-	II
Pulsatilla montana	+	+	-	-	-	II
Sanguisorba minor	-	-	+	-	+	II

The place and data of relevés: 1: Felsőbún (Boiu), 16 m², cover 90%, SW, alt. 590 m, 05.07.1999; 2: Székelykeresztúr (Cristuru-Secuiesc), 25 m², cover 95%, S, alt. 480 m, 11.07.1999; 3: Szentábrahám (Avramești), 16 m², cover 90%, SW, alt. 520 m, 14.06.2001; 4: Nagy Kede (Chedia Mare), 25 m², cover 90%, W, alt. 610 m, 15.06.2001; 5: Makfalva (Ghindari), 16 m², cover 95%, W, alt. 510 m, 12.08.2002.

Table 5. *Clematido recti-Laserpitietum latifolii*

Number of relevé	1	2	3	4	5	K
<i>Diagnostic species group</i>						
Laserpitium latifolium	3	4	4	3	3	V
Polygonatum odoratum	2m	+	+	1	+	V
Clematis recta	+	+	+	-	-	III
Trifolium alpestre	+	-	-	+	+	III
Lilium martagon	+	+	+	-	-	III
<i>Geranium sanguinei</i>						
Anthericum ramosum	2m	+	+	2m	+	V
Peucedanum oreoselinum	1	+	+	1	2m	V
Thalictrum minus	+	+	+	-	+	IV
Vincetoxicum officinalis	+	+	-	+	+	IV
Inula hirta	-	+	-	+	-	II
Veronica teucrium	-	+	-	+	-	II
Geranium sanguineum	+	-	-	+	-	II
<i>Origanietalia, Trifolio-Geranietea</i>						
Stachys officinalis	1	+	+	+	+	V
Calamintha vulgare	+	+	+	+	+	V
Melampyrum bihariense	1	+	+	+	+	V
Astragalus glycyphyllos	-	+	+	+	+	IV
Tanacetum corymbosum	+	-	+	+	+	IV
Centaurea jacea	-	+	+	+	+	IV
Agrimonia eupatoria	+	-	+	+	+	IV
Origanum vulgare	+	+	+	+	-	IV
Peucedanum cervaria	-	+	+	+	+	IV
Campanula rapunculoides	+	-	-	+	+	III
Vicia tenuifolia	-	+	-	+	+	III
Campanula persicifolia	+	-	+	-	+	III
Trifolium medium	-	+	-	-	+	II
Hieracium umbellatum	+	-	-	+	-	II
Trifolium ochroleucon	-	-	-	+	+	II
Hypericum perforatum	+	-	+	-	-	II

Lathyrus niger	-	-	+	+	-	II
Verbascum lychnitis	-	+	-	+	-	II
Echinops sphaerocephalos	+	-	+	-	-	II
Solidago virgaurea	+	+	-	-	-	II
Chamaecytisus hirsutus	-	-	+	-	+	II
Inula conyza	+	+	-	-	-	II
Lembotropis nigricans	+	-	-	-	+	II
Pteridium aquilinum	+	-	-	-	+	II
Seseli libanotis	-	-	+	+	-	II
<i>Cirsio-Brachypodium</i>						
Brachypodium rupestre	2a	2m	1	2m	2a	V
Dorycnium herbaceum	1	+	+	+	+	V
Bupleurum falcatum	+	+	+	+	+	V
Onobrychis viciifolia	+	+	+	-	+	IV
Carex humilis	1	+	-	1	-	III
Heklianthemum nummularium	+	+	-	+	-	III
Thesium linophyllum	+	+	-	-	+	III
Eryngium planum	-	-	+	+	+	III
Elymus hispidus	-	+	-	+	+	III
Carlina acaulis	-	+	-	-	+	II
Inula salicina	-	+	-	-	+	II
Securigera varia	+	+	-	-	-	II
Ferulago sylvatica	-	+	+	-	-	II
<i>Festuco-Brometea s.l.</i>						
Galium verum	+	+	+	+	+	V
Seseli annuum	+	+	+	+	+	V
Asperula cynanchica	+	+	+	+	-	IV
Filipendula vulgaris	-	+	+	+	+	IV
Festuca rupicola	1	+	+	+	-	IV
Centaurea biebersteinii	-	+	+	+	+	IV
Bromus erectus	+	+	+	-	+	IV
Salvia pratensis	+	+	-	+	+	IV
Centaurea scabiosa	+	+	-	-	+	III
Pseudolysimachion spicatum	+	-	+	+	-	III
Acinos arvensis	+	+	-	+	-	III
Trifolium montanum	-	+	+	-	+	III
Dianthus carthusianorum	+	+	+	-	-	III
Euphorbia cyparissias	-	+	+	+	-	III
Scabiosa ochroleuca	+	+	-	+	-	III
Pimpinella saxifraga	+	-	-	+	-	II
<i>Molinio-Arrhenatheretea</i>						
Briza media	+	+	+	+	+	V
Dactylis glomerata	1	+	+	+	+	V
Achillea millefolium	+	+	+	+	+	V
Lotus corniculatus	+	+	+	-	+	IV
Festuca pratensis	+	+	+	-	+	IV
Genista tinctoria	-	+	+	+	+	IV

Leucanthemella vulgare	+	+	+	-	+	IV
Festuca arundinacea	+	+	+	-	+	IV
Prunella vulgaris	+	-	+	-	+	III
Agrostis capillaris	+	+	-	-	+	III
Knautia arvensis	-	+	+	+	-	III
Arrhenatherum elatius	+	+	+	-	-	III
Angelica sylvestris	+	+	+	-	-	III
Trifolium pratense	-	+	+	-	+	III
Heracleum sphondylium	+	+	-	+	-	III
Taraxacum officinale	+	+	-	-	+	III
Anthoxanthum odoratum	-	+	+	-	-	II
Galium mollugo	-	+	-	-	+	II
Eupatorium cannabinum	-	+	+	-	-	II
Cirsium oleraceum	-	+	+	-	-	II
Avenula pubescens	-	+	-	-	+	II
<i>Varia</i>						
Primula veris	+	+	-	-	-	II
Convallaria majalis	+	-	-	+	-	II
Helleborus purpurascens	-	+	+	-	-	II
Aconitum variegatum	-	-	+	-	+	II
Gentiana asclepiadea	-	-	-	+	+	II
Iris graminea	-	+	-	+	-	II
Pulmonaria officinalis	+	+	-	-	-	II
Stellaria holostea	-	+	+	-	-	II
Astrantia major	+	-	-	-	+	II

The place and data of relevés: 1: Kissolymos (Șoimosu Mic), 4 m², cover 90%, NE, alt. 510 m, 14.08.2002; 2: Rugonfalva (Rugănești), 6 m², cover 95%, NW, alt. 530 m, 07.08. 2002; 3: Nagy Kede (Chedia Mare), 4 m², cover 100%, N, alt. 620 m, 07.08.2002; 4: Siklód (Șiclod), 6 m², cover 90%, W, alt. 980 m, 12.08.2002; 5: Oroszhegy (Dealu), 4 m², cover 95%, W, alt. 860 m, 10.08.2002.

Table 6. *Stachyo-Melampyretum bihariensis*

Number of relevé	1	2	3	4	5	K
<i>Diagnostic species group</i>						
Melampyrum bihariense	2b	3	2b	3	2b	V
Stachys officinalis	2m	+	2m	+	2m	V
Agrimonia eupatoria	1	+	+	+	-	IV
Inula bifrons	+	+	-	-	-	II
<i>Trifolion medii</i>						
Trifolium medium	1	+	-	+	+	IV
Achillea millefolium	+	+	+	-	+	IV
Centaurea jacea	-	+	+	+	+	IV
Veronica chamaedrys	+	-	+	+	+	IV
Lathyrus pratensis	-	+	+	+	-	III

Galium mollugo	+	+	-	-	+	III
Inula bifrons	-	+	+	-	II	
Vicia sepium	-	-	+	-	+	II
<i>Origanietalia</i> s.l.						
Vincetoxicum officinale	+	+	+	+	+	V
Origanum vulgare	+	+	1	+	1	V
Laserpitium latifolium	1	+	-	+	1	IV
Polygonatum odoratum	+	+	+	+	-	IV
Astragalus glycyphyllos	-	+	+	-	+	III
Solidago virgaurea	+	+	+	-	-	III
Clinopodium vulgare	-	+	+	+	-	III
Lathyrus sylvestris	+	-	-	+	+	III
Hieracium umbellatum	+	+	-	-	+	III
Hieracium sabaudum	-	+	+	+	-	III
Trifolium alpestre	+	+	+	-	-	III
Lembotrops nigricans	+	-	-	+	+	III
Peucedanum oreoselinum	-	+	-	+	+	III
Campanula persicifolia	+	+	-	-	-	II
<i>Cirsio-Brachypodion</i>						
Brachypodium pinnatum	1	1	+	+	1	V
Dorycnium herbaceum	-	+	+	-	+	III
Onobrychis viciifolia	+	+	+	-	-	III
Securigera varia	-	+	-	+	+	III
Bulpeurum falcatum	+	+	+	-	-	III
Fragaria viridis	-	+	-	+	+	III
Hypericum perforatum	+	-	-	-	+	II
Eryngium planum	+	+	-	-	-	II
<i>Molinio-Arrhenatheretea</i>						
Trifolium pratense	+	+	+	-	+	IV
Briza media	+	+	-	+	+	IV
Knautia arvensis	-	+	+	+	+	IV
Heracleum sphondylium	+	+	+	-	-	III
Leucanthemella vulgare	-	+	-	+	+	III
Dactylis glomerata	1	+	-	-	1	III
Seseli annuum	+	+	+	-	-	III
Prunella vulgaris	+	+	-	+	-	III
Festuca heterophylla	-	-	+	+	-	II
Lotus corniculatus	+	+	-	-	-	II
Hypochoeris radicata	+	-	-	+	-	II
Crepis biennis	-	+	+	-	-	II
<i>Varia</i>						
Brachypodium sylvaticum	-	1	+	+	-	III
Helleborus purpurascens	+	+	-	-	+	III
Pulmonaria officinalis	-	+	+	+	-	III
Symphytum tuberosum	+	+	+	-	-	III
Primula veris	+	+	+	-	-	III
Lilium martagon	-	-	+	-	+	II

<i>Clematis vitalba</i>	-	+	-	-	+	II
<i>Euphorbia amygdaloides</i>	+	-	+	-	-	II
<i>Stellaria graminea</i>	-	-	-	+	+	II
<i>Thalictrum aquilegifolium</i>	+	+	-	-	-	II

The place and data of relevés: 1: Hidegkút (Vidacut), 4 m², cover 80%, SW, alt. 620 m, 12.07.2002; 2: Székelykeresztúr (Cristuru-Secuiesc), 4 m², cover 85%, NW, alt. 530 m, 05.06.1999; 3: Gagy (Geoagiu), 4 m², cover 85%, NW, alt. 610 m, 06.06.1999; 4: Nagymedesér (Medişoru Mare), 4 m², cover 85%, E, alt 620 m, 06.08.2002; 5: Magyarós (Aluniş), 4 m², cover 80%, alt. 680 m, 11.08.2002.

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**FÉLSZÁRAZ GYEPEK ÉS SZEGÉLYTÁRSULÁSOK
AZ ERDÉLYI-MEDENCE KELETI TÉRSÉGÉBEN**
(Összefoglalás)

Az Erdélyi-medence keleti peremén, a Küküllő-menti dombvidék és a Keleti-Kárpátok találkozásánál, a Maros és az Olt folyók által behatárolt, geológiailag többnyire pliocéni és szarmata eredetű homokkő, kavics, agyag és mára üledékekből felépülő magas dombvidék található, melyet „Sóvidéki-dombság”, „Udvarhelyi-dombság”, „Homoródi-dombság” ill. „Erdélyi-szubkárpátok” néven ismer a szakirodalom (MAC 1972). A térséget keleten, a Kárpátok felé a Bekecs (1080 m), Siklói-kő (1028 m), Firtos (1060) és a Rez-tető (932 m) vonulata, nyugaton pedig az Erdőszentgyörgy - Erked - Homoród (többé-kevésbé az egykori Székelyföldi-) peremvonal határolja be. A térségre jellemzőek a kelet-nyugat irányú hosszú, nagyobb párhuzamos völgyek (Nyárád, Kis-Küküllő, Nagy-Küküllő, Fehér-Nyikó), az ezeket keresztben átszelő kisebb vízfolyások (Havad-, Küsmőd-, Solymos- Gagy-pataka stb.), melyek kedvező feltételeket biztosítanak az Erdélyi-medence központi részéből jövő szub-kontinentális (thermo-xerofil) hatások érvényesülésének (pl. szőlőkultúra).

Több éves terepi munka és megfigyelés eredményeként, jelen dolgozat ezen átmeneti térségre jellemző félszáraz gyep- és szegélytársulások (*Cirsio-Brachypodium*, *Geranion sanguinei* sorozatok) cönológiai viszonyainak elemzésével és chorológiájával foglalkozik. A növénytársulások tájképi helyzete igen érdekes jelleget mutat. A nap-sütötte déli, délnyugati, meredek ill. suvadásos hegyoldalakon feltűnően elterjedtek a mészkedvelő xerotherm szegélyek (*Inula ensifoliae-Peucedanietum carvifoliae*) valamint a szálkaperjegyepék (*Cariceto humilis-Brachypodietum pinnati*), a lankásabb hegyoldalokon és plató helyzetben, az egykori irtások helyén a fogtekerceses-rétek (*Festuco rupicolae-Danthonietum*) érdekes állományai, az északi, nyirkos hegyoldalakon pedig az újonnan leírt erdélyi nyúlfarkfüves társulás (*Dorycnio herbacei-Seslerietum heuflerianae*) állományai a meghatározóak. Az árnyékos és hűvösebb erdő- és cserjeszegélyek, cönológiai együttese a széleslevelű bordamag-társulás (*Clematido recti-Laserpitietum latifoliae*), mely foltszerű megjelenésével, míg az üde csormolyás erdőszegélyek (*Stachyo-Melampyretum bihariensis*) hosszú sávyszerű megjelenésükkel jellemzik a magas dombvidéki tájat.

Az élőhelytípusok sokszínűsége, a hagyományos gyepgazdálkodási és állattartási módok fennmaradása, kedvezően hatott a terület florisztikai értékeire is. Így a térségből eddig nem, vagy kevésbé ismert ritka-, védett vagy élőhely-indikátor fajok közül a tanulmány a következőket emeli ki: *Aster amellus*, *A. linosyris*, *Astragalus austriacus*, *A. mosnspessulanus*, *Asyneuma canescens*, *Artemisia pontica*, *Cephalaria radiata*, *Chamaecytisus albus*, *Cleistogenes serotina*, *Echium maculatum*, *Gentiana cruciata*, *G. asclepiadea*, *Inula ensifolia*, *I. bifrons*, *Iris variegata*, *I. graminea*, *I. ruthenica*, *Jurinea mollis*, *Linum austriacum*, *L. hirsutum*, *L. tenuifolium*, *Phlomis tuberosa*, *Peucedanum officinale*, *Pulsatilla montana*, *Salvia nutans* etc. A félszáraz gyepék és erdőszegélyek cönológiai-florisztikai viszonyainak feltárásával szeretnénk hozzájárulni a székelyföldi vegetáció jobb ismeretéhez, nagy botanikusának, a száz éve született SOÓ REZSŐ emlékének megőrzéséhez.