

**NEW SITES FOR *STIPA DASYPHYLLA* (LINDEM.) TRAUTV.
IN TRANSYLVANIA WITH EMPHASIS ON THE SPECIES
DISTRIBUTION IN ROMANIA**

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Abstract: The paper reports the presence of *Stipa dasyphylla* (Lindem.) Trautv. in two new sites in Transylvania (Romania). The habitat type and plant communities in which the species occurs are described. The associations in which *S. dasyphylla* was identified are *Stipetum pulcherrimae* Soó 1942 (at Cheia, Cluj county) and *Danthonio alpinae* – *Stipetum stenophyllae* Ghișa 1941 (in the Turda Gorge, Cluj county). The distribution of this species in Romania is also analyzed and discussed. So far, it was mentioned only from 6 localities. The present study reveals that two sites (Murfatlar and Vălenii de Sus) given in previous works may be considered as uncertain.

Introduction

The sturdy perennial grasses of the genus *Stipa* (*Poaceae*) are important representatives of the xeric vegetation of steppes, forest steppes and rocky grasslands. From all the various species of this genus, ten can be found in the Romanian Flora [8].

Stipa dasyphylla (Lindem.) Trautv. (*S. pennata* L. γ *dasyphylla* Lindem.; *S. pulcherrima* var. *hirsuta* (Velen.) Hand.-Mazz.; *S. villifolia* Simk.; *S. joannis* Čelak. subsp. *villifolia* Simk. *S. dasyphylla* Trautv. var. *villifolia* (Simk.) Dom. et Podp.) [16, 17, 19] is distinguished from the other feather-grasses by the following morphological characteristics [1, 17, 18, 19]:

1. the stems are up to 80 cm, with puberulent, purplish basal sheaths;
2. the narrow grayish leaflets are covered with abundant, 1.5-2 mm long hairs on both surfaces, those of the adaxial surface protruding between the margins of the convolute leaf;
3. the ventral lines of hairs on lemma usually reach the base of the awn, just sometimes remaining with 1-2 mm below it;
4. the length of the dorsal and sub-dorsal lines of hairs on lemma are approximately equal.

S. dasyphylla is a xerophilous and moderately – thermophilic species occurring on dry, stony places and open grasslands with thin, nutrient-poor soil [3, 30, 33]. Regarding its phytosociological behaviour, it is considered a characteristic species of the *Festucion rupicolae* alliance [4, 5, 24, 30].

The geographic distribution of this species shows three main concentration areas [28, 29, 31]: 1. the Western Siberian Lowland; 2. the Donets Basin in the northern part of the Black and Azov Seas; 3. Central Europe (the foothills of the Western Carpathians in the northern part of Hungary and south of Slovakia). Therefore, *S. dasyphylla* is considered a Eurasian Continental species [3] with Ponto-Pannonian affinities [30]. The extreme western population of this species is located in Germany [21, 27].

In Romania, so far, *S. dasyphylla* has been reported only from a few scattered localities. Due to its limited presence and to the isolation of populations, new occurrences of this species are important in order to enlarge its Romanian distribution, as well as to understand its chorology and phytogeography in Central Europe.

The main purpose of this paper is to report the presence of *Stipa dasyphylla* in two new, recently discovered sites in Transylvania (Romania), as well as to characterize the habitat type and plant communities in which the species occurs. Also, the aim of the study is to draw the distribution of this species in Romania, based on herbarium collections and on bibliographic data.

Material and Methods

The new sites of *S. dasyphylla* were discovered in the summers of 2004 and 2005, respectively. The collected material is registered and kept in the *Herbarium of Babeș-Bolyai University (CL)* from Cluj-Napoca (inventory numbers: 656790, 657229, 657230). In order to identify and characterize the plant communities in which this species occurs, phytosociological relevés were performed according to the method of *Central European School* [7]. The assignment to different plant associations was based on the floristic structure of the relevés, taking into account the presence of characteristic species. The nomenclature of plant taxa follows *Flora Europaea* [32].

To determine the distribution of *S. dasyphylla* in Romania, as precisely as possible, herbarium and bibliographic sources were used. The Herbariums of the following institutions have been consulted: *Babeș-Bolyai University (CL)* and *University of Agronomical Sciences and Veterinary Medicine (CLA)* in Cluj-Napoca, *A. I. Cuza University (I)* in Iași, *Institute of Biology, Romanian Academy (BUCA)* and *University of Agronomical Sciences and Veterinary Medicine (BUAG)* in Bucharest, *Natural History Museum (SIB)* in Sibiu, as well as *Hungarian Natural History Museum (BP)* in Budapest. The bibliographic documentation consisted in the review of the previous studies regarding the Romanian occurrences of the species, as well as the latest floristic records. For drawing the distribution map, *IDRISI* software [15] and a *Digital Elevation Model (DEM - <http://www.ngdc.noaa.gov/mgg/topo/globe.html>)* have been used.

Results and Discussion

A. Characterization of the new Transylvanian sites

The two newly discovered sites of *S. dasyphylla* are located in Transylvania, near the town of Turda (Cluj county): the first one near the village **Cheia** and the second one in the **Turda Gorge**. The two populations of the species are situated at 5-6 km distance from each other. From geographic point of view, these new localities belong to a transition area between the Apuseni Mountains and the Transylvanian Lowland [22].

Both areas were surveyed from botanical point of view in the last century [11, 13, 14, 20, 23]. In spite of detailed studies, there were no mentions regarding the presence of *S. dasyphylla*.

a. Cheia. The site belongs to a hilly area, which is situated on the left side of the Arieș River. The main hill is named Sardău (549 m. a.s.l). On the southern slopes of this hill a relatively compact main population and a smaller subpopulation of *S. dasyphylla* was found. The main one grows on “*grainstone*” (limestone including detrital material, of Badenian age) and the other one on magmatic bedrock (ophiolites). Both stands are located on a relatively small surface (400 m² and 50 m², respectively). The soil is eroded, presenting a very thin layer. The individuals of *S. dasyphylla* grow almost on the rocky surface, in open grassland (Fig. 1).

b. Turda Gorge. This area is characterised by a great floristic diversity: it is the meeting place of dry grassland elements of the Transylvanian Lowland with the mountain and calcareous rocky grassland species. Also, the flora includes many rarities [20, 23]. The population of *S. dasyphylla* was found at the exit of the canyon, on the left side of the Hășdate rivulet (below the

place named “*Povârnişul lui Pop*”), on magmatic bedrock (ophiolites). The slope has southern, south-western exposure. The soil is deeper than at the previous site. This population is larger than the other one from Cheia, extending on a total surface of approximately 1000 m². The individuals of *S. dasyphylla* grow in well developed closed grassland (Fig. 2).

The plant communities in which *S. dasyphylla* was identified are: *Stipetum pulcherrimae* Soó 1942 at Cheia and *Danthonio alpinae – Stipetum stenophyllae* Ghişa 1941 in the Turda Gorge (Tab. 1). According to the reviewed literature, so far in Romania, this species was recorded only in the Pontic steppe grasslands of *Stipo ucrainicae-Festucetum valesiaca* Dihoru, (1969) 1970, from Babadag, Dobrudja region [12].

B. Distribution of *Stipa dasyphylla* in Romania

In Romania, *S. dasyphylla* has a very scattered distribution with isolated populations. So far, it was reported from 6 localities. To these occurrences are added the two newly discovered Transylvanian sites. From all the known localities, two are considered uncertain (Fig. 3, Tab. 2):

1. **Murfatlar**: the specimens collected by Grinţescu I. and Borza A. (1916, 1922) identified as *S. joannis* Čelak var. *villifolia* Simk. (deposited in CL) and cited in the later floristic works [2, 8, 19, 26] were verified and revised as *Stipa ucrainica* P. Smirn. There is no other existing herbarium material or bibliographical data regarding the presence of *S. dasyphylla* at this site.
2. **Vălenii de Sus**: is given as locality of occurrence for *S. dasyphylla* only by Beldie (1979) [2]. This very poor information is unproved by herbarium vouchers and the species is not mentioned in other bibliographic sources. Additionally, there is a toponymic discordance: the author refers to *Vălenii de Sus* from Dolj county, but this toponym is found only in Gorj county.

The two, newly reported sites show similar ecological features as the first one discovered in Romania (Deva, Colţu Hill – *Exs*: Péterfi, 1918 – Tab. 2), belonging to the xeric-rocky habitats of the foothill region of the Western Romanian Carpathians [9]. Future investigations in these kinds of habitat could reveal the existence of other populations of *S. dasyphylla* in this region.

Also, additional field surveys in Dobrudja should clarify the exact distribution of the species in this area. New vegetation studies should be performed in the future, for better understanding of the phytosociological behaviour of *S. dasyphylla* in the xeric-pontic grasslands.

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Tab. 1 Plant communities with *Stipa dasyphylla* in the new Transylvanian sites1 - 3 - *Stipetum pulcherrimae* Soó 19424 - 8 - *Danthonio alpinae* - *Stipetum stenophyllae* Ghişa 1941

Number of relevés	1	2	3	4	5	6	7	8	
Altitude (m a.s.l.)	360	360	370	460	470	465	460	465	
Exposure	S	S	S	S	S-W	S-W	S	S, SW	
Slope (°)	10-15	10-15	15	20	15	15-20	20	5-8	K*
Surface (m ²)	25	25	25	25	25	25	25	25	
Cover (%)	45	65	55	75	95	95	70	85	
Number of species	19	25	24	21	25	27	31	28	
Char. Ass.									
<i>Danthonia alpina</i>	-	-	-	1	1	1-2	1-2	2	V
<i>Stipa tirsia</i>	-	+	-	2-3	3	3-4	+1	3	V
<i>Stipa pulcherrima</i>	2	2-3	2	-	-	-	+	-	I
Cirsio-Brachypodion									
<i>Dianthus giganteus</i> subsp. <i>giganteus</i>	-	-	-	-	+	-	-	+	II
<i>Inula ensifolia</i>	-	+1	-	+	+1	1	+1	+	V
<i>Scabiosa ochroleuca</i>	-	-	-	-	+	-	-	-	I
Festucion rupicolae									
<i>Ajuga chamaepitys</i>	-	-	+	-	-	-	-	-	-
<i>Ajuga laxmannii</i>	-	-	+	-	-	-	-	-	-
<i>Aster amellus</i>	-	-	-	-	+	-	-	-	I
<i>Astragalus monspessulanus</i>	-	+	-	-	-	-	-	-	-
<i>Cleistogenes serotina</i>	-	-	-	+	-	+	-	-	II
<i>Festuca rupicola</i>	+	-	+	1-2	2	-	1	-	III
<i>Festuca valesiaca</i>	+	-	-	-	-	-	+1	-	I
<i>Onosma heterophylla</i>	-	-	+	-	-	-	-	-	-
<i>Reseda lutea</i>	+	-	-	-	-	-	-	-	-
<i>Seseli pallasii</i>	-	-	-	-	+	+	-	+	III
<i>Stipa dasyphylla</i>	+1	+1	+	1	1	+	1	+	V
Festucetalia valesiaca									
<i>Aconitum anthora</i>	-	-	-	-	-	-	-	+	I
<i>Adonis vernalis</i>	-	-	+	-	-	-	-	-	-
<i>Allium albidum</i> subsp. <i>albidum</i>	-	-	-	+	+	+	+	-	IV

Number of relevés	1	2	3	4	5	6	7	8	K*
<i>Hieracium pilosella</i>	-	-	-	-	-	-	+	-	I
<i>Hypericum perforatum</i>	-	-	-	+	-	-	+	-	II
<i>Potentilla recta</i>	-	-	-	-	-	-	-	+	I
<i>Salvia nemorosa</i>	-	+	-	-	-	-	-	-	-
<i>Salvia verticillata</i>	+	-	-	-	-	-	-	-	-
<i>Sedum acre</i>	-	-	-	-	-	-	+	-	I
<i>Sedum album</i>	-	-	-	-	-	-	+	-	I
<i>Teucrium chamaedrys</i>	-	+	-	-	-	-	-	-	-
<i>Thymus glabrescens</i> s. l.	-	-	-	-	-	+	+	+	III
<i>Trifolium montanum</i>	-	-	-	-	-	+	-	+	II
<i>Geranium sanguinei</i>									
<i>Geranium sanguineum</i>	-	-	-	1-2	-	1	1	+	IV
<i>Peucedanum cervaria</i>	-	-	-	-	+	-	-	-	I
<i>Peucedanum oreoselinum</i>	-	-	-	-	+	-	-	-	I
<i>Vincetoxicum hirundinaria</i> subsp. <i>hirundinaria</i>	-	-	-	-	-	-	-	+	I
<i>Quercetalia pubescenti-petreae</i>									
<i>Chamaecytisus hirsutus</i>	-	-	-	-	+	-	-	-	I
<i>Inula conyza</i>	-	-	-	-	-	+	-	-	I
<i>Lembotropis nigricans</i>	-	+	-	-	-	-	-	-	-
<i>Ligustrum vulgare</i>	-	-	+	-	-	-	-	-	-
<i>Pyrus pyraster</i>	-	-	-	-	-	-	-	+	I
<i>Variae</i>									
<i>Berberis vulgaris</i>	-	-	+	-	-	-	+	-	I
<i>Carpinus betulus</i>	-	-	-	-	-	+	-	+	II
<i>Chamaespartium sagittale</i>	-	-	-	-	-	-	-	+	I
<i>Crataegus monogyna</i>	-	+	+	-	-	-	+	-	I
<i>Galium album</i> subsp. <i>album</i>	-	-	-	-	-	+	-	-	I
<i>Genista januensis</i> var. <i>spathulata</i>	-	-	-	-	-	-	-	+	I
<i>Tragopogon pratensis</i> subsp. <i>orientalis</i>	-	-	-	-	-	+	-	-	I
<i>Melilotus alba</i>	+	-	-	-	-	-	-	-	-
<i>Melilotus officinalis</i>	+	+	-	-	-	-	-	-	-
<i>Rosa canina</i>	-	-	+	-	-	-	-	-	-

Place and date of relevés: 1-3 Sardău Hill, Cheia (Cluj county), 20.06.2005

4-8 Turda Gorge (Cluj county), 30. 07. 2005

* - the constancy of species is calculated only for the *Danthonio alpinae - Stipetum stenophyllae* Ghișa 1941 community



Fig. 1: Habitat with *Stipa dasyphylla* (Lindem.) Trautv. at Cheia (Cluj county) – Photo: J. P. Frink



Fig. 2: Habitat with *Stipa dasyphylla* (Lindem.) Trautv. in the Turda Gorge (Cluj county) – Photo: J. P. Frink

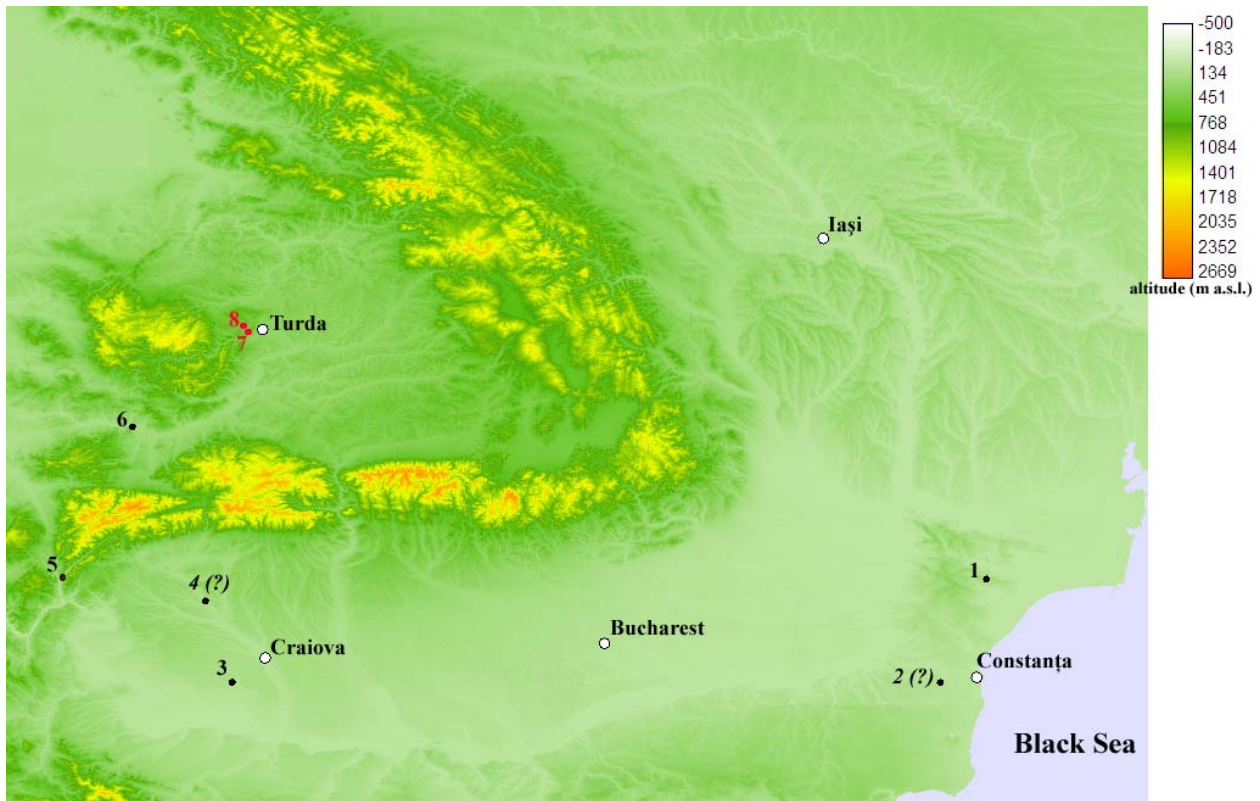


Fig. 3: Distribution of *Stipa dasyphylla* (Lindem.) Trautv. in Romania

Table 2: Localities with *Stipa dasyphylla* (Lindem.) Trautv. in Romania

Regions of Romania	Localities	References
<i>Dobruđja</i>	1. Babadag - Dadovar Hill (Tulcea county)*	Dihoru <i>et</i> Doniță, 1970
	2. Murfatlar (Constanța county) - ?	Prodan, 1934; Morariu, 1972
<i>Oltenia</i>	3. Radovan - Valea Rea (Dolj county)*	Cîrțu, 1970; Popescu <i>et al.</i> , 2003
	4. Vălenii de Sus (Gorj county) - ?	Beldie, 1979
<i>Banat</i>	5. Mehadia - Herculane Bath (Caraș-Severin county)	Exs.: Prodan, herbarium sheet without date (BUCA)**
		Borza, 1947
<i>Transylvania</i>	6. Deva - Colțu Hill (Hunedoara county)	Exs.: Péterfi, 1918 (CL) Ciuntu, 1983
	7. Cheia - Sardău Hill (Cluj county)	new site, Exs.: Frink, 2004, 2005 (CL)
	8. Turda Gorge (Cluj county)	new site, Exs.: Frink, 2005 (CL)

*Herbarium vouchers referring to these localities are missing from public herbariums

**Herbarium acronyms in the table, as well as in the text are given according *Index Herbariorum* (<http://www.nybg.org/bsci/ih.>)

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NOI LOCALITĂȚI PENTRU *STIPA DASYPHYLLA* (LINDEM.) TRAUTV. ÎN TRANSILVANIA, CU REFERIRI LA DISTRIBUȚIA SPECIEI ÎN ROMÂNIA

(Rezumat)

Prezenta lucrare menționează două stațiuni noi ale speciei *Stipa dasyphylla* (Lindem.) Trautv. în Transilvania și prezintă distribuția ei în România, pe baza materialelor de herbar și a surselor bibliografice existente.

După o scurtă descriere a caracterelor morfologice distinctive și indicarea corologiei generale a speciei, sunt prezentate și caracterizate cele două noi localități în care aceasta a fost identificată: Dealul Sardău, lângă satul **Cheia** (jud. Cluj), în ambianța asociației *Stipetum pulcherrimae* Soó 1942 (Tab. 1, rel. 1-3; Fig. 1), respectiv **Cheile Turzii** (jud. Cluj), sub „*Povârnișul lui Pop*”, în fitocenoze aparținând la *Danthonio – Stipetum stenophyllae* Ghișa 1941 (Tab. 1, rel. 4-8; Fig. 2).

Cu privire la distribuția speciei în România (Fig. 3, Tab. 2), sunt făcute unele precizări legate de prezența acesteia la **Murfatlar** (materialul de herbar citat în literatură, depus în CL a fost verificat și reconsiderat ca *Stipa ucrainica* P. Smirn.) și la **Vălenii de Sus** (material de herbar lipsă), autorii considerând ambele localități ca fiind incerte, pe baza informațiilor existente la momentul actual.