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PRELIMINARY DATA ABOUT THE CHOROLOGY OF THE SPECIES *SEMPERVIVUM MARMOREUM* GRISEB. (CRASSULACEAE) IN SOUTHERN CARPATIAN MOUNTAINS IN ROMANIA.

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Abstract: *Sempervivum marmoreum* Griseb**.** is a monocarpic crassulacean that perennates by offshoots. It has 12-16-merous flowers, with white pink(ish) petals sometimes white striated with pink-or garnet-red to burgundy mid-petal veins. The ciliated leaves, are glandular hairy on both sides in young specimens or in young leaves becoming glabrescent in older leaves or old specimens late in the summer.

The species is a carpato-balcanic (*dacian*) element, with a range spanning between cca. 15°E-27°E meridians, reaching eastwards the Turkish borders and the Croatian Adriatic coast westwards. In Romania it is distributed throughout the country, showing some degree of ecological amplitude, the species inhabiting preponderantly dryer habitats in rocky locations with high altitudinal preference.

The region involved in our study spans North of Danube being limited approximately by the 46°N parallel to the North, comprising a wide variety of habitats from the Danube flood plains to the highest peaks in the Romanian Carpathian Mountains (an altitude ranging between n 50 - 2550m a.s.l.), with a climate and edaphic conditions similarly diverse.

Our study presents a more precise distribution list of the locations from which *Sempervivum marmoreum* Griseb. was mentioned and a grid map in the UTM projection system of the species distribution in Southern Carpathian Mountains, together with some chorological and ecological considerations with regard to biotic and abiotic factors involved in its distribution.

Keywords: *Sempervivum marmoreum* Griseb, *Crassulaceae*, chorology, Southern Carpathian Mountain range, Romania, distribution UTM grid map, UTM geocodes, ecology, phyto-coenology.

Background

Sempervivum marmoreum Griseb. is a crassulacean described by Grisebach in 1843 in the first volume of *Spicilegium Florae Rumelicae et Bithynicae* [18] from Mt Athos, Greece: "In m. *Athone*: in regione subalpina versus pinetum (substr. marmor.)"

It is a monocarpic perennial blooming only after several years of vegetation. A hardy xerophyte, it tolerates well large variations of temperature, humidity and insolation, due to special metabolic and morphologic adaptations to save and store water in their succulent mesophyll. As its special vacuolar and metabolic apparatus can minimize O_2 toxic effects on tissues, this plant is not required to open the stomata during photosynthesis. This adaptation allows it to continue photosynthetic CO_2 fixation even in the absence of liquid water sources.

Its soil requirements add to this plants considerable ecological amplitude, matched only by its vegetative inexhaustible propagation apparatus. *Sempervivum marmoreum* Griseb. is a long-lived perennial, propagating via stolons like most of other *Semperviva*. The promiscuity observed amongst the other *Sempervivum s.s.* species supposedly produced in this case some putative hybrids with *S tectorum*, amongst which *S. michaelis-borsi* Domk. is notorious in Romania; they were contested by later authors and rejected or synonymised. A notable exception form this hybridizing facility is shown by *Jovibarba heuffelii* (Schott) A&D Love, which in populations highly mixed with *S. marmoreum* Griseb showed not a single hybrid [2].

It has a wealth of synonims, of which the following were described from Romanian Carpathians also being the most often used in floristic works concerning the region of interest.

Sempervivum assimile Schott, and *S. blandum* Schott were both described in 1853 from Romanian Carpathians "ex Siebenburgen" [34]; *S. rubicundum* Schur, (1858) described from Turda Canyon, in Apuseni Mts. [38, 39].

Domokos, [14] described *S. banaticum* from Banat, close to Svinița "*ad Danubium inferiorem in rupibus rhyoliticis, montis Treskovác, ad pagum Szvinica alt. cca. 700 m*", and in 1935 the notorious 'hybrid' *S. michaelis-borsii* Domk. from Bihor Mts. '*in Transsilvania, Biharicum, In Tordai hasadék et prope pag. Rorockó in mt. Székelykó, ad rupes calcareas'*.

Although *S. schlehanii* Schott (1853), was described form Dalmatian Alps, it is often cited in Romania.

Like in the case of *Jovibarba heuffelii* (Schott) A&D Love [2], our field observations on live specimens revealed a considerable variation in the characters involved in the delineation of the derived taxa which are merely gradual transition forms, therefore, based on morphological characters, we subscribe to the view expressed in Atlas Florae Europae [21] that unites all the related taxa under this name *S. marmoreum* Griseb.

We have found for instance plants corresponding to *S. michaelis-borsi* Domk. in sites in Banat and Bucegi, where the putative parent *S. tectorum* is clearly missing and various transition forms could be attributed to several former 'allied species'.

Like other *Semperviva* and *Jovibarba heuffelii* (Schott) A&D Love, *S. marmoreum* Griseb. populations consist of relatively compact clones that show some geographical isolation which limits severely the gene flow between them thus favoring speciation [2].

In other species from *Sempervivum s.l.* the populations have evolved gradients of characters in conspecific adjacent clonal populations, making positive identification of taxa at least challenging. Obeying this generic characteristic, *Sempervivum marmoreum* Griseb. is a taxon rather difficult to identify when only rosettes are available, easily distinguishable from the others only when blooming. The widely accepted character of leaf pubescence is variable and unreliable, but the dimension of mature rosettes that are many folds larger than the reddish-flowers, distinguish at a glance typical *Sempervivum marmoreum* Griseb. plants from the other redish-flowered Romanian native taxa.

Taxonomically, at supraspecific infrageneric level, according to Atlas Florae Europaeae [21] *S. marmoreum* Griseb. has a definite status being subordinated to *Sempervivum s.s.*

At specific level, despite the continual variation of some of its characters like petal color and shape, leaf pubescence; leaf colour and shape; etc, approaching it to *S. tectorum*, *S. marmoreum* Griseb. is a rather well circumscribed species, although encompassing several ill defined infraspecific components. In Romania, several taxa described during the last 150 years could be ascribed to *Sempervivum marmoreum* Griseb. The taxa presently ascribed to *Sempervivum marmoreum* Griseb and most frequently cited from the region that we have studied include *S. rubicundum* Schur, *S. schlehani* Schott, *S. blandum* Schott, *S. assimile* Schott, *S. heterophyllum Haszl non* Jav, *S. blandum* Schott, *S. michaelis-borsi* Domk.

Phylogenetically and systematically, *Sempervivum marmoreum* Griseb. is related closest to *S. tectorum* complex and then to the rest of *Sempervivum s.l.* taxa.

From an ecological standpoint, *Sempervivum marmoreum* Griseb. typically is a thermophylous xerophyte, and usually a saxicolous-chasmophylous orophyte. Its substrate requirements are diverse, showing a marked preference for limestones, but accepting and even thriving on a range of substrates including schistose, riolithic and trachytic. It builds cushion-like conglomerations of densely packed rosettes of clonal vegetative descent, making good use of every crack or coarseness of sheer rock walls. In Romania it typically prefers fertile soils like calcicolous rendzina on well-drained exposed limestones, although it shows considerable

ecological amplitude. Its altitudinal range spans from virtually sea level in Banat to over 2300m *s.m.* in the highest Carpathians

From a phyto-geographical and chorological point of view, *Sempervivum marmoreum* Griseb. is a characteristic carpatho-balcanic (*dacian*) floristic element, with a European range spanning between cca. 15°E-27°E meridians, reaching eastwards the Turkish borders and the Croatian Adriatic coast westwards. Its native range is confined to the mountains of the Greek peninsula, the Balkans and all of the Carpathian mountain chain.

Based on the classification of Meusel et al [27], *Sempervivum marmoreum* Griseb. could be designated as a central (S) European orophyte, due to its prevailing occurrence (besides the Carpathian mountains) in Balkan, Balkan-Rhodope, Dinaric, and Scardo-Pindic orographic systems.

As t'Hart work suggests [19], the Carpathians, together with the Balkans might have very well been a speciation center in *Sedum*, and probably contributed to the speciation of *Sempervivum* as well.

In Romania it is well spread throughout the country, showing broad ecological amplitude, the species mostly dwelling in dry habitats of higher rocky zones. According to Atlas Florae Europae, in Romania, it occures over the entire Carpatian chain.The region involved in our study spans North of Danube being limited approximately by the 44°N to the South and by 46°N parallel to the north; and spanning between 21° E meridian to the West and 27° E meridian towards East. It comprises the mountains situated approximately between km 4900-5100N of the UTM projection zones 34 and 35.

The studied region comprises a wide variety of habitats from the Danube flood plains to the highest peaks in the Romanian Carpathian Mountains (an altitude ranging between 50 - 2550m a.s.l).

The climate is extreme-continental characterized by wide annual and diurnal variations in temperature and rainfall, the region also showing similarly diverse ground cover and edaphic conditions.

This study presents a more precise distribution list of the sites from which *Sempervivum marmoreum* Griseb. was mentioned and the first grid map in the UTM projection system depicting the species distribution in Southern Carpathian Mountains, together with some chorological and ecological considerations with regard to biotic and abiotic factors involved in its distribution.

Method

At this stage we have encompassed under *Sempervivum marmoreum* Griseb. all the citations that were not obviously erroneous, considering all synonymised taxa that are presently assigned to *Sempervivum marmoreum* Griseb. as listed above. We have also checked herbarium material from several very important herbaria in: Bucharest (-BUCA, BUAG, BUC), Cluj (-CL), Iasi (-I), Vienna (-W, WU), Montpellier (-MPU), Munchen (-M, MSB), Prague (-PRC), and incorporated data gathered there where applicable, along with data from fieldwork and personal collections of the authors. A locality was positively confirmed only when floriferous specimens were found. To establish the UTM geocodes for the locations cited we have used when applicable Lehrer's work about the cartography of Romanian fauna and flora using arealographic coordinates [23] or geocodes derived from GPS coordinate readings from surveys done by the authors. The UTM geocodes were given when possible for the closest human settlement available.

For the cases when the citations were too ambiguous or couldn't be precisely located, we have only indicated the UTM 100km-quadrants geocodes. For each location cited we have mentioned when available altitudes, citation sources and the name under which the plants were cited by each author where it differed from the accepted species name. Due to the limited space available and because this wasn't the objective of this study, we haven't presented in this report

data like collection dates, ecological and phyto-sociological information which will form the object of a future article.

Results

Our results comprise a number of 124 locations cited, in which *Sempervivum marmoreum* Griseb. was mentioned, sometimes redundantly. Out of these, 29 locations were reported before 1957, a number of 60 are reports published by other scholars after Răvăruț's monographic work from Flora RPR [31] until now, and a number of 35 are citations of new locations or older locations for which we have positively confirmed the presence of *Sempervivum marmoreum* Griseb, strictly based on floriferous specimens. The locations were sorted by county and by UTM geocode. The data are presented below in tabular format (see Table 1),

Table 1: Location list from where *Sempervivum marmoreum* Grieseb **was mentioned**

County	**Location and Altitude** (*m. s. m.*)	**UTM Geocode***	**Information Source****
AG	Cheia Argeşului by Arefu (r. Curtea de Argeş)	LL12	[4]
BV	*Sub S. schlehani* Mts Făgăraş Piatra Budei		[31]
BV	*Sub S. schlehani* Mts Făgăraş Cheia Gegiu		[31]
BV	*S. "tectorum"* Piatra Craiului 1800-1900 m	LL64	[14] [24]
BV	Mt Piatra Craiului Mare above Zărneşti	LL64	[24]
BV	*Sub S. blandum* Schott, Plant. Trans. Herbarii Schott 305. In australii alpium tractu, alt 7100ped. Die 12 Aug. 1850 legit Th. Kotschy in monte Krajuluj	LL64	W0005262
BV	Zărneşti	LL64	[4]
BV	Râşnov	LL74	**(B 98)**
BV	Racoşu de Jos	LL79	[4]
BV	Postăvaru Mt	LL84	[4] [24]
BV	*Sub S. blandum* Brasso, leg. G Moesz 21 Jul 1903	LL85	W1930-3161
BV	*Sub S. rubicudum* Schur Kronstadt, leg. J. Barth 14 Aug 1895 1000msm *Transsilvania in rupibus subalpinis*	LL85	PRC #na
BV	*Sub S. rubicudum* Schur Kronstadt, (PRC in Herb Dr. C. Bainitz Herb. Europ. Flora Transsilvanica leg. J. Barth 19.07.1879 *Ad saxa*	LL85	PRC #na
BV	Braşov, cult. in Greek cemetery	LL85	**(B 98)**
BV	Mt Postăvaru (Piatra Christianului), 1800 m	LL85	[24]
BV	+ *sub erythraeum* Mt Tâmpa, by Braşov	LL85	[24]
BV	Rock close to Brasov, 1200 m	LL85	[24]
BV	*Sub S. schlehani* Braşov	LL85	[31]
BV	Oraşul Braşov on Timpa	LL85	[4]
BV	*S. sub assimile* Schott Braşov on Timpa (W in Herb Johann Vetter Steinige Abhange der Zinne bei Kronstadt 21.VII.1918 leg. Johann Vetter)	LL85	W1947-18930
BV	*S. sub assimile* Schott Braşov on Timpa (W in Herb Ernest Korb Auf Burgwiesen am Sudabhange de Zinne bei Kronstadt 21.VII.1918 Leg L. Wallender)	LL85	W2823
CS	The vegetation of the pastures from the Aninei mountains	EQ69	[2]
CS	Cozla (Defileul Dunării)	EQ74	**(B&N 04)**
CS	Drencova (Defileul Dunării)	EQ74	**(B&N 04)**
CS	Plavişeviţa	EQ93	**(B 93)**
CS	Cheile Caraşului şi ale Gârliştei	ER60	[35], [36] **(B97)**
CS	Cheile Gârliştei	ER60	[35], [36] **(B 84, 93,97)**
CS	Cheile Caraşului	ER60	[35], [36] **(B 93)**
CS	Doman	ER71	**(B 93)**

CS	Banat Cerna Valey, by Gîrdomanul and downwords	FQ	[8]**(B&N 95)**
CS	above Băile Herculane, near Mehadia, on limestone rocks	FQ07	**(B 93)**
CS	In the neighborhoods of Mehadia	FQ07	[8]
CS	Mt Străjuțului between Mehadia and Băile Herculane	FQ07	[8]
CS	Globurău	FQ08	**(B 93)**
CS	Ciorici near Băile Herculane, on limestone rocks	FQ16	**(B 93**
CS	Sub *S. schlehani*, *In rupibue calcareis loco Ciorici dicto prope Băile Herculane*, 01.07.1931, *(* in PRC Herb. K Domin et V Krajina: Iter Romanicum 1931 No162)	FQ16	**PRC #na**
CS	Sub *S. schlehani*, *Sub caumine montis Domogled prope Băile Herculane*, 01.07.1931, *(* in PRC Herb. K Domin et V Krajina: Iter Romanicum 1931)	FQ17	**PRC #na**
CS	Pecinișca near Băile Herculane, on limestone rocks	FQ16	**(B 93)**
CS	Cheile Rudăriei (W of Baile Herculane)	FQ17	**(B 93)**
CS	Mt Domogled near Băile Herculane 900-1060 m	FQ17	**(B 93-99) (B&N 03) (N 03)**
CS	Băile Herculane cult. + sub *S. schlehani*	FQ17	**(B 97)** +[31]
CS	*sub assimile* Mt Domogled near Băile Herculane 900-1060 m	FQ17	[12]
CS	*sub erythraeum* Mt Domogled near Băile Herculane 900-1060 m	FQ17	[24]
CS	Mt Domogled near Băile Herculane	FQ17	[31]
CS	+ *sub erythraeum* around Băile Herculane	FQ17	[8][24]
CS	*sub assimile* Schott CK Schneider, (Prope Herkulesbad aug 1907 leg Golopencza)	FQ17	W1907-20554
CS	Cornereva	FQ19	**(B 93)**
CS	Jidoștița	FQ25	**(B 93)**
CS	Gornenti	FQ27	**(B 93)**
DB	NE of Câmpulung: Mt Mateiaș, limestone rocks, S and SSE	LL41	**(B&N 04)**
DB	*sub blandum* Valea Mare în Muscel	LL50	[16]
DB	Rucăr above Ghimbav and by Dîmbovicioara	LL52	(12)
DB	P Craiului Cheile Dâmbovicioarei, above 700 m	LL52	**(B 87)**
DB	NE of Rucăr: limestone rocks in Pasul Giuvala, 1000 m	LL52	**(B&N 04)**
DB	*sub blandum* Cheile Dâmbovicioara, cca800 m	LL52	[16]
DB	Strunga, limestone rocky slopes, 1700-1900 m	LL52	[4]
DB	Piatra Craiului Creasta Sudica at “Seaua Funduri” to “Refugiul la Grind” (Leg Ciocarlan 14 08 1959)	LL74	BUAG6582
DB	*Sub S. schlehani* Bran-Poarta	LL74	[31]
DB	Bran-Poarta	LL74	[4]
GJ	Mt Piatra Cloșanilor, on limestone rocks, intensively grazed	FQ49	**(B 92)**
GJ	Mtii Mehedinților pe Piatra Cloșanilor (r. Baia de Aramă);	FQ49	[4]
GJ	*sub wettsteinii* Zănoaga Slăveiului Mts Parîngului, 2200 m	FR91	[24]
GJ	Parâng Mts Coasta lui Rusu alt 2000-2200, (Leg Ciocarlan 12.08.61)	GR14	BUAG6583
HD	*sub wettsteinii* Retezat Zănoga lake, 1950-2000 m	**FR**	[24]
HD	*sub wettsteinii* Retezat between Carja and Slăveiu peaks 2350m	**FR**	[24]
HD	*sub wettsteinii* Retezat Tăul Negru, 1950m	**FR**	[24]
HD	Retezat, Rîul Mare, near Gura Zlata 850 m s.m.	**FR**	[24]
HD	Retezat Mts, Gura Zlata	**FR**	[8]
HD	E of Sadova Nouă	FR01	[8]
HD	valea Rîul Mare 550-900 m leg Nyarady 08.08.1925 BUC320779, BUCA180580, BUCA190177, W1965-7627	FR43	[8]
HD	Retezat, valea Rîul Mare, towards Clopotiva	FR44	[24]
HD	*sub matricum* Deva;	FR48	[24]
MH	*Sub S. schlehani* Vârciorova	FQ15	[31] **(B 84, 93,97)**
MH	Dubova (Defileul Dunării)	EQ04	**(B&N 04)**
MH	Mraconia Valley	EQ05	**(B93)**

MH	*Sub S. schlehani* Valley of the Danube	EQ74	[31]
MH	Şvinița (Defileul Dunării)	EQ82	**(B&N 04)**
MH	*sub erythraeum* Cerna Valley	FQ	[24]
MH	Cerna valey between Băile Herculane and Cerna Sat	FQ	[8]
MH	Mt Străjuț between Mehadia and Băile Herculane	FQ07	[8][24]
MH	Inelet	FQ18	**(B 93)**
MH	Balta Cerbului	FQ18	**(B 93),(N04)**
MH	Valea Țesnei	FQ18	(**B&N 99, 00) (N 03)**
MH	Cerna valley by Cerna Sat	FQ49	[8]**(B&N04)**
PH	Bucegi:	LL	[16]
PH	*sub blandum* Bucegi Mt Zănoaga	LL72	[4]
PH	*sub blandum* Zănoaga	LL72	[4]
PH	*sub blandum* Bucegi Horoabei Valley	LL73	[4],
PH	*sub blandum* Bucegi Mt Bătrina, on the rock walls of Turnul Seciului	LL73	[4], **(B 97)**
PH	*sub assimile* Bucegi, Cerbului Valley	LL82	[15]
PH	*sub assimile* Bucegi Mt Omu, limestone, 1800-1900 m	LL82	[15]
PH	*sub S. schlehani* Bucegi Mt Urlătoarea	LL82	[31]
PH	In montibus Bucegi *in valle* Valea Cerbului sub cacumine *montis Omu, solo calcareo, 1800-1900m.sm. leg Krajina3930 09.07.1931 (* in PRC Herb. K Domin et V Krajina: Iter Romanicum 1931 No940)	LL82	PRC #na
PH	*sub S. schlehani* Mt Bucegi Cerbului Valley	LL82	[31]
PH	*sub S. schlehani* Strunga	LL82	[31]
PH	*sub blandum* Bucegi Poiana Pustnicului	LL82	[4]
PH	*sub blandum* Bucegi Jepii Mici Mt. "la Urlătoarea"	LL82	[4]
PH	*sub blandum* Bucegi Mt Caraiman ("pe branele de pe versantul sudic")	LL82	[4]
PH	*sub blandum* Bucegi Brina Urlătorilor 1550 m	LL82	[4]
PH	*sub blandum* Bucegi, Poiana Tirlelor	LL82	[4]
PH	*sub blandum* Bucegi, Valea Babei,	LL82	[4]
PH	*sub blandum* Bucegi, Valea Alba, 1550 m	LL82	[4]
PH	*sub blandum* Bucegi, Valea Cerbului	LL82	[4]
PH	*sub blandum* Bucegi Mt Omu, limestone, 1800-1900 m	LL82	[4]
PH	*sub blandum* Bucegi Mt Furnica, Valea Călugarului	LL82	[4]
PH	*sub blandum* Bucegi Piatra Arsă,	LL82	[4]
PH	*sub blandum* Bucegi Poiana Stânii	LL82	[4]
PH	*sub blandum* Sinaia at Sf. Anna rock	LL82	[4] **(B 97)(N02)**
PH	Mt Baicu	LL82	[8]
SB	*Sub S. schlehani* Mediaş	KL67	[31]
SB	*Sub S. schlehani* Vorumloc (Mediaş)	KL67	[31]
SB	*Sub S. schlehani* Cristian de Sibiu	KL67	[31]
SB	*Sub S. schlehani* Şeica Mică (Mediaş)	KL67	[31]
SB	Pasul Turnu Roşu.	KL85	[39]
SB	Făgăraş on sandstone rocks near Vidraru Dam, W side, 800-900m	LL13	**(B 98)**
VL	Buila Mts, Mt. Stogşoare, close to the tunnel	KL71	(9) [29]

*The UTM geocodes were given when possible for the closest human settlement available, and when the locations couldn't be precisely located, we have only indicated the UTM 100km-quadrants geocodes.

**For the information source se the reference list. New locations or older locations in which we positively confirmed the presence of *Sempervivum marmoreum* Grieseb. are highlighted. In several sites specimens were found in subsequent years, which were equally mentioned for reference. From these sites, specimens usually were either photographed, or collected and stored dried or preserved in ethanol in authors' collections.

(BN + XX) = (Barca & Niculae + the last 2 digits of the year when the plant was found *in situ*) *e.g.* (BN 04) = (Barca & Niculae 2004)

(B + XX) = (Barca + the last 2 digits of the year when the plant was found *in situ*)

(N + XX) = (Niculae + the last 2 digits of the year when the plant was found *in situ*)

W#### = Herbarium acronym (according to: Holmgren, et al. 1998) and sheet number of the herbarium sheets bearing the cited specimen

#na = Sheet number non available at the time of herbarium visit

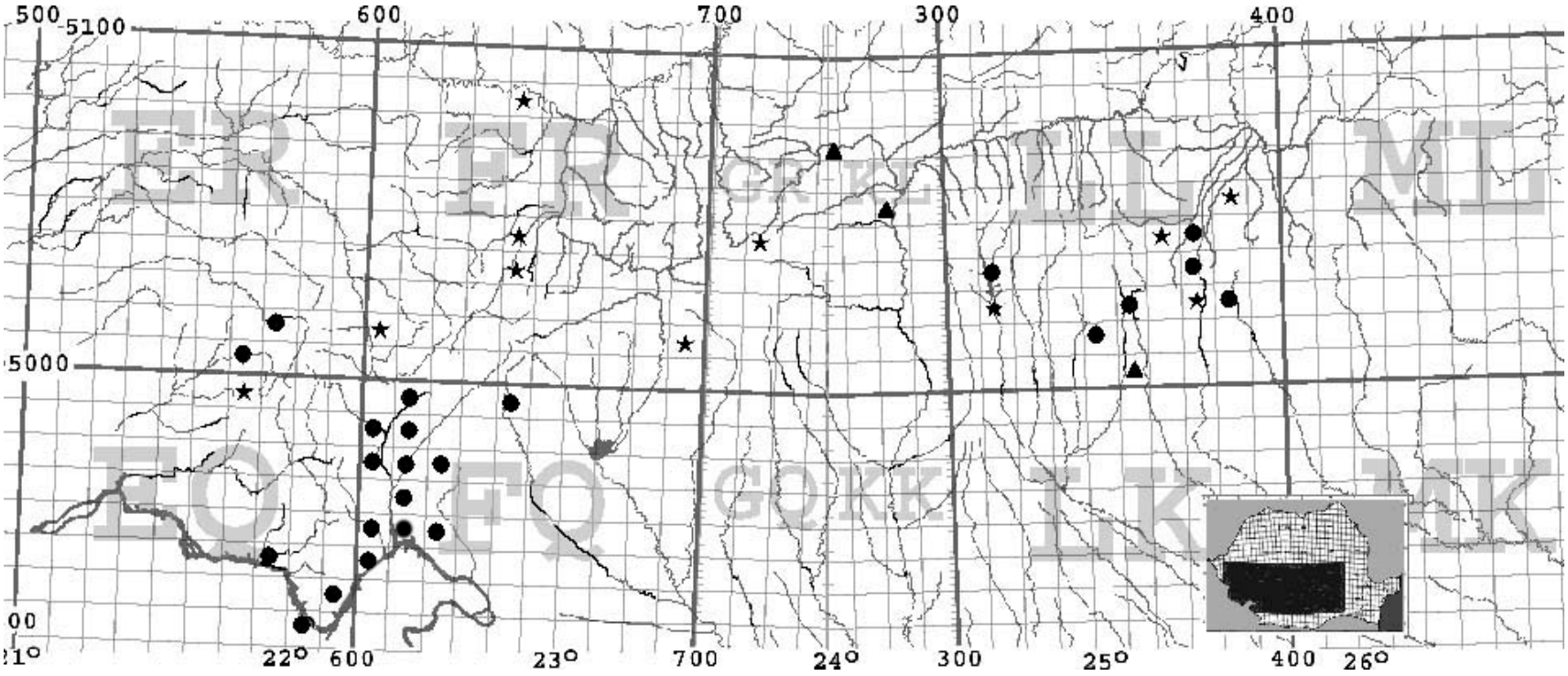

Fig 1: Distribution map in UTM projection system of the sites where *Sempervivum marmoreum* Griseb. was positively identified. ▲ designates sites cited before 1957, ★ designates sites cited after 1957 by other authors and ● designates new sites or older sites in which we positively confirm ed the presence of *Sempervivum marmoreum* Griseb (only if floriferous specimens have been found

Some of the sites were impossible to assign definite UTM coordinates set, usually due to imprecise or insufficient data available. These sites were either discarded until further clarification, or were only mentioned in the table without placement on the map.

The following map illustrates the distribution of *Sempervivum marmoreum* Griseb. showing the selected mentioned sites that could be clearly located. For better clarity the map shows in a more convenient format the 100Km quadrants and the hydrographic network in the UTM system.

We have indicated the sites cited using different symbols for the 3 data subsets, of which the most important is the subset comprising the sites in which the presence of the species was positively confirmed by us (only if floriferous specimens have been found). The other two subsets comprise the literature data that were divided using the monographic work of Răvăruț [31] as milestone, as depicted in figure 1.

Conclusions

This study reports findings of both literature and herbarium material surveys and previously unpublished data from personal fieldwork of the authors. Our preliminary results indicate that, despite some new locations reported here by us, the distribution *Sempervivum marmoreum* Griseb. populations is similar to the data previously published and largely agrees with the distribution published in Atlas Florae Europaeae [21].

Apparently, the limiting factor regulating the distribution of *Sempervivum marmoreum* Griseb. to the mountainous zones in Romania is actually the fact this species is not capable of sustaining viable populations in habitats where it has to stand against competition. Another interesting factor involved in *Sempervivum marmoreum* Griseb. distribution might be the fact that it was actively propagated by human populations in some places. This happened as a result of the medicinal and other household uses (sometimes replacing *S. tectorum* L) this species has in ethnic Romanian, German and Hungarian populations from some areas as described by us in a forthcoming paper.

Typically, *Sempervivum marmoreum* Griseb. was frequently encountered in xeric habitats being found in the analyzed region in Romania in thermophylous associations as Roman reported it in 1974 along the Canyon of Danube also in *Asplenietea* [32]

The lowest altitude we have found populations of *Sempervivum marmoreum* Griseb. was cca.60m. a.s.l.¸ in the Canyon of Danube, but we believe it very probably grew in that location tens of meters below this present level before the “Portile de Fier” dam was built and the retention lake appeared.

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DATE PRELIMINARE DESPRE COROLOGIA SPECIEI *SEMPERVIVUM MARMOREUM* GRISEB. (CRASSULACEAE) IN CARPATII MERIDIONALI DIN ROMANIA

(Rezumat)

Sempervivum marmoreum Griseb. este o *Crassulaceae* monocarpica perenă, care se propagă vegetativ prin emiterea de stoloni repenți care înrădăcinează. Prezintă flori 12-16-mere, cu petale alb-roz şi uneori striate medial cu nervuri roz-roşii sau roşu-grena până la vişiniu. Frunze ciliate sunt glandular păroase pe ambele fețe la exemplarele tinere sau la frunzele tinere, devenind glabrescente la frunzele mai bătrâne sau la exemplarele bătrâne spre sfârşitul verii.

Specia este carpato-balcanică, cu un areal cuprins între meridianele 15°E-27°E atingând spre răsărit granițele occidentale ale Turciei şi țărmurile Adriatice ale Croației către vest. În Romania este răspândită în întreaga țară, unde are oarecare amplitudine ecologică, specia ocupând cu precădere habitate uscate din zone stâncoase cu o preferință pentru altitudini înalte.

Zona luată în studiu se întinde la N de Dunăre fiind limitată la N de paralela 46 şi cuprinde biotopuri variate de la Dunăre până la vârfurile cele mai înalte din Carpații Româneşti, (altitudine variind intre 50-2550m *s.m.*), cu o climă şi pedologie de asemenea foarte variate.

Studiul nostru prezintă o listă cât mai completă a localităților din care a fost mentionată specia *Sempervivum marmoreum* Griseb, precum şi o hartă raster în sistemul UTM a răspândirii speciei în Carpații Meridionali. De asemenea se fac considerații privind factorii biotici şi abiotici care intervin în corologia şi ecologia speciei care face subiectul acestui studiu.