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ON THE OCCURRENCE OF THE *POA GRANITICA* GROUP IN THE ROMANIAN CARPATHIANS

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Abstract: The *Poa granitica* group includes two taxa endemic to the Carpathian Mountains, morphologically distinguishable and of disjunct distribution. The distribution of *P. granitica* Br.-Bl. subsp. *granitica* is limited to the Western Carpathians, that of *P. granitica* Br.-Bl. subsp. *disparilis* (Nyár.) Nyár. to the South-Eastern Carpathians. Both taxa are characteristic of (sub-) alpine acidophilic communities (*Salicion herbaceae*). The most important character for distinguishing these subspecies is the indumentum of the lemma. The main goal of this paper is to examine critically some older reports from the botanical literature regarding the presence of *P. granitica* Br.-Bl. subsp. *granitica* in the Romanian Carpathians. Also, morphological description and distributions are given for both taxa. Following a review of available herbarium material and some field surveys, we consider that the presence of *P. granitica* Br.-Bl. subsp. *granitica* is highly doubtful in the Romanian Carpathians and, consequently, this taxon should be removed from checklists of the Romanian flora.

Keywords: *Poa granitica* group, disjunctive distribution, chorology, Romanian Carpathians

Introduction

The *Poa granitica* group, endemic to the Carpathian Mountains, belongs to section *Cenisia* Ascherson & Graebner (sect. *Stoloniferae* Nannf., *pro parte*) [13], together with *P. arctica* R.Br. and *P. cenisia* All. The species of this section are perennial, rhizomatous plants, with extra-vaginal sterile shoots and usually with distichously arranged leaves. The *Poa granitica* group comprises two taxa [20], morphologically distinguishable and with disjunct distribution ranges, *Poa granitica* Br.-Bl. subsp. *granitica* and *P. granitica* Br.-Bl. subsp. *disparilis* (Nyár.) Nyár. Both taxa are confined to primary (sub-) alpine acidocline snow-patch scrub, belonging to the phytosociological order *Salicetalia herbaceae* Br.-Bl. 1926 [10, 14].

The distribution of *P. granitica* subsp. *granitica* is restricted to the Western Carpathians, while subsp. *disparilis* occurs in the South-Eastern Carpathians. This disjunctive distribution of the *Poa granitica* group was controversial, as some authors had reported the occurrence of *P. granitica* subsp. *granitica* in the Romanian Carpathians [19, 18, 25]. Subsequently, the reporting of this taxon from the Romanian Carpathians was considered to be an error [12], whereas Beldie (1979) did not mention *P. granitica* subsp. *granitica* in the list of vascular plants of Romania. Other authors [7, 22] included both taxa in the flora of the South-Eastern Carpathians, as opposed to Edmondson (1980) and Marhold & Hindák (1998) who considered *P. granitica* subsp. *granitica* as endemic to the Western Carpathians.

The purpose of this work is to analyze critically the information from botanical literature that has included *Poa granitica* Br.-Bl. subsp. *granitica* in the flora of Romania. Moreover, we present a short description of the two taxa within the *Poa granitica* group, underlining the distinctive characters between them as well as the detailed distribution of *P. granitica* Br.-Bl. subsp. *disparilis* in Romania.

Brief taxonomic history of the *Poa granitica* grup

During the 5th International Phytogeographic Excursion, held in 1928 in the Tatra Mountains, J. Braun-Blanquet observed a species of *Poa* that occurred abundantly in communities developed on lithosols [4]. Initially, it was considered to be *Poa cenisia* All., but subsequently proved to be a new species, unknown until then. Unable to assign this taxon to any known species, in 1929 Braun-Blanquet described a new species for science, namely *Poa granitica*.

Four years later, E. Nyárády (1933), studying herbarium material of specimens of *P. granitica* Br.-Bl. collected from the Maramureş and Rodna Mountains, described the variety *disparilis* that is distinguished from the type of the species through certain morphological characters, both qualitative (colour of the spikelets) and quantitative (indumentum of the lemma, length of the panicle, width of the stem leaves).

Chrtek & Jirásek (1964) considered *P. granitica* subsp. *granitica* to be endemic to the Western Carpathians, while for the populations of the South-Eastern Carpathians they described a new species, i.e. *Poa deylii*, into which they subsumed in synonymy *P. granitica* Br.-Bl. var. *disparilis* Nyár. and *P. granitica* Br.-Bl. var. *subcarpatica* Jirásek.

E. Nyárády (1965) reconsidered the taxonomic rank of var. *disparilis* Nyár., assigning it subspecific rank (*P. granitica* Br.-Bl. subsp. *disparilis* (Nyár.) Nyár), in which he included *P. deylii* Chrtek & Jirásek in synonymy.

Materials and Methods

In order to clarify the presence of *Poa granitica* subsp. *granitica* in the Romanian flora, the revision of herbarium material and field research complemented the study of the literature. To this purpose, the following public herbaria were consulted (herbarium acronyms according to [26]): BUC, BUCA, BUCM, CL, CLA, IAGB, SIB. The study of herbarium material involved critical examination of all herbarium sheets of the taxa belonging to *Poa granitica* group from the whole of the Carpathian Mountains.

The field study included a field trip to the Western Carpathians (High Tatra) for the collection of specimens of *P. granitica* subsp. *granitica*. Research was also carried out in the Romanian Carpathians in order to check in the field literature data concerning the chorology of *P. granitica* subsp. *disparilis* in Romania.

Subsequently, on the basis of literature [4, 6, 20] and herbarium material, the morphological characters used to differentiate *P. granitica* subsp. *granitica* and *P. granitica* subsp. *disparilis* were highlighted. Forty-eight individuals of *P. granitica* subsp. *granitica* were studied (of which 25 were from herbarium collections and 23 collected during the field surveys) and 132 individuals of *P. granitica* subsp. *disparilis* (97 from herbarium collections, 35 from field surveys). The following features were examined: plant habit, stem length, width of stem leaves, lamina morphology, panicle shape, panicle length, number of spikelets on the branches, spikelet length and number of florets, glume colour and lemma indumentum. In order to emphasize the morphologically distinctive features between the two taxa, detailed photos of spikelets were taken using the Optika SZR-14 stereomicroscope. The photos represent original herbarium material collected from Smutná Dolina (High Tatra) of *P. granitica* subsp. *granitica*, and Rebra Peak (Rodna Mts) in the case of *P. granitica* subsp. *disparilis*.

Results and Discussion

Brief morphological presentation

For a better distinction between the two taxa of the *Poa granitica* group, their main morphological characters are presented comparatively (Tab.1). *P. granitica* subsp. *disparilis* can be distinguished from the type of the species mainly upon the degree of development of the indumentum of the lemma. By analyzing the spikelet of the two taxa, it can be noticed that in *P.*

granitica subsp. *granitica* the rows of hairs on the lateral veins and midrib of the lemma appeared as conspicuous whitish stripes (Figs 1 & 2). Important variations of these characters were not detected within the individuals analyzed, each one of them being definitely assigned to one of the two taxa (i.e. subsp. *disparilis* or subsp. *granitica*).

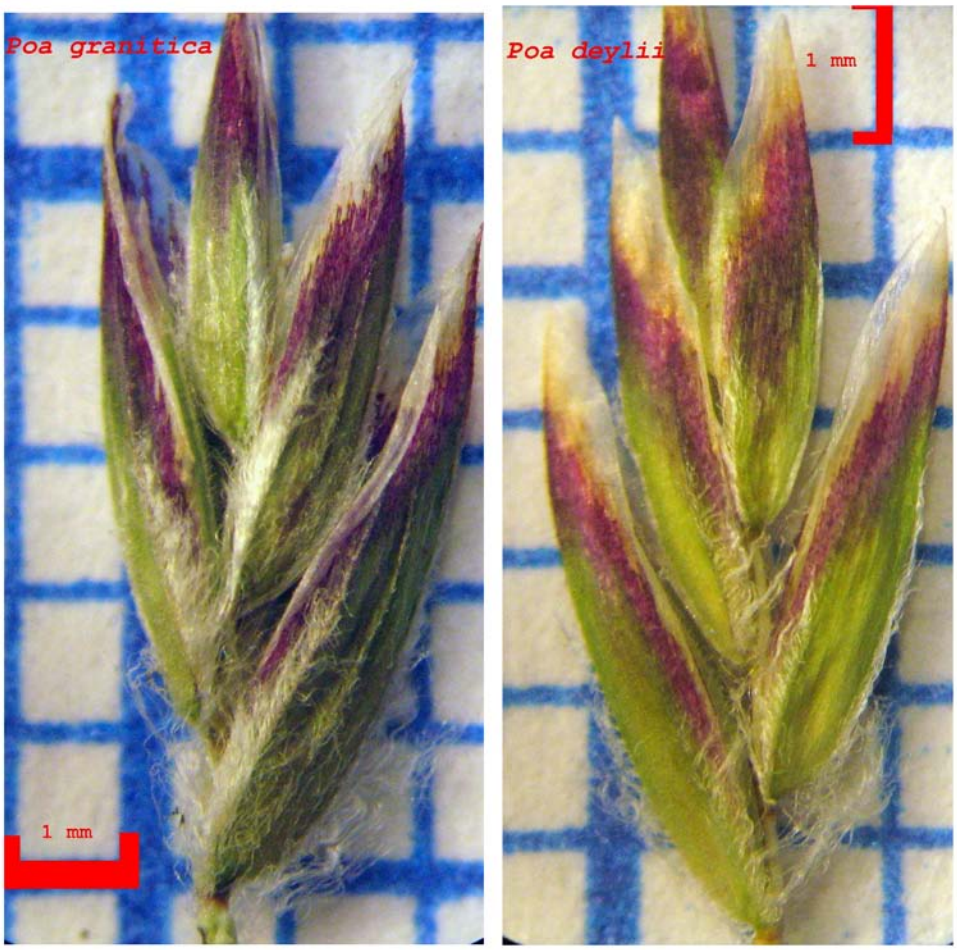

Fig. 1: Comparative morphology of the spikelets of *Poa granitica* subsp. *granitica* (left) and *P deylii* (right).

Reconsidering the presence of *Poa granitica* subsp. *granitica* in the Romanian flora

First, E. Nyárády (1933) mentioned *P. granitica* subsp. *granitica* from the Rodna Mts, Bucegi Mts, Făgăraş Mts and Ţarcu Massif. Nevertheless, he specified neither the source of this information, nor the herbarium material he studied in order to support these chorological data. In addition, A. Nyárády (1950) also reported, besides *P. granitica* subsp. *disparilis*, *P. granitica* subsp. *granitica* in the Rodnei Mts, even specifying the existence of herbarium material for the type of the species.

But Chrtek & Jirásek (1964) found no herbarium sheets with specimens of *P. granitica* subsp. *granitica* collected from the South-Eastern Carpathians and, in 1965, E. Nyárády reconsidered his position on the chorology of *P. granitica* subsp. *granitica* by limiting its distribution to the Western Carpathians.

Şerbănescu (1971) relied on older information [18]; [1] on the distribution of the taxon *P. granitica* subsp. *granitica* in Romania, also specifying herbarium material in support of this information. Still, by reviewing the public herbaria mentioned by the author (CL, BUCA), no herbarium sheets with specimens of *P. granitica* subsp. *granitica* collected in Romania were identified.

Ciocârlan (2000), on the basis of older bibliographical sources, mentioned the occurrence of *P. granitica* subsp. *granitica* in the Rodna Mts, but the information was not supported by any herbarium material (V. Ciocârlan, pers. comm.).

Until now no data regarding the presence of *P. granitica* subsp. *granitica* in the Romanian Carpathians could be confirmed on the basis of herbarium material, so this taxon should be considered as doubtfully present in the Romanian Flora.

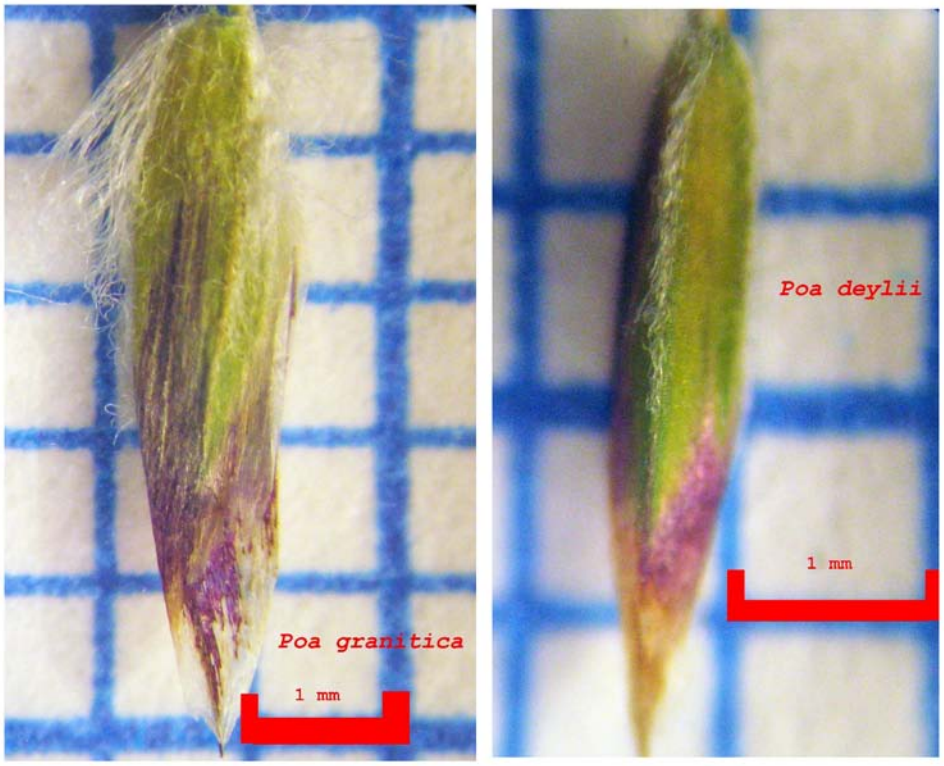

Fig. 2: Comparative morphology of the lemma in *Poa granitica* subsp. *granitica* (left) and *P deylii* (right).

Table 1: Distinctive morphological characters of the taxa assigned to the *Poa granitica* group (based on [4, 6, 12]). The most important characters for distinguishing the two taxa are presented in bold.

POA GRANITICA SUBSP. ***GRANITICA***	***POA GRANITICA*** SUBSP. ***DISPARILIS***
robust plants, rhizomatous, with multiple stems	more or less caespitose plants, with stoloniferous rhizomes
stems erect, 25–40 cm tall	stems ascending at the base, then erect, 30–50 (70) long
basal cauline leaves 2–4 mm wide, prominently nerved	leaves more or less strap-shaped, with a flat or pleated lamina; stem leaves 2 mm wide and 5-8 cm long, more or less patent
ovoid, contracted panicle; lower branches of the panicle 2–7, all erect, than patulous	ovoid panicle, 5–8 cm long, more or less patent, divaricate
up to 12 spikelets on the panicle branch	2–12 spikelets on the panicle branch
spikelets with 3–5 florets, 6–8 mm long	spikelets with 2–5 florets, 5–8 mm long
glabrous, violet glumes; the inferior glume 3.8 mm long, the superior glume 4 mm long	brown-yellow glumes, rarely variegated violet, the inferior glume 3–3.5mm, the superior glume 3.8–4mm long
lemma clearly nerved, abundantly crispate-hairy on the keel and marginal veins, densely lanate at the base	**lemma with short, straight hairs on keel and marginal veins, sparsely lanate at the base**

Geographical distribution of ***Poa granitica*** subsp. ***disparilis***

P. granitica subsp. ***disparilis*** is endemic to the South-Eastern Carpathians (Fig. 3). This taxon occurs in: Maramureş Mts, Rodna Mts, Bucegi Mts, Iezer-Păpuşa Mts (a new locality, discovered during our field surveys), Făgăraş Mts, Parâng Mts, Retezat Mts, Godeanu Mts and Cernei Mts (Tab. 2).

Mititelu *et al*. (1989) reported the taxon as occurring in the Suhard Mountains (Suceava County), but no *P. granitica* subsp. *disparilis* voucher specimens from the Suhard Mts are deposited in any public herbarium. During our field surveys in this mountain range, we found neither this taxon, nor the habitat characteristic for *P. granitica* subsp. *disparis* (*Salicetalia herbaceae*). Considering all these aspects, the presence of *P. granitica* subsp. *disparilis* in this mountain should be considered for the moment as highly doubtful. Also, this taxon was reported from Sâlhoi (1200 m alt., Maramureş Mts; [12, 8]), but there are no herbarium specimens collected from this place and it seems that these reports were erroneous (G. Coldea, personal observation).

Table 2: The distribution of *P. granitica* subsp. *disparilis* in Romania (localities marked in bold are certified through herbarium material).

MASSIF	LOCALITY	REFFERENCES
Bucegi	Creasta Morarului, Găvanele, **Vf. Omu, Vf. Furnica**, Valea Cerbului	Nyárády E., 1965; Beldie, 1967; Şerbănescu, 1971; Ghişa & Beldie , 1972 **Exs**.: **CL**
Cernei	Vf. Dobrii	Boşcaiu, 1971; Şerbănescu, 1971; Ghişa & Beldie, 1972
Făgăraş	Bâlea, **V. Doamnei**, **Vf. Moşului**, Vf. Paltinu, Vf. Vânătoarea lui Buteanu, Vf. Piscului, Valea Brescioarei, **Vf. Râiosu**	Buia & Todor, 1948; Nyárády E., 1967; Şerbănescu, 1971; Puşcaru- Soroceanu & Puşcaru, 1971; Drăgulescu, 2003 **Exs: CL, SIB**
Godeanu		Ghişa & Beldie, 1972; Negrean & Oltean, 1989
Iezer-Păpuşa	Lacul Iezer	**Exs: CL (new locality for Carpathians)**
Maramureş	**Pop Ivan**	Nyárády E. 1965; Şerbănescu, 1971 ; Ghişa & Beldie, 1972, **Exs: CL**
Parâng	Vf. Mândra, Vf. Cârja	Şerbănescu, 1971; Ghişa & Beldie, 1972
Retezat	Lacul Gemenea, Lacul Zănoaga, **Poarta Bucurii**, Tăul Negru,	Nyárády E. 1965; Şerbănescu, 1971, Ghişa & Beldie, 1972 **Exs.: SIB**
Rodna	Beneş, Buhăiescu, **Corongiş, Ineu**, **Valea Lala**, **Obârşia Rebrii**, **Pietrosul Mare**, Cişa-Omul, Anieşul Mare, Anieşul Mic, Vf. Gărgălău, Vf. Laptelui, Vf. Momaia, Vf. Piatra Alba, **Rebra**, Repedea, Puzdra	Nyárády, A., 1950; Nyárády E.,1965; Şerbănescu, 1971; Ghişa & Beldie, 1972; Coldea, 1990 **Exs: CL, SIB**
Ţarcu	Ţarcu-Petreanu	Ghişa & Beldie, 1972; Negrean & Oltean, 1989

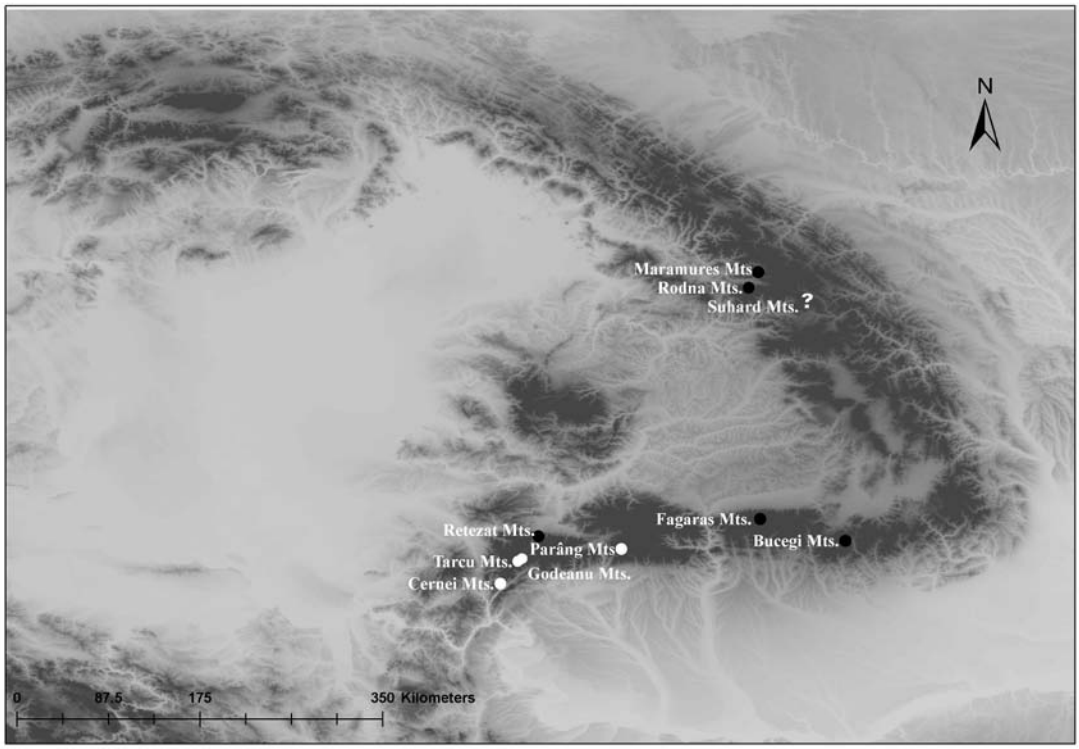

Fig. 3: The distribution of *Poa granitica* subsp. *disparilis* in the Romanian Carpathians (●- massif in which the occurrence is certified through herbarium material, ○ - only bibliographical data, no voucher specimen, ?- doubtful occurrence)

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PREZENŢA GRUPULUI *POA GRANITICA* ÎN CARPAŢII ROMÂNEŞTI

(Rezumat)

Lucrarea prezintă o analiză critică asupra prezenţei în flora României a grupului *Poa granitica*, endemic pentru Munţii Carpaţi şi care reuneşte doi taxoni: *Poa granitica* Braun-Blanq. subsp. *granitica* şi *Poa granitica* Braun-Blanq. subsp. *disparilis* (Nyár.) Nyár.

Principalele caracteristici morfologice ale subspeciilor *granitica* şi *disparilis* sunt prezentate comparativ, cu sublinierea gradului diferit de dezvoltare a indumentului lemei, care reprezintă cel mai important caracter de diferenţiere. Astfel, sunt prezentate imagini de detaliu a spiculeţelor celor doi taxoni ai grupului *P. granitica*.

Întrucât până în prezent nici o informaţie referitoare la prezenţa taxonului *Poa granitica* subsp. *granitica* în flora României nu este susţinută prin material de herbar, acesta trebuie considerat ca dubios în flora Carpaţilor româneşti. De asemenea, lucrarea realizează o sinteză a datelor existente asupra răspândirii subspeciei *Poa granitica* subsp. *disparilis* în România. O nouă localitate (Munţii Iezer-Păpuşa), descoperită în decursul deplasărilor noastre pe teren, este de asemenea raportată.

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