

## OBSERVATIONS ON THE PHYTODIVERSITY OF THE SITE OF THE STEPPE ISLANDS OF ȘURA MICĂ - SLIMNIC (SIBIU COUNTY), ROMANIA

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### Abstract

*Phytodiversity, representing the totality of plant species in a given habitat or territory, plays an essential role in maintaining ecological balance, perpetuating the floristic structure of plant communities and producing phytomass, food for consumers and a source of useful materials for the development of human civilizations. Our research was conducted in the ROSCI0093 site in the period 2011-2024. The aim of the investigations was to assess the diversity of plants in the Peri area, respectively to highlight the flora (elaboration of a floristic list, phytocenological surveys). The results can be used to understand the dynamics of the local ecosystem, to highlight potential threats diminishing phytodiversity, to develop conservation strategies.*

**Key words:** phytodiversity, Peri-Șura Mare perimeter, Șura Mică-Slimnic steppe islands, Sibiu County, Romania

### INTRODUCTION

The site of the steppe islands Șura Mică - Slimnic was designated for the preservation of wild flora and fauna as well as natural habitats of community interest. The site is fragmented, consisting of islands of steppe vegetation existing, in particular, on the sunny slopes of some hills belonging to the administrative districts of Slimnic, Șura Mare and Șura Mica, located north of Sibiu. It is a Site of Community Importance by Order of the Ministry of the Environment and Sustainable Development No. 1964 of December 13, 2007, being an integral part of the Natura 2000 European ecological network in Romania, with code ROSCI0093. On an area of 367 hectares the site would have had, at its establishment, seven types of community habitats and over 400 plant species (cormophytes). The aim of the investigations was to assess the diversity of plants in the Peri area, respectively to highlight the flora (elaboration of a floristic list, phytocenological surveys).

### MATERIALS AND METHODS

Our research at the ROSCI0093 site from 2011-2024 (Fig. 1) involved a complex set of activities, consisting of detailed field observations and identification of plant species using specialized literature [1], [2], [3] [10], together with optical instruments such as magnifying glasses and binoculars, phytocenological surveys in order to highlight the composition, floristic structure and distribution of plant communities in the investigated area, thus contributing to a better understanding of the dynamics of the local ecosystem [4], [5], [6].



Fig.1. The site of the Steppe Islands Șura Mica – Slimnic, the fragment Peri  
Source: [9].

Fragments of the ROSCI0093 site have also been studied by other researchers who have emphasized the steppe character of some habitats, the characteristic and rare species of these islands of xerothermophilous vegetation [7], [8], [11-15].

## RESULTS AND DISCUSSIONS

The investigations led to the following findings:

1. 168 species were identified (Table 1);
2. The phytodiversity has decreased under the action of several factors among which the decrease of precipitation, intensive grazing with hundreds of cattle and sheep, human activities in the territory;
3. Some rare species and habitats, which were arguments for the site designation, have disappeared or have not been found (e.g. species *Adenophora lilifolia*, *Anacamptis pyramidalis*, *Angelica palustris* and habitat 6410 Meadows with *Molinia* on carbonaceous, peaty or loamy-clay soils Molinion caeruleae);
4. Zakel Hill Reserve was fenced;
5. The best preserved are the hills of the Sharba Valley;
6. The most degraded is the Peri perimeter (Şura Mare) as a consequence of soil subsidence and erosion, the grass cover having 75% cover, almost one third of the flora being weed species). The species characteristic of the initial grassland, i.e. of the Festuco-Brometea class, are mostly of low abundance-dominance.

In the upper part of the study plot we could identify a phytocenosis belonging to the Festucion valesiaca alliance (Table 2). It has several characteristic species of both habitat 6210 (*Festuca valesiaca*, *Arabis hirsuta*, *Brachypodium pinnatum*, *Carex caryophyllea*, *Eryngium campestre*, *Medicago falcata*, *Polygala comosa*, *Sanguisorba minor*, *Silene otites*, *Veronica prostrata*, *Leontodon hispidus*) and 6240 (*Festuca valesiaca*, *Teucrium chamaedrys*, *Potentilla arenaria*, *Astragalus austriacus*).

According to its floristic composition, even partially altered, the phytocenosis in question can be classified in the Festucetum valesiaca

association. Within it, *Dichantium ischaemum* patches have developed which could also be treated as *Dichanthietum ischaemi* subas. *festucetosum valesiaca*.

In the lower part of the plot, the vegetation is difficult to categorize due to the penetration of several weed and shrub species (34 species), sometimes with high abundance and dominance (Table 1).

The information noted in this paper may be useful in the management of this area, which is both agricultural land, grassland and Natura 2000 site.

Table 1. Relevee effectuate

Taxon	Column Number	
	1 Top of the plot (summary 4 relevee	2 Lower part of the plot) (summary 2 relevee)
<i>Festuca valesiaca</i> Schleicher	3-4	2-3
<i>Achillea collina</i> (Becker ex Rchb.f.) Heimerl	+	-
<i>Achillea millefolium</i> L.	+	+
<i>Acinos arvensis</i> (Lam.) Dandy	+	-
<i>Agrimonia eupatoria</i> L.	+	-
<i>Agrostis capillaris</i> L. ( <i>A. tenuis</i> Sibth.)	+1	1
<i>Ajuga genevensis</i> L.	+	-
<i>Ajuga reptans</i> L.	-	+
<i>Alyssum alyssoides</i> (L.) L.	+	-
<i>Amaranthus retroflexus</i> L.	-	+
<i>Anthoxanthum odoratum</i> L.	+	-
<i>Arabis hirsuta</i> (L.) Scop.	-	+
<i>Arenaria serpyllifolia</i> L.	+	+
<i>Artemisia campestris</i> L.	+	-
<i>Asperula cynanchica</i> L.	+	-
<i>Astragalus austriacus</i> Jacq.	+	-
<i>Astragalus monspessulanus</i> L.	+	-
<i>Ballota nigra</i> L.	-	+
<i>Bellis perennis</i> L.	-	+
<i>Brachypodium pinnatum</i> (L.) Beauv.	+1	-
<i>Bupleurum falcatum</i> L.	+	-
<i>Calamintha vulgare</i> L.	1	-
<i>Campanula sibirica</i> L.	+	-
<i>Capsella bursa-pastoris</i> (L.) Medik	-	+
<i>Carduus acanthoides</i> L.	+	+
<i>Carex caryophyllea</i> Latourr	+	-

<i>Carex tomentosa</i> L.	+	-	<i>Melilotus officinalis</i> Lam.	-	+
<i>Caucalis platycarpus</i> L.	-	+	<i>Lactuca serriola</i> Torner	-	+
<i>Centaurea biebersteinii</i> DC. (C. micranthos S.G. Gmelin)	+-1	-	<i>Lolium perenne</i> L.	-	+
<i>Centaurea scabiosa</i> L.	+	-	<i>Lepidium campestre</i> (L.)R.Br.	-	+
<i>Cerastium holosteoides</i> Fries	+	+	<i>Lotus corniculatus</i> L.	+	+
<i>Chelidonium majus</i> L.	-	+	<i>Muscari racemosum</i> Mill.	+	-
<i>Chenopodium album</i> L.	-	+	<i>Nonea pulla</i> DC.	+	-
<i>Cichorium intybus</i> L.	-	+	<i>Onobrychis viciifolia</i> Scop.	+	-
<i>Cirsium arvense</i> (L.) Scop.	-	+	<i>Oxalis stricta</i> L.	-	+
<i>Convolvulus arvensis</i> L.	-	+	<i>Peucedanum oreoselinum</i> (L.) Moench.	-	+
<i>Cornus sanguinea</i> L.	-	+	<i>Pimpinella saxifraga</i> L.	+	-
<i>Coronilla varia</i> L.	-	+	<i>Plantago lanceolata</i> L.	+	+
<i>Crataegus monogyna</i> Jacq.	+	1	<i>Plantago major</i> L.	-	+
<i>Crepis tectorum</i> L.	+	-	<i>Plantago media</i> L.	+	+
<i>Dactylis glomerata</i> L.	+	+	<i>Poa annua</i> L.	-	+
<i>Daucus carota</i> L.	+	+	<i>Polygala comosa</i> Schkuhr.	+	+
<i>Descurainia sophia</i> (L.) Web.	-	+	<i>Polygonum aviculare</i> L.	+	+
<i>Dichanthium ischaemum</i> (L.) Roberty	+-1	-	<i>Potentilla arenaria</i> Borkh.	1-2	-
<i>Dipsacus fullonum</i> L. (D. sylvestris Hudson)	+	+	<i>Potentilla argentea</i> L.	+	-
<i>Dorycnium pentaphyllum</i> Scop. subsp <i>herbaceum</i> (Vill.) Rouy.	+	-	<i>Potentilla reptans</i> L.	-	+
<i>Echium vulgare</i> L.	+	-	<i>Primula veris</i> L. em. Huds	-	+
<i>Elymus repens</i> (L.) Gould (Agropyron repens (L.) Beauv.)	+	1	<i>Prunella vulgaris</i> L.	+	+
<i>Eryngium campestre</i> L.	-	+	<i>Prunus spinosa</i> L.	+	1-2
<i>Euphorbia cyparissias</i> L.	+-1	+	<i>Pyrus pyrastrer</i> (L.) Burgsd.	+	+
<i>Erigeron annuus</i> (L.) Pers. (Stenactis annua (L.) Less.)	-	+	<i>Ranunculus acris</i> L.	-	+
<i>Fragaria viridis</i> Weston.	+-1	-	<i>Rhinanthus angustifolius</i> C.C. Gmelin	-	+
<i>Galium aparine</i> L.	-	+	<i>Rosa canina</i> L.	+	1
<i>Galium mollugo</i> L.	+	-	<i>Rubus caesius</i> L.	-	+
<i>Galium verum</i> L.	+	-	<i>Rumex acetosella</i> L.	-	+
<i>Genista tinctoria</i> L.	+	+	<i>Taraxacum officinale</i> Weber	-	+
<i>Genistella sagittalis</i> (L.) Gams.	+	+	<i>Salvia nemorosa</i> L.	-	+
<i>Geum urbanum</i> L.	-	+	<i>Salvia pratensis</i> L.	+	-
<i>Glechoma hederacea</i> L.	-	+	<i>Sanguisorba minor</i> Scop.	+	-
<i>Helleborus purpurascens</i> Waldst. et Kit.	-	+	<i>Setaria pumila</i> (Poiret) Schultes	-	+
<i>Hieracium pilosella</i> L.	+	-	<i>Silene otites</i> (L.) Wib.	+	-
<i>Hypericum elegans</i> Steph.	-	+	<i>Stellaria media</i> (L.) Vill.	-	+
<i>Hypochoeris radicata</i> L.	-	+	<i>Teucrium chamaedrys</i> L.	+	-
<i>Hypericum perforatum</i> L.	+	+	<i>Thymus pulegioides</i> L.	+	-
<i>Leontodon hispidus</i> L.	+	-	<i>Trifolium arvense</i> L.	+	-
<i>Linaria genistifolia</i> (L.) Miller	-	+	<i>Trifolium montanum</i> L.	+	-
<i>Linum perenne</i> L.	+	-	<i>Trifolium repens</i> L.	+	+
<i>Luzula campestris</i> (L.) DC	+	-	<i>Urtica dioica</i> L.	-	1
<i>Medicago falcata</i> L.	+	-	<i>Verbascum phoeniceum</i> L.	+	-
<i>Medicago lupulina</i> L.	+	-	<i>Veronica chamaedrys</i> L.	-	+
			<i>Veronica teucrium</i> L.	+	-
			<i>Xanthium spinosum</i> L.	+	+

Source: Own calculation.

Place and date of survey:

**Column 1:** Şura Mare, In Peri, 29.04.2013, 11.05.2013, 09.08.2013, 19.10.2024 [4], [5], [6].

**Column 2:** Şura Mare, In Peri, 29.04.2013, 09.08, 2013, 19.10.2024 [4], [5], [6].

For each species in the table, the abundance-dominance was noted according to the Braun-Blanquet scale, where:

+ means abundance-dominance: 0.1%- 1%

1 means abundance-dominance: 1%- 10%

2 means abundance-dominance: 10%- 25%

3 means abundance-dominance: 25%- 50%

4 means abundance-dominance: 50% - 75%

5 means abundance-dominance: 75%- 100%

In addition to the sample areas, the following species were also identified on the site: *Althaea officinalis* L., *Anthyllis vulneraria* L., *Arrhenatherum elatius* (L.) Beauv., *Briza media* L., *Bromus arvensis* L., *Carlina vulgaris* L., *Centaurea apiculata* Ledeb. subsp. *spinulosa* (Rochel) Dostal, *Centaurea phrygia* L., *Cerastium semidecandrum* L., *Conyza canadensis* (L.) Cronq. (*Erigeron canadensis* L.), *Crepis biennis* L., *Crepis setosa* Haller, *Dianthus carthusianorum* L., *Digitaria sanguinalis* (L.) Scop., *Erigeron acris* L., *Erophila verna* (L.) Chevall., *Euonymus europaeus* L., *Filipendula vulgaris* Mnch., *Fragaria vesca* L., *Geranium pusillum* Burm., *Hieracium bauhini* Besser, *Inula ensifolia* L., *Knautia arvensis* (L.) Coulter, *Lathyrus nissolia* L., *Ligustrum vulgare* L., *Linaria vulgaris* Miller, *Linum hirsutum* L., *Melilotus albus* Medik., *Ononis arvensis* L., *Onopordon acanthium* L., *Orchis morio* L., *Polygala vulgaris* L., *Ranunculus repens* L., *Reseda lutea* L., *Rumex acetosa* L., *Rumex crispus* L., *Salvia austriaca* Jacq., *Salvia verticillata* L., *Scabiosa ochroleuca* L., *Sinapis arvensis* L., *Sisymbrium officinale* (L.) Scop., *Sonchus arvensis* L., *Stachys annua* (L.) L., *Stachys recta* L., *Stellaria graminea* L., *Thalictrum minus* L., *Thlaspi arvense* L., *Tragopogon pratensis* L. subsp. *orientalis* (L.) Celak, *Trifolium pratense* L., *Verbena officinalis* L., *Veronica arvensis* L., *Veronica prostrata* L., *Viola ambigua* Wald. et Kit.

## CONCLUSIONS

The investigated territory in the Peri area has a high phytodiversity potential, which could be significantly improved by reducing zoo-anthropogenic influences. In particular, the group of about 400 specimens of *Orchis morio* in the vicinity has the potential to expand in the studied perimeter. This expansion could favor the inclusion of the area in habitat category 6210 - Semi-natural xerophytic meadows of Festuco-Brometalia, a site of major importance for the protection and conservation of orchids. This would help to recognize and protect the site as an area of biodiversity conservation interest.

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