Electronic Appendix 1. – Vascular plants endemic and subendemic to the Carpathians and their subunits. Apomictic taxa are marked (rows with a grey background; these taxa were omitted in the ecological analyses). If all subspecies of particular species are endemic, we mentioned the species also separately in the table (rows with an orange background; these species were not included in the statistical evaluations).

Abbreviations: AC – Apuseni Carpathians, EC – Eastern Carpathians, SC – Southern Carpathians, Tr – Transylvanian Basin, WC – Western Carpathians; A – Austria, CZ – Czech Republic, HU – Hungary, PL – Poland, RO – Romania, SK – Slovakia, SRB – Serbia, UA – Ukraine. Subunits with only scattered/sporadical occurrence of the evaluated taxon are listed in the end separated by a slash, e.g. EC (PL, UA, RO), SC (RO), AC (RO)/WC (PL).

Taxon	**Occurrence in the Carpathians**	**Category of endemism**	**References**
Achillea oxyloba subsp. *schurii* (Sch. Bip.) Heimerl (Syn.: *A. schurii* Sch. Bip.; *Ptarmica tenuifolia* (Schur) Schur)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Oprea 2005; Ciocârlan 2009; Počynok & Prokopiv 2010; Sârbu et al. 2013; Ziman & Derbak 2013
Aconitum bucovinense Zapał. (Syn.: *A. callibotryon* subsp. *bucovinense* (Zapał.) Grinț.; *A. firmum* subsp. *bucovinense* (Zapał.) Graebn. et P. Graebn.)	EC (PL, UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Starmühler 1998a, b, 2000; Mitka 2001, 2002, 2003, 2012; Ilnicki & Mitka 2009; Boroń et al. 2011; Novikoff & Mitka 2011a, b
Aconitum degenii Gáyer subsp. *degenii* [1] (Syn.: *A. paniculatum* subsp. *degenii* (Degen) Graebn.)	WC (SK), EC (PL, UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Mucher 1993; Starmühler 1997, 1998a, b, 2000; Mitka 2001, 2003; Ilnicki & Mitka 2011; Novikoff & Mitka 2011a, b; Novikov 2013a; Eliáš jr. et al. 2015
Aconitum firmum Rchb.	WC (CZ, SK, PL), EC (UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) subendemic	Starmühler 1997, 1998b, 2000; Mitka 2001, 2003; Starmühler & Mitka 2001; Mihok et al. 2005; Novikoff & Mitka 2011a, b
Aconitum firmum Rchb. subsp. *firmum* (Syn.: *A. napellus* subsp. *firmum* (Rchb.) Gáyer; *A. firmum* subsp. *palmatifidum* (Rchb.) Beldie)	WC (SK, PL), EC (UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Skalický 1990; Starmühler 1997, 1998b, 2000; Mitka 2001, 2003; Starmühler & Mitka 2001; Mitka et al. 2007; Novikoff & Mitka 2011a
Aconitum firmum subsp. *fissurae* Nyár. [2, 3] (Syn.: *A. hunyadense* Degen; *A. romanicum* Woł.)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Starmühler 1996a, 1997, 1998b, 1999, 2000; Mitka 2001, 2002; Starmühler & Mitka 2001; Ilnicki & Mitka 2009; Novikoff & Mitka 2011a
Aconitum firmum subsp. *maninense* (Skalický) Starm. (Syn.: *A. firmum* var. *maninense* Skalický)	WC (SK, PL)	West-Carpathian endemic	Starmühler & Mitka 2001; Mitka 2003; Mitka et al. 2007; Ilnicki & Mitka 2009
Aconitum firmum subsp. *moravicum* Skalický	WC (CZ, SK, PL)	West-Carpathian endemic	Skalický 1990; Mitka 2003; Mitka et al. 2007; Ilnicki & Mitka 2009
Aconitum firmum subsp. *skerisorae* (Gáyer) Starm. [4] (Syn.: *A. skerisorae* Gáyer; *A. napellus* subsp. *skerisorae* (Gáyer) Seitz)	AC (RO)	Apuseni-Carpathian endemic	Starmühler 2000; Mitka 2003
Aconitum lasianthum (Rchb.) Simonk. [5] (Syn.: *A. vulparia* subsp. *lasianthum* (Rchb.) Ciocârlan)	SC (RO)/EC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Grințescu 1953; Morariu & Beldie 1976; Starmühler 1999; Oprea 2005
Aconitum lasiocarpum (Rchb.) Gáyer (Syn.: *A. paniculatum* subsp. *lasiocarpum* (Rchb.) Soó; *A. toxicum* subsp. *lasiocarpum* (Rchb.) Grinț.)	WC (SK, PL), EC (SK, PL, UA, RO) , †SC (RO)	West-East-Carpathian subendemic	Joachimiak et al. 1999; Mitka & Starmühler 2000; Mitka 2001, 2003; Ilnicki & Mitka 2011; Novikoff & Mitka 2011a, b
Aconitum lasiocarpum (Rchb.) Gáyer subsp. *lasiocarpum* [6]	EC (SK, PL, UA, RO)	East-Carpathian endemic	Mitka & Starmühler 2000; Mitka 2001, 2003; Ilnicki & Mitka 2011; Novikoff & Mitka 2011a, b
Aconitum lasiocarpum subsp. *kotulae* (Pawł.) Starm. et Mitka [7, 8] (Syn.: *A. variegatum* subsp. *kotulae* Pawł.)	WC (SK, PL), EC (SK, PL, UA, RO), †SC (RO)	West-East-Carpathian subendemic	Mitka & Starmühler 2000; Mitka 2001, 2003; Ilnicki & Mitka 2011; Novikoff & Mitka 2011a, b

Taxon	Occurrence in the Carpathians	Category of endemism	References
Aconitum moldavicum Hacq. (Syn.: *A. lycoctonum* subsp. *moldavicum* (Hacq.) Jalas)	WC (SK, PL, HU), EC (SK, PL, UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) subendemic	Mitka 2003; Mihok et al. 2005; Novikoff & Mitka 2011a, b; Mitka et al. 2013
Aconitum moldavicum Hacq. subsp. *moldavicum* [9]	WC (SK, PL, HU), EC (SK, PL, UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) subendemic	Mitka 2003, 2008; Novikoff & Mitka 2011a, b
Aconitum moldavicum subsp. *hosteanum* (Schur) Graebn. et P. Graebn. [10] (Syn.: *A. hosteanum* Schur; *A. moldavicum* subsp. *hosteanum* (Schur) Beldie, nom. illeg.)	EC (PL, UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Mitka 2003, 2008; Čornej 2011; Novikoff & Mitka 2011a, b
Aconitum toxicum Rchb. subsp. *toxicum* [11]	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Mucher 1993; Mitka 2001; Ilnicki & Mitka 2011
Aconitum toxicum subsp. *bucegiense* (Nyár.) Mucher	EC (RO), SC (RO)	East-South-Carpathian endemic	Mucher 1993; Mitka 2001; Starmühler & Mitka 2001
Aconitum toxicum subsp. *crispulum* (Nyár.) Mucher	SC (RO)	South-Carpathian endemic	Mucher 1993; Starmühler & Mitka 2001
Alchemilla acrostegia Plocek	WC (SK)	West-Carpathian endemic (Západné Tatry Mts: Červené vrchy massif)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla aequidens Pawł.	WC (SK, PL)	West-Carpathian endemic	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla amauroptera Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla amblyoides Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla amicorum Pawł.	WC (SK, PL)	West-Carpathian endemic (Západné Tatry Mts: Červené vrchy massif)	Plocek 1992; Kurtto et al. 2007
Alchemilla anceps Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla animosa Plocek	WC (SK)	West-Carpathian endemic	Plocek 1992; Kurtto et al. 2007
Alchemilla aspera Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla babiogorensis Pawł.	WC (PL), EC (UA)	West-East-Carpathian endemic	Volgin & Syčak 1989a; Plocek 1992; Syčak 2002, 2011
Alchemilla bogumili Pawlus	WC (SK, PL)	West-Carpathian endemic	Plocek 1992; Kurtto et al. 2007
Alchemilla boleslai Pawł. [12]	WC (SK, PL)	West-Carpathian endemic	Plocek 1983, 1992; Kliment 1999; Kurtto et al. 2007; Negrean 2011
Alchemilla brachycodon Plocek	WC (SK)	West-Carpathian endemic (Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla braun-blanquetii Pawł.	WC (PL), EC (UA)	West-East-Carpathian endemic	Plocek 1992; Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla bucovinensis Sytschak [13]	EC (UA, RO)	East-Carpathian endemic	Syčak 1992, 2002, 2011; Kurtto et al. 2007
Alchemilla calviflora Plocek	WC (PL)	West-Carpathian endemic (Tatry Zachodnie Mts: Czerwone Wierchy massif)	Plocek 1992; Kurtto et al. 2007
Alchemilla chalarodesma Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1990; Kliment 1999; Kurtto et al. 2007
Alchemilla chilitricha Plocek	WC (SK)	West-Carpathian endemic (Západné Tatry Mts: Sivý vrch Mt. group)	Plocek 1992; Kurtto et al. 2007
Alchemilla contractilis (Plocek) Fröhner	WC (SK), SC (RO)	West-South-Carpathian endemic	Plocek 1992; Kurtto et al. 2007; Negrean 2011
Alchemilla crassa Plocek	WC (SK)	West-Carpathian endemic	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla curtischista Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla czywczynensis Pawł. [14]	EC (UA, RO)	East-Carpathian subendemic	Pawłowski 1952; Fröhner 1986; Syčak 2002, 2011; Kurtto et al. 2007, 2009

Taxon	Occurrence in the Carpathians	Category of endemism	References
Alchemilla decurrens Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla delitescens Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla deylii Plocek ex Soják	EC (UA)	East-Carpathian endemic	Soják 1983b; Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla dolichotoma Plocek	EC (RO), SC (RO)	East-South-Carpathian endemic	Plocek 1985; Kurtto et al. 2007
Alchemilla dostalii Plocek	WC (SK)	West-Carpathian endemic (Západné Tatry Mts: Mt. Osobitá)	Plocek 1992; Kurtto et al. 2007
Alchemilla echinogloba Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Pilsko)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla erythropodoides Pawł.	WC (SK)	West-Carpathian endemic (Tatry Mts)	Fröhner 1968, 1975; Kurtto et al. 2007
Alchemilla eugenii Pawł. [15]	WC (PL, ?SK)	West-Carpathian endemic (Tatry Zachodnie Mts: Czerwone Wierchy massif)	Pawłowski 1952; Plocek 1992; Kurtto et al. 2007
Alchemilla exaperta Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla fusoidea Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Pilsko)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla giewontica Pawł.	WC (PL)	West-Carpathian endemic (Tatry Zachodnie Mts: Mt. Giewont)	Plocek 1992; Kurtto et al. 2007; Mirek & Piękoś-Mirkowa 2010
Alchemilla grandiceps Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Babia hora)	Plocek 1992; Kurtto et al. 2007
Alchemilla gruneica Plocek [16]	WC (CZ, SK)	West-Carpathian subendemic	Plocek 1992; Kurtto et al. 2007
Alchemilla gymnopoda Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla hoverlensis Pawlus et Lovelius	EC (UA)	East-Carpathian endemic (Čornohora Mts)	Pawlus 1988; Syčak 1992, 2011; Kurtto et al. 2007
Alchemilla hyperptycha Plocek	WC (SK)	West-Carpathian endemic (Vysoké Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla isodonta Plocek	WC (SK)	West-Carpathian endemic (Nízke Beskydy Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla jasiewiczii Pawł.	WC (PL)	West-Carpathian endemic (Tatry Wysokie Mts)	Plocek 1992; Kurtto et al. 2007; Mirek & Piękoś-Mirkowa 2010
Alchemilla kornasiana Pawł.	WC (PL), EC (UA)	West-East-Carpathian endemic	Plocek 1992; Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla kosiarensis Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla kulczyńskii Pawł.	WC (SK, PL)	West-Carpathian endemic (Západné Tatry Mts: Červené vrchy massif)	Plocek 1992; Kurtto et al. 2007
Alchemilla ladislai Pawł. [17]	WC (SK, PL)	West-Carpathian endemic (Západné Tatry Mts: Červené vrchy massif)	Plocek 1992; Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla laevipes Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Babia hora)	Plocek 1992; Kurtto et al. 2007
Alchemilla laxa Plocek [18]	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Pilsko)	Plocek 1990, 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla longidens Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Babia hora)	Plocek 1990, 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla lorata Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla loxotropa Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Babia hora)	Plocek 1992; Kurtto et al. 2007
Alchemilla ludovitiana Plocek	WC (SK)	West-Carpathian endemic (Branisko Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla marginata Plocek [19]	WC (SK)	West-Carpathian endemic (Vysoké Tatry Mts)	Plocek 1992; Kurtto et al. 2007

Taxon	Occurrence in the Carpathians	Category of endemism	References
Alchemilla megalodonta Plocek	WC (SK)	West-Carpathian endemic (Vysoké Tatry Mts)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla microsphaerica Fröhner	WC (SK, PL)	West-Carpathian endemic	Plocek 1992; Kurtto et al. 2007
Alchemilla moncophila Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla multiloba Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla obesa Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla oculimarina Pawł.	WC (SK, PL)	West-Carpathian endemic (Vysoké Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla patens Plocek	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts)	Plocek 1992; Šípošová et al. 2004b; Kurtto et al. 2007
Alchemilla polonica Pawł. (Syn.: *A. pseudincisa* var. *polonica* (Pawł.) Plocek)	WC (SK, PL)	West-Carpathian endemic	Plocek 1992; Kurtto et al. 2007
Alchemilla pseudincisa Pawł.	WC (SK, PL), EC (UA)	West-East-Carpathian endemic	Volgin & Syčak 1989b; Plocek 1992; Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla pseudothmari Pawł.	WC (PL)	West-Carpathian endemic (Tatry Zachodnie Mts: Czerwone Wierchy massif)	Plocek 1992; Kurtto et al. 2007
Alchemilla reversantha Plocek (Syn.: *A. inversa* Plocek non Juz., nom. illeg.)	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Plocek 1992; Šípošová et al. 2004a; Kurtto et al. 2007
Alchemilla rhodobasis Plocek	WC (SK)	West-Carpathian endemic (Západné Tatry Mts: Sivý vrch Mt. group)	Plocek 1986, 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla rhodocycla Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla sejuncta Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla sericoneuroides Pawł.	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla smaragdina Plocek	WC (SK)	West-Carpathian endemic	Plocek 1992; Kurtto et al. 2007
Alchemilla smytniensis Pawł.	WC (PL), EC (UA)	West-East Carpathian endemic	Syčak 1992, 2011; Kurtto et al. 2007
Alchemilla sojakii Plocek	WC (SK)	West-Carpathian endemic (Krivánska Fatra Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla sokolowskii Pawł. [20]	WC (PL)	West-Carpathian endemic (Tatry Zachodnie Mts: Czerwone Wierchy massif)	Plocek 1992; Kurtto et al. 2007; Mirek & Piękoś-Mirkowa 2010
Alchemilla stanislaae Pawł.	WC (SK, PL)	West-Carpathian endemic (Tatry Mts, Nízke Tatry Mts) [21]	Plocek 1992; Kurtto et al. 2007
Alchemilla stenoleuca Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla suavis Plocek [22]	WC (CZ, SK)	West-Carpathian endemic	Plocek 1973, 1992; Syčak 1992, 2011; Kurtto et al. 2007
Alchemilla subsessilis Plocek	WC (SK)	West-Carpathian endemic (Oravské Beskydy Mts: Mt. Pilsko)	Plocek 1992; Kliment 1999; Kurtto et al. 2007
Alchemilla superata Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla szaferi Pawł.	EC (UA)	East-Carpathian endemic	Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla tacikii Plocek	WC (SK, PL)	West-Carpathian endemic (Vysoké Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla thaumasia Plocek	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla turkulensis Pawł.	EC (PL, UA)	East-Carpathian endemic	Syčak 2002, 2011; Kurtto et al. 2007
Alchemilla versipiloides Pawł. [23]	WC (PL)	West-Carpathian endemic (Tatry Zachodnie Mts: Czerwone Wierchy massif)	Plocek 1992; Kurtto et al. 2007; Piękoś-Mirkowa & Mirek 2009; Mirek & Piękoś-Mirkowa 2010
Alchemilla virginea Plocek	WC (SK)	West-Carpathian endemic (Krivánska Fatra Mts)	Plocek 1992; Kurtto et al. 2007

Taxon	Occurrence in the Carpathians	Category of endemism	References
Alchemilla wallischii Pawł.	WC (SK, PL)	West-Carpathian endemic (Tatry Mts, Nízke Tatry Mts)	Plocek 1992; Kurtto et al. 2007
Alchemilla zapalowiczii Pawł. [24]	WC (†SK), EC (UA)	East-Carpathian subendemic	Walters & Pawłowski 1968; Plocek 1992; Kurtto et al. 2007, 2009; Negrean 2011
Alchemilla zmudae Pawł. [25]	WC (PL)	West-Carpathian endemic (Tatry Mts)	Plocek 1992; Kurtto et al. 2007; Mirek & Piękoś-Mirkowa 2009, 2010
Allium fussii A. Kern. [26] (Syn.: *A. fuscum* subsp. *fussii* (A. Kern.) Ciocârlan; *A. paniculatum* subsp. *fussii* (A. Kern.) Ciocârlan, nom. illeg.)	EC (RO), SC (RO)	East-South-Carpathian endemic	Brullo et al. 1996; Mráz 2005a; Oprea 2005; Ciocârlan 2009; Šafářová et al. 2011
Alopecurus pratensis subsp. *laguriformis* (Schur) Tzvelev (Syn.: *A. laguriformis* Schur)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Oprea 2005; Čornej 2011; Tasenkevich 2011
Andryala laevitomentosa (Nyár. ex Sennikov) P. D. Sell ex Greuter [27, 28] (Syn.: *Pietrosia laevitomentosa* Nyár. ex Sennikov)	EC (RO)	East-Carpathian endemic (Bistrița Mts: Mt. Pietrosul Broștenilor)	Morariu & Beldie 1976; Beldie 1979; Dihoru & Pârvu 1987; Sennikov 1999a; Greuter 2003; Oprea 2005, 2007; Negrea & Pricop 2009a, b; Fereira et al. 2015
Antennaria carpatica (Wahlenb.) Bluff et Fingerh. subsp. *carpatica* [29]	WC (SK, PL), EC (UA); †RO (EC, SC)	West-East-Carpathian endemic	Chrtek & Pouzar 1985; Oltean et al. 1994; Kliment 1999; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013; Ziman & Derbak 2013
Anthemis cretica subsp. *pyrethriformis* (Schur) Govaerts [30, 31] (Syn.: *A. carpatica* subsp. *pyrethriformis* (Schur) Prodan)	SC (RO)/EC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Beldie 1979; Oprea 2005; Sârbu et al. 2013
Anthemis kitaibelii Spreng. (Syn.: *A. cretica* subsp. *kitaibelii* (Spreng.) Ciocârlan)	SC (RO), AC (RO)	South-Apuseni-Carpathian endemic	Oprea 2005; Hurdu et al. 2012a, b
Aquilegia nigricans subsp. *subscaposa* (Borbás) Soó (Syn.: *A. subscaposa* Borbás; *A. vulgaris* subsp. *subscaposa* (Borbás) Borza)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Oprea 2005; Dihoru & Negrean 2009
Aquilegia transsilvanica Schur [32]	SC (RO)/EC (RO)	East-South-Carpathian endemic	Oprea 2005; Kobiv 2012b
Arabidopsis halleri subsp. *tatrica* (Pawł.) Kolník (Syn.: *Cardaminopsis halleri* subp. *tatrica* (Pawł.) Dostál ex Měsíček)	WC (SK, PL)	West-Carpathian endemic	Kolník & Marhold 2006
Arabidopsis neglecta (Schult.) O'Kane et Al-Shehbaz [33] (Syn.: *Cardaminopsis neglecta* (Schult.) Hayek)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Jalas & Suominen 1994; Kliment 1999; Měsíček 2002; Oprea 2005
Arenaria tenella Kit. (Syn.: *A. ciliata* subsp. *tenella* (Kit.) Braun-Blanq.)	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Perný & Michalková 2012
Armeria maritima subsp. *barcensis* (Simonk.) P. Silva (Syn.: *A. barcensis* Simonk.)	EC (RO)	East-Carpathian endemic	Beldie 1979; Dihoru & Pârvu 1987; Ciocârlan 2009
Armeria pocutica Pawł. [34]	EC (?†UA, RO)	East-Carpathian endemic (Maramureș Mts)	Pawłowski 1962; Ciocârlan 1988, 2009; Kahalo & Syčak 2009; Negrean 2011
Asperula carpatica Morariu [35]	EC (RO)/SC (RO)	East-South-Carpathian endemic	Negrean 2011
Astragalus australis subsp. *krajinae* (Domin) Domin [36] (Syn.: *A. krajinae* Domin)	EC (UA)	East-Carpathian endemic	Domin 1931a, 1935; Witkowski et al. 2003; Ziman 2009; Čornej 2011
Astragalus exscapus subsp. *transsilvanicus* (Schur) Nyár. (Syn.: *A. exscapus* var. *transsilvanicus* (Schur) Gams)	Tr (RO)	endemic to Transylvanian Basin	Roman et al. 1996; Dihoru & Negrean 2009

Taxon	Occurrence in the Carpathians	Category of endemism	References
Astragalus peterfii Jáv. [37]	Tr (RO)	endemic to Transylvanian Basin	Roman et al. 1996; Şuteu et al. 2003; Dihoru & Negrean 2009; Bartha 2012
Astragalus pseudopurpureus Guşul.	EC (RO)	East-Carpathian endemic (Hăşmaş Mts)	Ciocârlan 2009; Dihoru & Negrean 2009
Astragalus roemeri Simonk. [38]	EC (RO)/AC (RO)	East-Apuseni-Carpathian endemic	Váczy & Beldie 1976; Dihoru & Negrean 2009; Bartha & Bartók 2013
Athamanta turbith subsp. *hungarica* (Borbás) Tutin [39] (Syn.: *A. hungarica* Borbás)	SC (RO, SRB)	South-Carpathian endemic	Stevanović et al. 1991; Popescu et al. 2003; Hurdu et al. 2012a, b; Sârbu et al. 2013
Aubrieta columnae subsp. *platycarpa* (Ciocârlan) Ciocârlan [40] (Syn.: *A. intermedia* subsp. *falcata* Ciocârlan)	SC (RO)	South-Carpathian endemic (Piatra Craiului Mts)	Beldie & Váczy 1976; Oprea 2005; Ciocârlan 2006, 2009; Negrean 2011
Barbarea lepuznica Nyár.[41] (Syn.: *B. vulgaris* subsp. *lepuznica* (Nyár.) Soó)	SC (RO)	South-Carpathian subendemic	Dihoru & Pârvu 1987; Ciocârlan 2009; Dihoru & Negrean 2009; Strajeru & Stevanović 2013
Bromus monocladus Domin [42] (Syn.: *B. pannonicus* subsp. *monocladus* (Domin) P. M. Sm.; *Bromopsis pannonica* subsp. *monoclada* (Domin) Holub)	WC (SK)	West-Carpathian endemic	Kliment 1999; Dúbravková 2014 in litt.; Somlyay 2014 in litt.
Campanula carpatica Jacq.	WC (SK), EC (UA, RO), SC (RO)/AC	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Kliment 1999; Goliašová et al. 2008
Campanula crassipes Heuff.	SC (RO, SRB)	South-Carpathian endemic	Hurdu et al. 2012a, b
Campanula glomerata subsp. *subcapitata* (Popov) Fed. (Syn.: *C. subcapitata* Popov)	EC (SK, UA)	East-Carpathian endemic	Kliment 1999; Ziman et al. 2006; Goliašová et al. 2008
Campanula kladniana (Schur) Witasek [43] (Syn.: *C. rotundifolia* subsp. *kladniana* (Schur) Tacik)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Čopyk 1976; Tasenkevyč 2003b; Oprea 2005; Ziman et al. 2006
Campanula serrata (Kit.) Hendrych (Syn.: *C. napuligera* Schur)	WC (SK, PL), EC (UA, RO), SC (RO), AC	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Kliment 1999; Goliašová et al. 2008
Campanula tatrae Borbás [44] (Syn.: *C. polymorpha* (Witasek) Prain et al.; *C. rotundifolia* subsp. *polymorpha* (Witasek) Tacik)	WC (SK, PL), EC (UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Kliment 1999; Goliašová et al. 2008
Campanula xylocarpa Kovanda	WC (SK, HU)	West-Carpathian endemic	Kliment 1999; Goliašová et al. 2008
Cardamine glanduligera O. Schwarz [45] (Syn.: *Dentaria glandulosa* Waldst. et Kit. ex Willd.)	WC (CZ, SK, PL, HU), EC (SK, PL, UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Jalas & Suominen1994; Roman et al. 1996; Kliment 1999; Marhold & Kochjarová 2002
Carduus kerneri Simonk. subsp. *kerneri* [46] (Syn.: *C. transsilvanicus* A. Kern.)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Franco 1976; Čopyk 1976; Oprea 2005; Čornej 2011; Hurdu et al. 2012a, b; Ziman & Derbak 2013
Carduus kerneri subsp. *lobulatiformis* (Csüros et Nyár.) Soó [47] (Syn.: *C. lobulatiformis* Csürös et Nyár.)	SC (RO)	South-Carpathian endemic	Dihoru & Pârvu 1987; Ciocârlan 2009; Dihoru & Negrean 2009; Hurdu et al. 2012a
Carduus lobulatus Borbás	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Šípošová et al. 2004a; Zarzycki 2008
Centaurea reichenbachii DC. [48] (Syn.: *C. reichenbachioides* Schur ex Hayek)	AC (RO)	Apuseni-Carpathians endemic	Dostál 1976; Ochsmann 2000; Hurdu et al. 2012a; Ciocârlan 2009; Sârbu et al. 2013
Centaurea rodnensis Simonk. [49, 50, 51] (Syn.: *C. carpatica* (Porcius) Porcius, nom. illeg.; *C. rarauensis* Prodan)	EC (?UA, RO)	East-Carpathian endemic (Rodna Mts)	Beldie 1979; Tasenkevich 2011; Hurdu et al. 2012a, b; Koutecký 2013

Taxon	Occurrence in the Carpathians	Category of endemism	References
Centaurea simonkaiana Hayek (Syn.: *C. trichocephala* subsp. *simonkaiana* (Hayek) Dostál)	AC (RO)	Apuseni-Carpathian endemic	Dihoru & Parvu 1987; Dihoru & Negrean 2009
Centaurea triniifolia Heuff. [52]	SC (RO, SRB)	South-Carpathian endemic	Dostál 1976; Ochsmann 2000; Hurdu et al. 2012a
Cephalaria radiata Griseb. et Schenk [53]	Tr (RO)/EC (RO), SC (RO), AC (RO)	subendemic to Transylvanian Basin	Prodan 1961; Dihoru & Pârvu 1987; Oprea 2005
Cephalaria uralensis subsp. *multifida* (Roman) Roman et Beldie [54]	SC (RO)	South-Carpathian endemic (Almajului Mts: Porțile de Fier Gorge)	Beldie & Váczy 1976; Dihoru & Pârvu 1987; Ciocârlan 2011; Sârbu et al. 2013
Cerastium arvense subsp. *lerchenfeldianum* (Schur) Asch. et Graebn. [55, 56] (Syn.: *C. lerchenfeldianum* Schur)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Oprea 2005; Negrean & Oltean 1989; Hurdu et al. 2012b
Cerastium tatrae Borbás (Syn.: *C. glandulosum* (Kit.) Jáv. non Schur, nom. illeg.; *C. arvense* subsp. *glandulosum* (Kit.) Soó)	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Kliment 1999; Letz & Michalková 2012
Cerastium transsilvanicum Schur	EC (RO), SC (RO)	East-South-Carpathian endemic	Čopyk 1976; Morariu & Beldie 1976; Jalas & Suominen 1983; Oprea 2005; Ciocârlan 2009
Chrysosplenium alpinum Schur	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Beldie 1977; Oprea 2005; Kobiv 2010; Čornej 2011; Sârbu et al. 2013
Clinopodium pulegium (Rochel) Bräuchler [57] (Syn.: *Micromeria pulegium* (Rochel) Benth., nom. illeg.)	SC (RO, SRB)	South-Carpathian subendemic	Diklić & Nikolić 1986a; Bogosavljević et al. 2007; Hurdu et al. 2012b; Đug et al. 2013; Slavkovska et al. 2013
Cochlearia borzaeana (Coman et Nyár.) Pobed.	EC (RO)	East-Carpathian endemic	Kochjarová et al. 2006; Dihoru & Negrean 2009
Cochlearia tatrae Borbás	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Kliment 1999; Kochjarová & Valachovič 2002
Cota tinctoria subsp. *fussii* (Griseb. et Schenk) Oberpr. et Greuter (Syn.: *Anthemis tinctoria* subsp. *fussii* (Griseb. et Schenk) Beldie)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathians endemic	Dihoru & Pârvu 1987; Oprea 2005
Crocus banaticus J. Gay [58]	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Mihály & Komendar 1993; Oprea 2005; Myhaľ 2009; Hurdu et al. 2012b
Crocus discolor G. Reuss (Syn.: *C. scepusiensis* (Rehman et Woł.) Borbás)	WC (SK, PL)	West-Carpathian endemic	Májovský et al. 1991; Kliment 1999
Cyanus dominii (Dostál) Holub	WC (SK)	West-Carpathian endemic	Olšavská et al. 2011, 2012; Olšavská & Löser 2013
Cyanus dominii (Dostál) Holub subsp. *dominii* (Syn.: *Cyanus triumfetti* subsp. *dominii* (Dostál) Dostál; *Centaurea triumfetti* subsp. *dominii* Dostál)	WC (SK)	West-Carpathian endemic	Olšavská et al. 2011, 2012; Olšavská & Löser 2013
Cyanus dominii subsp. *slovenicus* (Dostál) Olšavská (Syn.: *Centaurea triumfetti* var. *slovenica* Dostál)	WC (SK)	West-Carpathian endemic	Olšavská et al. 2011, 2012; Olšavská & Löser 2013
Cyanus dominii subsp. *sokolensis* (Pawł.) Olšavská (Syn.: *Centaurea axillaris* var. *sokolensis* Pawł.)	WC (SK)	West-Carpathian endemic	Olšavská et al. 2011, 2012; Olšavská & Löser 2013
Cyanus maramarosiensis (Jáv.) Dostál [59] (Syn.: *Centaurea maramarosiensis* (Jáv.) Czerep.; *C. mollis* subsp. *maramarosiensis* (Jáv.) Soó)	EC (?SK, UA, RO)	East-Carpathian endemic	Kliment 1999; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Cyanus mollis (Waldst. et Kit.) J. Presl et C. Presl [60] (Syn.: *Centaurea mollis* Waldst. et Kit.; *Cyanus montanus* subsp. *mollis* (Waldst. et Kit.) Soják)	WC (CZ, SK, PL, HU), EC (UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Kliment 1999; Oprea 2005; Olšavská & Löser 2013

Taxon	Occurrence in the Carpathians	Category of endemism	References
Cyanus pinnatifidus (Schur) Holub (Syn.: *Centaurea pinnatifida* Schur; *C. triumfetti* subsp. *pinnatifida* (Schur) Dostál)	EC (RO), SC (RO), AC	East-South-Apuseni-Carpathian endemic	Oprea 2005; Olšavská et al. 2012
Cyanus pinnatifidus (Schur) Holub subsp. *pinnatifidus* (Syn.: *Centaurea pinnatifida* Schur subsp. *pinnatifida*)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Oprea 2005
Cyanus pinnatifidus subsp. *sooanus* (Borhidi) Greuter [61] (Syn.: *Centaurea pinnatifida* subsp. *sooana* (Borhidi) Soó)	EC (RO)	East-Carpathian endemic (Ceahlău Mts)	Borhidi 1957; Oprea 2005
Cyclamen purpurascens subsp. *immaculatum* (Hrabětová) Halda et Soják [62] (Syn.: *C. fatrense* Halda et Soják)	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts, Nízke Tatry Mts)	Kliment 1999; Kanka et al. 2008; Turis 2009; Slovák et al. 2012; Kučera et al. 2013
Dactylorhiza cordigera subsp. *siculorum* (Soó) Soó [63] (Syn.: *Orchis cordigera* subsp. *siculorum* Soó)	EC (RO), AC (RO)	East-Apuseni-Carpathian endemic	Soó 1967, 1980b; Popescu & Sanda 1998; Oprea 2005; Ciocârlan 2009; Hurdu et al. 2012a
Dactylorhiza maculata subsp. *schurii* (Klinge) Soó [64] (Syn.: *Orchis maculata* var. *schurii* (Klinge) Paucă et Beldie)	EC (UA, RO), SC (RO), AC (RO), Tr (RO)	endemic to Eastern, Southern & Apuseni Carpathians and Transylvanian Basin	Soó 1967; Paucă & Beldie 1972; Čornej 2011; Hurdu 2014 in litt.
Daphne arbuscula Čelak.	WC (SK)	West-Carpathian endemic (Muránska planina Mts)	Erdelská & Turis 1996
Delphinium elatum subsp. *nacladense* (Zapał.) Holub [65] (Syn.: *D. nacladense* Zapał.)	EC (PL, UA, RO), SC (RO)	East-South-Carpathian endemic	Čopyk 1976; Starmühler 1996b; Oprea 2005; Kobiv et al. 2007a; Chorney et al. 2008; Mitka et al. 2008; Novikov 2013b
Delphinium oxysepalum Borbás et Pax	WC (SK, PL)	West-Carpathian endemic	Kliment 1999
Delphinium simonkaianum Pawł.	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Beldie 1977; Dihoru & Pârvu 1987; Oprea 2005
Dianthus callizonus Schott et Kotschy	SC (RO)	South-Carpathian endemic (Piatra Craiului Mts)	Morariu & Beldie 1976; Coldea 1997; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Dianthus carthusianorum subsp. *tenuifolius* (Schur) Hegi [66] (Syn.: *D. tenuifolius* Schur)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Kuz'mina 2004; Fedorončuk & Čornej 2005; Oprea 2005; Čornej 2011
Dianthus giganteus subsp. *banaticus* (Heuff.) Tutin (Syn.: *D. banaticus* (Heuff.) Borbás)	SC (RO, SRB)	South-Carpathian endemic	Dihoru & Pârvu 1987; Oprea 2005; Hurdu et al. 2012a, b
Dianthus glacialis subsp. *gelidus* (Schott, Nyman et Kotschy) Tutin (Syn.: *D. gelidus* Schott., Nyman et Kotschy)	EC (RO), SC (RO)	East-South-Carpathian endemic	Dihoru & Pârvu 1987; Oprea 2005; Hurdu et al. 2012a
Dianthus henteri Heuff. ex Griseb. et Schenk	SC (RO)	South-Carpathian endemic	Dihoru & Pârvu 1987; Popescu et al. 2003; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Dianthus nitidus Waldst. et Kit. (Syn.: *D. nitidus* Waldst. et Kit. subsp. *nitidus*)	WC (SK, †PL)	West-Carpathian endemic	Kliment 1999; Kmeťová 2012
Dianthus praecox Willd. ex Spreng. subsp. *praecox* [67, 68] (Syn.: *D. plumarius* subsp. *praecox* (Willd. ex Spreng.) Domin)	WC (SK, PL)	West-Carpathian endemic	Kmeťová 1985, 2012
Dianthus praecox subsp. *lumnitzeri* (Wiesb.) Kmeťová [69] (Syn.: *D. lumnitzeri* Wiesb.; *D. plumarius* subsp. *lumnitzeri* (Wiesb.) Domin)	WC (A, CZ, SK)	West-Carpathian endemic	Baksay 1972; Kmeťová 1985, 2012; Somogyi et al. 2012
Dianthus praecox subsp. *pseudopraecox* (Novák) Kmeťová ex Dostál [70, 71] (Syn.: *D. hungaricus* subsp. *pseudopraecox* (Novák) Kmeťová ex Futák)	WC (SK, HU)	West-Carpathian endemic	Kmeťová 1985, 2012
Dianthus spiculifolius Schur [72] (Syn.: *D. kitaibelii* subsp. *spiculifolius* (Schur) Novák; *D. petraeus* subsp. *spiculifolius* (Schur) Ciocârlan)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Negrean & Oltean 1989; Fedorončuk & Diduch 2002b; Oprea 2005; Holobiuc et al. 2009

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Doronicum carpaticum (Griseb. et Schenk) Nyman [73]	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Álvarez Fernández 2003; Pachswöll 2013
Draba dorneri Heuff. [74]	SC (RO)	South-Carpathian endemic	Sârbu & Lupu 1989; Ion 2012; Catană et al. 2013
Draba haynaldii Stur	EC (RO), SC (RO)	East-South-Carpathian endemic	Beldie 1979; Oprea 2005; Dihoru & Negrean 2009
Draba kotschyi Stur [75]	EC (RO), SC (RO)	East-South-Carpathian endemic	Jalas et al. 1996; Oprea 2005; Ciocârlan 2009
Draba lasiocarpa subsp. *klasterskyi* (Chrtek) Chrtek	WC (SK)	West-Carpathian endemic (Slovenský kras Mts)	Peniašteková & Kliment 2002
Draba simonkaiana Jáv. [76] (Syn.: *D. stellata* subsp. *simonkaiana* (Jáv.) Ciocârlan)	SC (RO)	South-Carpathian endemic	Dihoru & Pârvu 1987; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Erigeron hungaricus (Vierh.) Pawł. [77] (Syn.: *E. nanus* Schur non Nutt., nom. illeg.)	WC (SK, PL), EC (RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Mirek & Piękoś-Mirkowa 2008b; Ciocârlan 2009
Eritrichium jankae Simonk. [78] (Syn.: *E. nanum* subsp. *jankae* (Simonk.) Jáv.)	EC (RO), SC (RO)	East-South-Carpathian endemic	Oprea 2005; Ciocârlan 2009; Șuteu 2012; Sârbu et al. 2013
Erysimum hungaricum Zapał. [79, 80]	EC (RO)	East-Carpathian endemic (Maramureș Mts: Mt. Lostun Mic)	Kobiv et al. 2007a; Kobiv 2010; Sârbu et al. 2013
Erysimum pieninicum (Zapał.) Pawł.	WC (PL)	West-Carpathian endemic (Pieniny Mts)	Maciejewska-Rutkowska et al. 2007; Korzeniak 2008
Erysimum wahlenbergii (Asch. et Engl.) Borbás	WC (SK, PL)	West-Carpathians endemic	Kliment 1999; Michalková 2002
Erysimum witmannii Zaw. [81]	WC (SK, PL, HU), EC (UA, RO), SC (RO)/?†AC	West-East-South-Carpathian endemic	Kliment 1999; Michalková 2002
Erysimum witmannii Zaw. subsp. *witmannii* [82, 83, 84] (Syn.: *E. baumgartenianum* Schur)	WC (SK, PL), EC (RO), SC (RO)/?†AC (RO)	West-East-South-Carpathian endemic	Nyárády 1955; Borza 1964; Tomšovic 1988; Kliment 1999; Ančev & Polatschek 2006
Erysimum witmannii subsp. *pallidiflorum* (Szépl. ex Jáv.) Soó (Syn.: *E. pallidiflorum* Szépl. ex Jáv.)	WC (SK, HU)	West-Carpathian endemic	Michalková 1999, 2002
Erysimum witmannii subsp. *transsilvanicum* (Schur) P. W. Ball [85, 86] (Syn.: *E. transsilvanicum* Schur; *E. czetzianum* Schur)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Nyárády 1955; Popescu et al. 2003; Kobiv 2010; Oprea & Sîrbu 2012, 2013; Vojtkó et al. 2012
Euphorbia carpatica Woł. [87, 88] (Syn.: *Tithymalus carpaticus* (Woł.) Á. Löve et D. Löve; *T. jasiewiczii* Chrtek et Křísa)	EC (UA, RO)	East-Carpathian endemic	Čopyk 1976; Mirek et al. 2002; Dihoru & Negrean 2009; Čornej 2011
Euphorbia sojakii (Chrtek et Křísa) Dubovik (Syn.: *E. austriaca* subsp. *sojakii* Chrtek et Křísa; *Tithymalus sojakii* (Chrtek et Křísa) Holub)	EC (SK, PL, UA)	East-Carpathian endemic	Kliment 1999
Euphrasia exaristata Smejkal [89]	WC (SK, PL)	West-Carpathian endemic (Západné Tatry Mts: Červené vrchy massif)	Králik 1997; Staszkiewicz 2009
Euphrasia slovaca (Yeo) Holub subsp. *slovaca* (Syn.: *E. arctica* subsp. *slovaca* Yeo)	WC (CZ, SK, PL), EC (UA, RO)	West-East-Carpathian endemic	Králik 1997; Kliment 1999; Oprea 2005; Čornej 2011; Sârbu et al. 2013
Euphrasia stipitata Smejkal	WC (SK)	West-Carpathian endemic (Krivánska Fatra Mts)	Králik 1997; Kliment 1999
Euphrasia tatrae Wettst. [90] (Syn.: *E. minima* subsp. *tatrae* (Wettst.) Hayek; *E. minima* var. *tatrae* (Wettst.) Pawł.)	WC (SK, PL), EC (UA, RO), ?SC (RO)	West-East-Carpathian endemic	Smejkal 1963; Mihoková & Mikoláš 1994; Smejkal & Čeřovský 1999
Ferula sadlerana Ledeb. [91, 92]	WC (SK, HU), AC (RO)	West-Apuseni-Carpathian subendemic	Lendvay & Kalapos 2014
Festuca amethystina subsp. *orientalis* Krajina [93] (Syn.: *F. inarmata* Schur)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Cvelev 1972, 1974, 1976; Prokudin et al. 1977; Oprea 2005; Sârbu et al. 2013

Taxon	Occurrence in the Carpathians	Category of endemism	References
Festuca bucegiensis Markgr.-Dann.	SC (RO)	South-Carpathian endemic	Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Festuca carpatica F. Dietr. (Syn.: *F. pseudolaxa* Schur; *Leucopoa carpatica* (F. Dietr.) H. Scholz)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999
Festuca gautieri subsp. *lutea* (Hack.) Foggi et Signorini (Syn.: *F. gautieri* subsp. *lutea* (Hack.) Ciocârlan; *F. scoparia* subsp. *lutea* (Hack.) Beldie)	EC (RO)	East-Carpathian endemic (Hăşmaş Mts)	Morariu & Beldie 1976; Oprea 2005; Sârbu et al. 2013
Festuca nitida subsp. *flaccida* (Schur) Markgr.-Dann.	EC (RO), SC (RO)	East-South-Carpathian endemic	Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Festuca pachyphylla Degen ex Nyár. (Syn.: *F. rupicola* subsp. *pachyphylla* (Degen ex Nyár.) Beldie; *F. stricta* subsp. *rumelica* Foggi et Petrova)	SC (RO)	South-Carpathian endemic	Markgraf-Dannenberg 1980; Ciocârlan 2009; Hurdu et al. 2012a
Festuca porcii Hack.	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Beldie 1972; Čopyk 1976; Oprea 2005; Kobiv et al. 2007a
Festuca saxatilis Schur [94] (Syn.: *F. rupicola* subsp. *saxatilis* (Schur) Rauschert; *F. rupicola* subsp. *saxatilis* (Schur) Beldie, nom. illeg.; *F. stricta* subsp. *saxatilis* (Host) Foggi et Signorini)	EC (SK, UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Kliment 1999; Oprea 2005
Festuca tatrae (Czakó) Degen [95] (Syn.: *F. amethystina* subsp. *tatrae* (Czakó) Soó)	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Ciocârlan 2009; Čornej 2011
Festuca versicolor Tausch subsp. *versicolor* [96]	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian subendemic	Kliment 1999; Oprea 2005
Festuca versicolor subsp. *dominii* Krajina	EC (RO)	East-Carpathian endemic (Rodna Mts)	Dihoru & Pârvu 1987; Oprea 2005; Ciocârlan 2009
Galium abaujense Borbás	WC (SK, HU)	West-Carpathian endemic	Kliment 1999
Galium album subsp. *suberectum* (Klokov) Michalk. [97, 98] (Syn.: *G. suberectum* Klokov)	WC (SK), EC (UA)	West-East-Carpathian endemic	Klokov 1961; Michalková 1993; Gynda 2004
Galium baillonii D. Brândză	SC (RO)	South-Carpathian endemic	Dihoru & Pârvu 1987; Popescu et al. 2003; Oprea 2005; Ciocârlan 2009
Galium kitaibelianum Schult. et Schult. f. [99]	EC (RO), SC (RO), AC	East-South-Apuseni-Carpathian subendemic	Oprea 2005; Hurdu et al. 2012b
Galium transcarpaticum Stojko et Tasenk.	EC (UA)	East-Carpathian endemic	Tasenkevyč 2003b; Gynda 2004; Kobiv 2010; Čornej 2011
Genista tinctoria subsp. *oligosperma* (Andrae) Jáv. [100] (Syn.: *G. oligosperma* (Andrae) Simonk.; *G. rupestris* Schur)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Čopyk 1976; Morariu & Beldie 1976; Oprea 2005; Ciocârlan 2009; Čornej 2011
Gentiana cruciata subsp. *phlogifolia* (Schott et Kotschy) Tutin [101] (Syn.: *G. phlogifolia* Schott et Kotschy)	EC (RO), SC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Strid & Tan 1991; Oprea 2005; Ciocârlan 2009
Gentiana laciniata Kit. ex Kanitz [102]	EC (UA)	East-Carpathian endemic	Rybczyński et al. 2014
Gentianella amarella subsp. *reussii* (Tocl) Holub (Syn.: *Gentiana reussii* Tocl)	WC (SK)	West-Carpathian endemic	Kliment 1999; Šípošová et al. 2004b
Gentianella fatrae (Borbás) Holub (Syn.: *G. austriaca* subsp. *fatrae* (Borbás) Á. Löve et D. Löve)	WC (SK)	West-Carpathian endemic	Kliment 1999; Šípošová et al. 2004a
Gentianella lutescens subsp. *tatrae* (Ronniger) Holub	WC (SK)	West-Carpathian endemic	Kliment 1999; Mirek & Piękoś-Mirkowa 2010
Gypsophila petraea (Baumg.) Rchb. [103] (Syn.: *G. transsylvanica* Spreng.)	EC (RO), SC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Jalas & Suominen 1986; Oprea 2005; Hurdu et al. 2012b

Taxon	Occurrence in the Carpathians	Category of endemism	References
Helictotrichon decorum (Janka) Henrard	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Oprea 2005; CBIS 2008 (http://www.carpates.org/cbisec/bot.php?id=1222)
Hepatica transsilvanica Fuss	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Oprea 2005
Heracleum carpaticum Porcius	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Čopyk 1976; Oprea 2005; Kobiv et al. 2007a; Ciocârlan 2009; Dihoru & Negrean 2009
Heracleum sphondylium subsp. *transsilvanicum* (Schur) Brummitt (Syn.: *H. transsilvanicum* Schur; *H. palmatum* Baumg.)	EC (UA, RO), SC (RO), AC	East-South-Apuseni-Carpathian endemic	Čopyk 1976; Oprea 2005; Čornej 2011; Sârbu et al. 2013
Hesperis matronalis subsp. *schurii* Soó [104] (Syn.: *H. oblongifolia* Schur; *H. matronalis* subsp. *oblongifolia* (Schur) F. Dvořák)	SC (RO)	South-Carpathian endemic	Morariu & Beldie 1976; Beldie 1977; Ball 1993; Ciocârlan 2009
Hesperis matronalis subsp. *vrabelyiana* (Schur) Soó (Syn.: *H. vrabelyiana* (Schur) Borbás)	WC (HU)	West-Carpathian endemic (Bükk Mts)	Dvořák 1968; Soó 1968; Ball 1993; Šeffer et al. 2010
Hesperis slovaca (F. Dvořák) F. Dvořák [105] (Syn.: *H. dinarica* subsp. *slovaca* F. Dvořák)	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts)	Dvořák 1963, 1968; Zahradníková et al. 2002; Šípošová et al. 2004b
Hieracium abietogenum Nyár. ex Szeląg [106]	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2003a, 2006b
Hieracium austrotatricum Szeląg	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts)	Ronikier & Szeląg 2008; Ilnicki & Szeląg 2011
Hieracium bohatschianum Zahn	SC (RO)	South-Carpathian endemic (Almajului Mts: Mt. Treskovaț)	Ilnicki & Szeląg 2011; Szeląg 2011
Hieracium borbasii R. Uechtr. [107] (Syn.: *H. sparsum* subsp. *borbasii* (R. Uechtr.) Zahn)	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2006b; Ilnicki & Szeląg 2011
Hieracium borsanum Mráz	EC (RO)	East-Carpathian endemic (Rodna Mts)	Mráz 2001b, 2003a
Hieracium carpaticum Besser subsp. *carpaticum*	WC (SK, PL)	West-Carpathian endemic	Zahn 1937; Chrtek jr. 2014 in litt.; cf. Piękoś-Mirkowa & Mirek 2003; Šeffer et al. 2010
Hieracium cernaeglavae (Hruby et Zahn) Mráz (Syn.: *H. rohacsense* subsp. *cernaeglavae* (Hruby et Zahn) Zahn)	EC (UA, RO)	East-Carpathian endemic	Mráz 2002
Hieracium coldei Szeląg (Syn.: *H. sparsum* subsp. *coldei* (Szeląg) Greuter)	EC (RO), SC (RO)	East-South-Carpathian endemic	Szeląg 2006a, b, 2012
Hieracium crassipedipilum (Pawł. et Zahn) Chrtek f.	WC (SK, PL)	West-Carpathian endemic	Chrtek jr. & Marhold 1998; Štorchová et al. 2002; Chrtek jr. et al. 2004a
Hieracium czeremoszense Woł. et Zahn	EC (UA)	East-Carpathian endemic	Zahn 1936; Šljakov 1989; Szeląg 2007
Hieracium dacicum R. Uechtr.	SC (RO)	South-Carpathian endemic (Retezat Mts)	Zahn 1938; Szeląg 2014 in litt.
Hieracium decipientiforme (Woł. et Zahn) Schljakov	EC (UA)	East-Carpathian endemic	Chrtek jr. 1997; Chrtek jr. 2014 in litt.
Hieracium deylii Mráz (Syn.: *H. pietroszense* subsp. *deylii* (Mráz) Greuter)	EC (UA)	East-Carpathian endemic	Mráz 2003a
Hieracium fagarasense (Nyár. et Zahn) Nyár. [108] (Syn.: *H. sparsum* subsp. *fagarasense* Nyár. et Zahn)	SC (RO)	South-Carpathian endemic (Făgăraș Mts)	Szeląg 2006b; Szeląg 2014 in litt.; cf. Beldie 1979, Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013
Hieracium filarszkyi Jáv. et Zahn	SC (RO)	South-Carpathian endemic (Retezat Mts)	Zahn 1938; Szeląg 2014 in litt.
Hieracium fritzeiforme Zahn	SC (RO)	South-Carpathian endemic (Retezat Mts)	Zahn 1938; Szeląg 2014 in litt.
Hieracium hryniawiense Woł. (Syn.: *H. raddeanum* subsp. *hryniawiense* (Woł.) Greuter)	EC (UA)	East-Carpathian endemic	Šljakov 1989; Mráz 2003b; Szeląg 2007
Hieracium jankae R. Uechtr.	SC (RO)	South-Carpathian endemic (Almajului Mts)	Mráz & Szeląg 2004; Szeląg 2014 in litt.

Taxon	Occurrence in the Carpathians	Category of endemism	References
Hieracium jarzabczynum (Pawł. et Zahn) Mráz et Chrtek f.	WC (SK, PL)	West-Carpathian endemic	Chrtek jr. & Mráz 2007; Chrtek jr. et al. 2007
Hieracium kotschyanum Heuff. (Syn.: *H. kotschyanum* Heuff. subsp. *kotschyanum*; *H. sparsum* subsp. *kotschyanum* (Heuff.) Zahn)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Mráz & Szeląg 2004; Szeląg 2006b; Ilnicki & Szeląg 2011
Hieracium krivanense (Woł. et Zahn) Schljakov	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Chrtek jr. & Marhold 1998; Štorchová et al. 2002; Chrtek jr. et al. 2004a
Hieracium lingelsheimii Pax	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts)	Schuhwerk & Lippert 1999; Chrtek jr. et al. 2004a
Hieracium lomnicense Woł.	EC (UA)	East-Carpathian endemic	Šljakov 1989; Szeląg 2007
Hieracium lubricicaule (Zahn) Borza (Syn.: *H. sparsum* subsp. *lubricicaule* Zahn)	SC (RO)	South-Carpathian endemic (Retezat Mts, Țarcu Mts)	Szeląg 2003b, 2006b; Mráz & Szeląg 2004
Hieracium magocsyanum Ják. (Syn.: *H. sparsum* subsp. *magocsyanum* (Ják.) Zahn)	SC (RO)	South-Carpathian endemic (Retezat Mts, Țarcu Mts)	Mráz & Szeląg 2004; Szeląg 2006b; Ilnicki & Szeląg 2011
Hieracium mirekii Szeląg	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2006b; Ilnicki & Szeląg 2011
Hieracium mitkae Szeląg (Syn.: *H. kotschyanum* subsp. *longidentatum* Nyár. ex Szeląg; *H. sparsum* subsp. *longidentatum* (Nyár. ex Szeląg) Greuter)	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2003a, 2006b
Hieracium mlinicae (Hruby et Zahn) Chrtek f. et Mráz (Syn.: *H. nigrescens* subsp. *mlinicae* Hruby et Zahn)	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Zahn 1927; Chrtek jr. et al. 2004b; Chrtek jr. & Mráz 2007
Hieracium napaeum Zahn	EC (RO), SC (RO), AC	East-South-Apuseni-Carpathian endemic	Zahn 1936; Szeląg 2014 in litt.
Hieracium negoiense (Răvărut et Nyár.) Soó [109] (Syn.: *Crepis negoiensis* Răvărut et Nyár.)	SC (RO)	South-Carpathian endemic (Retezat Mts)	Morariu & Beldie 1976; Oprea 2005; Sârbu et al. 2013
Hieracium nigrescens subsp. *koprovanum* Rech. f. et Zahn	WC (SK, PL)	West-Carpathian endemic (Tatry Mts, Nízke Tatry Mts)	Zahn 1927; Mráz 2001b, 2002; Chrtek jr. et al. 2004b, 2007
Hieracium nigrilacus Nyár.	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2006b
Hieracium ostii-bucurae Nyár. ex Szeląg [110, 111] (Syn.: *H. longifoliosum* Nyár. ex Szeląg; *H. sparsum* subsp. *sparsiforme* (Degen et Zahn) Greuter)	SC (RO)	South-Carpathian endemic	Szeląg 2003a, 2006b; Mráz & Szeląg 2004
Hieracium palenicae Rech. f. et Zahn	WC (SK)	West-Carpathian endemic (Západné Tatry Mts)	Zahn 1937; Procházka & Chrtek jr. 1999; Chrtek jr. 2014 in litt.
Hieracium paltinae Ják. et Zahn	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2014 in litt.; cf. Zahn 1938
Hieracium pawlowskianum Nyár. (Syn.: *H. riumarense* Nyár. ex Szeląg; *H. tomiasiforme* (Nyár.) Nyár.; *H. sparsum* subsp. *nigrovirenticeps* (Nyár. et Zahn) Greuter)	SC (RO)	South-Carpathian endemic (Retezat Mts, Țarcu Mts)	Szeląg 2003a, 2004a, 2006b
Hieracium paxianum Nyár. et Zahn	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Mráz et al. 2005
Hieracium perfoliosum Nyár. ex Szeląg	SC (RO)	South-Carpathian endemic (Godeanu Mts)	Szeląg 2003a, 2006b
Hieracium pietroszense Degen et Zahn [112]	EC (RO)	East-Carpathian endemic (Rodna Mts)	Mráz 2003a
Hieracium pinetophilum (Degen et Zahn) Chrtek f.	WC (SK, PL)	West-Carpathian endemic	Chrtek jr. & Marhold 1998; Štorchová et al. 2002; Chrtek jr. et al. 2004a
Hieracium pisaturense Nyár.	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2003b, 2006b; Szeląg 2014 in litt.; cf. Zahn 1938
Hieracium pocuticum Woł.	EC (UA, RO)	East-Carpathian endemic	Šljakov 1989; Szeląg 2007; cf. Tasenkevyč 2003b

Taxon	Occurrence in the Carpathians	Category of endemism	References
Hieracium pojoritense Woł.	EC (RO)	East-Carpathian endemic	Ștefureac & Tăcină 1979; Mráz 2003b; Mráz & Szeląg 2004; Mráz & Paule 2006; Szeląg 2006b, 2007
Hieracium polyphyllobasis (Nyár. et Zahn) Szeląg (Syn.: *H. sparsum* subsp. *polyphyllobasis* (Nyár. et Zahn) Greuter)	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2006b; Ilnicki & Szeląg 2011
Hieracium porphyriticum A. Kern. (Syn.: *H. sparsum* subsp. *porphyriticum* (A. Kern.) Zahn)	SC (RO), AC (RO)	South-Apuseni-Carpathian endemic	Szeląg 2006b; Ilnicki & Szeląg 2011; Szeląg 2014 in litt.
Hieracium prassivae Zahn	WC (SK)	West-Carpathian endemic (Vysoké Tatry Mts, Nízke Tatry Mts)	Šípošová et al. 2004b
Hieracium pseudostygium Woł. (Syn.: *H. nigritum* subsp. *pseudostygium* (Woł.) Zahn)	EC (UA)	East-Carpathian endemic	Šljakov 1989; Szeląg 2007; cf. Čornej 2011
Hieracium rapunculoidiforme Woł. et Zahn [113]	EC (UA, ?RO)	East-Carpathian endemic	Zahn 1911; Šljakov 1989
Hieracium ratezaticum (Nyár. et Zahn) Mráz	SC (RO)	South-Carpathian endemic (Retezat Mts)	Mráz 2001b; Mráz & Szeląg 2004
Hieracium rohacsense Kit.	WC (SK, PL)	West-Carpathian endemic	Mráz 2001a, 2002, 2005a; Šípošová et al. 2004a
Hieracium scitulum Woł. [114]	EC (UA)	East-Carpathian endemic	Šljakov 1989; Chrtek jr. 2004; Szeląg 2007
Hieracium silesiacum E. Krause [115]	WC (SK, PL)	West-Carpathian subendemic	Chrtek jr. 1996; Chrtek jr. et al. 2002; Szeląg 2004b, 2006b; Mráz 2005b
Hieracium slovacum Chrtek f.	WC (SK)	West-Carpathian endemic (Belianske Tatry Mts)	Chrtek jr. & Marhold 1998; Štorchová et al. 2002; Chrtek jr. et al. 2004a
Hieracium subsinuatum Borbás (Syn.: *H. subserratosinuatum* Zahn, nom. illeg.)	WC (SK)	West-Carpathian endemic (Tatry Mts)	Zahn 1937; Kliment 1999; Procházka & Chrtek jr. 1999; Chrtek jr. 2014 in litt.
Hieracium telekianum Boros et Lengyel (Syn.: *H. sparsum* subsp. *telekianum* (Boros et Lengyel) Greuter)	EC (RO)	East-Carpathian endemic (Harghita Mts)	Mráz & Szeląg 2004; Szeląg 2006b; cf. Beldie 1977, Ciocârlan 2009, Sârbu et al. 2013
Hieracium tomiasae (Nyár. et Zahn) Nyár. (Syn.: *H. sparsum* subsp. *tomiasae* Nyár. et Zahn; *H. sparsum* var. *tomiasae* (Nyár. et Zahn) Ciocârlan)	SC (RO)	South-Carpathian endemic (Țarcu Mts: Mt. Tomeasa)	Mráz & Szeląg 2004; Szeląg 2006b; Ilnicki & Szeląg 2011; cf. Dihoru & Pârvu 1987
Hieracium tomosense Simonk.	EC (RO), SC (RO)	East-South-Carpathian endemic	Ilnicki & Szeląg 2011; Szeląg 2013
Hieracium tubulare Nyár. [116] (Syn.: *H. sparsum* var. *tubulare* (Nyár.) Ciocârlan; *H. sparsum* subsp. *tubulatum* (Zahn) Greuter)	SC (RO)	South-Carpathian endemic (Retezat Mts)	Mráz & Szeląg 2004; Szeląg 2006a, b; Ilnicki & Szeląg 2011
Hieracium ukierniae Woł. et Zahn	EC (UA)	East-Carpathian endemic	Šljakov 1989; Szeląg 2014 in litt.
Hieracium vapenicanum (Lengyel et Zahn) Chrtek f. et Mráz	WC (SK, PL)	West-Carpathian endemic	Zahn 1927; Chrtek jr. et al. 2004b, 2007; Chrtek jr. & Mráz 2007
Hieracium virgicaule Nägeli et Peter [117]	WC (SK, PL, HU)	West-Carpathian endemic	Zahn 1930; Chrtek jr. et al. 2004a
Hieracium worochtae Woł.	EC (UA)	East-Carpathian endemic	Zahn 1938; Šljakov 1989; Szeląg 2007
Hieracium zajacii Szeląg	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Szeląg 2010
Hieracium zanogae Pax	SC (RO)	South-Carpathian endemic (Retezat Mts)	Szeląg 2006b
Hylotelephium argutum (Haw.) Holub (Syn.: *Sedum carpaticum* G. Reuss; *S. telephium* subsp. *fabaria* (W. D. J. Koch) Kirschl.)	WC (†CZ, SK, PL), EC (SK, UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Grulich 1984; Kliment 1999
Jovibarba globifera subsp. *preissiana* (Domin) Holub [118] (Syn.: *J. preissiana* (Domin) Omelczuk et Czopik)	WC (SK, PL), EC (UA, RO)	West-East-Carpathian subendemic	Letz 1998; Kliment 1999

Taxon	Occurrence in the Carpathians	Category of endemism	References
Jurinea transylvanica (Spreng.) Simonk. [119] (Syn.: *J. mollis* subsp. *transylvanica* (Spreng.) Hayek)	Tr (RO)/EC (RO), SC (RO), AC (RO)	subendemic to Transylvanian Basin	Dihoru & Pârvu 1987; Oprea 2005
Knautia kitaibelii (Schult.) Borbás subsp. *kitaibelii* [120, 121]	WC (A, CZ, SK, PL)	West-Carpathian subendemic	Soják 1983b; Štěpánek 1985, 1997; Kliment 1999; Böhm & Facsar 2000; Kolář et al. 2009
Knautia slovaca Štěpánek	WC (SK)	West-Carpathian endemic	Štěpánek 1983, 1985
Koeleria macrantha subsp. *transsilvanica* (Schur) A. Nyár. [122] (Syn.: *K. transsilvanica* Schur; *K. macrantha* subsp. *transsilvanica* (Schur) Beldie, nom. illeg.)	EC (†UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Deyl 1934; Ghișa 1972; Soják 1983b; Popescu et al. 2003; Oprea 2005; Kricsfalusy & Budnikov 2007
Koeleria tristis Domin	WC (SK)	West-Carpathian endemic	Kliment 1999; Pečinka et al. 2006
Lathyrus transsilvanicus (Spreng.) Fritsch [123, 124, 125]	WC (SK, HU), EC (UA, RO), Tr (RO)/AC (RO)	subendemic to Western & Eastern Carpathians and Transylvanian Basin	Kliment 1999; Oprea 2005; Petrova & Vladimirov 2009; Proc' & Kiš 2009; Kobiv 2010; Tosheva et al. 2011; Marinov et al. 2014
Leontodon kulczynskii Popov (Syn.: *L. repens* Schur, nom. illeg.)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Čopyk 1976; Hel'tman 1989; Oprea 2005; Čornej 2011
Leucanthemopsis alpina subsp. *tatrae* (Vierh.) Holub [126] (Syn.: *L. tatrae* (Vierh.) Holub; *Chrysanthemum alpinum* f. *tatrae* Vierh.)	WC (SK, PL)	West-Carpathian endemic (Tatry Mts, Nízke Tatry Mts)	Holub 1977b; Kliment 1999; Mirek & Piękoś-Mirkowa 2009, 2010
Leucanthemum rotundifolium (Waldst. et Kit. ex Willd.) DC. [127] (Syn.: *L. waldsteinii* (Sch. Bip.) Pouzar; *Chrysanthemum rotundifolium* Waldst. et Kit. ex Willd.)	WC (SK, PL), EC (SK, PL, UA), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian subendemic	Zelený 1970; Čopyk 1976; Kliment 1999; Oprea 2005
Linum extraaxilare Kit. [128] (Syn.: *L. perenne* subsp. *extraaxillare* (Kit.) Nyman)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian subendemic	Kliment 1999; Oprea 2005; Petrova & Vladimirov 2009; Vladimirov et al. 2011
Linum uninerve (Rochel) Jáv. [129, 130]	SC (RO)/EC (RO)	East-South-Carpathian subendemic	Dihoru & Pârvu 1987; Oprea 2005; Petrova 2011
Luzula alpinopilosa subsp. *obscura* S. Fröhner	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Mirek & Piękoś-Mirkowa 2010; Čornej 2011
Melampyrum saxosum Baumg. [131, 132] (Syn.: *M. sylvaticum* subsp. *saxosum* (Baumg.) P. Beauv.; *M. herbichii* Woł.)	EC (SK, PL, UA, RO), SC (RO)	East-South-Carpathian endemic	Štech & Drábková 2005; Těšitel & Štech 2007; Michalik & Mitka 2008; Těšitel et al. 2009
Minuartia oxypetala (Woł.) Kulcz. (Syn.: *M. verna* subsp. *oxypetala* (Woł.) G. Halliday)	EC (UA, RO)	East-Carpathian endemic	Pawłowski 1939; Beldie 1977; Fedoronchuk & Diduch 2002c; Oprea 2005; Kobiv et al. 2007a; Kobiv 2010; Čornej 2011
Minuartia pauciflora (Kit. ex Kanitz) Dvořáková [133] (Syn.: *M. zarencznyi* (Zapał.) Klokov)	WC (SK, PL), EC (UA)	West-East-Carpathian endemic	Dvořáková 2003
Nigritella carpatica (Zapał.) Teppner, E. Klein et M. Zagulskij (Syn.: *Gymnadenia carpatica* (Zapał.) Teppner et E. Klein)	EC (UA, RO)	East-Carpathian endemic	Teppner et al. 1994; Teppner & Klein 1998; Teppner 2004; Čornej 2009
Noccaea banatica (R. Uechtr.) F. K. Mey. [134] (Syn.: *Thlaspi dacicum* subsp. *banaticum* (R. Uechtr.) Nyár.; *T. dacicum* subsp. *banaticum* (R. Uechtr.) Dvořáková, nom. illeg.)	SC (RO)	South-Carpathian endemic	Beldie 1977; Dihoru & Pârvu 1987; Popescu et al. 2003; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Noccaea caerulescens subsp. *tatrensis* (Zapał.) Holub (Syn.: *Thlaspi caerulescens* subsp. *tatrense* (Zapał.) Dvořáková)	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Hodálová & Mártonfi 2002
Noccaea dacica (Heuff.) F. K. Mey. subsp. *dacica* (Syn.: *Thlaspi dacicum* Heuff. subsp. *dacicum*)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Morariu & Beldie 1976; Jalas et al. 1996; Tasenkevyč 2003b; Oprea 2005; Ciocârlan 2009

Taxon	Occurrence in the Carpathians	Category of endemism	References
Noccaea jankae (A. Kern.) F. K. Mey. [135] (Syn.: *Thlaspi jankae* A. Kern.)	WC (SK, HU)	West-Carpathian endemic	Clapham & Akeyrod 1993; Kliment 1999; Hodálová & Mártonfi 2002
Onosma pseudarenaria Schur subsp. *pseudarenaria* [136]	Tr (RO)/EC (RO), AC (RO)	subendemic to Transylvanian Basin	Oprea 2005; Dihoru & Negrean 2009; Șuteu 2012
Onosma viridis (Borbás) Jáv. [137, 138] (Syn.: *Onosma tornensis* Jáv.)	WC (SK, HU), SC (RO), AC (RO), Tr (RO)	endemic to Western, Southern & Apuseni Carpathians and Transylvanian Basin	Grințescu & Nyárády 1960a; Kolarčik et al. 2010; Mártonfi et al. 2014
Ophrys holubyana Andras. [139]	WC (CZ, SK)	West-Carpathian endemic	Kliment 1999; Dítě 2014 in litt.
Ornithogalum orthophyllum subsp. *acuminatum* (Schur) Zahar.	SC (RO)	South-Carpathian endemic (Bârsei Mts: Postăvarul massif)	Dihoru & Pârvu 1987; Oprea 2005
Oxytropis campestris subsp. *tatrae* (Borbás) Dostál	WC (SK, PL), EC (RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Tasenkevich 2011
Oxytropis carpatica Uechtr. (Syn.: *O. jacquinii* subsp. *carpatica* (R. Uechtr.) Hausskn.)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005
Papaver corona-sancti-stephani Zapał. (Syn.: *P. alpinum* subsp. *corona-sancti-stephani* (Zapał.) Borza; *P. pyrenaicum* subsp. *corona-sancti-stephani* (Zapał.) Borza)	EC (RO), SC (RO)	East-South-Carpathian endemic	Beldie 1977; Dihoru & Pârvu 1987; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Papaver tatricum (A. Nyár.) Ehrend. (Syn.: *P. alpinum* subsp. *tatricum* A. Nyár.)	WC (SK, PL)	West-Carpathian endemic	Kliment 1999
Papaver tatricum (A. Nyár.) Ehrend. subsp. *tatricum*	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Bernátová 2002; Mirek & Piękoś-Mirkowa 2010
Papaver tatricum subsp. *fatraemagnae* Bernátová	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Bernátová 2002; Šípošová et al. 2004a; Kliment et al. 2008
Pedicularis baumgartenii Simonk. [140]	SC (RO)/EC (RO)	East-South-Carpathian endemic	Beldie 1977; Dihoru & Pârvu 1987; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Peucedanum rochelianum Heuff. [141, 142]	Tr (RO)	subendemic to Transylvanian Basin	Boșcaiu 1965; Boșcaiu & Rațiu 1965; Dihoru & Pârvu 1987; Paucă-Comănescu & Negrean 1994; Jakab et al. 2008; Kovács 2011
Phyteuma tetramerum Schur	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Čopyk 1976; Morariu & Beldie 1976; Negrean & Oltean 1989; Oprea 2005; Čornej 2011
Phyteuma vagneri A. Kern. (Syn.: *P. spiciforme* Rochel)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Dihoru & Pârvu 1987; Negrean & Oltean 1989; Oprea 2005
Pilosella plaicensis (Woł.) Soják (Syn.: *Hieracium plaicense* Woł.)	EC (UA)	East-Carpathian endemic	Szeląg 2007
Pilosella ullepitschii (Błocki) Szeląg [143] (Syn.: *P. alpicola* subsp. *ullepitschii* (Błocki) Soják; *Hieracium alpicola* subsp. *ullepitschii* (Błocki) Zahn)	WC (SK, PL)/EC (RO), SC (RO)	West-East-South-Carpathian endemic	Szeląg 2008; Šingliarová et al. 2008, 2011a, b, 2013; Šingliarová & Mráz 2009; Ilnicki & Szeląg 2011
Plantago atrata subsp. *carpatica* (Soó) Soó	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Sârbu et al. 2013
Poa babiogorensis Bernátová, Májovský et Obuch	WC (PL)	West-Carpathian endemic (Beskid Żywiecki Mts: Mt. Babia Góra)	Bernátová et al. 1999, 2003a
Poa carpatica (V. Jirásek) Chopik [144] (Syn.: *P. nemoralis* subsp. *carpatica* V. Jirásek)	WC (SK, PL), EC (UA)	West-East-Carpathian endemic	Čopyk 1976; Bernátová et al. 2006

Taxon	Occurrence in the Carpathians	Category of endemism	References
Poa granitica Braun-Blanq.	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999
Poa granitica Braun-Blanq. subsp. *granitica*	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Kliment 1999; Mirek & Piękoś-Mirkowa 2008c
Poa granitica subsp. *disparilis* (Nyár.) Nyár. [145] (Syn.: *P. deylii* Chrtek et V. Jirásek)	EC (UA, RO), SC (RO)	East-South-Carpathian endemic	Ghișa & Beldie 1972; Beldie 1972; Oprea 2005; Ciocârlan 2009; Kobiv 2010; Sârbu et al. 2013
Poa margilicola Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts: Mt. Borišov)	Bernátová & Májovský 1997; Bernátová et al. 2003b; Šípošová et al. 2004a
Poa nobilis Skalińska [146]	WC (SK, PL)	West-Carpathian endemic (Tatry Wysokie Mts)	Piękoś-Mirkova et al. 1996; Kliment 1999; Piękoś-Mirkova 2008
Poa pannonica subsp. *scabra* (Asch. et Graebn.) Soó [147]	WC (SK, HU), †EC (UA)/SC (RO)	West-South-Carpathian endemic	Kliment 1999; Oprea 2005; Dúbravková et al. 2010; Borhidi et al. 2012
Poa rehmannii (K. Richt.) Woł. [148] (Syn.: *P. rehmannii* (K. Richt.) Szafer, nom. illeg.; *P. nemoralis* subsp. *rehmannii* (K. Richt.) Asch. et Graebn.)	EC (UA, RO)	East-Carpathian endemic	Čopyk 1976; Beldie 1979; Oprea 2005; Dihoru & Negrean 2009; Čornej 2011; Sârbu et al. 2013
Poa sejuncta Bernátová, Májovský et Obuch	WC (SK)	West-Carpathian endemic (Západné Tatry Mts: Mt. Osobitá)	Bernátová et al. 1999, 2003a
Prangos carinata Griseb. ex Degen [149, 150] (Syn.: *P. carinata* Griseb. ex Grecescu, nom. illeg.; *P. ferulacea* subsp. *carinata* (Griseb. ex Degen) Dihoru)	SC (RO)	South-Carpathian endemic (Almajului Mts: Porțile de Fier Gorge)	Morariu & Beldie 1976; Beldie 1977; Dihoru & Pârvu 1987; Oprea 2005; Dihoru & Negrean 2009
Primula auricula subsp. *hungarica* (Borbás) Soó [151]	WC (SK, PL)	West-Carpathian subendemic	Soó 1964, 1980a; Simon 1992; Kliment 1999
Primula auricula subsp. *serratifolia* (Rochel) Jáv.	SC (RO, SRB)	South-Carpathian endemic	Beldie 1979; Popescu et al. 2003; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009
Primula leucophylla Pax [152] (Syn.: *P. elatior* subsp. *leucophylla* (Pax) Hesl.-Harr.f. ex W. W. Sm. et H. R. Fletcher)	EC (RO)	East-Carpathian endemic	Șuteu 2012; Șuteu et al. 2011, 2013; Hurdu et al. 2014 in litt.
Primula wulfeniana subsp. *baumgarteniana* (Degen et Moesz) Lüdi (Syn.: *P. baumgarteniana* Degen et Moesz)	SC (RO)	South-Carpathian endemic	Dihoru & Pârvu 1987; Oprea 2005; Dihoru & Negrean 2009; Negrean 2011; Hurdu et al. 2012a; Sârbu et al. 2013
Pulmonaria rubra subsp. *filarszkyana* (Jáv.) Domin [153] (Syn.: *P. filarszkyana* Jáv.)	EC (UA, RO)	East-Carpathian endemic	Čopyk 1976; Beldie 1979; Oprea 2005; Čornej 2011; Ciocârlan 2009; Sârbu et al. 2013
Pulsatilla slavica G. Reuss [154] (Syn.: *P. halleri* subsp. *slavica* (G. Reuss) Zamels)	WC (SK, PL)	West-Carpathian endemic	Goliašová 1985; Kliment 1999; Šípošová et al. 2004b; Ciocârlan 2009
Pulsatilla subslavica Futák ex Goliašová	WC (SK)	West-Carpathian endemic	Goliašová 1985; Kliment 1999
Pyrola carpatica Holub et Křísa (Syn.: *P. rotundifolia* subsp. *carpatica* (Holub et Křísa) Beldie et Váczy)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Ciocîrlan 2009
Ranunculus altitatrensis Paclová et Murín	WC (SK)	West-Carpathian endemic (Vysoké Tatry Mts)	Paclová 1999
Ranunculus carpaticus Herbich	EC (SK, UA, RO), SC (RO)	East-South-Carpathian endemic	Kliment 1999; Oprea 2005
Ranunculus flabellifolius Heuff. ex Rchb. [155]	SC (RO, SRB)	South-Carpathian endemic	Jalas & Suominen 1989; Stevanović et al. 1991; Dunkel 2011
Ranunculus malinovskii Elenevsky et Derv.-Sok. (Syn.: *R. kladnii* auct. non Schur)	EC (UA)	East-Carpathian endemic	Cvelev 2001; Diduch et al. 2004a; Čornej 2011; Turlaj 2011

Taxon	Occurrence in the Carpathians	Category of endemism	References
Ranunculus pseudomontanus Schur [156, 157] (Syn.: *R. montanus* subsp. *pseudomontanus* (Schur) Ciocârlan)	WC (SK, PL), EC (UA, RO), SC (RO), AC	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Kožuharov & Petrova 1988; Kliment 1999; Oprea 2005
Rosa coziae Nyár. [158, 159] (Syn.: *R. villosa* subsp. *coziae* (Nyár.) Ciocârlan)	SC (RO)	South-Carpathian endemic	Oprea 2005; Ciocârlan 2009; Kerényi-Nagy 2011; Hurdu et al. 2012a
Salix kitaibeliana Willd. (Syn.: *S. retusa* subsp. *kitaibeliana* (Willd.) Jáv.)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999
Salvia transsylvanica (Schur ex Griseb. et Schenk) Schur [160]	Tr, EC (RO)/SC (RO)	endemic to Transylvanian Basin, Eastern and Southern Carpathians	Dihoru & Pârvu 1987; Oprea 2005
Saussurea porcii Degen [161]	EC (UA, RO)	East-Carpathian endemic	Kobiv et al. 2007b; Dihoru & Negrean 2009; Bahlej 2010; Kobiv 2010; Počynok & Prokopiv 2010; Derevenko 2011; Mátis et al. 2014
Saxifraga moschata subsp. *dominii* Soó	WC (SK, PL)	West-Carpathian endemic	Kliment 1999
Saxifraga moschata subsp. *kotulae* S. Pawł.	WC (SK, PL)	West-Carpathian endemic (Tatry Mts, Nízke Tatry Mts)	Kliment 1999; Mirek & Piękoś-Mirkowa 2010
Saxifraga mutata subsp. *demissa* (Schott et Kotschy) D. A. Webb (Syn.: *S. demissa* Schott et Kotschy; *S. transsilvanica* Fuss)	SC (RO)	South-Carpathian endemic	Beldie 1977; Dihoru & Pârvu 1987; Webb 1993a; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Saxifraga wahlenbergii Ball	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Cieślak et al. 2013
Scabiosa columbaria subsp. *banatica* (Waldst. et Kit.) Diklić [162] (Syn.: *S. banatica* Waldst. et Kit.; *S. columbaria* subsp. *banatica* (Waldst. et Kit.) Soó, nom. illeg.)	SC (RO, SRB), AC (RO)/EC (RO)	East-South-Apuseni-Carpathian endemic	Prodan 1961; Diklić 1973; Mardari 2009; Hurdu et al. 2012b
Scabiosa lucida subsp. *barbata* Nyár. (Syn.: *S. pseudobanatica* subsp. *barbata* (Nyár.) Chrtek; *S. opaca* Klokov)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Kobiv et al. 2007a; Oprea 2005
Scilla kladnii Schur [163] (Syn.: *S. bifolia* subsp. *subtriphylla* (Schur) Domin; *S. alpina* Schur)	WC (CZ, SK, HU, PL), EC (SK, PL, UA), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Kereszty 1993; Kricsfalusy & Vajnagi 1994; Kliment 1999; Kochjarová et al. 2004, 2005; Trávníček et al. 2010
Scorzoneroides pseudotaraxaci (Schur) Holub (Syn.: *Leontodon pseudotaraxaci* Schur; *L. montanus* subsp. *pseudotaraxaci* (Schur) Finch et P. D. Sell)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Čornej 2011
Sempervivum carpathicum Wettst. ex Prodan [164]	WC (SK, PL), EC (PL, UA, RO), SC (RO)	West-East-South-Carpathian endemic	Letz 1998; Kliment 1999
Sempervivum carpathicum Wettst. ex Prodan subsp. *carpathicum* [165] (Syn.: *S. montanum* subsp. *carpathicum* (Wettst. ex Prodan) A. Berger)	WC (SK, PL), EC (PL, UA, RO), SC (RO)	West-East-South-Carpathian endemic	Letz 1998, 2002; Letz & Marhold 1998; Kliment 1999
Sempervivum carpathicum subsp. *heterophyllum* (Hazsl.) Letz [166] (Syn.: *S. montanum* subsp. *heterophyllum* (Hazsl.) Jáv. ex Soó)	WC (SK)	West-Carpathian endemic	Letz 1998, 2002; Letz & Marhold 1998; Kliment 1999
Sempervivum matricum Letz [167]	WC (SK, HU)	West-Carpathian subendemic	Blanár & Letz 2005; Letz 2009
Senecio dacicus Hodálová et Marhold (Syn.: *S. hercynicus* subsp. *dacicus* (Hodálová et Marhold) Greuter)	SC (RO), AC (RO)	South-Apuseni-Carpathian endemic	Hodálová & Marhold 1998; Hodálová 1999a, b; Negrean 2011
Senecio ucranicus Hodálová [168] (Syn.: *S. hercynicus* subsp. *ucranicus* (Hodálová) Greuter)	EC (SK, PL, UA, RO), SC (RO)	East-South-Carpathian subendemic	Hodálová 1999b; Rola 2014
Sesleria heuflerana Schur	WC (SK, HU), EC (UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Kliment 1999

Taxon	Occurrence in the Carpathians	Category of endemism	References
Sesleria heuflerana Schur subsp. *heuflerana* [169]	WC (SK, HU), EC (UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Čopyk 1976; Gejdeman 1986; Kliment 1999; Oprea 2005
Sesleria heuflerana subsp. *hungarica* (Ujhelyi) Deyl [170] (Syn.: *S. hungarica* Ujhelyi)	WC (HU)	West-Carpathian endemic (Bükk Mts)	Lysák 1996; Kliment 1999; Borhidi et al. 2012
Sesleria rigida Heuff. ex Rchb. [171] (Syn.: *S. haynaldiana* Schur; *S. rigida* subsp. *haynaldiana* (Schur) Beldie)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Beldie 1979; Oprea 2005; Kuzmanović et al. 2013
Sesleria tatrae (Degen) Deyl [172] (Syn.: *S. sadlerana* subsp. *tatrae* (Degen) Deyl)	WC (SK, PL)	West-Carpathian subendemic	Fabiszewski 1970; Hendrych 1987; Kliment 1999; Budzáková et al. 2014
Silene dinarica Spreng.	SC (RO)	South-Carpathian endemic	Beldie 1977; Chater et al. 1993; Ciocârlan 2009
Silene nivalis (Kit.) Rohrb. (Syn.: *Lychnis nivalis* Kit.; *Polyschemone nivalis* (Kit.) Schott, Nyman et Kotschy)	EC (RO)	East-Carpathian endemic (Rodna Mts)	Coldea 1997; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Silene nutans subsp. *dubia* (Herbich) Zapał. (Syn.: *S. dubia* Herbich)	EC (SK, PL, UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Kliment 1999; Oprea 2005; Mereďa et al. 2012
Silene zawadzkii Herbich [173, 174] (Syn.: *Elisanthe zawadzkii* (Herbich) Klokov; *Melandrium zawadzkii* (Herbich) A. Braun; *Silenanthe zawadzkii* (Herbich) Griseb. et Schenk)	EC (UA, RO)	East-Carpathian endemic	Klokov 1952; Morariu & Beldie 1976; Beldie 1977; Chater et al. 1993; Fedoronchuk & Diduch 2002d; Cvelev 2004a; Ciocârlan 2009; Kobiv 2010; Hurdu et al. 2012a; Sârbu et al. 2013
Soldanella carpatica Vierh.	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Zhang & Kadereit 2002; Kochjarová & Hrouda 2006
Sorbus amici-petri Mikoláš [175]	WC (SK)	West-Carpathian endemic (Čierna hora Mts)	Mikoláš 2003
Sorbus atrimontis Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Bernátová & Májovský 2003; Uhlířová & Bernátová 2004; Kliment et al. 2008
Sorbus borbasii Jáv.	SC (RO)	South-Carpathian endemic	Kárpáti 1960; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Hurdu et al. 2012a
Sorbus caeruleomontana Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts: Mt. Siná)	Bernátová & Májovský 2003; Šípošová et al. 2004b
Sorbus dacica Borbás	AC (RO)	Apuseni-Carpathian endemic (Trascău Mts)	Kárpáti 1960; Dihoru & Negrean 2009; Hurdu et al. 2012a
Sorbus diversicolor Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Bernátová & Májovský 2003; Šípošová et al. 2004a; Uhlířová & Bernátová 2004
Sorbus dolomiticola Mikoláš [176]	WC (SK)	West-Carpathian endemic (Čierna hora Mts)	Mikoláš 1996
Sorbus haljamovae Bernátová et Májovský [177]	WC (SK)	West-Carpathian endemic	Bernátová & Májovský 2003; Uhlířová & Bernátová 2004
Sorbus hazslinszkyana (Soó) Májovský (Syn.: *S. austriaca* subsp. *hazslinszkyana* (Soó) Kárpáti)	WC (SK, HU)	West-Carpathian endemic	Kárpáti 1960; Kliment 1999
Sorbus margittaiana (Jáv.) Kárpáti (Syn.: *S. hostii* subsp. *margittaiana* Jáv.)	WC (SK)	West-Carpathian endemic (Kriváńska Fatra Mts)	Bernátová et al. 1998; Májovský et al. 1998
Sorbus montisalpae Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts)	Bernátová & Májovský 2003; Šípošová et al. 2004a; Uhlířová & Bernátová 2004

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Sorbus pekarovae Májovský et Bernátová	WC (SK)	West-Carpathian endemic (Veľká Fatra Mts: Mt. Pekárová)	Májovský & Bernátová 1996; Bernátová & Májovský 1999; Šípošová et al. 2004a
Sorbus salatini Bernátová et Májovský	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts: Mt. Salatín)	Bernátová & Májovský 2003; Šípošová et al. 2004b
Sorbus scepusiensis Kovanda	WC (SK)	West-Carpathian endemic (Volovské vrchy Mts)	Kovanda 1985, 1986; Kliment 1999
Sorbus umbellata subsp. *banatica* (Jáv.) Kárpáti	SC (RO)	South-Carpathian endemic	Kárpáti 1960; Ciocârlan 2009
Sorbus zuzanae Májovský et Bernátová [178]	WC (SK)	West-Carpathian endemic	Bernátová & Májovský 2003; Šípošová et al. 2004a; Uhlířová & Bernátová 2004
Stipa crassiculmis subsp. *heterotricha* Dihoru et Roman [179]	SC (RO)	South-Carpathian endemic (Cozia Mts)	Dihoru & Pârvu 1987; Negrean & Oltean 1989; Dihoru & Negrean 2009; Negrean 2011; Vázguez & Gutiérrez 2011
Stipa danubialis Dihoru et Roman	SC (RO)	South-Carpathian endemic (Almajului Mts: Porțile de Fier Gorge)	Beldie 1979; Dihoru & Pârvu 1987; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009
Swertia punctata Baumg. [180] (Syn.: *S. perennis* subsp. *punctata* (Baumg.) Ciocârlan)	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Beldie 1979; Tan & Vladimirov 2001; Oprea 2005; Kricsfalusy & Budnikov 2007; Kobiv 2010, 2012a
Symphytum cordatum Waldst. et Kit. ex Willd. [181] (Syn.: *S. cordatum* Waldst. et Kit., nom. illeg.; *S. cordifolium* Baumg.)	WC (SK, PL), EC (SK, PL, UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Čopyk 1976; Roman et al. 1996; Kliment 1999; Oprea 2005; Čornej 2011
Syringa josikaea J. Jacq. ex Rchb. f.	EC (UA), AC (RO)	East-Apuseni-Carpathian endemic	Dihoru & Negrean 2009; Bilz 2013; Lendvay et al. 2013
Taraxacum carpaticum Štěpánek et Kirschner [182]	SC (RO)	South-Carpathian endemic	Štěpánek et al. 2011
Taraxacum erythrocarpum Kirschner et Štěpánek	WC (SK)	West-Carpathian endemic	Kirschner & Štěpánek 1985; Kliment 1999
Taraxacum nigricans (Kit.) Rchb. [183]	WC (SK)	West-Carpathian endemic (Nízke Tatry Mts)	Štěpánek et al. 2011
Taraxacum pawlowskii Soest [184]	WC (PL, ?SK)	West-Carpathian endemic (Tatry Wysokie Mts)	Tacik 1980; Mirek & Piękoś-Mirkowa 2009, 2010
Taraxacum pieninicum Pawł. [185] (Syn.: *T. hoppeanum* subsp. *pieninicum* (Pawł.) Pawł.)	WC (PL)	West-Carpathian endemic (Pieniny Mts: Mt. Trzy Korony)	Zarzycki 1986; Mirek et al. 1995; Wróbel & Zarzycki 2008
Tephroseris longifolia subsp. *moravica* Holub	WC (CZ, SK)	West-Carpathian endemic	Kochjarová 1998; Kochjarová & Hrouda 2004; Janišová et al. 2012; Hegedüšová et al. 2013; Olšavská et al. 2015
Thalictrum minus subsp. *carpaticum* (B. Kotula) Osvač.	WC (SK, PL)	West-Carpathian endemic (Tatry Mts)	Kliment 1999; Mirek & Piękoś-Mirkowa 2010
Thesium kernerianum Simonk.	EC (RO), SC (RO)	East-South-Carpathian endemic	Negrean & Oltean 1989; Oprea 2005; Dihoru & Negrean 2009
Thymus alternans Klokov [186]	EC (SK, UA, RO)/SC (RO), AC (RO)	East-South-Apuseni-Carpathian subendemic	Klokov 1960; Mártonfi 1996; Kliment 1999; Oprea 2005; Mártonfi 2014 in litt.
Thymus bihoriensis Jalas (Syn.: *T. marginatus* A. Kern. non Sm. ex Dickson, nom. illeg.)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Beldie 1979; Dihoru & Pârvu 1987; Oprea 2005
Thymus comosus Heuff. ex Griseb. et Schenk (Syn.: *T. comosus* Schur, nom. illeg.)	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Morariu & Beldie 1976; Dihoru & Pârvu 1987; Oprea 2005
Thymus dacicus Borbás [187] (Syn.: *T. porcii* Borbás)	EC (RO), SC (RO, SRB), AC (RO)	East-South-Apuseni-Carpathian subendemic	Guşuleac 1961; Diklić & Vasić 2000
Thymus pulcherrimus Schur	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian subendemic	Kliment 1999; Oprea 2005

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Thymus pulcherrimus Schur subsp. *pulcherrimus* (Syn.: *T. circumcinctus* Klokov)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Mártonfi 1997; Kliment 1999; Čornej 2011
Thymus pulcherrimus subsp. *sudeticus* (Lyka) P. A. Schmidt [188, 189] (Syn.: *T. carpathicus* Čelak.)	WC (SK, PL)	West-Carpathian subendemic	Kliment 1999
Trifolium orbelicum subsp. *monticolum* (Domin) Májovský	WC (SK, PL)	West-Carpathian endemic	Kliment 1999; Mirek & Piękoś-Mirkowa 2010
Trifolium pratense subsp. *kotulae* (Pawł.) Soják [190] (Syn.: *T. pratense* var. *kotulae* Pawł.; *T. frigidum* Schur)	WC (SK, PL), EC (UA, RO), SC (RO)	West-East-South-Carpathian endemic	Kliment 1999; Oprea 2005; Kricsfalusy & Budnikov 2007
Trifolium sarosiense Hazsl. [191] (Syn.: *T. medium* subsp. *sarosiense* (Hazsl.) Simonk.; *T. sarosiense* subsp. *banaticum* (Heuff.) Holub)	WC (SK, HU), EC (?UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Western, Eastern, Southern & Apuseni Carpathians and Transylvanian Basin (pan-Carpathian subendemic)	Hendrych 1993, 1995; Kliment 1999
Trisetum flavescens subsp. *tatricum* Chrtek [192]	WC (SK), EC (SK, PL, †UA)	West-East-Carpathian endemic	Kliment 1999; Čornej 2011
Trisetum fuscum (Kit. ex Schult.) Schult. (Syn.: *T. ciliare* (Kit.) Domin)	WC (SK, PL), EC (UA, RO), SC (RO), AC (RO)	West-East-South-Apuseni-Carpathian (pan-Carpathian) endemic	Kliment 1999; Oprea 2005
Trisetum macrotrichum Hack.	EC (RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Buia & Morariu 1972; Morariu & Beldie 1976; Oprea 2005
Tulipa hungarica Borbás [193, 194] (Syn.: *T. hungarica* subsp. *undulatifolia* (Roman) Roman et Beldie)	SC (RO, †SRB)	South-Carpathian endemic	Ciocârlan 2009; Dihoru & Negrean 2009; Negrean 2011; Ćalić et al. 2012; Stevanović 2013
Valeriana tripteris subsp. *heterophylla* (Baumg.) Rostański [195, 196, 197] (Syn.: *V. tripteris* var. *heterophylla* Baumg.; *V. transsilvanica* Schur; *V. sisymbriifolia* Schur non Vahl, nom. illeg.)	EC (SK, PL, UA, RO), SC (RO), AC (RO)/WC (PL)	East-South-Apuseni-Carpathian endemic	Schur 1866; Simonkai 1887; Katina 1961; Morariu 1961; Rostański 1967, 1970; Prokudin 1987; Dmytrach 2010; Tasenkevyč 2014
Viola declinata Waldst. et Kit. [198]	EC (UA, RO), SC (RO), AC (RO)	East-South-Apuseni-Carpathian endemic	Oprea 2005; Velev & Apostolova 2009
Viola jooi Janka [199]	EC (UA, RO), SC (RO), AC (RO), Tr (RO)	subendemic to Eastern, Southern & Apuseni Carpathians and Transylvanian Basin	Grințescu et al. 1955; Oprea 2005; Čornej 2011; Cristea 2014

Notes

[1] The occurrence of *Aconitum degenii* subsp. *degenii* was reported from the Eastern, Southern and Apuseni Carpathians (e.g. Mucher 1993, Starmühler 1998a, 2000). In Slovak herbarium collections, Novikov (2013a, 2014 in litt.) found also several specimens from the Slovak part of the Western Carpathians (cf. Eliáš jr. et al. 2015).

[2] Outside the Carpathian arch *Aconitum firmum* subsp. *fissurae* is known from Velebit Mts in Croatia (Starmühler & Mitka 2001). In the record from the central Dneper Valley (Starmühler 1997) the taxon might have been changed with the local endemic *Aconitum odontandrum* Wissjul. (Novikov 2014 in litt.).

[3] In the included literature *Aconitum firmum* subsp. *fissurae* is reported as *Aconitum napellus* subsp. *fissurae* (Nyár.) Seitz; *A. callibotryon* subsp. *hunyadense* (Degen) Soó; *A. firmum* subsp. *hunyadense* (Degen) Morariu et Beldie; *A. tatrae* subsp. *hunyadense* (Degen) Soó; *A. tauricum* subsp. *hunyadense* (Degen) Ciocârlan or *A. firmum* subsp. *romanicum* (Woł.) Beldie.

[4] Eligibility of a separate subspecies *Aconitum firmum* subsp. *skerisorae* was justified by Starmühler (2000); it was accepted also by Mitka (2003), Tasenkevich (2011) and Novikov (2014 in litt.).

[5] *Aconitum lasianthum* has centre of its distribution in the Romanian Southern Carpathians, it occurs sparsely also in the Eastern (Penteleu Mts) and Apuseni Carpathians (Trascău Mts) (Grințescu 1953, Oprea 2005).

[6] The record of *Aconitum lasiocarpum* subsp. *lasiocarpum* from the Beskid Niski Mts (Mitka & Starmühler 2000) concerns subsp. *kotulae* (Mitka 2003).

[7] Outside the Carpathians *Aconitum lasiocarpum* subsp. *kotulae* was reported from Podillja and Polissja in Ukraine (Mitka 2001, 2003, Novikoff & Mitka 2011a, b; cf. Diduch 2009).

[8] In the Southern Carpathians *Aconitum lasiocarpum* subsp. *kotulae* is documented by a single older record (Walz 1884 CL) from Mt. Cristianul Mare in the Postavărul Massif (Mitka & Starmühler 2000, Mitka 2003).

[9] In Poland and Ukraine *Aconitum moldavicum* subsp. *moldavicum* occurs also outside the Carpathians at lower altitudes in Kotlina Sandomierska, Wyżyna Małopolska, Wyżyna Lubelska; Opillja, Podillja (Mitka 2003, 2008). Naturalized plants from a cultivation were found near Graz in Austria (Starmühler 2004).

[10] In Poland and Ukraine *Aconitum moldavicum* subsp. *hosteanum* has been recorded also outside the Carpathians: Kotlina Sandomierska, Pogórze Przemyskie, Góry Świętokrzyskie, Wyżyna Małopolska; Podillja, Roztočča, Mal'e Polissje, Voronjaky, Holohory (Mitka 2008).

[11] Outside the Carpathians *Aconitum toxicum* subsp. *toxicum* is known from two localities in the surrounding of Sarajevo (Bosnia) and from Mt. Ranisava (Durmitor Mts) and Mt. Balj in Montenegro (Mucher 1993, Ilnicki & Mitka 2011).

[12] Based on the Soják's herbarium material from Făgăraş Mts, Plocek (1983) reported *Alchemilla boleslai* also from the Southern Carpathians; later he reported its distribution area as restricted to the Western Carpathians (Plocek 1992). Negrean (2011) wrongly localized the record of Plocek to Parâng Mts. As Boruz (2014 in litt.) failed in finding the species in the Romanian herbaria and in the field, she considered its occurrence in Romania as doubtful (cf. Kurtto et al. 2007). The reference material was not found in the Soják's collections (PR) (Šída 2014 in litt.), nor in the collections of PRC (Hadinec 2014 in litt.).

[13] Syčak (1992) described *Alchemilla bucovinensis* from the Ukrainian Carpathians and identified it also with populations from the Romanian Eastern Carpathians (Maramureş Mts), provisionally reported as *A. romanica* Plocek ined. (cf. Kurtto et al. 2007).

[14] *Alchemilla czywczynensis* was described from Čyvčyny Mts (Pawłowski 1952). Outside the Eastern Carpathians it was found in Pamporovo (Rodopi Mts, Bulgaria) (Fröhner 1986, Kurtto et al. 2007, 2009).

[15] In the original diagnosis of *Alchemilla eugenii*, Pawłowski (1952) reported its occurrence in Mt. Kresanica (2 110 m a.s.l.) at the Slovak-Polish border. Plocek (1992) considered this record, documented by a herbarium specimen, as dubious.

[16] Apart from frequent occurrence in the Moravsko-sliezske Beskydy Mts and Javorníky Mts *Alchemilla gruneica* is known also from the Hrubý Jeseník Mts in the Sudeten Mts (Plocek 1992).

[17] Syčak (2002) reported *Alchemilla ladislai* also from the Ukrainian Carpathians; however, these data are erroneous (Sychak sec. Kurtto et al. 2007, Syčak 2011).

[18] According to Plocek (Plocek in Kliment 1999), the populations from the Veľká Fatra Mts and Javorníky Mts reported as *Alchemilla laxa* (Plocek 1990, 1992) belong to a different taxon.

[19] According to Plocek (1992), similar populations occur also in the Southern Carpathians (Bucegi Mts). Kurtto et al. (2007) report *Alchemilla marginata* only from Slovakia. Boruz (2014 in litt.) has not found this species in the Southern Carpathians; according to her knowledge it is absent from Romania.

[20] Plocek (1992) considered *Alchemilla sokolowskii* to be a synonym of *A. pseudincisa*. In our study we follow the concept of Kurtto et al. (2007), who consider *A. sokolowskii* to be a separate species.

[21] With respect to the relative alpine flora strongly affected by the Pleistocene glaciation we recognize endemics to Tatry Mts s. str. occurring in the Západné Tatry Mts, Vysoké Tatry Mts and Belianske Tatry Mts, and endemics to Tatry Mts s. lat. occurring also at higher altitudes of the Nízke Tatry Mts (for details see Kliment 2003); to distinguish between them we report the precise information on their occurrence.

[22] *Alchemilla suavis* was described from the Moravian part of the Bílé Karpaty Mts and found also on Mt. Krompašský vrch in the Slovenské rudohorie Mts (Plocek 1973, 1992); such distribution was accepted also by Kurtto et al. (2007). According to Plocek (1992), the species area involves also the Ukrainian and Romanian Eastern Carpathians. However, Syčak (2002, 2011) has not reported this species from the Ukrainian Carpathians. Neither it was found in the Romanian herbarium collections nor in the Romanian Carpathians (Boruz 2014 in litt.). Based on these facts we reduced its distribution area to the Western Carpathians.

[23] Plocek (1992) reported *Alchemilla versipiloides* as synonym of *A. versipila* Buser; however, Kurtto et al. (2007) accepted it as a separate species (cf. Piękoś-Mirkowa & Mirek 2009).

[24] There is only a single, recently not confirmed, evidence of *Alchemilla zapalowiczii* occurrence from the Western Carpathians, specifically from the Belianske Tatry Mts (Dostál 1949 PRC). Therefore, Kurtto et al. (2007) consider this species as probably extinct in Slovakia. Based on the second volume of Flora Europaea (Walters & Pawłowski 1968; cf. Negrean 2011) the occurrence of *A. zapalowiczii* is reported also from the Romanian Carpathians although it was confirmed neither in herbaria nor during the field research (Boruz 2014 in litt.). Kurtto et al. (2009) reported sporadical occurrence of this species from the Jakupica Mts in Macedonia.

[25] Plocek (1992) reported *Alchemilla zmudae* as synonym of *A. stanislaae*; however, Kurtto et al. (2007) accepted it as a separate species (cf. Mirek & Piękoś-Mirkowa 2009, 2010).

[26] According to Brullo et al. (1996) *Allium fussii* differs from *A. fuscum* in several traits of leaves and inflorescences, therefore it was regarded as a separate species within the *Allium paniculatum* group (cf. Mráz 2005a, Šafářová et al. 2011).

[27] Based on common morphological seed traits Sennikov (1999a) ordered *Andryala laevimentosa* together with another narrow endemic (SE Spain, Morocco) relic alpine species *A. agardhii* Haens. ex DC. to oligotypic genus *Pietrosia* Nyár. ex Sennikov (cf. Negrean 2004). The results of the most recent molecular-phylogenetic study (Fereira et al. 2015) support the opinion of Greuter (2003) and justify its backward classification within the monophyletic genus *Andryala* L. Up-to-date note on taxonomy, nomenclature, biology, phylogeny and conservation status of *Andryala laevitomentosa*, particularly important microchoric species endemic to the Romanian Carpathians, were published by Negrea & Pricop (2009a, b ut *Pietrosia laevitomentosa*). Records from the Ukrainian Carpathians demand of a confirmation (cf. Kricsfalusy & Budnikov 2007).

[28] In the included literature it is reported also using invalid names *Andryala levitomentosa* (Nyár.) P. D. Sell., *Hieracium levimentosum* (Nyár.) Soó and *Pietrosia levitomentosa* Nyár.

[29] The occurrence of *Antennaria carpatica* subsp. *carpatica* in Romania is reported only in older recently not confirmed records from the Gutâi, Ceahlău, Bucegi and Făgăraș Mts (Oprea 2005; cf. Ciocârlan 2009, Sârbu et al. 2013), therefore the subspecies has been considered as extinct in Romania already by Oltean et al. (1994). Chrtek & Pouzar (1985) report it occurrence only from the Western (Vysoké Tatry Mts, Nízke Tatry Mts) and Eastern Carpathians (Mt. Blyznycja, Mt. Drahobrat).

[30] In the Eastern Carpathians *Anthemis cretica* subsp. *pyrethriformis* grows only in the Ceahlău Mts (Beldie 1979, Oprea 1985, Sârbu et al. 2013).

[31] In some Romanian literature (Dihoru & Pârvu 1987, Negrean & Oltean 1989, Oltean et al. 1994, Popescu & Sanda 1998, Sârbu et al. 2013) it is invalidly reported as *Anthemis carpatica* subsp. *pyrethriformis* (Schur) Beldie (cf. Fernandes 1976).

[32] The occurrence of *Aquilegia transsilvanica* is reported also from the Ukrainian Carpathians (e.g. Čopyk 1976, Stojko & Tasenkewitsch 1991, Stoyko & Tasenkevich 1993, Vasil'eva 2001, 2012, Kricsfalusy & Budnikov 2002, 2007, Tasenkevyč 2003b, Ziman et al. 2009). According to Kobiv (2012b), it certainly grows in the Southern Carpathians (Parîng, Făgăraș, Iezer and Bucegi Mts) and outside them only in the southeastern part of the Eastern Carpathians (Buzău Mts), while all records from the Ukrainian Carpathians are erroneous.

[33] Sporadic records of *Arabidopsis neglecta* in the Austrian Alps (Janchen 1957, Čopyk 1976, Piękoś-Mirkowa et al. 1996, etc.) refer alpine forms of *Arabidopsis arenosa* (cf. Kliment 1999).

[34] *Armeria pocutica* is a very rare stenochoric endemic described in the Ukrainian Carpathians and known only from the Čornyj Čeremoš Valley in the Čyvčyny Mts (Pawłowski 1962) in Ukraine and a single locality (Borșa, under Mt. Luhi in the Cizla Valley) in the Romanian Maramureș Mts (Beldie & Váczy 1976, Morariu & Beldie 1976, Beldie 1979, Ciocîrlan 1988, 2009, Popescu & Sanda 1998, Negrean 2011). Its occurrence in its *locus classicus* has not been confirmed since the last 30 years (Kahalo & Syčak 2009).

[35] Apart its frequent occurrence in Hășmaș Mts, where there is a centre of its distribution, *Asperula carpatica* occurs also in the Rarău Mts (here only within its *locus classicus* in Pietrele Doamnei); in the Southern Carpathians its occurrence was reported from a single locality in the Piatra Craiului Mts (Negrean 2011).

[36] *Astragalus australis* subsp. *krajinae* is an alpine taxon known from a sub-alpine belt of the Ukrainian mountains Svydovec Mts and Marmaroš Mts (Ziman 2009). It was described by Domin (1931a) from Svydovec Mts as a species distinct from *A. australis* (L.) Lam., but later it was re-classified to subspecies (Domin 1935). Since its description it is unequivocally accepted by the Ukrainian authors (in both taxonomic and syntaxonomic literature); and it is also accepted in the Carpathian Red List (Witkowski et al. 2003). In some comprehensive taxonomic studies (Chater 1968; Podlech 2008, 2011) it is evaluated as synonym of *A. australis*.

[37] Rare and endangered stenoendemic of the Romanian flora, *Astragalus peterfii*, is recently known from two adjacent localities situated only 5 km from each other (Suatu, Căianu) located east of Cluj (Șuteu et al. 2003, Bartha 2012).

[38] *Astragalus roemeri* has centre of its distribution in the Romanian Carpathians (Hășmaș Mts). For a longer time not confirmed sporadic occurrence from the Apuseni Carpathians (cf. Váczy & Beldie 1976) was confirmed by Bartha & Bartók (2013), who found two flowering and one sterile individuals on Mt. Scărița. According to these authors, the population is at the border of extinction; it represents a rare exclave occurrence outside the Eastern Carpathians.

[39] The occurrence of *Athamanta turbith* subsp. *hungarica* in Serbia is restricted to the Serbian part of the Southern Carpathians (Gornjačka klisura; cf. Stevanović et al. 1991, Hurdu et al. 2012b).

[40] The subspecies *Aubrieta columnae* subsp. *platycarpa*, known only from the Piatra Craiului Mts (Marele Grohotiș) in the Southern Carpathians, is reported using distinct names in the Romanian literature: *Aubrieta deltoidea* (L.) DC., *A. intermedia* Heldr. et Orph. ex Boiss., *A. intermedia* subsp. *falcata* Ciocârlan and also using invalidly published name *A. deltoidea* subsp. *falcata* (Ciocârlan) Adr. Oprea. To avoid confusions, Ciocârlan (2006) published a new name *A. columnae* subsp. *platycarpa*, but probably due to its publication in less accessible conference proccedings this name is not reported in any supranational database. In the Romanian Red Book (Dihoru & Negrean 2009) the subspecies is mentioned in the note to another subspecies, *A. columnae* subsp. *croatica* (Schott, Nyman et Kotschy) Mattf. (Parâng Mts), which Anastasiu & Negrean (2005) classified as alien taxon of the Romanian flora.

[41] In the Southern Carpathians *Barbarea lepuznica* is recently occurring in the Retezat Mts (including Mt. Piule in the Retezat Mic Mts) and in the Godeanu Mts (Borăscu massif). Outside the Southern Carpathians it grows in Vršacki breg (Vršac Mts) within the Serbian Vojvodina, in close vicinity to the western margin of the Southern Carpathians (Dihoru & Negrean 2009, Strajeru & Stevanović 2013).

[42] Soó (1973, 1980a) reported *Bromus monocladus* (ut *B. pannonicus* var. *monocladus* (Domin) Soó) also from Hungary (Budai Mts). According to recent information (Somlyay 2014 in litt.), this species does not occur in Hungary, it is also not included in the Hungarian vegetation database (Dúbravková 2014 in litt.).

[43] In the past, the name *Campanula kladniana* was used also for populations of other alpine species of *C. rotundifolia* agg., so that the information on its distribution area was dirstorted.

[44] Distinct conceptions of the species *Campanula tatrae* (for details see Kliment 1999, Goliašová et al. 2008) is reflected in distinct size of its distribution area and distinct endemic status reported in the literature – from the West-Carpathian endemic to the pan-Carpathian endemic.

[45] In Moravia, Poland and Ukraine *Cardamine glanduligera* sporadically occurs also in the adjacent geographic units (Czech Republic: Opavská pahorkatina Mts, Jesenické podhůří Mts; Poland: Kotlina Śląska Basin, Wyżyna Krakowsko-Wieluńska Mts, Góry Świętokrzyskie Mts, Puszcza Sandomierska, Kotlina Sandomierska Basin, Wyżyna Lubelska Mts; Ukraine: Zakarpattja, Roztočča-Opillja). Isolated localities are in the primeaval forest Puszcza Knyszyńska in Poland and in the vicinity of Dnester estuary in Ukraine; it occurs scarcely also in shady forest of central Moldavia (Kliment 1999, Diduch 2007).

[46] In the literature *Carduus kerneri* subsp. *kerneri* is evaluated as a Carpathian-Balkan taxon. According to Franco (1976), data from the north Balkan mountains are related to subsp. *austro-orientalis* Franco (i.e. subsp. *scardicus* (Griseb.) Kazmi).

[47] In the Romanian literature *Carduus kerneri* subsp. *lobulatiformis* is also invalidly reported as *C. viridis* subsp. *lobulatiformis* (Csürös et Nyár.) Beldie.

[48] *Centaurea reichenbachii* belongs to the *Centaurea stoebe* group. It was accepted by Dostál (1976), Ochsmann (2000) and Greuter (in Euro+Med). *Centaurea calvescens* Pančić was also included as synonym by Ochsmann (l. c.). According to Dostál (l. c.), Beldie (1979), Popescu & Sanda (1998), Dihoru & Negrean (2009), Ciocârlan (2009), Sârbu et al. (2013), Hurdu (2014 in litt.) and Vonica (2014 in litt.), these two species are close but different. Occurrence of *C. reichenbachii* in Romania is restricted to the Trascău Mts and Scarița-Belioara

Massif in the Apuseni Carpathians (Hurdu et al. 2012a); the data from the Iron Gates Gorge refer probably *C. calvescens* (cf. Beldie 1979, Dihoru & Negrean 2009). According to Mráz et al. (2011a), this species can hardly be morphologically distinguished from *C. stoebe*. Mráz et al. (2012) include it to *Centaurea stoebe*.

[49] *Centaurea rodnensis* Simonk. was invalidly reported from several Ukrainian and Romanian mountains of the Eastern Carpathians as *Centaurea carpatica* (Porcius) Porcius and it was considered as the local endemic. The revision of herbarium material indicated that *C. rodnensis* occurs rarely only in the Rodna Mts (5 localities) and is a narrow endemic of this mountain range. Older data from other mountains are erroneous and refer mainly *Centaurea phrygia* s. str. (Koutecký 2013).

[50] Following Beldie & Alexandrescu (1976), Morariu & Beldie (1976) and Beldie (1979), we preliminarily included *Centaurea rarauensis* to synonyms of *Centaurea rodnensis*. Koutecký (2014 in litt.) considers *C. rarauensis* to be a problematic taxon. The type does not exist and no plants matching the description were found (neither in herbaria nor in the field).

[51] In the included literature *Centaurea rodnensis* was refered also as *Centaurea carpatica* (Porcius) J. Wagner, *C. carpatica* (Porcius) J. Wagner subsp. *carpatica*, *C. carpatica* (Porcius) Porcius subsp. *carpatica*, *C. phrygia* subsp. *carpatica* (Porcius) Dostál, *C. carpatica* subsp. *rarauensis* (Prodan) Ciocârlan and *C. phrygia* subsp. *rarauensis* (Prodan) Dostál.

[52] *Centaurea triniifolia* belongs to the *Centaurea stoebe* group, which was accepted also by Dostál (1976), Ochsmann (2000) and Greuter (in Euro+Med). It grows in the southwestern part of the Southern Carpathians in broader vicinity of the Iron Gates Gorge; older records from the Trascău Mts need revision (Hurdu 2014 in litt.). According to Mráz et al. (2011a), it can hardly be morphologically distinguished from *C. stoebe*. Mráz et al. (2012) include it to *Centaurea stoebe*.

[53] *Cephalaria radiata* occurs predominantly in the Transylvanian Basin and adjacent Carpathian promontories. Scarcely it occurs also on the adverse side of the Southern Carpathians, in the vicinity of the city Ploiești (Prodan 1961).

[54] *Cephalaria uralensis* subsp. *multifida* is known only from several localities in the vicinity of the Iron Gates Gorge in Romania (Beldie et Váczy 1976, Dihoru & Pârvu 1987, Ciocârlan 2011, Sârbu et al. 2013 and others).

[55] Based on an older record (Hayek 1924) *Cerastium arvense* subsp. *lerchenfeldianum* was reported from Serbia or the former Yugoslavia (Morariu & Beldie 1976, Jalas & Suominen 1983, Jalas et al. 1993, Oprea 2005, Ciocârlan 2009); consequently this subspecies was evaluated as a Carpathian-Balkan taxon (e.g. Boşcaiu & Ehrendorfer 1996) or subendemic to the Eastern and Southern Carpathians (Heltmann 1985). According to Hurdu et al. (2012b), the record from Serbia is erroneous; they consider *Cerastium *lerchenfeldianum* to be endemic to the South-Eastern Carpathians.

[56] Letz (in Letz & Michalková 2012) found, that plants from the type locality of *Cerastium lerchenfeldianum* Schur are octoploid, similarly to populations of *Cerastium arvense* from almost the whole Carpathian region except the Tatry Mts (the distribution area of *Cerastium tatrae*). Regarding the leaf indument, the plants fall within the variability of *C. arvense*. For that reason, the authors include *Cerastium lerchenfeldianum* to synonyms of *Cerastium arvense* L. So far these preliminary results were not supported by a published comparative study. Until this problem is definitively resolved, we respect a separate position *Cerastium *lerchenfeldianum* at the subspecies level as well as its endemic status.

[57] Outside the Romanian and Serbian part of the Southern Carpathians *Clinopodium pulegium* scarcely grows in the Tara planina Plateau (Zaovine Village) in Serbia (Diklić & Nikolić 1986a, Hurdu et al. 2012b); a very infrequent occurrence was reported from Bosnia and Herzegovina nearby the cities Zvornik and Višegrad (Đug et al. 2013).

[58] Outside the Carpathians *Crocus banaticus* sporadically occurs in the vicinity of the city Šabac in Serbia (Hurdu et al. 2012b). Myhal' (2009) reports that the single population site in Serbia (without specifying the locality) was distroyed due to local economic activities.

[59] A single occurrence of *Cyanus maramarosiensis* in Slovakia („Mt. Stinka; determined by prof. Dostál") was reported without further details by Májovský (1970 ut *Centaurea montana* subsp. *marmarossica*) within a note to the record of *Ranunculus carpaticus*. Hadač, Terray et al. (1991) reported from Stinská Mt. only the occurrence of *Centaurea mollis*. Also Greuter (in Euro+Med) and Olšavská (2014 in litt.) regard the occurrence of *Cyanus maramarosiensis* in Slovakia as questionable.

[60] Outside the Carpathians *Cyanus mollis* was found on Mt. Kobilica (Šar planina Mts) at the border of Macedonia and Kosovo and in two Croatian localities (Plitvička jezera and Mrzin) (Kliment 1999).

[61] *Cyanus pinnatifidus* subsp. *sooanus* was described by Borhidi (1957 ut *Centaurea achtarovii* subsp. *sooana*) from the Ceahlău Mts (Eastern Carpathians); outside this mountain range it has not been found so far.

[62] In the last decades, the narrow endemic subspecies *Cyclamen purpurascens* subsp. *immaculatum* was reported usually at the species level (as *Cyclamen fatrense*) in the literature focussing on the Western Carpathians. The current molecular-taxonomic study by Kučera et al. (2013) confirmed its separate position, however only at the level of subspecies.

[63] Soó (1980b) reported occurrence of *Dactylorhiza cordigera* subsp. *siculorum* also from the western Ukraine (i.e. from the Ukrainian Carpathians). However, the Ukrainian authors (Čopyk 1976, Malynovs'kyj et al. 2002, Kricsfalusy & Budnikov 2007, Kobiv 2010, etc.) report from the Ukrainian Carpathians only the Balkan-Carpathian species *D. cordigera*.

[64] *Dactylorhiza maculata* subsp. *schurii* was reported from the Eastern, Southern and Apuseni Carpathians (Soó 1967, Paucă & Beldie 1972); according to Hurdu (2014 in litt.) it is known also from several localities in the Transylvanian Basin.

[65] In the majority of literature, *Delphinium elatum* subsp. *nacladense* is evaluated as endemic of the Eastern Carpathians; however, Starmühler (1996b) reported also herbarium materials from the Piatra Craiului Mts in the Southern Carpathians.

[66] In several overviews of endemic plants (Stojko & Tasenkewitsch 1991, Stoyko & Tasenkevich 1993, Kricsfalusy a Budnikov 2002) *Dianthus carthusianorum* subsp. *tenuifolius* is reported also from the Ukrainian Carpathians. According to Fedoročuk & Čornej (2005), the occurrence of this subspecies does not extend up to Ukraine and the data from the Ukrainian Carpathians are erroneous (cf. Čornej 2011). On the other hand, Kuz'mina (2004) reports that its occurrence in the Ukrainian Carpathians is documented by a single herbarium specimen (Marmaroš Mts, Mt. Pop Ivan, Popov 1946).

[67] In older literature *Dianthus praecox* subsp. *praecox* was reported using nomenclatorically incorrect names *D. praecox* Kit. subsp. *praecox*, *D. plumarius* subsp. *praecox* (Kit. ex Schultes) Domin and *D. plumarius* subsp. *praecox* (Kit.) Pawł.

[68] To *Dianthus *praecox* also *D. hungaricus* subsp. *pseudopraecox* was included by Jalas & Suominen (1986), although its taxonomic position they consider to be controversial; in accord with this concept they report *Dianthus *praecox* also from Hungary.

[69] Baksay (1972) reported the occurrence of *Dianthus praecox* subsp. *lumnitzeri* also from the Pilis Mts in the northern Hungary (cf. Kmeťová 1985). According to current molecular studies records of this subspecies from Hungary should be reffered to *Dianthus plumarius* subsp. *regis-stephani* (Rapaics) Baksay (Somogyi et al. 2012, Barina 2014 in litt.).

[70] *Dianthus praecox* subsp. *pseudopraecox* is a rare subspecies, occurring only in the Slovenský kras Karst including its Hungarian part (Aggteleki karszt Karst), and sporadically also in the Bükk Mts (Kmeťová 1985, 2012).

[71] Baksay (1972) reported *Dianthus plumarius* subsp. *praecox* from the northwestern Hungary. According to Kmeťová (1985), these data are erroneous and concern subsp. *pseudopraecox* (cf. Kmeťová 2012).

[72] *Dianthus spiculifolius* was reported (Klokov 1952, Prokudin 1987, Tasenkevyč 2003b) also from the Ukrainian Carpathians (the southern part of Bukovina County), although with certain ambiguity in some studies (Fedoročuk & Diduch 2002b, Kuz'mina 2004). According to Čornej (2011), the data from Ukraine are erroneous and the species grows only in the Romanian part of Bukovina County.

[73] Occurrence of *Doronicum carpaticum* is reported also from the Apuseni Carpathians (Oprea 2005), Bulgaria (Pawłowski 1970) and Serbia (Greuter in Euro+Med). According to Álvarez Fernández (2003), its distribution area is restricted only to the Carpathians; according to Pachswöll (2013), it grows only in the Eastern and Southern Carpathians in the region spreading from mountain ranges Čornohora and Svydovec in Ukraine to the Țarcu Mts and Retezat Mts in Romania. Records from the Apuseni Carpathians in Romania, and from Bulgaria and Serbia refer a closely relative species *Doronicum columnae* Ten.

[74] Several authors (Oprea 2005, Dihoru & Negrean 2009, Sârbu et al. 2013, and others) report the occurrence of *Draba dorneri* also from the Făgăraș Mts. This record was not confirmed and it probably concerns *Draba kotschyi* (Ion 2014 in litt.).

[75] Older records of *Draba kotschyi* from the Alps concern *Draba norvegica* Gunnerus (Hurdu et al. 2012b; cf. Walters & Akeyrod 1993, Jalas et al. 1996).

[76] In the included literature *Draba simonkaiana* was reported also as *D. stellata* subsp. *simonkaiana* (Jáv.) Beldie.

[77] In the included literature *Erigeron hungaricus* is wrongly reported also as *Erigeron neglectus* A. Kern.

[78] The results of molecular analyses (Șuteu 2012) proved that the Carpathian (*Eritrichium jankae*) and Alpine populations (*Eritrichium nanum*) are hardly genetically differentiated, however, they are well isolated biogeographically (cf. Tribsch & Schönswetter 2003).

[79] *Erysimum hungaricum* is a very rare species, since its decription (Zapałowicz 1913) known only from the limestone rocks on the southern slope of the borderline Mt. Malyj Lostun (Čyvčyny Mts) / (Maramureș Mts, Mt. Lostun Mic), already in the Romanian part of the mountain range (Kobiv 2010). According to Sârbu et al. (2013), its occurrence in Romania needs to be confirmed (cf. Oprea 2005, Ciocârlan 2009).

[80] Tasenkevich (2002) considers *Erysimum hungaricum* to be subendemic to the Alps and Carpathians. This evaluation is based on a broader species concept (*E. hungaricum* incl. *E. wahlenbergii*) and enlargement of its area to the Austrian Alps (cf. Melzer & Polatschek 1971).

[81] Based probably on the same chromosome number (2n = 14), invalidly described *Erysimum vagicum* Holub et Tomšovic (syn. *E. witmannii* subsp. *vagicum* (Holub et Tomšovic) Dostál, nom. inval.) was also often included to *E. witmannii* although it was evaluated by Michalková (2002) as a diploid cytotype of *Erysimum odoratum* Ehrh.

[82] Reports on occurrence of *Erysimum witmannii* subsp. *witmannii* in the Carpathians are very conflicting. Some authors, e.g. Konětopský (1963) and Čopyk (1976) reduce the distribution of *E. witmannii* s. str. only to the Western Carpathians, others (e.g. Beldie 1977, Ciocârlan 2009, Sârbu et al. 2013) only to the Eastern Carpathians. Nyárády (1955) and Tomšovic (1988) report it also from the Southern Carpathians (Făgăraș Mts).

[83] Borza (1964) published the occurrence of *Erysimum baumgartenianum* from Cheile Gălzii (Trascău Mts). It is the single known record of *Erysimum witmannii* in the Apuseni Carpathians.

[84] The older records of *Erysimum baumgartenianum* Schur from Bulgaria concern *Erysimum cuspidatum* (M. Bieb.) DC. (cf. Ančev & Polatschek 2006).

[85] In the newer Romanian handbooks (Beldie 1977, Ciocârlan 2009, Sârbu et al. 2013) the distribution area of *Erysimum witmannii* subsp. *transsilvanicum* is restricted to the Southern Carpathians. However, Nyárády (1955) reported its occurrence also from the Eastern Carpathians; currently it was reported e.g. by Oprea & Sîrbu (2012, 2013) and Vojtkó et al. (2012). Tomšovic (1988) delimited its distribution in Romania to the Eastern and Southern Carpathians, from the Maramureș Mts to the Retezat Mts.

[86] From the Ukrainian Carpathians a single occurrence of *Erysimum witmannii* subsp. *transsilvanicum* is known from Mt. Velykyj Kamiň in the Čyvčyny Mts (Čopyk 1976, Il'jïns'ka et al. 2007, Kobiv 2010).

[87] *Euphorbia carpatica* has centre of its distribution in the Ukrainian Carpathians. In the Romanian Eastern Carpathians it is known only from Oaș and Gutâi Mts (Dihoru & Negrean 2009). From Poland (Bieszczady Mts) it was reported by an error (cf. Mirek et al. 2002); the data concern *Euphorbia sojakii*.

[88] Malynovs'kyj et al. (2002) reported occurrence of *Euphorbia carpatica* using an invalid name *Euphorbia jasiewiczii* (Chrtek et Křísa) Dubovik.

[89] For a long time, narrow endemic *Euphrasia exaristata* has been known only from the Slovak part of the Červené vrchy Massif (Západné Tatry Mts), however, recently it was discovered also in its Polish part (Staszkiewicz 2009).

[90] Our evaluation of endemic status of *Euphrasia tatrae* is based on Smejkal (1963) and Smejkal & Čeřovský (1999), where the species distribution area is restricted to the Western Carpathians and the western part of the Eastern Carpathians. In Romanian literature (Răvăruț 1960, Beldie 1967b, Oprea 2005), the species is reported from the Romanian Eastern (Maramureș, Rodna, Ceahlău & Rarău Mts) and Southern Carpathians (Bucegi & Retezat Mts); however, Mihoková & Mikoláš (1994) question the records from the Southern Carpathians (possibly confusion with *Euphrasia minima* Jacq. ex DC.). Records from the Krkonoše Mts concern local narrow endemic *Euphrasia corcontica* (Smejkal) Smejkal et Dvořáková (Dvořáková 1999).

[91] According to the current data (Lendvay & Kalapos 2014), *Ferula sadlerana* occurs recently in seven localities, four of them located in the Western Carpathians, one in the Apuseni Carpathians and two outside the Carpathians in the northern part of the Transdanubian Mountains in Hungary.

[92] In older (not included) studies, *Ferula sadlerana* is usually evaluated as subendemic to the Pannonian Basin.

[93] In several sources (e.g. Markgraf-Dannenberg 1980, Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013), the occurrence of *Festuca amethystina* subsp. *orientalis* is reported also from the western part of the Balkan Peninsula. However, this taxon was not included in recent Balkan floras neither as species nor as subspecies (Krahulec 2014 in litt.).

[94] In the included literature *Festuca saxatilis* is reported also using invalid name *Festuca rupicola* subsp. *saxatilis* (Schur) Jáv.

[95] Records of *Festuca tatrae* from the Ukrainian Carpathians are erroneous (Čornej 2011, Kobiv 2014 in litt., Tasenkevich 2014 in litt.., Kobiv 2014 in litt.). Beldie (1967b) reported scarce occurrence of *Festuca amethystina* subsp. *tatrae* from the Bucegi Mts in the Southern Carpathians (cf. Beldie 1972). Ciocârlan (2009) considered this record to be erroneous; his opinion is shared also by other Romanian botanists (Hurdu 2014 in litt.).

[96] Outside the Carpathians *Festuca versicolor* subsp. *versicolor* occurs scarcely in the Bohemian and Polish part of the Krkonoše Mts (see Kliment 1999 for details).

[97] The eligibility of delimitation of the subspecies *Galium album* subsp. *suberectum* was questioned in some comprehensive studies (cf. Ehrendorfer & Krendl 1976); but according to the current results (Gynda 2004), it differs from subsp. *album* morphologically and ecologically, and these two subspecies are reproductively isolated.

[98] In the present overviews (Čornej 2011, Tasenkevich 2011) *Galium album* subsp. *suberectum* was evaluated as endemic to the Eastern Carpathians. Michalková (1993) reported this subspecies from several mountain ranges and basins in the Slovak part of the Western Carpathians.

[99] Outside the Carpathians *Galium kitaibelianum* scarcely occurs also in Serbia: Velika Remeta, Krušedol (Hurdu et al. 2012b). In several studies (e.g. Popescu & Sanda 1998, Oprea 2005) is it considered to be a Carpathian-Balkan species.

[100] In the included literature *Genista tinctoria* subsp. *oligosperma* (Andrae) Ják. is reported also using nom. illeg. (younger homonyma) *G. tinctoria* subsp. *oligosperma* (Andrae) Prodan, *G. tinctoria* subsp. *oligosperma* (Andrae) Borza and *G. tinctoria* subsp. *oligosperma* (Andrae) Soó.

[101] Records of *Gentiana cruciata* subsp. *phlogifolia* from Greece (Falakron Mts) are erroneous; according to Strid & Tan (1991), the populations of the place belong to subsp. *cruciata*.

[102] Tutin (1972) identified *Gentiana laciniata* with *Gentiana pyrenaica* L., which is distributed from the Pyrenees through the Carpathians to the mountains of the southwestern Bulgaria. Current study by Rybczyński et al. (2014) confirmed the eligibility of delimitation of *G. laciniata* as a separate species, narrow endemic to the Ukrainian Carpathians (cf. Čopyk 1976, Kricsfalusy 1999, Malynovs'kyj et al. 2002, Antosyak & Kozurak 2011) with a scarce occurrence in the Čornohora, Svydovec and Boržava Mts. Based on explicit differences in the lenght and width of sepal teeth, both species were distinguished already by Cvelev (1978).

[103] Records of *Gypsophila petraea* from Bulgaria (Rodopi Mts) are erroneous (cf. Jalas & Suominen 1986, Hurdu et al. 2012b).

[104] Taxonomic concept of the genus *Hesperis* is based on a monography by Dvořák (1968), with regards to the current nomenclatoric information.

[105] In the description of *Hesperis dinarica* subsp. *slovaca*, Dvořák (1963) along with the Nízke Tatry Mts wrongly reported also the locality „Transsilvania, Carpati Orientales, comit. Máramaros, mons Nagy Pietrosz". In his monography (Dvořák 1968), *Hesperis slovaca* is already reported only from the Nízke Tatry Mts as a local endemit.

[106] The nomenclature of the species of the genus *Hieracium* is in accordance with current taxonomic studies, in the section *Cernua* following mainly Szeląg (2003b).

[107] Further synonyms of *Hieracium borbasii* are as follows: *Hieracium evolutum* (Nyár. et Zahn) Zahn; *H. pseudokotschyanum* (Nyár. et Zahn) Nyár.; *H. pseudotubulare* (Nyár. et Zahn) Nyár.; *H. sublubricicaule* (Nyár. et Zahn) Nyár. (cf. Szeląg 2006b).

[108] In the included literature *Hieracium fagarasense* is also reported as follows: *Hieracium kotschyanum* subsp. *fagarasense* (Nyár. et Zahn) Beldie; *H. sparsum* subsp. *borbasii* var. *fagarasense* (Nyár. et Zahn) Ciocârlan.

[109] In the included literature *Hieracium negoiense* is also reported using invalid name *Hieracium krasanii* var. *negoiense* (Răvărut et Nyár.) Beldie et L. Alex.

[110] *Hieracium ostii-bucurae* is a narrow endemic known from only three adjacent mountain ranges Retezat, Țarcu and Godeanu Mts (cf. Szeląg 2006b).

[111] The tetraploid chromosome number (2n = 36) reported for *Hieracium longifoliosum* in Mráz (2006) concern *Hieracium polyphyllobasis* (Szeląg 2006b).

[112] Zahn (1936) reported occurrence of *Hieracium pietroszense* besides of *locus classicus* (Rodna Mts: Mt. Pietrosu) also from several sites at high altitudes in the Southern Carpathians (Retezat Mts) and the Alps. According to the current knowledge (Mráz 2003a), it occurs only in the Eastern Carpathians (Rodna Mts). Records from the Southern Carpathians were confirmed as erroneous based on the study of herbarium material; the occurrence in the Alps is very unprobable.

[113] *Hieracium rapunculoidiforme* was described from Mt. Pietrosz (Ukraine: Čornohora Mts, Mt. Petros) on the border of former Kingdom of Hungary and Galicia region (Zahn 1911). It is considered to be endemic to the Eastern Carpathians in numerous Ukrainian and Romanian overviews. Nyárády (1965) located *locus classicus* wrongly to Mt. Pietrosu in the Maramureș Mts. Szeląg (2014 in litt.) expects species occurrence also in the Romanian Eastern Carpathians.

[114] Record of *Hieracium scitulum* from the other Carpathian subunits concern *H. scitulum* s. lat. (Szeląg 2014 in litt.); records from the Krkonoše Mts are erroneous (Chrtek jr. 2004).

[115] Outside the Western Carpathians *Hieracium silesiacum* recently scarcely occurs only in the Hrubý Jeseník Mts (Velká kotlina Cirque) (Szeląg 2004b).

[116] Record of *Hieracium tubulare* in the Harghita Mts (Mráz & Szeląg 2004) concerns *Hieracium coldei* (Szeląg 2006a).

[117] The occurrence of *Hieracium virgicaule* outside the Western Carpathians is reported by a single historical evidence from the Maramureș Mts in the Eastern Carpathians (Zahn 1930 ut *H. virgicaule* subsp. *nudatum*). Šljakov (1989) does not report this species from Ukraine; it was also not confirmed in the Romanian Eastern Carpathians (Nyárády 1965, Oprea 2005). Chrtek et al. (2004a) considered the above-mentioned record as dubious.

[118] In Poland *Jovibarba globifera* subsp. *preissiana* scarcely occurs also outside the Carpathians (Letz 1998).

[119] *Jurinea transylvanica* has a centre of its distribution in the Transylvanian Basin. Sporadically, it was found also in the Romanian Eastern (Hășmaș Mts), Southern (Retezat Mts) and Apuseni Carpathians (Cheile Turzii Gorge); several localities are also in jud. Galați, already outside the Carpathians (Oprea 2005). Records from Bulgaria are erroneous (Greuter in Euro+Med).

[120] Outside the Western Carpathians *Knautia kitaibelii* subsp. *kitaibelii* occurs rarely in the Záhorská nížina Basin (Štěpánek 1985). Böhm & Facsar (2000) reported its sporadic occurrence from the Pilis Mts in Hungary, together with subsp. *tomentella* (Szabó) Baksay.

[121] Up to this day, *Knautia kitaibelii* has been reported also from Ukraine and Romania (currently e.g. Kricsfalusy & Budnikov 2002, 2007, Ciocârlan 2009). The distribution area of *K. kitaibelii* towards the east reaches the Pieniny Mts, records from the Ukrainian and Romanian Carpathians are erroneous (cf. Soják 1983b, Štěpánek 1985, 1997).

[122] Deyl (1934), and based on his collections later also Soják (1983b), reported *Koeleria macrantha* subsp. *transsilvanica* also from the Ukrainian Carpathians, from where its occurrence was later not confirmed (cf. Kricsfalusy & Budnikov 2007).

[123] From the Transylvanian Basin *Lathyrus transsilvanicus* sporadically spreads beyond to the Cheile Turzii Gorge on the eastern margin of the Apuseni Carpathians (Oprea 2005).

[124] In 1903, *Lathyrus transsilvanicus* was collected in a beech forest in the Armankaja River Valley (Sredna Stara planina Mts), ca 1 600 m a.s.l., where it has not been confirmed since 1905 and was considered to be extinct in Bulgaria (Petrova & Vladimirov 2009, Tosheva et al. 2011). During 2007–2011 it was recorded in three near microlocalities (Triglav Massif, seven gorges locality) in the Sredna Stara Planina Mts, 1 450–1 500 m a.s.l. (Marinov et al. 2014).

[125] In the included literature it is also reported as *Lathyrus transsilvanicus* (Spreng.) Rchb. f.

[126] Holub (1977b) constrained the occurrence of diploid endemic subspecies *Leucanthemopsis alpina* subsp. *tatrae* only to the Tatry Mts with a note that the relations of the Tatry populations with populations of *Leucanthemopsis alpina* from the Eastern and Southern Carpathians require further study. *Leucanthemopsis *tatrae* was evaluated as endemic to the

Tatry Mts e.g. by Čopyk (1976), Kliment (1999), Piękoś-Mirkowa & Mirek (2003) and Mirek & Piękoś-Mirkowa (2009, 2010). Oprea (2005) reported it from the Romanian Eastern and Southern Carpathians remarking that it is a single subspecies growing in the Romanian Carpathians. Without a detailed information it was reported also by Mosyakin & Fedoronchuk (1999) from the Ukrainian Carpathians and by Sârbu et al. (2013) from the Romanian Carpathians. Further authors, e.g. Popescu & Sanda (1998) and Ciocârlan (1990, 2009), report from Romania only the species (using diverse names) without information on its distribution. According to the current information, reliable records of *Leucanthemopsis alpina* at the subspecies level are missing as from the Ukrainian Carpathians (Kozurak 2014 in litt.), so from the Romanian Carpathians (Pușcaș 2014 in litt.). Until the taxonomic affiliation of *L. alpina* populations from the Ukrainian and Romanian Carpathians will be resolved, we retain the present endemic status of *Leucanthemopsis *tatrae*.

[127] Outside the Carpathians *Leucanthemum rotundifolium* sporadically occurs in the Vranica Planina Mts in Bosnia; an older record from the southern Croatia proved to be erroneous (Zelený 1970, Kliment 1999, and others).

[128] Outside the Carpathians *Linum extraaxillare* very scarcely occurs only in Bulgaria. In the localities Mt. Karlovska (Centralna Stara planina Mts) and Mt. Vitoša (Vitoša Mts) its occurrence have not been confirmed for more than 80 years, therefore the species was considered to be extinct in Bulgaria (Petrova & Vladimirov 2009). In 1995, it was collected on Mt. Kucheto in the Centralna Stara planina Mts (Vladimirov et al. 2011).

[129] Outside the Carpathians *Linum uninerve* occurs very scarcely (including only three localities) in the Centralna Stara planina Mts (Kuru Dere) and the Rodopi Mts (Dobrostan Massif), in small populations with restricted reproductive ability (Petrova 2011). In Romania it was found in the vicinity of the city Lugoj at the border of the Southern Carpathians (Poiana Ruscă Mts) and the Pannonian Basin (Dihoru & Pârvu 1987).

[130] In the included literature it is also reported as *Linum uninerve* (Rochel) Borbás.

[131] *Melampyrum saxosum* (with white-coloured petals) and *M. herbichii* (with yellow-coloured petals) were so-far evaluated as two separate taxa (microspecies). Těšitel et al. (2009) in their thorough morphometric and molecular study did not find traits, which would differentiate between the white-coloured and the yellow-coloured populations; these also do not differ in their geographical distribution. Therefore they suggested to consider both microspecies as a single species with an older valid name *Melampyrum saxosum* Baumg.

[132] Towards the west, an introgressive hybridization between yellow-flowering plants and *Melampyrum sylvaticum* populations probably occurs, which hindered identification of the western border of *M. herbichii* distribution (cf. Štech & Drábková 2005, Těšitel & Štech 2007). As a consequence, the species was evaluated variously in the present overviews of endemics: from an endemic to the Eastern and Southern Carpathians to a pan-Carpathian subendemic or a Sudeten-Carpathian species. Similarly to other east-Carpathian species (s. l.), also in this case the biogeographic border between the Western and Eastern (South-Eastern) Carpathians is of special importance, and the typical populations of *Melampyrum saxosum* (incl. *M. herbichii*) do not extend over this border (for details see Těšitel et al. 2009).

[133] In the included literature *Minuartia pauciflora* is wrongly reported as *Minuartia verna* subsp. *gerardii* (Willd.) Graebn.; this name concerns the alpine plants.

[134] In the included literature *Noccaea banatica* is reported using an invalid name *Thlaspi dacicum* subsp. *banaticum* (R. Uechtr.) Jáv. (cf. Holub 1984).

[135] Records of *Noccaea jankae* in Romania (Beldie & Váczy 1976, Beldie 1977, Dihoru & Negrean 2009, Sârbu et al. 2013, and others) concern probably a Carpathian-Balkan species *Noccaea kovatsii* (Heuff.) F. K. Mey. (*T. jankae* Borbás non A. Kern. and *T. jankae* Velen. non A. Kern. also belong to synonyms of *N. kovatsii*; cf. Čopyk 1976, Ančev 2007).

[136] Outside the Transylvanian Basin *Onosma pseudarenaria* subsp. *pseudarenaria* sporadically occurs also in the Eastern (Hășmaș Mts) and Apuseni Carpathians (Trascău Mts: Cheile Turzii Gorge) (Oprea 2005).

[137] According to molecular analyses (Kolarčik et al. 2010), *Onosma viridis* occurs only in the western, south-western and southern parts of the Transylvanian Basin (mainly close to its border with the Apuseni and the Southern Carpathians), in the Apuseni Carpathians (Trăscău Mts), in the southern part of the Banat Mts (cf. Grințescu & Nyárády 1960a), as well as in the Slovenský kras and Aggtelek Karsts (populations formerly reported as *O. tornensis*; see next note). In this respect it belongs to the taxa endemic to the Western, Southern and Apuseni Carpathians and the Transylvanian Basin. According to a broader concept (cf. Valdés in Euro+Med), it represents a Carpathian-Balkan species distributed from Serbia, Bulgaria and Greece to Turkey. The whole taxonomic complex of closely related species within *Onosma heterophylla* s. lat. (see Kolarčik et al. 2010, 2014 for details), requires deeper taxonomic (and subsequently also chorological) revision.

[138] Since its description (Jávorka 1906), *Onosma tornensis* has been considered as one of the rarest stenoendemic of the Western Carpathians with a restricted occurrence in a small area in the eastern part of the Slovenský kras Karst including the Slovak-Hungarian plateau Dolný vrch. With regard to its rarity it was included in the World Red Book of endangered species as well as to the international directives (Bern1, Annex II of Habitat Directive 92/43/EEC). The recent study of molecular variation (Kolarčik et al. 2010) confirmed significant DNA similarity of *Onosma tornensis* populations from Slovakia with *Onosma viridis* populations from the Banat part of the Southern Carpathians and taxonomic identity of both species. Regarding this fact, Mártonfi et al. (2014), in accordance with regulations of the International Code of Nomenclature for algae, fungi, and plants (McNeill et al. 2012, Art. 11.5), reports *O. tornensis* as synonym of *O. viridis*.

[139] So-far *Ophrys holubyana* have been reported as subendemic to the Western Carpathians. Records from the northern Hungary (cf. Kliment 1999) concern recent hybrids of *Ophrys holoserica* (Burm. f.) Greuter and *Ophrys scolopax* subsp. *cornuta* (Steven) E. G. Camus (Dítě 2014 in litt.).

[140] In the Eastern Carpathians *Pedicularis baumgartenii* is reported only from the Ceahlău Mts (Dihoru & Pârvu 1987, Ciocârlan 2009, Sârbu et al. 2013).

[141] *Peucedanum rochelianum* is a species of wet aluvial meadows (*Peucedano rocheliani-Molinietum caerulae*) and forests (*Querco-Betuletum molinietosum*). The centre of its distribution is in the sub-Carpathian depressions in the south-western part of the Transylvanian Basin wedged in the adjacent montain ranges of the Southern Carpathians (Caransebeș Depression, Hațeg Depression, Sibiu Depression), at altidudes between 230 and 400 m (Boșcaiu 1965, Boșcaiu & Rațiu 1965, Kovács 2011). Records from the central and eastern Transylvania (Dihoru & Pârvu 1987, Jakab et al. 2008) can be dubious (Kovács l. c.). Sporadic occurrence was reported also in the forests near the villages Mavrodolu and Plopeni at the southern foothill of the Southern Carpathians (Paucă-Comanescu & Negrean 1994) and in the surroundings of Galați city in the south-eastern Romania (Dihoru & Pârvu 1987).

[142] Kovács (2011), with the reference to Boșcaiu (1965), reports occurrence of *Peucedanum rochelianum* also from Croatia. However, Boșcaiu (l. c.) reported from the Croatian Dalmatia occurrence of a vicariant taxon *Peucedanum coriaceum* subsp. *pospichalii* (Thell.) Horvatić and association *Peucedano pospichalii-Molinietum litoralis*. *Peucedanum rochelianum* was not reported in the relevant Croatian literature (Krahulec 2014 in litt.).

[143] *Pilosella ullepitschii* occurs predominantly in the Western Carpathians; only scarcely it occurs in the Eastern (three localities) and Southern (one locality) Carpathians (Šingliarová & Mráz 2009).

[144] Bernátová et al. (2006) distinguished two subspecies within *Poa carpatica*: subsp. *carpatica* (endemic to the Western and Eastern Carpathians) and subsp. *supramontana* Bernátová et al. (endemic to the Veľká Fatra Mts, Krivánska Fatra Mts and Nízke Tatry Mts). However, the later mentioned subspecies was invalidly described because the original diagnosis lacked specification of herbarium collection or institution in which holotype specimen was conserved (Art. 40.7 of Melbourne Code, McNeill et al. 2012).

[145] In older Romanian sources (Ghișa & Beldie 1972) also *Poa deylii* var. *retezatensis* (A. Nyár.) Ghișa et Beldie (only Retezat Mts) is recorded, evaluated as a separate taxon (*Poa granitica* subsp. *retezatensis* A. Nyár) also by Greuter (in Euro+Med). However, in the current Romanian identification keys (Ciocârlan 2009, Sârbu et al. 2013) only occurrence of *Poa granitica* subsp. *disparilis* is reported.

[146] *Poa nobilis* is an alpine hybridogenous species (probably *Poa alpina* f. *vivipara* × *Poa granitica*) described from the Polish side of the Tatra Mts (Skalińska 1955), which was stabilised thanks to its vivipary (Pogan 1977). During the field survey in the nineties of the last century, its occurrence has not been confirmed (Piękoś-Mirkowa et al. 1996), which is reflected also in the current evaluation within the category DD (Piękoś-Mirkowa 2008).

[147] *Poa pannonica* subsp. *scabra* has centre of its distribution on neutral and alkaline substrates (volcanic rocks and limestones) in the Slovak part of the Western Carpathians with outstrokes towards the south in the Északi-középhegység Mts and in the northern part of the Dunántúli-középhegység Mts (Visegrádi Mts). In the Ukrainian Carpathians only older records exist from slopes of Chorna Hora near the town Sevluš (Vinohradiv) (Jirásek 1934, 1935); in more recent floras (Čopyk 1976, etc.) it was not reported any more. In Romanian Carpathians the subspecies was reported near the Iron Gates Gorge; older record is from the vicinity of Arad City (Oprea 2005).

[148] In the included literature it is usually reported as *Poa rehmannii* (Asch. et Graebn.) Woł. As a synonym of *Poa nemoralis* B. [subsp.] *rehmannii* Asch. et Graebn. Ascherson & Graebner (1900: 413) reported the name *Poa caesia* d) *Rehmanni* Richter Pl. Eur. I. 83 (1890), which is a reference to the first published name and should be regarded as a bazionym (Marhold 2014 pers. comm.).

[149] *Prangos carinata* is a rare species known only from the Iron Gates Gorge (between the locality of Vîrciorova and the village of Gura Văii) in the Southern Carpathians (Morariu & Beldie 1976, Beldie 1977, Dihoru & Negrean 2009).

[150] In the included literature it is reported also under invalid name *Prangos carinata* Griseb.

[151] Outside the Western Carpathians *Primula auricula* subsp. *hungarica* sporadically occurs on dolomites in some mountain ranges (Vértes, Bakony, Balaton-vidék) of the Transdanubian Mountains in Hungary (Soó 1964, 1980a, Simon 1992, and others).

[152] *Primula leucophylla* is an alpine taxon of the *Primula elatior* group adapted to a cool climate, ecologically, phenologically and genetically isolated from *P. elatior* s. str. Its occurrence is restricted to the limestone mountain ranges in the central part of the Eastern Carpathians, from the Rarău Mts to the Vrancei Mts (Șuteu 2012, Șuteu et al. 2011, 2013, Hurdu 2014 in litt.; cf. Ciocârlan 2009, Sârbu et al. 2013).

[153] According to Șuteu (2012), „Studies based on sequences analysis indicate that the taxon *P. filarszkyana* should be considered a subspecies of the species *Pulmonaria rubra*". Therefore, in our study we included the taxon at the level of subspecies.

[154] The West-Carpathian endemic *Pulsatilla slavica* was reported also from the north-eastern Romania (Mîrzesti) by some Romanian authors (Beldie & Váczy 1976, Beldie 1977, Sanda et al. 1983, Ciocîrlan 1988, Popescu & Sanda 1998). Goliašová (1985) considered its occurrence in Romania as unlikely. Ciocârlan (2009) evaluated the published records as erroneous.

[155] *Ranunculus flabellifolius* is a narrow species of the *Ranunculus auricomus* group with rather ambiguous taxonomic evaluation. While e.g. Jalas & Suominen (1989), Stevanović et al. (1991) and Dunkel (2011) considered it as a separate species of this group (cf. Beldie 1977, Popescu & Sanda 1998, Ciocârlan 2009, Sârbu et al. 2013, Hörandl & Raab-Straube in Euro+Med, and others), Tutin & Akeroyd (1993) included it within *Ranunculus cassubicus* L. (cf. Oprea 2005). According to Dunkel (2011), *Ranunculus flabellifolius* represents the corner stone of the whole complex. In our study, we therefore accept *R. flabellifolius* as a separate species.

[156] Outside the Carpathians, *Ranunculus pseudomontanus* sporadically occurs in the Bulgarian mountain ranges Vitoša and Zapadni Rodopi Mts (Kožuharov & Petrova 1988).

[157] In the included literature it is also reported under invalid name *Ranunculus montanus* subsp. *pseudomontanus* (Schur) Beldie.

[158] *Rosa coziae* represents one of four separate species of the *Rosa villosa* agg. (Kerényi-Nagy 2011), restricted by its occurrence to the Cozia and Căpătânii Mts in the Southern Carpathians (Oprea 2005, Ciocârlan 2009, Hurdu et al. 2012a).

[159] In the included literature it is also reported using invalid names *Rosa villosa* subsp. *coziae* (Nyár.) Beldie and *R. villosa* subsp. *coziae* (Nyár.) Beldie et L. Alex.

[160] In the Southern Carpathians the occurrence of *Salvia transsylvanica* is known only from the vicinity of the village Boteni (Dihoru & Pârvu 1987, Oprea 2005).

[161] Current distribution of *Saussurea porcii*, a narrow endemic species of the Eastern Carpathians, was studied by Kobiv et al. (2007b), later also by Počynok & Prokopiv (2010), and its biology was studied by Bahlej (2010). Počynok & Prokopiv (l. c.) reported its occurrence on seven confirmed localities in the Ukrainian mountain ranges: Čyvčyny Mts (five localities), Čornohora Mts (one locality) and Svydovec Mts (one locality). In the Rodna Mts (Romania) the species was considered extinct (cf. Dihoru & Negrean 2009). The occurrence not confirmed since 1902 has been verified by Mátis, Szabó & Bartha in August 2014 (Mátis et al. 2014).

[162] Diklić (1973) reported *Scabiosa columbaria* subsp. *banatica* from the eastern and south-eastern part of Serbia and from Vojvodina; Hurdu et al. (2012b) delimited its occurrence in Serbia to the Serbian part of the Southern Carpathians and ranked it as endemic to the South-Eastern Carpathians.

[163] In Ukraine and Hungary *Scilla kladnii* sporadically occurs also outside the Carpathians (cf. Speta 1977, Kereszty et al. 1986, Kereszty 1993, Kricsfalusy & Vajnagi 1994).

[164] In the included literature *Sempervivum carpathicum* is reported also as *Sempervivum wettsteinii* Letz ined.; wrongly also as *Sempervivum montanum* L.

[165] In the included literature *Sempervivum carpathicum* subsp. *carpathicum* is reported also as *Sempervivum wettsteinii* Letz ined. subsp. *wettsteinii*.

[166] In the included literature *Sempervivum carpathicum* subsp. *heterophyllum* is reported also as *Sempervivum wettsteinii* subsp. *heterophyllum* (Hazsl.) Letz ined.

[167] Outside the Carpathians *Sempervivum matricum* grows also in the northern part of the Transdanubian Mountains in Hungary (Letz 2009).

[168] *Senecio ucranicus* is distributed from the Polish and Slovak part of the Eastern Carpathians to the Făgăraș Mts in the Southern Carpathians; in Ukraine it rarely outreaches to Volyn and Podillja, in Poland to Pogórze Dynowskie Mts at the border of the Eastern and Western Carpathians (Hodálová 1998b, Rola 2014).

[169] *Sesleria heuflerana* subsp. *heuflerana* extends rarely to Podillja from the Ukrainian Carpathians (Čopyk 1976) and to rocky limestone hillsides of Moldavian Priprutia from the Romanian Carpathians (Gejdeman 1986).

[170] In several surveys (e.g. Deyl 1980, Májovský, Murín et al. 1987, Dostál 1989, 1992) *Sesleria heuflerana* subsp. *hungarica* is reported also from Slovakia. The only occurrence of octoploid plants from Slovakia (Slovenský kras Karst) was evaluated as an octoploid cytotype of *S. heuflerana* by Lysák (1996).

[171] Deyl (1980) reported the occurrence of *Sesleria rigida* also from the northern part of the Balkan Peninsula. According to the results of the molecular-taxonomic study by Kuzmanović et al. (2013), *S. rigida* s. str. occurs only in the Romanian Carpathians; records from the Balkan mountains concern closely related species of *Sesleria rigida* s. lat.: *S. filifolia* Hoppe, *S. serbica* (Adamović) Ujhelyi and *S. achtarovii* Deyl.

[172] Outside the Western Carpathians *Sesleria tatrae* occurs very scarcely in a single locality in the Śnieżnik Kłodzki Massif in Poland (Fabiszewski 1970, Hendrych 1987, Kliment 1999, Budzáková et al. 2014, and others).

[173] In the Ukrainian Carpathians *Silene zawadzkii* occurs rarely only in two localities (Velykyj Kamin' and Mokryniv Kamin') in the Čyvčyny Mts (Kobiv 2010).

[174] Based on Drăgulescu (2003), Oprea (2005) reported the ocurrence of *Silene zawadzkii* also from the Făgăraș Mts (Mt. Arpașu) in the Southern Carpathians although he himself considered this species to be endemic to the Eastern Carpathians. In later studies (Ciocârlan 2009, Hurdu et al. 2012a, Sârbu et al. 2013), this report was not considered.

[175] *Sorbus amici-petri* is a narrow endemic hybridogenous taxon described from sunny hills in the vicinity of Obišovce, Kysak and Trebejov Villages (Mikoláš 2003) in the phytogeographical district Stredné Pohornádie (eastern Slovakia), geomorphologically ordered to the Čierna hora Mts (Mazúr & Lukniš 1980).

[176] *Sorbus dolomiticola* is a stenoendemic of the area between Kysak and Trebejov in the eastern Slovakia (Mikoláš 1996).

[177] *Sorbus haljamovae* is an alpine hybridogenous species in its occurrence restricted to relic calcareous dwarf mountain pine (*Pinus mugo*) communities in the Veľká Fatra, Krivánska Fatra and Nízke Tatry Mts (Bernátová & Májovský 2003).

[178] *Sorbus zuzanae* is an alpine hybridogenous species, in its occurrence restricted to relic calcareous dwarf mountain pine (*Pinus mugo*) communities in the Veľká Fatra, Krivánska Fatra and Nízke Tatry Mts (Bernátová & Májovský 2003).

[179] *Stipa crassiculmis* subsp. *heterotricha* is a subspecies with ambiguous taxonomic evaluation (cf. Ciocârlan 2009, Sârbu et al. 2013), however, considered as a separate taxon by Vázguez & Gutiérrez (2011) (cf. Popescu & Sanda 1998, Dihoru & Negrean 2009, Negrean 2011).

[180] Outside the Carpathians two small populations of *Swertia punctata* are recently known only from two adjacent localities (1 300 and 2 000 m a.s.l.) on Mt. Midžur (Zapadna Stara planina Mts) on the Bulgarian-Serbian border; it is also reported from Kosovo (Tan & Vladimirov 2001).

[181] In Ukraine, *Symphytum cordatum* scarcely occurs also outside the Carpathians in the vicinity of Lviv as an isolated population in Volyn near the Sluč River (Čopyk 1976).

[182] A narrow endemic *Taraxacum carpaticum* was up to now recorded only in two neighbouring mountain ranges, Bucegi Mts and Piatra Craiului Mts within the Southern Carpathians (Štěpánek et al. 2011).

[183] *Taraxacum nigricans* is an inconsistently evaluated species described from the Nízke Tatry Mts (Ďumbier Mt.), in the past reffered also from the Polish, Ukrainian and Romanian parts of Carpathians, or from even larger area. The checking of the type material confirmed, that it is restricted to the region of original diagnosis (Štěpánek et al. 2011).

[184] Besides the classical locality in the Polish part of the Vysoké Tatry Mts, Tacik (1980) reports the occurrence of *Taraxacum pawlowskii* (he evaluates this occurrence as unsure) also from the Velická dolina Valley in the Slovak part of the mountain range.

[185] *Taraxacum pieninicum* is probably the best known stenoendemic species of the Pieniny Mts. Its occurrence is known only from the rocky walls of Mt. Okrąglica in the Trzy Korony Massif in the Polish part of the Pieniny Mts. After extinction of the original population in its *locus classicus* (crash of the rocky wall), the species has been considered as missing for longer time (Zarzycki 1986 to Mirek et al. 1995). During a detailed field survey of the rocky walls in 1999–2000 it has been re-discovered under the top of Mt. Okrąglica (Wróbel & Zarzycki 2008).

[186] Along with recently known occurrences in the Slovak, Ukrainian and Romanian Carpathians and their surroundings (see Kliment 1999 for details), a sporadic occurrence of *Thymus alternans* documented by herbarium specimens is known also from the Southern (Făgăraș Mts: Nucșoara, Mártonfi 2014 in litt.) and Apuseni Carpathians (Bihor Mts; cf. Kliment 1999). Our recent evaluation is most compatible with the evaluation by Čornej (2011), who denoted *Thymus alternans* as subendemic to the Carpathians.

[187] Outside the Carpathians *Thymus dacicus* sporadically occurs in Moldova (Iași City) and in the Walachian (Câmpia Română) Basin (Guşuleac 1961, Diklić & Vasić 2000).

[188] Outside the Western Carpathians *Thymus pulcherrimus* subsp. *sudeticus* occurs in two isolated localities in the Hrubý Jeseník Mts.

[189] In the included literature *Thymus pulcherrimus* subsp. *sudeticus* was incorrectly reported as *Thymus macrophyllus* Rchb.

[190] In the Romanian literature *Trifolium pratense* subsp. *kotulae* is reported as *T. pratense* subsp. *nivale* (Sieber) Arcang. and *T. pratense* var. *frigidum* Gaudin.

[191] From the Carpathians, *Trifolium sarosiense* sporadically reaches also the northern part of the Transdanubian Mountains, eastern part of the Pannonian Basin and south-eastern part of Serbia: Vršac, Bor, Pirot (Hendrych 1993, 1995); the author assums also its occurrence in the Ukrainian Carpathians.

[192] From the Ukrainian Carpathians *Trisetum flavescens* subsp. *tatricum* is documented only by older herbarium specimens (K. Igošina 1948 LE) from Mt. Petros in the Čornohora Mts (Cvelev 1974, 1976, Prokudin et al. 1977, Čornej 2011).

[193] In Serbia a single locality of *Tulipa hungarica* was known from the southern side of the Iron Gate Gorge (Đerdap National Park; cf. Ćalić et al. 2012); recently the species is evaluated as extinct in Serbia (Stevanović 2013, Turis et al. 2014).

[194] Oprea (2005) incorrectly reported *Tulipa hungarica* var. *undulatifolia* Roman as synonym of *Tulipa undulatifolia* Boiss. (cf. Negrean 2011).

[195] Rostański (1967, 1970) ordered to *Valeriana tripteris* subsp. *heterophylla* plants with at least some stem leaves composed of 5 leaflets, with a large oblong-ovate terminal divisions and about 0.5 mm long hairs on the leaf margin. From the nominate subspecies it differs also ecologically; it occurs in springs, aluvial alder forests, moist habitats along the mountain brooks and in *Alnus viridis* stands (Schur 1866, Dmytrach 2010). It is accepted as a separate subspecies e.g. by Mirek et al. (2002), and as a separate species (ut *Valeriana transsilvanica* Schur) by Katina (1961) and Prokudin (1987).

[196] Rostański (1967) reported the ocurrence of *Valeriana tripteris* subsp. *heterophylla* from the Polish and Ukrainian part of the Eastern Carpathians. From the Polish Bieszczady Mts the subspecies sporadically protrudes to the neighbouring Beskid Niski Mts (Rostański 1967, 1970) ordered already to the Western Carpathians. Probably based on these facts, it was evaluated as endemic to the Western and Eastern Carpathians by Tasenkevyč (2014). However, Morariu (1961 ut *V. tripteris* var. *heterophylla*) reported several localities of this taxon not only from the Eastern but also from the Southern and Apuseni Carpathians (cf. Schur 1866, Simonkai 1887 ut *Valeriana tripteris* var. *bijuga* Simk.).

[197] Kirschner (2007) ordered similar populations from the alluvial alder forests and springs in the Bukovské vrchy Mts to *Valeriana montana* var. *ternata* Schur. The occurrence of *Valeriana montana* L. (without closer specification) in the Bukovské vrchy Mts (springs and alluvia in the Zbojský potok Valley) was first reported by Hadač (1989); species distribution in the mountain range was later substantionally completed by Hadač, Terray et al. (1991).

[198] In some of the included literature (e.g. Beldie 1977, Oprea 2005, Ciocârlan 2009) *Viola declinata* is evaluated as a Carpathian-Balkan species. According to Velev & Apostolova (2009), it does not occur in Serbia nor in Bulgaria (cf. Diklić 1972, Delipavlov 1979).

[199] In Ukraine, *Viola jooi* grows also in the Pokuttja region (Čornej 2011).

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Electronic Appendix 2. – "Critical" (unclear) endemic taxa

Taxon	Synonyms	References
Aconitum moldavicum subsp. *simonkaianum* (Gáyer) Starm. [200]	*Aconitum simonkaianum* Gáyer	Grinţescu 1953; Starmühler 1998a; Mitka 2008
Allium zahariadi Májovský subsp. *zahariadi* [201]	*Allium ochroleucum* subsp. *pseudosuaveolens* Zahar.; *A. ericetorum* subsp. *pseudosuaveolens* (Zahar.) Ciocârlan	Zahariadi 1966; Májovský & Murín 1985; Somogyi 1999a; Ciocârlan 2009; Sârbu et al. 2013
Allium zahariadi subsp. *michalkoi* Májovský [202]		Májovský & Murín 1985; Somogyi 1999a, b, 2002
Bupleurum falcatum subsp. *dilatatum* Schur [203]	*Bupleurum dilatatum* (Schur) Baksay	Tutin 1968; Kliment 1999; Oprea 2005
Carduus fissurae Nyár. [204]		Nyárády 1965; Beldie & Alexandrescu 1976; Ciocârlan 2009
Carex sempervirens subsp. *tatrorum* (Zapał.) Pawł. [205]		Kliment 1999; Marhold et al. 2007; Luceño et al. 2008
Carex sempervirens subsp. *pseudotristis* (Domin) Pawł. [206]	*Carex sempervirens* var. *pseudotristis* Domin	Domin 1931b; Luceño et al. 2008
Centaurea globurensis Nyár. [207]		Dostál 1976; Dihoru & Pârvu 1987; Greuter in Euro+Med
Centaurea pugioniformis Nyár. [208]		Prodan & Nyárády 1964; Dostál 1976; Ciocârlan 2009
Dactylorhiza carpatica (Batoušek et Kreutz) P. Delforge [209]		Kubát 2010; Kaplan 2012
Dianthus carpaticus Woł. [210, 211]	*Dianthus carthusianorum* var. *carpaticus* (Woł.) Zapał.; *D. bucovinensis* (Zapał.) Klokov	Klokov 1952; Tutin 1964; Jalas & Suominen 1986; Fedoronˇcuk & Diduch 2002a; Kuz'mina 2004; Fedoronˇcuk 2009
Hieracium amoenanthes Nyár. et Zahn [212]		Zahn 1936; Nyárády 1965
Hieracium borzae Nyár. et Zahn [213]		Zahn 1938; Nyárády 1965
Hieracium breazense Nyár. [214]		Zahn 1938; Nyárády 1965
Hieracium caesiogenum Woł. et Zahn [215]		Zahn 1936; Nyárády 1965; Šljakov 1989
Hieracium calcogeton (Zahn) Greuter [216]		Zahn 1938; Nyárády 1965
Hieracium chloribracteum Degen et Zahn [217]		Zahn 1936; Nyárády 1965
Hieracium dentatum subsp. *sarmaticum* Zahn [218]	*Hieracium sarmaticum* (Zahn) Schljakov	Zahn 1927, 1935; Nyárády 1965; Šljakov 1989
Hieracium grecescui Nyár. et Zahn [219]		Zahn 1938; Nyárády 1965
Hieracium klopotivae Pax [220]		Nyárády 1965; Szeląg 2014 in litt.
Hieracium krizsnae Lengyel et Zahn [221]		Zahn 1927; Šípošová et al. 2004a
Hieracium mukaczevense Üksip [222]		Juksip 1959; Šljakov 1989
Hieracium nyaradyanum Zahn [223]		Zahn 1938; Nyárády 1965
Hieracium pelagae Degen et Zahn [224]		Zahn 1938; Nyárády 1965
Hieracium peterfii Nyár. et Zahn [225]		Zahn 1938; Nyárády 1965
Hieracium phaedrocheilon Zahn [226]		Zahn 1938; Nyárády 1965
Hieracium praebiharicum Boros [227]		Boros 1972
Hieracium prodanianum Nyár. et Zahn [228]		Zahn 1938; Nyárády 1965
Hieracium pseudocaesiiforme Nyár. et Zahn [229]		Zahn 1938; Nyárády 1965
Hieracium pseudocaesium Degen et Zahn [230]		Zahn 1938; Nyárády 1965
Hieracium pseudonigritum Pax [231]		Zahn 1938; Nyárády 1965
Hieracium pseudopaltinae Nyár. et Zahn [232]		Zahn 1938; Nyárády 1965
Hieracium pseudoratezatense Nyár. et Zahn [233]		Zahn 1938; Nyárády 1965
Hieracium stenodontophyllum Nyár. et Zahn [234]		Zahn 1936; Nyárády 1965
Hieracium trischistum Nyár. et Zahn [235]		Zahn 1938; Nyárády 1965
Hieracium vurtopicum Zahn [236]		Zahn 1938; Nyárády 1965
Hieracium wichurae Zahn [237]		Zahn 1936; Nyárády 1965

Taxon	Synonyms	References
Knautia dipsacifolia subsp. *lancifolia* (Heuff.) Ehrend. [238]	*Knautia dipsacifolia* var. *lancifolia* (Heuff.) Simonk.; *K. sylvatica* subsp. *lancifolia* (Heuff.) Soó	Ehrendorfer 1976; Oprea 2005; Papović et al. 2014; Štěpánek 2014 in litt.
Knautia dipsacifolia subsp. *pocutica* (Szabó) Ehrend. [239]	*Knautia dipsacifolia* var. *pocutica* Szabó	Ehrendorfer 1976; Oprea 2005; Štěpánek 2014 in litt.
Knautia dipsacifolia subsp. *turocensis* (Borbás) Jáv. ex Kiss [240]	*Knautia turocensis* (Borbás) Szabó	Ehrendorfer 1976; Kliment 1999
Leucanthemum raciborskii Popov et Chrshan. [241]		Cvelev 1961, 1994; Čopyk 1976; Heywood 1976; Zelený 1982; Ziman et al. 2006
Leucojum vernum var. *carpathicum* Sweet [242]	*Leucojum vernum* subsp. *carpathicum* (Sweet) K. Richt.	Soják 1962; Kliment 1999; Bělohlávková 2010
Minuartia cataractarum (Janka) Nyár. [243]	*Alsine cataractarum* Janka; *Minuartia frutescens* subsp. *cataractarum* (Janka) Soó; *M. hirsuta* subsp. *cataractarum* (Janka) Soó	Jalas & Suominen 1983; Halliday 1993; Dihoru & Negrean 2009; Sârbu et al. 2013
Myosotis transsylvanica Porcius [244]		Grinţescu & Nyárády1960b; Grau 1964; Grau & Merxmüller 1972; Walter & Gillett 1998
Poa molinerii subsp. *glacialis* Beldie [245]		Beldie 1967b
Poa nyaradyana Nannf. [246]	*Poa laxa* subsp. *pruinosa* Nyár.; *P. laxa* var. *caesioglauca* Schur ex Nyár.	Nyárády 1928; Şerbănescu 1967; Ghişa & Beldie 1972; Edmondson 1980; Ciocârlan 2009
Potentilla chrysantha subsp. *pastorum* Soják [247]		Soják 1993
Primula elatior subsp. *carpathica* (Griseb. et Schenk) W. W. Sm. et Forrest. [248]	*Primula carpathica* (Griseb. et Schenk) Fuss	Schwarz 1968; Valentine & Kress 1972
Primula elatior subsp. *poloninensis* (Domin) Dostál [249]	*Primula elatior* f. *poloninensis* Domin; *P. poloninensis* (Domin) Fed.	Morariu et al. 1960; Valentine & Kress 1972; Prokudin 1987; Ziman et al. 2006
Primula matthioli subsp. *pubens* (Schott, Nyman et Kotschy) Kovt. [250]	*Cortusa matthioli* subsp. *pubens* (Schott, Nyman et Kotschy) Jáv.	Morariu & Nyárády 1960; Kobiv 1999, 2009, 2010, 2012a; Kovtonjuk 2013
Pulmonaria montana subsp. *porciusii* Gusul. [251]		Guşuleac 1960; Merxmüller & Sauer 1972; Ciocârlan 2009; Valdés in Euro+Med
Ranunculus binatus Kit. ex Rchb. [252]	*Ranunculus auricomus* subsp. *binatus* (Kit. ex Rchb.) Jasiewicz	Dunkel 2011
Rubus moestus Holuby [253]		Holuby 1873; Nyárády 1956; Kurtto in Euro+Med
Rumex carpaticus (Zapał.) Zapał. [254]	*Rumex arifolius* subsp. *carpaticus* (Zapał.) Pawł.; *Acetosa alpestris* subsp. *carpatica* (Zapał.) Dostál	Borodina 1979; Cvelev 1996; Grabovskaja-Borodina 2012; Oprea & Sîrbu 2013
Scabiosa lucida subsp. *calcicola* Błoński [255]	*Scabiosa calcarea* Tocl	Chrtek 1985a, b; Štěpánek & Holub 1997; Kliment 1999
Scabiosa lucida subsp. *pseudobanatica* (Schur) Holub [255]	*Scabiosa lucida* subsp. *pseudobanatica* (Schur) Chrtek, nom. illeg.; *S. columbaria* subsp. *pseudobanatica* (Schur) Jáv.; *S. pseudobanatica* (Schur) Chrtek subsp. *pseudobanatica*	Chrtek 1985a, b; Kliment 1999; Oprea 2005; Bucalo et al. 2006; Kricsfalusy & Budnikov 2007
Soldanella hungarica group [256] (*S. angusta* Zhang; *S. hungarica* Simonk.; *S. major* (Neilr.) Vierh.; *S. marmarossiensis* Klášt.; *S. oreodoxa* Zhang; *S. pseudomontana* F. K. Mey.; *S. rugosa* Zhang; *S. stiriaca* F. K. Mey.; *S. tatricola* Niederle)	*Soldanella hungarica* subsp. *major* (Neilr.) Pawłowska	Klášterský 1930; Pawłowska 1963; Kress 1984; Meyer 1985; Hrouda & Kochjarová 1997; Zhang et al. 2001; Zhang & Kadereit 2002, 2004; Niederle 2003, 2005; Fischer et al. 2008
Sorbus paxiana Jáv. [257]		Jávorka 1927; Kárpáti 1960
Trisetum alpestre subsp. *glabrescens* (Schur) Tzvelev [258]	*Trisetum alpestre* var. *glabrescens* Schur	Schur 1866; Cvelev 1974, 1976; Prokudin et al. 1977

Notes

[200] Starmühler (1998a) re-classified the species *Aconitum simonkaianum* to the subspecies level (*Aconitum moldavicum* subsp. *simonkaianum* (Gáyer) Starm.) and reported it from the Ukrainian and Romanian Eastern Carpathians (cf. Starmühler 1998b, Mitka 2008, Mitka & Novikoff 2011, Novikoff & Mitka 2011a, b, Novikov 2013b). However, already Grințescu (1953) considered this taxon to be a hybrid, thus he reported it as *Aconitum* ×*simonkaianum* (Gáyer) Grinț. (*A. hosteanum* × *A. velutinum*) [*Aconitum velutinum* = *A. lasiostomum*]. The hybrid formula *Aconitum lasiostomum* × *A. moldavicum* was published after the subspecies name also by Mitka (2008; cf. Mitka & Gawroński 2010). According to him, the hybrid status of this taxon should be confirmed by further biochemical and molecular analyses on representative material including the whole area of *Aconitum moldavicum*. Subspecies *A. moldavicum* subsp. *simonkaianum* is evaluated as nothotaxon (*A. moldavicum* subsp. *hosteanum* × *A. lasiostomum* subsp. *lasiostomum*) also by Novikov (2014 in litt.).

[201] *Allium zahariadi* subsp. *zahariadi* is a subspecies with a complicated taxonomic history. It was described as *Allium ochroleucum* subsp. *pseudosuaveolens* from fen meadows between the Vlăhița Village and Tolvaioș Gorge in the Eastern Carpathians by Zahariadi (1966), who recorded it also in the vicinity of the nearby village of Căpilnița. Based on his decription, Májovský (in Májovský & Murín 1985) described a narrowly perceived species of meadows *Allium zahariadi* with subspecies *A. zahariadi* subsp. *zahariadi* and *A. zahariadi* subsp. *michalkoi* (see below). According to at that time valid International code of botanical nomenclature (Greuter et al. 1994), Somogyi (1999a) considered the description of subsp. *pseudosuaveolens*, as well as of other derived taxa, to be invalid (due to the absence of a type specimen in the description). He ordered it to a broadly perceived species *Allium ericetorum* Thore, involving the populations of meadow communities. The subsp. *pseudosuaveolens* was reclassified to the last mentioned taxon also by Ciocârlan (2009), who reported *A. ericetorum* subsp. *pseudosuaveolens* as a narrow endemic known from only two localities mentioned in the original diagnosis (cf. Sârbu et al. 2013). Although according to Art. 40.3 of the recent code version (McNeill et al. 2012) the description of *Allium ochroleucum* subsp. *pseudosuaveolens* can be considered as valid (Marhold 2014 in litt., Turland 2014 in litt.), the endemic status of this taxon remains unclear until the detailed knowledge on the intraspecific variability of the *Allium ericetorum* group is known within its whole distribution area.

[202] A tall white-flowering meadows subspecies *Allium zahariadi* subsp. *michalkoi* was described from the vicinity of the Šaca Village in the Košická kotlina Basin (Májovský & Murín 1985), from where it is recently known in a single microlocality (Feráková & Somogyi 1999, Somogyi 1999b, 2002). Its evaluation as a narrow endemic to the Western Carpathians (Tasenkevich 2002) is left open by now (see the note above).

[203] The subspecies *Bupleurum falcatum* subsp. *dilatatum* includes robust, up to 2 m high branched plants, with stem leaves up to 20 (25) cm long and 3–6.5 cm broad (Šourková 1984) and tetraploid chromosome number (2n = 32). According to Tutin (1968), it is not clear whether there is a correlation between the morphometric characters and chromosome number; the subspecies is mentioned only in a note. The precise distribution of this subspecies is also not known up to now, it is reported from the Western (Slovakia, Hungary), Eastern and Southern Carpathians (Romania) and the Transylvanian Basin (Kliment 1999, Oprea 2005) and it was evaluated as a pan-Carpathian subendemic (Kliment 1999, Šeffer et al. 2010).

[204] Nyárády (1965) considered *Carduus fissurae* to be a hybridogenous species (*C. acanthoides* × *C. crispus*) and a local endemic to the Cheile Turzii Gorge (Trascău Mts) in the Apuseni Carpathians, where it was decribed (cf. Pawłowski 1970, Heltmann 1985, Oprea 2005). As a separate species it was accepted also by Greuter (in Euro+Med). Contrastingly, Beldie & Alexandrescu (1976), Morariu & Beldie (1976) and Ciocârlan (2009) identified it with the hybrid *Carduus* ×*leptocephalus* Peterm. (*C. acanthoides* × *C. crispus*). Some supranational databases (The Plant List, Catalogue of Life) report *C. fissurae* as a synonym of *Carduus crispus* L.

[205] *Carex sempervirens* subsp. *tatrorum*, a narrow-leaved calciphilous subspecies of taxonomically complicated species *Carex sempervirens* Vill., is considered to be endemic to the Western Carpathians (cf. Kliment 1999, Piękoś-Mirkowa & Mirek 2003, Mirek & Piękoś-Mirkowa 2009, 2010). However, its taxonomic evaluation is not consistent. Marhold et al. (2007) reported it as a synonym of the West-East-South-Carpathian calcicolous subspecies *Carex sempervirens* subsp. *laxiflora* (Schur) Jáv.; Luceño et al. (2008) as a synonym of a calciphilous subspecies *C. sempervirens* subsp. *sempervirens*, distributed on alkaline substrates from the mountain ranges of the Iberian Peninsula through the Alps, Jura, Apenines and Carpathians to mountain ranges of the Balkan Peninsula (cf. Marhold 1998, Jiménez-Mejías & Luceño in Euro+Med). Some supranational databases (The Plant List, Catalogue of Life) accept it only at the species level (cf. Ciocârlan 2009, Sârbu et al. 2013).

[206] The subspecies *Carex sempervirens* subsp. *pseudotristis* was described from the Ukrainian Carpathians (Domin 1931b ut *Carex sempervirens* var. *pseudotristis*) and sporadically considered (Tasenkevyč 2003b) to be endemic to the Eastern Carpathians. Luceño et al. (2008) used the name *C. sempervirens* subsp. *pseudotristis* for both the Pyrenean and the

Carpathian silicicolous populations of *Carex sempervirens*, meantime reported as *Carex granitica* Braun-Blanq. or *Carex sempervirens* subsp. *silicicola* Holub (cf. Jiménez-Mejías & Luceño in Euro+Med).

[207] *Centaurea globurensis* is a species with unclear taxonomic status, which was described from Mt. Arjana near the Globură Village (Cerna Mts, the Southern Carpathians) and included within the groups *Centaurea atropurpurea* Waldst. et Kit. (Dostál 1976), *C. calocephala* Willd. (Greuter in Euro+Med) and also *C. scabiosa* L. (Dihoru & Pârvu 1987).

[208] *Centaurea pugioniformis* is a narrowly-perceived species belonging to the group of *Centaurea macroptilon* Borbás, from which it differs only by narrower appendices not covering involucral bracts (Dostál 1976). It was reported from the Eastern, Southern and Apuseni Carpathians, the Transylvanian Basin, sporadically also from the localities outside the Carpathians – Timișoara, Iași (Prodan & Nyárády 1964, Oprea 2005). Niketić (2010) reported its occurrence also from the Serbian part of the Southern Carpathians (Đerdap: Lepenski vir, Kazan). According to Hurdu (2014 in litt.) and Vonica (2014 in litt.), it concerns a hybrid forms of the subspecies *Centaurea macroptilon* subsp. *oxylepis* (Wimmer et Grab.) Soó (cf. Ciocârlan 2009).

[209] *Dactylorhiza carpatica* is a taxonomically unclear species originated by hybridization of *Dactylorhiza* species and known only from the calcareous fen on the Moravian side of the Bílé Karpaty Mts (Kaplan 2012). It was included neither in the current checklist of vascular plants of the Czech flora (Danihelka et al. 2012) nor in the newest Czech Red list (Grulich 2012). Kubát (2010) reported it in a note to *Dactylorhiza fuchsii* (Druce) Soó with a comment that it probably concerns a taxon of hybridogenous origin, requiring further study. Mrázek (http://botany.cz/cs/dactylorhiza-traunsteineri-carpatica) considers it to be a hybridogenous species, stenoendemic to the Moravian Bílé Karpaty Mts.

[210] Fedorončuk (2009) evaluates *Dianthus carpaticus* as a local endemic to the Eastern Carpathians occurring in the subalpine and alpine belts of the Ukrainian Carpathians, well differentiated from the relative species *Dianthus carthusianorum* L. and *D. tenuifolius* Schur (cf. Fedorončuk & Diduch 2002a, Fedorončuk & Čornej 2005, Čornej 2011, Tasenkevich 2011). By a set of its morphological characters it represents a transitional position between these two species (Fedorončuk & Čornej l. c.). Contrastingly, Tutin (1964), Jalas & Suominen (1986) and Kuz'mina (2004) consider it to be a synonym of *Dianthus carthusianorum* L., Malynovs'kyj et al. (2002) as a synonym of *D. carthusianorum* subsp. *subalpinus* (Rehmann) Májovský et Králik. Reversely, Klokov (1952) reported *D. carthusianorum* var. *subalpinus* Rehmann as synonym of *Dianthus carpaticus*.

[211] As a synonym of *Dianthus carpaticus* Fedorončuk & Diduch (2002a) reported also *Dianthus bucovinensis* (Zapał.) Klokov, considered by Klokov (1952) as endemic to the Bukovinské Karpaty Mts; contrastigly, Jalas & Suominen (1986) considered it as synonym of *Dianthus carthusianorum*.

[212] Zahn (1936) reported *Hieracium amoenanthes* only from Mt. Retezat (Retezat Mts), 1 800–1 900 m a.s.l. in the Southern Carpathians (cf. Nyárády 1965). It is probably endemic to the Retezat Mts; however, the current taxonomic and chorological knowledge is missing. Heltmann (1985) and Dihoru & Pârvu (1987) considered it to be endemic to the Southern Carpathians.

[213] Zahn (1938) reported *Hieracium borzae* from Mt. Retezat (cf. Nyárády 1965). It is probably endemic to the Retezat Mts; however, the current taxonomic and chorological knowledge is missing. Heltmann (1985) and Dihoru & Pârvu (1987) considered it to be endemic to the Southern Carpathians.

[214] Zahn (1938) reported the occurrence of *Hieracium breazense* in the Răul Brescivarei Valley (Făgăraș Mts); Nyárády (1965) also in the locality Giurcuța de Sus (Apuseni Mts). The current taxonomic and chorological data on this species are not available. Heltmann (1985) considered it to be endemic to the Southern Carpathians, Dihoru & Pârvu (1987) evaluated it as endemic to the Southern and Apuseni Carpathians.

[215] *Hieracium caesiogenum* was described from Mt. Berdo near the Hryniava Village at the border of the Ukrainian and Romanian Carpathians. Zahn (1936) reported several localities from the Făgăraș Mts, Nyárády (1965) also from the Rodna Mts and Bihor-Vlădeasa Mts (cf. Oprea 2005). The Ukrainian authors evaluate it as endemic to the Eastern and Southern Carpathians in their surveys. The current data for delimitation of its real distribution are still missing; it is probably endemic to the Eastern and Southern Carpathians (cf. Zahn 1936).

[216] Zahn (1938) reported *Hieracium calcogeton* from the Bihar Mts (Apuseni Carpathians) using an invalid name *Hieracium biharianum* Prodan et Zahn (only a German diagnosis). Neither newer taxonomic nor chorological data are available (cf. Nyárády 1965). Heltmann (1985) as well as Dihoru & Pârvu (1987) ordered it as *Hieracium biharianum* to species endemic to the Apuseni Carpathians.

[217] According to Zahn (1936), *Hieracium chloribracteum* grows only in the Retezat Mts (the Southern Carpathians) at altitudes between 1 400 and 2 300 m. Nyárády (1965) considered it to be endemic to the Retezat Mts, Dihoru & Pârvu (1987) as endemic to the Southern Carpathians. The current taxonomic and chorological data for delimitation of its real distribution are missing.

[218] Zahn (1927, 1935) reported the occurrence of *Hieracium dentatum* subsp. *sarmaticum* from several mountain ranges in the Slovak part of the Western Carpathians, Šljakov (1989) from the Ukrainian Carpathians, Nyárády (1965) from the Apuseni Carpathians (Colții Trascău). Stoyko & Tasenkevich (1993) and Čornej (2011) evaluated it as endemic to the Western and Eastern Carpathians.

[219] According to Zahn (1938), *Hieracium grecescui* grows only in the Retezat Mts (cf. Nyárády 1965). Recent data on this species are missing. Heltmann (1985) and Dihoru & Pârvu (1987) considered it endemic to the Southern Carpathians.

[220] *Hieracium klopotivae* was described from the Retezat Mts (Clopotiva in the Râului Mare Valley). Nyárády (1965) reported it also from the Maramureş Mts (Stâna lui Vartic). This record was adopted by Oprea (2005) and Sârbu et al. (2013), who *H. klopotivae* evaluated as endemic to Romania or to the Carpathians. According to Szeląg (2014 in litt.), *Hieracium klopotivae* s. str. grows probably only in the Retezat Mts.

[221] *Hieracium krizsnae* was described by Zahn (1927) from Mt. Krížna in the Veľká Fatra Mts (the Western Carpathians). Its occurrence in this locality has not been confirmed since that time, however, it was documented by Lengyel's original herbarium specimen in the collection of BP (Šípošová et al. 2004a). It was evaluated as endemic to the Veľká Fatra Mts by Mráz (in Eliáš jr. et al. 2015).

[222] Juksip (1959) described *Hieracium mukaczevense* from an oak forest nearby the city Mukačevo. As endemic to the Eastern or the Ukrainian Carpathians it was evaluated e.g. by Stojko & Tasenkewitsch (1991), Stoyko & Tasenkevich (1993), Malynovs'kyj et al. (2002) and Tasenkevyč (2003b). Up to now, it is known only from the type specimen and no newer data are available since its description (Sennikov 2014 in litt.). Also later floristic studies (e.g. Prokudin 1987, Šljakov 1989) contain only basic information on *locus classicus* of this narrowly-perceived species.

[223] Zahn (1938) reported *Hieracium nyaradyanum* from the Făgăraş Mts and Ţarcu Mts, Nyárády (1965) from the Făgăraş, Godeanu and Ţarcu Mts. It is probably endemic to the Southern Carpathians (cf. Heltmann 1985, Dihoru & Pârvu 1987).

[224] Zahn (1938) reported the occurrence of *Hieracium pelagae* from Mt. Peleaga (Retezat Mts) in the Southern Carpathians and the Ţibleş Mts in the Eastern Carpathians. More recent data are not available (cf. Nyárády 1965). According to Heltmann (1985) and Dihoru & Pârvu (1987) it is endemic to the Eastern and Southern Carpathians.

[225] Zahn (1938) reported *Hieracium peterfii* from two localities in the Retezat Mts (the Southern Carpathians). More recent data are not known (cf. Nyárády 1965). The Romanian authors (Heltmann 1985, Dihoru & Pârvu 1987) considered it endemic to the Southern Carpathians.

[226] Zahn (1938) reported *Hieracium phaedrocheilon* from the localities Csikszentdomokos (Sândominic) and Marosfő (Izvoru Mureşului) in the Romanian Eastern Carpathians, Nyárády (1965) only mentioned its occurrence in the Southern Carpathians. More recent records are missing. Heltmann (1985) ordered it to species endemic to the Transylvanian Basin, Dihoru & Pârvu (1987) to species endemic to the Eastern Carpathians.

[227] *Hieracium praebiharicum* was described from a stand of the *Seslerietum rigidae* in the vicinity of the Poşaga de Sus Village, 500 m a.s.l., in the Gilău Mts (Apuseni Carpathians, Boros 1972). Although it is considered endemic to the Apuseni Carpathians or to Romania, in the Romanian lists of endemic species as well as in the national floras (Morariu & Beldie 1976, Beldie 1979, Heltmann 1985, Dihoru & Pârvu 1987, Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013), it is reported only from the *locus classicus*. Since its description, it has not been subject of a taxonomic study.

[228] Zahn (1938) reported *Hieracium prodanianum* from the Retezat Mts (the Southern Carpathians) and the Bihar Mts (Apuseni Carpathians). More recent taxonomic and chorological data are not available (cf. Nyárády 1965). Heltmann (1985), Dihoru & Pârvu (1987) ordered it to species endemics to the Southern Carpathians.

[229] Zahn (1938) reported *Hieracium pseudocaesiiforme* from the surroundings of the glacial lake Gemenea in the Retezat Mts; more recent data are not available (cf. Nyárády 1965). According to Heltmann (1985) and Dihoru & Pârvu (1987), it is endemic to the Southern Carpathians.

[230] Zahn (1938) reported *Hieracium pseudocaesium* from several localities in the Retezat and Făgăraș Mts (cf. Nyárády 1965). More recent data are not available. Heltmann (1985) and Dihoru & Pârvu (1987) consider it endemic to the Southern Carpathians.

[231] *Hieracium pseudonigritum* was described and is recently known only from Mt. Barnarului in the Bistrița Mts (cf. Zahn 1938, Nyárády 1965). Heltmann (1985) ordered it to species endemic to the Eastern Carpathians.

[232] Zahn (1938) reported *Hieracium pseudopaltinae* from the Bârsei (Piatra Mare) and Retezat Mts; his data were adopted by Nyárády (1965). In studies of Heltmann (1985) and Dihoru & Pârvu (1987) the species is evaluated as endemic to the Southern Carpathians.

[233] Zahn (1938) and Nyárády (1965) reported *Hieracium pseudoratezatense* from two localities in the Retezat Mts (the Southern Carpathians). More recent data are not available. Heltmann (1985) and Dihoru & Pârvu (1987) considered it endemic to the Southern Carpathians.

[234] *Hieracium stenodontophyllum* was described from alpine surroundings of the glacial lake of Gemenea (Retezat Mts) in the Southern Carpathians (cf. Zahn 1936, Nyárády 1965); more recent data on its chorology are not available. Heltmann (1985) and Dihoru & Pârvu (1987) considered it endemic to the Southern Carpathians.

[235] Zahn (1938) reported *Hieracium trischistum* from the Retezat Mts (the Southern Carpathians); Nyárády (1965) reported it as var. *dealunegri* Nyár. et Zahn also from the Godeanu Mts. According to Heltmann (1985) and Dihoru & Pârvu (1987), it is endemic to the Southern Carpathians.

[236] *Hieracium vurtopicum* was described and is recently known only from Mt. Vîrtopu (Făgăraș Mts) in the Southern Carpathians (cf. Zahn 1938, Nyárády 1965). According to Heltmann (1985) and Dihoru & Pârvu (1987), it is endemic to the Southern Carpathians.

[237] Zahn (1936) reported *Hieracium wichurae* from alpine regions of the Piatra Mare Massif (Bârsei Mts) in the Southern Carpathians; more recent data are missing also in the study of Nyárády (1965). According to Heltmann (1985) and Dihoru & Pârvu (1987), it is endemic to the Southern Carpathians.

[238] The subspecies *Knautia dipsacifolia* subsp. *lancifolia* is accepted in Flora Europaea (Ehrendorfer 1976), supranational databases (The Plant List, Catalogue of Life, wikipedia, and others) as well as in more recent taxonomic publications (Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013). In the included surveys of endemic species it is reported as endemic to the South-Eastern Carpathians or subendemic to the Carpathians. Besides the Romanian Eastern, Southern and Apuseni Carpathians (cf. Oprea 2005) it has been recently recorded also in the south-eastern Serbia (Papović et al. 2014). According to Štěpánek (2014 in litt.), individual subspecies were distinguished based on habitat-dependent characters; more recent taxonomic data on variability of *Knautia maxima* (Opiz) Ortmann (valid species name) are still missing. Regarding unclear taxonomic status and chorological data, individual subspecies were not considered in current lists of species endemic to the South-Eastern Carpathians (Hurdu et al. 2012a, b).

[239] Similarly to previous subspecies, *Knautia dipsacifolia* subsp. *pocutica* is also accepted by Ehrendorfer (1976) and other above-mentioned studies. It is reported from the Slovak (Bukovské vrchy Mts) and Polish (Bieszczady Mts) Carpathians, Ukrainian as well as Romanian part of the Eastern Carpathians, and currently (e.g. Oprea 2005, Sârbu et al. 2013) also from the Apuseni Carpathians (Bihor-Vlădeasa Mts). In the included surveys of endemic species it is reported as endemic to the Eastern Carpathians, endemic to the Western and Eastern Carpathians or endemic to the Eastern, Southern and Apuseni Carpathians. Popescu & Sanda (1998) report it as a synonym of subsp. *lancifolia*.

[240] The distribution of subspecies *Knautia dipsacifolia* subsp. *turocensis* varies in different published sources from the Western Carpathians (including the Északi-középhegység Mts) through the Ukrainian (Mt. Pikuj) and Romanian Eastern Carpathians (Rodna Mts), Southern Carpathians up to the Stara planina Mts (Mt. Midzor) in Bulgaria (see Kliment 1999 for details). Ehrendorfer (1976) delimited its distribution area to the Western Carpathians.

[241] The species *Leucanthemum raciborskii* was described from the Svydovec Mts and in several reviews of endemic species it is evaluated as endemic to the Eastern (Ukrainian) Carpathians (Čopyk 1976, Tasenkevich 2011, CBIS 2008: http://www.carpates.org/cbisec/bot.php?id=6015). Based on original herbarium specimens collected by the authors of species diagnosis, Ziman et al. (2006) evaluated *L. raciborskii* as an alpine endemic vicariant of *Leucanthemum vulgare* (1 600–1 800 m a.s.l., CBIS 2008), from which it differs by several morphological characters. Cvelev (1961, 1994) ordered it as a synonym of *Leucanthemum subalpinum* (Schur) Tzvelev described from the Southern Carpathians, which in this concept is considered endemic to the Eastern and Southern Carpathians (Kricsfalusy 1999, Antosyak & Kozurak 2011). Both species were identified also by Čopyk (1976), who estimated a diploid chromosome number (2n = 18) for *L. raciborskii*. Contrastingly, Heywood (1976) considered *Leucanthemum raciborskii* to be synonym of a broadly-percieved species

Leucanthemum vulgare Lam. Zelený (1982, 2015 in litt.) ordered *L. raciborskii* as well as *L. subalpinum* to synonyms of the Alpine-Carpathian alpine diploid subspecies *Leucanthemum vulgare* subsp. *alpicola* Á. Löve et D. Löve. All three taxa were evaluated as synonyms of *Leucanthemum gaudinii* Dalla Torre (cf. The Plant List, Catalogue of Life) by Greuter (in Euro+Med).

242 *Leucojum vernum* var. *carpathicum* is a taxon with unclear taxonomy, nomenclature (different authors citations) and distribution, reported mainly as a subspecies *Leucojum vernum* subsp. *carpathicum* (Sweet) K. Richt. Soják (1962) reports it from the Vihorlat Mts in the Eastern Slovakia mentioning also its basic morphological characters (conspicuously larger flowers with yellow spots, often more robust growth and increased number of individuals with two flowers in the populations). He considered it to be geografically and morphologically not very well-defined, in its distribution restricted to the Eastern Carpathians and adjacent regions (Ukraine, Transylvania). He emphasized that the morphological criterium should not be overestimated as two-flowered individuals erroneously determined as *Leucojum carpathicum* are scattered in other regions of the species disttibution (the Sudeten, the Alps) and vice versa, single-flowered individuals from Transylvania were wrongly ordered to nominate subspecies. Besides the Eastern Slovakia the taxon is reported, mainly in the older literature, also from Poland (Bieszczady Mts), Ukraine (the Carpathians, Opillja, Pravoberežnyj Lisostep) as well as from several localities at the foothill of Transylvanian mountain ranges in Romania (cf. Kliment 1999). With regard to its distribution, it was evaluated as subendemic to Eastern Carpathians in several overviews. A scattered occurrence of individuals corresponding in the abovementioned characters to subsp. *carpathicum* was recently reported by Bělohlávková (2010) from the Czech Republic (Ještědský hřbet), Poland, Bavaria and the Alps with a note that the taxon requires thorough taxonomic and phytogeographical analysis within the whole area of the species distribution (cf. Dostál et al. 1999).

243 *Minuartia cataractarum* is a species with unclear taxonomic evaluation. In the Romanian surveys of endemic species as well as in taxonomic studies (e.g. Dihoru & Pârvu 1987, Negrean & Oltean 1989, Oprea 2005, Ciocârlan 2009, Hurdu et al. 2012a, b) it is evaluated as endemic to the Southern Carpathians, known only from the Iron Gate Gorge and the southern part of the Mehedinți Mts (cf. Dihoru & Negrean 2009). In other taxonomic studies (Jalas & Suominen 1983, Halliday 1993, Sârbu et al. 2013) it is included within the species *Minuartia frutescens* (Kit. ex Schult.) Tuzson ex Degen. Beldie & Alexandrescu (1976), and also Morariu & Beldie (1976) order it to synonyms of *Minuartia hirsuta* subsp. *falcata* (Griseb.) Mattf., which, however, grows only in the Balkan according to Atlas Florae Europaeae (Jalas & Suominen 1983).

244 *Myosotis transsylvanica* was described and is known only from the Rodna Mts in the Eastern Carpathians (cf. Grințescu & Nyárády 1960b ut *Myosotis variabilis* f. *transsylvanica* (Porcius) Jáv.). Grau (1964) identified it with the subspecies *Myosotis decumbens* subsp. *variabilis* (Angelis) Grau. However, she noted that plants from Transylvania, reported as *M. transsilvanica*, differ from this subspecies by the absence of long calyx hairs and after inspection of sufficient material it can be evaluated as a separate subspecies (cf. Grau & Merxmüller 1972). *Myosotis transsylvanica* was evaluated as a separate subspecies by Walter & Gillett (1998); preliminarily it was accepted also by Valdés (in Euro+Med).

245 The subspecies *Poa molinerii* subsp. *glacialis* was described by Beldie (1967b) from alpine regions of the Bucegi Mts (the Southern Carpathians), at about 2 020–2 350 m a.s.l. From the nominate subspecies it differs by a significantly shorter stalk (3–12 cm), shorter and more compact inflorescence (0.8–2 cm) and only 2–3-flowered spikelets (Ciocârlan 2009). It is possibly endemic to the Bucegi Mts (cf. Beldie 1979, Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013); however, the current floristic data from this mountain range as well as the knowledge on its overall distribution are missing (Hurdu 2014 in litt.).

246 *Poa nyaradyana* is a species with an unclear taxonomic status and ambiguous distribution. It was described by Nyárády (1928, ut *Poa laxa* subsp. *pruinosa*) from the Făgăraș Mts (the Southern Carpathians). Ghișa & Beldie (1972, ut *Poa laxa* var. *caesioglauca*) reported it also from other mountain ranges of the Southern Carpathians, Oprea (2005) and Sârbu et al. (2013) also from some mountain ranges of the Romanian Eastern Carpathians. The morphometric comparison of *Poa laxa* Haenke and *Poa nyaradyana* (Șerbănescu 1967) detected significant overlap in all measured characters except the average of longer anthers in *Poa nyaradyana*. Therefore, Șerbănescu (l. c.) considered *Poa nyaradyana* to be an ecotype of *Poa laxa* not exceeding the variability of this species (cf. Edmondson 1980, Ciocârlan 2009); Tasenkevyč (2010) considered it to be an ecological (calciphilous) subspecies of *Poa laxa*.

In the current Romanian taxonomic handbooks (Popescu & Sanda 1998, Ciocârlan 2009, Sârbu et al. 2013), *Poa tremula* Schur (non Lam., nom. illeg.) is also reported as synonym of *Poa laxa*. This species, in most surveys evaluated as endemic to the Southern Carpathians, was reported by Schur (1866) also from Mt. Ineu (Rodna Mts) in the Eastern Carpathians. Șerbănescu (l. c.) ordered populations from Mt. Ineu to *Poa laxa*. Tasenkevyč (2010) considers *Poa tremula* as synonym of *Poa laxa* subsp. *pruinosa* (i.e. *Poa nyaradyana*).

247 Soják (1993) described the subspecies *Potentilla chrysantha* subsp. *pastorum* from the Bucegi Mts in the Southern Carpathians (subalpine meadows in the vicinity of Valea Jepilor below the top of Mt. Caraiman, above the Busteni Village); however, he has not mentioned its overall distribution. In the current Romanian taxonomic handbooks (Oprea 2005, Ciocârlan 2009, Sârbu et al. 2013) only the species is mentioned.

[248] *Primula elatior* subsp. *carpathica* is a subspecies with an unclear taxonomic status and distribution. Schwarz (1968) delimited its distribution only to the Carpathian mountain ranges. Its relation to other subspecies reported as endemic from individual Carpathian subunits, *Primula elatior* subsp. *poloninensis* (Domin) Dostál (see below) and *P. elatior* subsp. *tatrensis* (Domin) Soó, is not clear. At the level of subspecies or species of *Primula carpathica* (Griseb. et Schenk) Fuss, it is accepted also by some supranational databases (The Plant List, Tropicos, Catalogue of Life). On the other hand, Valentine & Kress (1972) evaluated it as synonym of subsp. *elatior* (cf. Marhold in Euro+Med). The variability of *Primula elatior* (L.) Hill. requires a thorough molecular-taxonomic study.

[249] Similarly to subsp. *carpathica*, also *Primula elatior* subsp. *poloninensis* is a subspecies with problematic taxonomic status and insufficiently known distribution. More recent chorological data are available from the Polish (Bieszczady Mts) and Slovak (Bukovské vrchy Mts) Carpathians, and Ukrainian part of the Eastern Carpathians. From the Romanian Carpathians only older data exist from the Bârsei Mts (Postăvarul Massif) and Piatra Craiului Mts in the Southern Carpathians (Morariu et al. 1960, ut *Primula elatior* f. *poloninensis*); in more recent Romanian taxonomic handbooks this subspecies is not distinguished. In most overviews of endemic species it is reported as endemic to the South-Eastern or, more sparsely, to the Eastern Carpathians. Ambiguous is also its taxonomic evaluation – from the level of a species through the one of a subspecies, variety, form to classification as a synonym of *Primula elatior* subsp. *elatior* (Valentine & Kress 1972).

[250] *Primula matthioli* subsp. *pubens* is a taxonomically and chorologically unclear subspecies, up to now known mainly as *Cortusa matthioli* subsp. *pubens*. Most of the published studies from the Carpathian region contains only data on the species *Cortusa matthioli*, therefore the precise distribution of the subspecies in not known. More recent actual data on its distribution are available from the Ukrainian Carpathians. Kobiv (1999, 2009, 2010, 2012a) found an abundant population on the east-facing slopes of Mt. Hoverla (Černohora Mts, the Eastern Carpathians), at about 1 630–1 650 m a.s.l. Only older records are available from the Romanian Carpathians (Morariu & Nyárády 1960), namely from the Rodna (*locus classicus*: Mt. Corongiș) and the Făgăraș Mts (Valea Bîlii; ut f. *subpubens* Nyár.). Probably with regard to the last-mentioned record, *Cortusa *pubens* is in some overviews evaluated as endemic to the Eastern and Southern Carpathians (Čopyk 1976, Kobiv 1999, Tasenkevich 2011). Contrastingly, Kovtonjuk (2013), already within the genus *Primula* L., where the genus *Cortusa* was reclassified according to the results of current molecular-phylogenetic studies (Mast et al. 2001, Yan et al. 2010), evaluates it as endemic to the Eastern Carpathians (cf. Kobiv 2012a). Within the distribution area of *Primula matthioli* (L.) V. A. Richt., Kovtonjuk (l. c.) distinguished together 11 subspecies including subsp. *pubens*. As a morphologically and to some extent also ecologically separate subspecies, *Cortusa matthioli* subsp. *pubens* was evaluated also by Kobiv (1999, 2010).

[251] The subspecies *Pulmonaria montana* subsp. *porciusii* was described from the subalpine belt of the Rodna Mts (Guşuleac 1960); later it was evaluated as endemic to this mountain range (Ciocârlan 2009) or as endemic to the Eastern Carpathians (Sârbu et al. 2013). Opinions to its taxonomic evaluation differ: Merxmüller & Sauer (1972) reported it in a note to *Pulmonaria mollis* Wulfen ex Hornem. (see also The Plant List); Valdés (in Euro+Med) considers it as synonym of *Pulmonaria dacica* (Simonk.) Simonk.

[252] *Ranunculus binatus* represents a microspecies within the *Ranunculus auricomus* group (Dunkel 2011) with insufficiently known distribution. Based on the original diagnosis and additional typification, it surely grows in Transylvania (Romania) and in the Slovak part of the Western Carpathians (cf. Dunkel l. c.). It is reported as endemic to the Western, Eastern & Southern Carpathians and Transylvanian Basin by Tasenkevyč (2003b).

[253] *Rubus moestus* was described from the vicinity of the Zemianske Podhradie Village (Biele Karpaty Mts) in the Western Slovakia (Holuby 1873). Nyárády (1956) reported its occurrence from two localities (Nicolae Bălcescu, Orșova) in the western Romania (cf. Ciocârlan 2009). Tasenkevich (2011, 2014) considers it as endemic to the Western Carpathians and Transylvanian Basin. According to Kurtto (in Euro+Med), the Romanian data are erroneous. More accurate distribution of *Rubus moestus* is still not known.

[254] *Rumex carpaticus* (Zapał.) Zapał. was described from the Ukrainian Carpathians (Černohora Mts). It is reported also from the Polish (Bieszczady Mts) and Slovak (Bukovské vrchy Mts) parts of the Eastern Carpathians, Romanian Eastern and Southern Carpathians. Usually it is considered endemic to the Eastern and Southern Carpathians, less frequently also endemic to the Eastern Carpathians. Opinions to its taxonomic status differ. Beside the separate position at the subspecies level (see the synonyms), it is usually ordered as a synonym of *Rumex alpestris* Jacq. (e.g. Oprea & Sîrbu 2013, The Plant List, Goliašová 2014 in litt.), or *Rumex rugosus* Campd. (Borodina 1979, Cvelev 1996, Catalogue of Life). Recently, Grabovskaja-Borodina (2012) included *Rumex rugosus* as well as *R. carpaticus* (Zapał.) Zapał. as synonyms of the subspecies *Rumex arifolius* subsp. *amplexicaulis* (Lapeyr.) Nyman. On the other hand, several older sources (e.g. Jalas & Suominen 1979, Rechinger & Akeroyd 1993, Oprea 2005) report *Rumex carpaticus* Rech. f. as a synonym of *R. alpestris*, but no more accurate data are available on this taxon.

[255] For a long time, in overviews of the Carpathian endemic species only subspecies *Scabiosa lucida* subsp. *pseudobanatica* has been reported, evaluated usually as a West-East-South-Carpathian or pan-Carpathian endemic. Chrtek (1985a) noticed the existence ot the subspecies *Scabiosa lucida* subsp. *calcicola*, distributed in the promontories and at lower altitudes of the Slovak and Moravian parts of the Western Carpathians (cf. Chrtek 1985b ut *S. lucida* subsp. *pseudobanatica*; Štěpánek & Holub 1997), which is probably endemic to the Western Carpathians (Štěpánek & Holub l. c., Kliment 1999). According to Chrtek (1985a), plants identical in all characters with the Slovak ones reach towards the east up to western part of the Ukrainian Carpathians (Mt. Pikuj), towards the south up to the Északi-középhegység Mts (Chrtek sec. Kliment 1999). *Scabiosa lucida* subsp. *pseudobanatica* is further reported from the Ukrainian and Romanian Carpathians (including the Apuseni Carpathians and Transylvanian Basin; cf. Oprea 2005), the accurate distribution of both subspecies is not known. Bucalo et al. (2006) reported the occurrence of *S. lucida* subsp. *pseudobanatica* also from the National Park Kozara (Bosnia and Hercegovina).

[256] *Soldanella hungarica* group represents a complicated taxonomic complex with an ambiguous evaluation of its inner classification, on which several considerably distinct conceptes were published:

Pawłowska (1963) distinguished within the complex the species *Soldanella montana* Mikan (the Austrian Alps; Český masív; the Western and Eastern Carpathians) and *Soldanella hungarica* Simonk. with two subspecies, subsp. *major* (Neilr.) Pawłowska (the Western, Eastern and Southern Carpathians; Rila, Rodopi; the Austrian Alps) and subsp. *hungarica* (the Eastern and Southern Carpathians). The Carpathian populations, reported as *S. montana*, were later included to new-described *Soldanella pseudomontana* F. K. Mey. by Meyer (1985). Populations from the Stara Planina, Vitoša, Pirin and Rodopi Mts, reported as *S. hungarica*, were ordered to the species *Soldanella chrysosticta* Kress (Kress 1984) and *Soldanella rhodopea* F. K. Mey. (Meyer 1985). The distribution area of *Soldanella hungarica* sensu Pawłowska became thus restricted to the Carpathians and the Austrian Alps. Although Meyer (l. c.) ordered the Austrian populations to the new-described species *Soldanella stiriaca* F. K. Mey., which is however not considered even in the current Austrian identification key (Fischer et al. 2008), according to Zhang & Kadereit (2002) this represents a superfluous name for *Soldanella major* (Neilr.) Vierh.

This for a long time accepted concept was markedly discredited by a serie of molecular-taxonomic and nomenclatoric studies (Zhang et al. 2001, Zhang & Kadereit 2002, 2004). *Soldanella hungarica* (s. l.), the species of the Eastern Alps and Carpathians, was divided to several, mainly new-described and narrowly-perceived endemic species: *Soldanella angusta* Zhang (the Ukrainian and Romanian Eastern Carpathians); *Soldanella marmarossiensis* Klášterský (the Slovak and Polish Western Carpathians; the Polish, Ukrainian and Romanian Eastern Carpathians); *Soldanella rugosa* Zhang (the Eastern Carpathians: Rodna Mts); *Soldanella oreodoxa* Zhang (the Apuseni Carpathians); *S. hungarica* Simonk. s. str. (syn. *S. pseudomontana* F. K. Mey.; the Southern Carpathians); *S. major* (Neilr.) Vierh. (syn. *S. stiriaca* F. K. Mey.; the Southern Carpathians and the Eastern Alps). However, the credibility of the distinguished species is very low considering a limited number of analysed individuals as well as a low-level separation in the obtained phylogenetic analyses (cf. Zhang et al. 2001); moreover, the area of Carpathians was insufficiently covered by samples.

Further ambiguity to the concept was introduced by Niederle (2003) by description of a new West-Carpathian species *Soldanella tatricola*, to which also plants from the Vysoké Tatry and Nízke Tatry Mts were ordered, by other authors reported as *S. montana* Willd., *S. hungarica* Vierh., *S. major* sensu Vierh. and *S. marmarossiensis* Klášt. Populations from the Polish Tatry foothills (Podtatrze, Wzniesienie Gubałowskie), until then reported as *Soldanella montana* or *S. pseudomontana* (cf. Pawłowska 1963, Kliment 1999), he described as a new subspecies *Soldanella montana* subsp. *gubalowkae*. A narrowly-perceived species *S. rugosa* (see above) was evaluated (Niederle 2003, 2005) as a superfluous name of *S. marmarossiensis* described from the Ukrainian Carpathians (Klášterský 1930); from the new-described narrow species (Zhang & Kadereit 2002) he only accepted the Apuseni endemic *S. oreodoxa*.

[257] A hybridogenous species *Sorbus paxiana* is up to now known only from three localities in the Southern Carpathians: Băile Herculane: Valea Cernei; Petroșani; Piatra Rosia (Jávorka 1927, Kárpáti 1960). More current data on its distribution are missing. Already Kárpáti (1960) evaluated *S. paxiana* only according to the literature data and herbarium specimens. Oprea (2005) reports it from the Cerna and Mehedinți Mts.

[258] An alpine taxon *Trisetum alpestre* subsp. *glabrescens* was described by Schur (1866) ranked as a variety from the Piatra Craiului Mts in the Southern Carpathians (cf. Buia & Morariu 1972). Cvelev (1974, 1976) and Prokudin et al. (1977) reported it from the montane belt of the Ukrainian Carpathians (Čyvčyny Mts: Čornyj dil) based on herbarium material of I. V. Artemčuk from 1961 wrongly determined as *Trisetum macrotrichum*. Čornej (2011) evaluated *Trisetum *glabrescens* as endemic to the Eastern and Southern Carpathians with a comment that its taxonomic rank and distribution require further study.

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Electronic Appendix 3. – Taxa with a wider non-endemic distribution

Taxon	Area	References
Alchemilla gorcensis Pawł.	Carpathians, the Balkan Peninsula	Kurtto et al. 2007
Alchemilla mollis (Buser) Rothm.	Turkey, Greece, Bulgaria, Romania	Kurtto et al. 2007; Kurtto in Euro+Med
Alchemilla walasii Pawł.	Western & Eastern Carpathians, Eastern Poland, Belarus, Podillja	Syčak 2002; Kurtto et al. 2007; Kurtto in Euro+Med
Alyssum repens Baumg. (Syn.: *A. transsilvanicum* Schur)	Austria, Romania, Croatia	Jalas et al. 1996; Španiel et al. 2011a, b; Španiel 2014 in litt.
Androsace villosa var. *arachnoidea* (Schott, Nyman et Kotschy) R. Knuth (Syn.: *A. villosa* subsp. *arachnoidea* (Schott, Nyman et Kotschy) Nyman)	South-eastern Europe, incl. Italy	Ferguson 1972a
Arabidopsis arenosa subsp. *borbasii* (Zapał.) O'Kane et Al-Shehbaz (Syn: *Cardaminopsis arenosa* subsp. *borbasii* (Zapał.) Pawł.)	Western, Central, Eastern & Southern Europe	Jalas & Suominen 1994
Arabis hornungiana Schur	Carpathians, Bulgaria, Croatia	Kliment 1999; Ciocârlan 2009
Avenula pubescens subsp. *laevigata* (Schur) Holub	Western & Southern Alps, Eastern & Southern Carpathians	Holub 1980; Ciocârlan 2009
Betula pubescens subsp. *carpatica* (Waldst. et Kit. ex Willd.) Asch. et Graebn.	Pyrenees, Alps, Hercynian massif, Carpathians	Sýkora 1983; Kliment 1999
Bupleurum longifolium subsp. *vapincense* (Vill.) Todor	Auvergne, Jura, Alps, Carpathians, Dinarides, Stara Planina Mts	Šourková & Hrouda 1997
Campanula abietina Griseb. (Syn.: *C. patula* subsp. *abietina* (Griseb.) Simonk.)	Carpathians, mountains of the Balkan Peninsula	Fedorov & Kovanda 1976; Goliašová et al. 2008
Campanula glomerata subsp. *elliptica* (Kit. ex Schult.) Kirschl. (Syn.: *C. elliptica* Kit. ex Schult.)	Carpathians, Serbia, Croatia, Italy	Fedorov & Kovanda 1976; Kliment 1999; Kovačić 2004; Goliašová et al. 2008
Campanula transsilvanica Schur ex Andrae	Eastern & Southern Carpathians; Pirin, Rila, Vitoša & Stara Planina Mts	Oprea 2005; Assyov & Petrova 2006
Carduus collinus Waldst. et Kit.	Western Carpathians, Ukraine, the Balkan Peninsula, Italy	Kliment 1999
Centaurea degeniana J. Wagner [259]	Southern Carpathians, Western Bulgaria	Dostál 1976; Oprea 2005; Assyov & Petrova 2006
Centaurea kotschyana Heuff.	Eastern & Southern Carpathians, northern part of the Balkan Peninsula	Dostál 1976; Oprea 2005; Greuter in Euro+Med
Chrysanthemum zawadzkii Herbich [260] (Syn.: *Dendranthema zawadzkii* (Herbich) Tzvelev)	Western Carpathians (Pieniny Mts), Russia, Northern Mongolia, North-eastern China	Zarzycki 1976, 1982, 2000; Holub 1999; Wróbel 2008; Szeląg & Kobiv 2014
Cirsium boujartii (Piller et Mitterp.) Sch. Bip. subsp. *boujartii*	Hungary, Romania	Negrean & Oltean 1989; Csiky et al. 2005
Cirsium decussatum Janka	Poland (Pogórze Przemyskie Mts), Belarus, Ukraine, Romania (Eastern & Southern Carpathians); Moldova	Prokudin 1987; Oprea 2005; Piórecki & Zarzycki 2008; Ciocârlan 2009; Greuter in Euro+Med
Cirsium grecescui Rouy	Romania (Southern Carpathians), Serbia, Macedonia	Gajić 1975; Negrean & Oltean 1989; Melovski & Matevski 2008
Colchicum haynaldii Heuff. (Syn.: *C. neapolitanum* var. *haynaldii* (Heuff.) Asch. et Graebn.)	Romania (Southern Carpathians), the Balkan Peninsula	Oprea 2005; Ciocârlan 2009; Alexiou 2013
Dactylis glomerata subsp. *slovenica* Domin (Syn.: *D. slovenica* (Domin) Domin)	Sudetes, Western & Eastern Carpathians, Ukraine (outside the Carpathians), Montenegro (rare)	Kliment 1999
Dactylorhiza fuchsii subsp. *sooana* (Borsos) Borsos (Syn.: *D. longebracteata* subsp. *sooana* (Borsos) Dostál)	Western Carpathians, Transdanubian Mid-Mountains, Mecsek Mts, Pannonian Plain	Kliment 1999
Dactylorhiza maculata subsp. *transsilvanica* (Schur) Soó (Syn.: *D. transsilvanica* (Schur) Aver.)	Carpathians, mountains of the Balkan Peninsula	Soó 1980b, Kubát 2010
Dianthus collinus subsp. *glabriusculus* (Kit.) Thaisz (Syn.: *D. glabriusculus* (Kit.) Borbás; *D. collinus* subsp. *moldavicus* (Prodan) Soó)	Western Carpathians (HU), Eastern Carpathians, Transdanubian Mid-Mountains, Pannonian Plain; lowlands in Eastern Romania	Tutin & Walters 1993; Kliment 1999; Ciocârlan 2009

Taxon	Area	References
Erigeron macrophyllus Herbich (Syn.: *E. acris* subsp. *macrophyllus* (Herbich) Gutermann)	Eastern Alps, Hercynian massif, Carpathians, mountains of the Balkan Peninsula, Belarus, Russia, Caucasus	Šída 1996
Erythronium dens-canis var. *niveum* Baumg. (*E. dens-canis* subsp. *niveum* (Baumg.) Buia et Paun)	Apuseni Carpathians, Oltenia region (RO), Srbija, Bulgaria	Zahariadi 1966; Delipavlov 1971; Diklić & Nikolić 1986b; Borza et al. 1998
Festuca xanthina Roem. et Schult.	Southern Carpathians, mountains in northern part of the Balkan Peninsula	Negrean & Oltean 1989; Markgraf-Dannenberg 1980; Foggi & Müller in Euro+Med
Gagea bohemica (Zauschn.) Schult. et Schult. f.	Central, South-eastern & South-western Europe, Turkey, Israel	Hrouda 2010a
Galium polonicum Błocki (Syn.: *G. carpaticum* Klokov)	South-eastern Poland, North-eastern Ukraine, Eastern Carpathians (UA, rare)	Kucowa 1967; Ehrendorfer & Krendl 1976; Kułak & Sender 2011
Galium pseudaristatum Schur	Eastern & Southern Carpathians, Transylvanian Basin, mountains of the Balkan Peninsula	Ehrendorfer & Krendl 1976; Oprea 2005; Marhold in Euro+Med
Geranium caerulatum Schur (Syn.: *G. sylvaticum* subsp. *caerulatum* (Schur) D. A. Webb et I. K. Ferguson)	Eastern & Southern Carpathians, mountains of the Balkan Peninsula	Webb & Ferguson 1968; Oprea 2005
Hieracium atrellum (Zahn) Üksip	Sudetes, Carpathians	Šljakov 1989; Chrtek jr. 2004; Oprea 2005
Hieracium catenatum Sennikov [261]	Eastern Carpathians (UA), Belarus	Sennikov 1995, 1999b
Hieracium stygium R. Uechtr.	Eastern Sudetes, Western Carpathians	Chrtek jr. 2004; Chrtek & Mráz 2007
Hieracium wimmeri R. Uechtr.	Sudetes, Western Carpathians (SK), Eastern Carpathians (UA)	Šljakov 1989; Szeląg 2011
Hypericum richeri subsp. *grisebachii* (Boiss.) Nyman (Syn.: *H. richeri* subsp. *transsilvanicum* (Čelak.) Ciocârlan)	South-eastern Alps; Eastern, Southern & Apuseni Carpathians; mountains of the Balkan Peninsula	Robson 1968, 2010; Oprea 2005; Čornej 2011
Jacobaea abrotanifolia subsp. *carpathica* (Herbich) B. Nord. et Greuter (Syn.: *Senecio abrotanifolius* subsp. *carpathicus* (Herbich) Nyman; *S. carpathicus* Herbich)	Western, Eastern & Southern Carpathians; mountains of the Balkan Peninsula	Kliment 1999; Oprea 2005
Jovibarba globifera subsp. *glabrescens* (Sabr.) Holub [262] (Syn.: *J. hirta* subsp. *glabrescens* (Sabr.) Holub)	Western Carpathians, Apuseni Carpathians, Transdanubian Mid-Mountains, Mecsek Mts, Pannonian Plain (rare)	Letz 1998; Kliment 1999
Larix decidua subsp. *polonica* (Racib. ex Wóycicki) Domin (Syn.: *L. decidua* subsp. *carpatica* (Domin) Domin; *L. decidua* subsp. *carpatica* (Domin) Šiman, nom. illeg.)	?Sudetes, Carpathians, Poland (outside the Carpathians)	Browicz et al. 1971; Skalická & Skalický 1987; Kliment 1999
Melittis melissophyllum subsp. *carpatica* (Klokov) P. W. Ball (Syn.: *M. carpatica* Klokov)	eastern part of Central Europe, eastwarts to Western Ukraine and South-western Belarus (incl. Western & Eastern Carpathians)	Ball 1972; Marhold 1993; Kliment 1999
Minuartia frutescens (Kit. ex Schult.) Tuzson ex Degen (Syn.: *M. hirsuta* subsp. *frutescens* (Kit. ex Schult.) Hand.-Mazz.)	Western, Southern & Apuseni Carpathians, Transylvanian Basin, mountains in northern part of the Balkan Peninsula	Kliment 1999; Letz 2012
Muscari transsilvanicum Schur (Syn.: *M. botryoides* subsp. *transsilvanicum* (Schur) Soó; *M. botryoides* subsp. *hungaricum* Priszter)	Eastern & Southern Carpathians, Pannonian Plain, Mecsek Mts, Villány Mts	Somlyay et al. 2006
Noccaea kovatsii (Heuff.) F. K. Mey. (Syn.: *Thlaspi kovatsii* Heuff.; *T. pawlowskii* Dvořáková)	Eastern, Southern & Apuseni Carpathians, mountains of the Balkan Peninsula	Clapham & Akeyrod 1993; Jalas et al. 1996; Oprea 2005; Kobiv et al. 2007a
Ornithogalum kochii Parl. (Syn.: *O. ortophyllum* subsp. *kochii* (Parl.) Zahar.)	South-eastern (incl. northern Italy) & Central Europe	Hrouda 2010b
Petasites kablikianus Tausch ex Bercht.	Sudetes, Carpathians, mountains of the Balkan Peninsula	Kliment 1999; Oprea 2005; Ciocârlan 2009 etc.
Poa cenisia subsp. *contracta* Nyár. (Syn.: *P. psychrophila* Boiss. et Heldr.)	Southern Carpathians, mountains of the Balkan Peninsula, Crete	Ghişa & Beldie 1972; Edmondson 1980; Ciocârlan 2009
Polygala supina subsp. *hospita* (Heuffel) McNeill	Southern Carpathians, northern part of the Balkan Peninsula	McNeill 1968; Negrean & Oltean 1989

Taxon	Area	References
Primula halleri subsp. *platyphylla* O. Schwarz	Carpathians, mountains of the Balkan Peninsula	Schwarz 1968; Nikolić & Diklić 1986; Kliment 1999; Assyov & Vassilev 2004; Mustafa et al. 2013; Schönswetter & Božo 2013
Pulmonaria rubra Schott subsp. *rubra*	Eastern, Southern & Apuseni Carpathians, mountains of the Balkan Peninsula	Guşuleac 1960; Merxmüller & Sauer 1972
Rhinanthus gracilis Schur [263]	Eastern & Southern Carpathians, Rila Mts	Păuca & Nyárády 1960; Assyov & Petrova 2006
Rhododendron myrtifolium Schott et Kotschy (Syn.: *R. kotschyi* Simonk.)	Eastern & Southern Carpathians, mountains of the Balkan Peninsula	Popova 1972; Căprar et al. 2014
Satureja kitaibelii Wierzb. ex Heuffel (Syn.: *S. montana* subsp. *kitaibelii* (Wierzb. ex Heuffel) P. W. Ball)	Southern Carpathians (RO, SRB), north part of the Balkan Peninsula	Ball & Getliffe 1972; Ančev 1989; Negrean & Oltean 1989
Saussurea discolor (Willd.) DC.	Alps, Carpathians, Appeniny, Rila Mts	Lipschitz 1976; Assyov & Petrova 2006
Saxifraga carpatica Sternb. (Syn.: *S. carpathica* Rchb., nom. illeg.)	Eastern Alps (rare), Carpathians, northern part of the Balkan Peninsula	Webb 1993a; Schneeweiss 1998; Kliment 1999
Saxifraga luteoviridis Schott et Kotschy (Syn.: *S. corymbosa* Boiss.)	Eastern, Southern & Apuseni Carpathians, mountains of the Balkan Peninsula	Beldie 1977; Webb 1993a; Jalas et al. 1999; Kobiv et al. 2007a
Saxifraga pedemontana subsp. *cymosa* Engl.	Eastern & Southern Carpathians, mountains of the Balkan Peninsula	Jalas et al. 1999; Oprea 2005
Scorzoneroides rilaensis (Hayek) Holub (Syn.: *Leontodon rilaensis* Hayek; *L. croceus* subsp. *rilaensis* (Hayek) Finch et P. D. Sell)	Eastern Carpathians (rare), Southern Carpathians, mountains of the Balkan Peninsula	Finch & Sell 1976; Ciocârlan 2009; Dakskobler et al. 2010; Oprea & Sîrbu 2013
Securigera elegans (Pančić) Lassen (Syn.: *Coronilla elegans* Pančić)	Western (SK, HU), Eastern & Southern Carpathians, mountains of the Balkan Peninsula	Chrtková 1988; Oprea 2005; Niketić & Tomović 2008
Silene heuffelii Soó	Eastern & Southern Carpathians, mountains of the Balkan Peninsula	Chater et al. 1993; Oprea 2005
Swertia perennis subsp. *alpestris* (Fuss) Simonk. (Syn.: *S. alpestris* Fuss; *S. perennis* var. *alpestris* (Fuss) Sagorski)	Alps, Hercynian Massif, Carpathians, Bulgaria (Vitoša Mts, Pirin Mts, Rila Mts)	Kliment 1999
Tephroseris papposa (Rchb.) Schur (Syn.: *Senecio papposus* (Rchb.) Less.)	Eastern, Southern & Apuseni Carpathians, mountains of the Balkan Peninsula	Kliment 1999; Greuter in Euro+Med
Tozzia carpathica Woł. (Syn.: *T. alpina* subsp. *carpathica* (Woł.) Dostál)	Carpathians, mountains of the Balkan Peninsula	Kliment 1999; Sârbu et al. 2013
Trifolium repens var. *ochranthum* K. Malý (Syn.: *T. repens* subsp. *ochranthum* (K. Malý) Nyár.)	Eastern & Southern Carpathians, mountains in northern part of the Balkan Peninsula	Cincović 1972; Oprea 2005
Trollius europaeus subsp. *transsilvanicus* (Schur) Domin (Syn.: *T. transsilvanicus* Schur; *T. altissimus* Crantz)	South-eastern Alps, Carpathians	Jalas & Suominen 1989; Tutin 1993
Verbascum glabratum subsp. *brandzae* (Franch. ex Brândză) Murb.	Southern Carpathians (rare), mountains in northern part of the Balkan Peninsula	Ferguson 1972b; Oprea 2005; Dihoru & Negrean 2009
Veronica baumgartenii Roem. et Schult.	Eastern & Southern Carpathians, mountains in northern part of the Balkan Peninsula	Walters & Webb 1972; Peev 1995; Oprea 2005; Ciocârlan 2009
Veronica spicata subsp. *crassifolia* (Nyman) Hayek	Southern Carpathians, northern part of the Balkan Peninsula	Walters & Webb 1972; Oprea 2005
Waldsteinia teppneri Májovský	Eastern Alps, Western Carpathians (rare)	Kliment 1999

Notes

[259] According to Vonica (2014 in litt.), *Centaurea degeniana* is a hybrid of *C. macroptilon* subsp. *oxylepis* and some other taxon of the *Centaurea* genus (cf. Koutecký 2008).

[260] *Chrysanthemum zawadzkii* is evaluated as Eurasian continental species distributed from the Carpathians to the eastern Asia, with a discontinuous distribution in Europe (Zarzycki 1976, Holub 1999, Wróbel 2008, Szeląg & Kobiv 2014). At the same time it is a very polymorphic species forming a serie of specific individual populations along a longitudinal gradient, which differ mainly by the colour of ligular flowers and shape of leaves (Holub 1981). Morphologic differences stimulated description of several subspecies (for details see Zarzycki 1976, Greuter in Euro+Med, and others). A relic exclave distribution in the Pieniny Mts (*locus classicus* of the species and the only occurrence in the Carpathians) is far remote (by more than 1 000 km; Zarzycki 2000) not only from the margin of its continuous Siberian ditribution but also from its distribution in the European part of Russia. The isolated population from the Pieniny Mts has been considered to be endemic (usually at the level of nominate subspecies or a variety) for a long time since the study by Pax (1898) was published (see the summary by Kliment 1999). On the other hand, Zarzycki (1982) considered it to be a late-glacial relic, reaching the Pieniny Mts in Late Plestocene during maximum development of the pine and larch-pine forests. The species was ordered to relics also by Holub (1981, 1987, 1999), who considered it as species of late-glacial steppes expanding to Europe from Siberia along the margin of a continental glacial sheet. Domin (1934) evaluated it as an old relic species with a large disjunctive distribution, which should be distinguished from true endemics. The endemic status of the Pieniny population was questioned already by Piękoś (1971); it is also not listed in the recent overview of endemic plants of Poland (Mirek & Piękoś-Mirkowa 2009).

[261] *Hieracium catenatum* is a central-European species up to now known only from Ukraine and Belarus (Sennikov 1995, 1999b) with presumed wider distribution towards the west (Sennikov 2014 in litt.).

[262] In the included literature *Jovibarba globifera* subsp. *glabrescens* (Sabr.) Holub is reported using an invalid name *Jovibarba hirta* subsp. *glabrescens* (Sabr.) Soó et Jáv.

[263] *Rhinanthus gracilis* is a Balkan-Carpathian species with a contradictory taxonomic evaluation. Although it is accepted e.g. in the Euro+Med database, the Romanian authors by themselves evaluate it differently. E.g. Popescu & Sanda (1998) reported it as *Rhinanthus* ×*gracilis* Schur (*R. alpinus* × *R. serotinus*), Oprea (2005) as a synonym of *R. alectorolophus* (Scop.) Pollich. Soó & Webb (1972) consider it to be transitional type between *R. alpinus* Baumg. and *R. angustifolius* C. C. Gmelin.

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Electronic Appendix 4. – Species, subspecies and varieties included to taxa with a wider non-endemic distribution

Taxon	Included in	References
Achillea carpatica Błocki ex Dubovik	*Achillea distans* Waldst. et Kit. ex Willd.	Danihelka 2013 in litt.
Acinos alpinus subsp. *baumgartenii* (Simonk.) Pawł. (Syn.: *A. baumgartenii* (Simonk.) Klokov)	*Acinos alpinus* (L.) Moench subsp. *alpinus* (syn.: *Calamintha alpina* (L.) Lam. subsp. *alpina*)	Popescu & Sanda 1998; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Aconitum jacquinii Rchb. (Syn.: *A. anthora* subsp. *jacquinii* (Rchb.) Domin)	*Aconitum anthora* L.	Novikoff & Mitka 2011a, b
Alchemilla intermedia subsp. *sooi* (Palitz) Soó (Syn.: *A. helvetica* subsp. *sooi* (Palitz) Dihoru et Pârvu)	*Alchemilla monticola* Opiz	Kurtto et al. 2007
Alchemilla pungentiflora (Plocek) Plocek	*Alchemilla straminea* Buser	Kurtto et al. 2007
Alchemilla subconnivens Pawł. [264]	*Alchemilla connivens* Buser	Fröhner 1975; Kurtto et al. 2007
Alchemilla tatricola Pawł.	*Alchemilla subcrenata* Buser	Plocek 1992; Kurtto et al. 2007
Alyssoides utriculata var. *micrantha* Ciocârlan	*Alyssoides utriculata* (L.) Medik.	Dihoru & Negrean 2009
Alyssum montanum subsp. *brymii* (Dostál) Soó	*Alyssum gmelinii* Jord. et Fourr.	Španiel et al. 2012; Španiel 2014 in litt.
Astragalus australis var. *bucsecsii* (Jáv.) Guşul. [265] (Syn.: *A. australis* proles *bucsecsii* Jáv.)	*Astragalus australis* (L.) Lam.	Jávorka 1916; Podlech 2011
Biscutella laevigata subsp. *hungarica* Soó (Syn.: *B. austriaca* subsp. *hungarica* (Soó) Peniašteková)	*Biscutella laevigata* subsp. *austriaca* (Jord.) Mach.-Laur.	Jalas et al. 1996; Peniašteková 2002
Bupleurum subfalcatum Schur [266] (Syn.: *B. exaltatum* Schur)	*Bupleurum falcatum* subsp. *cernuum* (Ten.) Arcang.	Todor 1958; Čopyk 1976; Malynovs'kyj et al. 2002; Oprea 2005; Abduloeva & Fedoronçuk 2006; Čornej 2011
Campanula patula subsp. *peterfii* (Soó) Soó [267]	*Campanula patula* L. subsp. *patula*	Ghişa et al. 1964; The Plant List
Cardamine marholdii Tzvelev [268]	*Cardamine pratensis* L.	Cvelev 2003; Marhold 2014 in litt.
Carduus bicolorifolius Klokov	*Carduus personata* subsp. *albidus* (Adamović) Kazmi	Oprea 2005; Čornej 2011; Greuter in Euro+Med
Centaurea phrygia subsp. *nigriceps* (Dobrocz.) Dostál	*Centaurea phrygia* L.	Koutecký 2014 in litt.
Centaurea coziensis Nyár. (Syn.: *C. stoebe* var. *coziensis* (Nyár.) Soó)	*Centaurea stoebe* L.	Beldie & Alexandrescu 1976; Morariu & Beldie 1976; Mráz 2014 in litt.
Centaurea ratezatensis Prodan [269] (Syn.: *C. phrygia* subsp. *ratezatensis* (Prodan) Dostál; *C. pseudophrygia* subsp. *ratezatensis* (Prodan) Soó)	*Centaurea stenolepis* Kern.	Vonica et al. 2013; Koutecký 2014 in litt.
Cerastium arvense subsp. *calcicolum* (Schur) Borza	*Cerastium arvense* L.	Letz & Michalková 2012
Cerinthe glabra subsp. *tatrica* Hadač	*Cerinthe glabra* Mill. subsp. *glabra*	Valdés in Euro+Med; cf. Kliment 1999
Chenopodium wolffii Simonk.	*Oxybasis glauca* (L.) S. Fuentes et al. (Syn.: *Chenopodium glaucum* L.)	Jalas & Suominen 1980; Ciocârlan 2009; Uotila in Euro+Med
Dianthus carthusianorum subsp. *saxigenus* (Schur) Dostál (Syn.: *D. saxigenus* Schur)	*Dianthus carthusianorum* L.	Jalas & Suominen 1986
Dianthus simonkaianus Péterfi (Syn.: *D. petraeus* subsp. *simonkaianus* (Péterfi) Tutin)	*Dianthus petraeus* subsp. *orbelicus* (Velen.) Greuter et Burdet	Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013; Marhold in Euro+Med
Draba aizoides subsp. *zmudae* Zapał.	*Draba aizoides* L. subsp. *aizoides*	Jalas et al. 1996; Peniašteková & Kliment 2002
Edraianthus kitaibelii (A. DC.) A. DC.	*Edraianthus graminifolius* (L.) A. DC.	Beldie & Alexandrescu 1976; Beldie 1979; Popescu & Sanda 1998; Oprea 2005; Sârbu et al. 2013
Festuca aglochis Borbás	*Festuca supina* Schur	Futák 1971; Kliment 1999; Piękoś-Mirkowa & Mirek 2003
Galium bellatulum Klokov	*Galium anisophyllon* Vill. [270]	Ehrendorfer et al. 1996; Marhold et al. 2007
Galium carpaticum Klokov	*Galium polonicum* Błocki [271]	Ehrendorfer & Krendl 1976; Malynovs'kyj et al. 2002

Taxon	Included in	References
Galium pawlowskii Kucova [272]	*Galium saxatile* L.	Ehrendorfer & Krendl 1976; Mirek & Piękoś-Mirkowa 1984; Marhold in Euro+Med
Geranium alpestre Schur	*Geranium sylvaticum* L.	Kliment 1999; Oprea 2005; Aedo in Euro+Med
Heliosperma quadrifidum subsp. *carpaticum* Zapał. [273] (Syn.: *H. carpaticum* (Zapał.) Klokov; *Ixoca carpatica* (Zapał.) Ikonn.)	*Heliosperma pusillum* (Waldst. et Kit.) Rchb.	Jalas & Suominen 1986; Čornej 2011
Hesperis rominacea F. Dvořák	*Hesperis dinarica* Beck	Jalas & Suominen 1994; Negrean 2011
Hesperis matronalis subsp. *nivea* (Baumg.) Kulcz. (Syn.: *H. nivea* Baumg.)	*Hesperis matronalis* subsp. *candida* (Kit. ex Schulzer, Kanitz et Knapp) Hegi et E. Schmidt	Dvořák 1968; Jalas & Suominen 1994; Zahradníková et al. 2002
Hesperis moniliformis Schur (Syn.: *H. matronalis* subsp. *moniliformis* (Schur) Borza)	*Hesperis matronalis* subsp. *candida* (Kit. ex Schulzer, Kanitz et Knapp) Hegi et E. Schmidt	Ball 1993; cf. Dvořák 1968
Hieracium berdoense Woł.	*Pilosella guthnickiana* (Hegetschw.) Soják	Bräutigam & Greuter in Euro+Med
Hieracium melananthum (Nägeli et Peter) P. D. Sell et C. West (Syn.: *H. chondrillifolium* subsp. *melananthum* (Nägeli et Peter) Zahn)	*Hieracium chondrillifolium* Fr.	Mirek et al. 2002; Chrtek jr. 2014 in litt.; Szeląg 2014 in litt.
Hieracium roxolanicum Rehm.	*Pilosella guthnickiana* (Hegetschw.) Soják	Bräutigam & Greuter in Euro+Med
Hypericum richeri subsp. *transsilvanicum* (Čelak.) Ciocârlan [274] (Syn.: *H. transsilvanicum* Čelak.; *H. alpigenum* Kit.)	*Hypericum richeri* subsp. *grisebachii* (Boiss.) Nyman	Robson 1968, 2010
Iris dacica Beldie (Syn.: *I. hungarica* subsp. *dacica* (Beldie) Prodan et Nyár.)	*Iris aphylla* L.	Webb & Chater 1980; Popescu & Sanda 1998; Oprea 2005; Ciocârlan 2009; Sârbu et al. 2013
Leontodon gutzulorum V. N. Vassil.	*Scorzoneroides autumnalis* subsp. *borealis* (Ball) Greuter	Greuter in Euro+Med
Leontodon schischkinii V. N. Vassil.	*Leontodon hispidus* subsp. *hastilis* (L.) Corb.	Hel'tman 1989; Greuter in Euro+Med
Leucanthemum subalpinum (Schur) Tzvelev	*Leucanthemum gaudinii* Dalla Torre	Greuter in Euro+Med; The Plant List
Libanotis humilis Schur (Syn.: *L. pyrenaica* subsp. *humilis* (Schur) Soó)	*Seseli libanotis* (L.) W. D. J. Koch	Čornej 2011; The Plant List
Minuartia graminifolia subsp. *hungarica* Jáv.	*Minuartia graminifolia* (Ard.) Jáv. subsp. *graminifolia*	Jalas & Suominen 1983; Halliday 1993; Oprea 2005; Dihoru & Negrean 2009; Sârbu et al. 2013
Muscari carpaticum Racib.	*Muscari botryoides* (L.) Mill.	Davis & Stuart 1980; Prokudin 1987
Onobrychis transsilvanica Simonk. (Syn.: *O. montana* subsp. *transsilvanica* (Simonk.) Jáv.)	*Onobrychis montana* DC. subsp. *montana*	Beldie & Alexandrescu 1976; Oprea 2005
Oxytropis montana subsp. *retezatensis* Pawł.	*Oxytropis neglecta* J. Gay ex Ten.	Beldie & Alexandrescu 1976; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Pinus nigra var. *banatica* Georgescu et Ionescu [275] (Syn.: *P. banatica* (Georgescu et Ionescu) Gergescu et Ionescu)	*Pinus nigra* J. F. Arnold subsp. *nigra*	Businský 2008; Raab-Straube in Euro+Med; World Checklist; Businský 2014 in litt.
Ranunculus pseudobulbosus Schur [276]	*Ranunculus sardous* Crantz	Tutin & Cook 1964; The Plant List
Ribes carpaticum Kit.	*Ribes petraeum* Wulfen	Jalas et al. 1999; Sennikov 2001; Oprea 2005
Ribes heteromorphum Ţopa	*Ribes spicatum* E. Robson	Webb 1993b; Jalas et al. 1999; Oprea 2005; Ciocârlan 2009; Dihoru & Negrean 2009; Sârbu et al. 2013
Silene carpatica (Zapał.) Czopik [277] (Syn.: *Oberna carpatica* (Zapał.) Czerep.; *O. behen* subsp. *carpatica* (Zapał.) Tzvelev)	*Silene vulgaris* (Moench) Garcke	Klokov 1952; Jalas & Suominen 1986; Cvelev 2004b
Silene donetzica subsp. *sillingeri* (Hendrych) Šourková [278]	*Silene donetzica* Kleopow	Mereďa et al. 2012; cf. Chater et al. 1993
Thalictrum transsilvanicum Schur	*Thalictrum minus* L.	Nyárády 1953; Diduch et al. 2004b; The Plant List
Thlaspi pawlowskii Dvořáková	*Noccaea kovatsii* (Heuff.) F. K. Mey.	Pyšek et al. 2002; Ciocârlan 2009; Kobiv 2010
Thymus clandestinus Schur	*Thymus pulegioides* L.	Mártonfi 1997

Taxon	Included in	References
Thymus subalpestris Klokov	*Thymus alpestris* Tausch ex A. Kern.	Mártonfi 1997
Tragopogon transcarpaticus Klokov	*Tragopogon pratensis* subsp. *orientalis* (L.) Čelak.	Richardson 1976; Cvelev 1989; Negru & Ioniță 2009

Notes

264 Syčak (2011) accepted *Alchemilla subconnivens* as a separate species.

265 In the studies of the Romanian authors *Astragalus australis* var. *bucsecsii* is usually reported as *A. australis* subsp. *bucsecsii* Jáv. and evaluated as endemic to the Romanian Carpathians occurring in the Ceahlău and Bucegi Mts. However, Jávorka (1916) described *Astragalus australis* proles *bucsecsii* without a rank from the Bucegi Mts, and this taxon was ordered to species synonyms by Podlech (2011). Ciocârlan (2009) reports from Romania only *Astragalus australis*; var. (subsp.) *bucsecsii* was not included to species endemic to the Romanian Carpathians neither by Hurdu et al. (2012a, b).

266 *Bupleurum subfalcatum* was described by Schur (1866) from the Rodna Mts (Mt. Ineu), with a synonym *B. exaltatum* Schur. Todor (1958) evaluated it only at the level of a form *Bupleurum falcatum* var. *cernuum* f. *subfalcatum* (Schur) Todor and reported it from the Romanian Eastern and Southern Carpathians. Oprea (2005) and Hand (in Euro+Med) ordered it to synonyms of *B. falcatum* subsp. *cernuum*. Čopyk (1976) and Malynovs'kyj et al. (2002) considered *B. subfalcatum* as endemic to the Eastern and Southern Carpathians. According to Čornej (2011) and Abduloeva & Fedorončuk (2006), the records of this species from Ukraine require a confirmation.

267 Soó (1926) described *Campanula patula* subsp. *peterfii* at the level of a variety from the castle hill in the Deva City in Transylvania (cf. Ghișa et al. 1964), later it was upgraded to the level of a subspecies (Soó 1977). Dihoru & Pârvu (1987) reported *C. patula* subsp. *peterfii* as endemic to the Southern Carpathians. Fedorov & Kovanda (1976) report it neither within the characteristics of the species *Campanula patula* L. nor as a synonym of by them accepted subspecies.

268 Cvelev (2003) described *Cardamine marholdii* based on quantitative differences (smaller flowers and leaflets in comparison with *Cardamine pratensis*) from the Ukrainian Carpathians (Horhany Mts: Mt. Perednja); outside this area he reports it also from the mountain ranges of the south-eastern Romania and south-eastern Poland. As a separate species it was accepted by Il'jïns'ka & Diduch (2007), Čornej (2011) and Dorofeev (2012). Marhold (2014 in litt.) consideres *C. marholdii* to be a synonym of *Cardamine pratensis* L.

269 According to Koutecký (2014 in litt.), *Centaurea ratezatensis* represents a morphotype of the closely related *Centaurea stenolepis*; it can be included within this species or evaluated as its variety (cf. Vonica et al. 2013).

270 According to the current knowledge (Marhold et al. 2007), to *Galium anisophyllon* belong also the diploid West-Carpathian populations reported by invalid names *Galium fatrense* Ehrend. et Šípošová and *G. anisophyllum* subsp. *fatrense* Ehrend. evaluated as endemic to the Western Carpathians (cf. Kliment 1999).

271 *Galium polonicum* was evaluated as endemic to the Eastern Carpathians by some Ukrainian authors (e.g. Kricsfalusy 1999, Malynovs'kyj et al. 2002); but better part of its localities are outside the Carpathians (cf. Kucowa 1967, Čornej 2011).

272 *Galium pawlowskii* was described by Kucowa (1962) based on Pawłowski collections from the Čyvčyny Mts (Mt. Stoh, ca 1 500 m) in the Ukrainian Carpathians. Chorney et al. (2008) and Čornej (2011) evaluated it as endemic to this mountain range, Tasenkevyč (2003b) as a paleoendemic. Mirek & Piękoś-Mirkowa (1984) considered *Galium pawlowskii* to be conspecific with *Galium saxatile* L. (cf. Ehrendorfer & Krendl 1976; Marhold in Euro+Med and others) and suggested its evaluation as the variety *G. saxatile* var. *pawlowskii*. As they did not report full quotation of bazionym, the suggested combinaton is invalid.

273 Zapałowicz (1911) reported *Heliosperma quadrifidum* subsp. *carpaticum* from the montane and alpine regions of the Tatry Mts, the Ukrainian and Romanian Eastern Carpathians, at about 700–1 950 m a.s.l. Klokov (1952), Ikonnikov (2004) and Tasenkevich (2011) ordered it to taxa endemic to the Western and Eastern Carpathians. All reported localities are part of the *Heliosperma pusillum* distribution area (cf. Frajman 2007, Frajman & Oxelman 2007, Šingliarová & Mráz 2012).

274 In the included literature *Hypericum richeri* subsp. *transsilvanicum* (Čelak.) Ciocârlan is reported as *H. richeri* subsp. *transsilvanicum* (Čelak.) Beldie; *H. richeri* subsp. *transsilvanicum* (Čelak.) Beldie et L. Alex. [nom. inval.].

[275] In the Romanian literature, *Pinus nigra* var. *banatica* was reported mainly as *Pinus nigra* subsp. *banatica* (Borbás) Novák. However, Borbás (1886) published only nomen nudum; the name of the variety was validly published only by Georgescu & Ionescu in 1935 (cf. Beldie 1952). Novák (in Klika et al. 1953) published the combination *Pinus nigra* subsp. *banatica* (Georgescu et Ionescu) Novák without full quotation of the bazionym, and therefore invalidly.

[276] According to Tutin & Cook (1964), *Ranunculus pseudobulbosus* probably represents a subspecies or a variety of the species *Ranunculus sardous* Crantz. Nyárády (1953) reported it as the form *R. bulbosus* f. *pseudobulbosus* (Schur) A. Nyár.

[277] Zapałowicz (1911) reported by him described variety *Silene venosa* var. *carpatica* from the highest regions of the Tatry Mts, the Polish, Ukrainian as well as Romanian Eastern Carpathians, hence the area falling under the distribution area of *Silene vulgaris* (cf. Mereďa et al. 2012). Although Jalas & Suominen (1986) included *Silene carpatica* to synonyms of *S. vulgaris*, several Ukrainian authors (e.g. Klokov 1952, Čopyk 1976, Cvelev 2004b), using various names, accepted a separate position of this taxon and consider it to be endemic to the Carpathians (Čopyk 1976, Kricsfalusy 1999).

[278] In the included literature *Silene donetzica* subsp. *sillingeri* is reported also by an invalid name *S. sillingeri* (Hendrych) Hendrych.

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Electronic Appendix 5. – Hybrids considered as endemic taxa

Taxon	a hybrid formula	References
Aconitum ×*bartokianum* Starm.	*A. toxicum* × *A. variegatum*	Starmühler 1999, 2000; Mitka 2001; Ilnicki & Mitka 2011
Aconitum ×*czarnohorense* (Zapał.) Mitka	*A. firmum* × *A.* ×*nanum*	Mitka 2003; Novikoff & Mitka 2011a, b
Aconitum ×*dragulescuanum* Mucher	*A. degenii* × *A. toxicum*	Mucher 1993; Starmühler 1996a, 1997, 2000; Mitka 2001; Ilnicki & Mitka 2011
Aconitum ×*gayeri* Starm.	*A. degenii* × *A. lasiocarpum*	Starmühler 1998b; Mitka 2001, 2003; Ilnicki & Mitka 2011; Mitka & Novikoff 2011; Novikoff & Mitka 2011a, b
Aconitum ×*nanum* (Baumg.) Simonk. (Syn.: *A. nanum* Baumg., *A. tauricum* Wulf. subsp. *nanum* (Baumg.) Gáyer	*A. bucovinense* × *A. firmum*	Mitka 2001, 2003; Ilnicki & Mitka 2009; Novikoff & Mitka 2011a, b
Aconitum ×*pawlowskii* Mitka et Starm.	*A. lasiocarpum* × *A. variegatum*	Mitka & Starmühler 2000; Starmühler 2002; Mitka 2003; Ilnicki & Mitka 2011; Mitka et al. 2013; Sutkowska et al. 2013
Aconitum firmum nsubsp. *fussianum* Starm.	*A. firmum* subsp. *firmum* × *A. firmum* subsp. *fissurae*	Starmühler 1999, 2000; Mitka 2001, 2002, 2003; Novikov & Mitka 2011b
Aconitum firmum nsubsp. *paxii* Starm.	*A. firmum* subsp. *maninense* × *A. firmum* subsp. *moravicum*	Mitka 2003, Mitka et al. 2007; Novikov & Mitka 2011b
Aconitum firmum nsubsp. *zapalowiczii* Starm.	*A. firmum* subsp. *firmum* × *A. firmum* nsubsp. *paxii*	Mitka 2003
Aconitum moldavicum nsubsp. *porcii* Starm.	*A. moldavicum* subsp. *moldavicum* × *A. moldavicum* subsp. *simonkaianum*	Starmühler 1998a; Mitka 2008; Mitka & Novikoff 2011; Novikoff & Mitka 2011a, b
Aconitum toxicum nsubsp. *nyaradyanum* Mucher	*A. toxicum* subsp. *crispulum* × *A. toxicum* subsp. *toxicum*	Mucher 1993; Starmühler 1997
Aconitum toxicum nsubsp. *ungarianum* Starm.	*A. toxicum* subsp. *bucegiense* × *A. toxicum* subsp. *toxicum*	Starmühler 2000
Centaurea ×*melanocalathia* Borbás ex Czakó (Syn.: *C. phrygia* subsp. *melanocalathia* (Borbás ex Czakó) Dostál; *Jacea phrygia* subsp. *melanocalathia* (Borbás ex Czakó) Soják)	*C. erdneri* × *C. jacea*	Koutecký et al. 2012
Hieracium ×*grofae* Woł.	*H. alpinum* × *H. umbellatum*	Chrtek jr. et al. 2006
Hieracium ×*krasanii* Woł. [279]	*H. alpinum* × *H. transsilvanicum*	Mráz et al. 2005, 2011b
Rosa ×*heterostyla* Chrshan. [280]	*R. canina* × *R. dumalis*	Buzunova 2001; Kurtto et al. 2004
Senecio ×*dominii* Hodálová	*S. germanicus* × *S. ucranicus*	Hodálová 1999a

Notes

[279] Along with the diploid primary hybrids the occurrence of apomictic polyploid individuals of *Hieracium krasanii* was also sporadically recorded from Romania (Bistriţa Mts; Chrtek jr. 2014 in litt.).

[280] According to Kurtto et al. (2004), the holotypus *Rosa heterostyla* Chrschan. was identified as the hybrid of *Rosa canina* × *R. dumalis* (cf. Buzunova 2001).

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Electronic Appendix 6. – Habitat preferences of vascular plants endemic and subendemic to the Carpathians. Classification of phytosociological alliances to habitat groups and habitats is shown in Appendix 7.

Abbreviations:

Habitat groups: W – wetlands, R – rocky habitats, G – grasslands, D – dwarf shrubs, S – shrubs, F – forests, H – human-made (anthropogenic) habitats

Vertical distribution: ↓ – submontane and montane vegetation, ↑ – subalpine and alpine vegetation (grey-shaded columns)

Geological bedrock: c – vegetation on calcareous bedrock, s – vegetation on silicate (non-calcareous) bedrock (incl. effusive rocks, mylonites, schists etc.), i – vegetation indifferent to the substrate

Subdivision of forest habitats: Fm – montane spruce forests, Fp – pine forests, Fd – deciduous and mixed forests

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i												
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Achillea oxyloba subsp. *schurii*		+		+			+	+	+			+		+				+				+		+											
Aconitum bucovinense							+	+				+		+										+											+
Aconitum degenii subsp. *degenii*				+							+			+			+							+								+			+
Aconitum firmum subsp. *firmum*		+	+	+	+		+	+				+	+	+			+			+		+		+	+	+	+	+					+	+		+
Aconitum firmum subsp. *fissurae*																+																				
Aconitum firmum subsp. *maninense*																+												+					+			
Aconitum firmum subsp. *moravicum*												+		+			+	+		+						+							+			
Aconitum firmum subsp. *skerisorae*																+												+					+			
Aconitum lasianthum												+								+														+		
Aconitum lasiocarpum subsp. *lasiocarpum*																+	+							+									+			
Aconitum lasiocarpum subsp. *kotulae*		+														+	+																+			+
Aconitum moldavicum subsp. *moldavicum*						+		+				+	+	+		+	+	+						+				+			+		+			+
Aconitum moldavicum subsp. *hosteanum*								+				+		+		+												+					+			+
Aconitum toxicum subsp. *toxicum*																+	+							+									+			+
Aconitum toxicum subsp. *bucegiense*																															+					
Aconitum toxicum subsp. *crispulum*																																+				
Allium fussii																															+					
Alopecurus pratensis subsp. *laguriformis*														+																						
Antennaria carpatica subsp. *carpatica*								+				+		+				+						+												
Anthemis cretica subsp. *pyrethriformis*							+		+			+		+																						
Anthemis kitaibelii								+																												
Aquilegia nigricans subsp. *subscaposa*								+					+																							
Aquilegia transsilvanica							+					+																+								
Arabidopsis halleri subsp. *tatrica*												+	+	+		+	+				+					+					+			+		
Arabidopsis neglecta				+			+		+			+		+																						
Arenaria tenella							+		+			+		+				+																		
Armeria maritima subsp. *barcensis*			+																																	
Armeria pocutica																	+																			
Asperula carpatica													+																							
Astragalus australis subsp. *krajinae*								+				+																								
Astragalus exscapus subsp. *transsilvanicus*													+				+																			

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i												
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Astragalus peterfii													+																							
Astragalus pseudopurpureus								+					+																							
Astragalus roemeri													+																							
Athamanta turbith subsp. *hungarica*								+					+																+							
Aubrieta columnae subsp. *platycarpa*							+																													
Barbarea lepuznica				+	+																															
Bromus monocladus								+					+																+		+					
Campanula carpatica			+				+	+		+		+	+				+												+		+			+		
Campanula crassipes								+					+																+		+					
Campanula glomerata subsp. *subcapitata*																	+																			
Campanula kladniana							+	+	+	+		+	+	+				+						+					+							+
Campanula serrata		+					+	+		+		+	+	+		+	+	+	+	+		+		+		+	+	+	+		+	+	+	+		+
Campanula tatrae							+	+	+			+	+	+			+	+				+		+		+	+									
Campanula xylocarpa								+					+								+								+		+			+		
Cardamine glanduligera						+		+				+		+			+				+		+	+	+	+	+			+	+	+	+		+
Carduus kerneri subsp. *kerneri*							+	+				+		+								+														+
Carduus kerneri subsp. *lobulatiformis*												+																								
Carduus lobulatus								+					+																							
Centaurea reichenbachii													+																							
Centaurea rodnensis												+																								
Centaurea simonkaiana													+				+																			
Centaurea triniifolia								+					+																							
Cephalaria radiata													+																							
Cephalaria uralensis subsp. *multifida*													+																							
Cerastium arvense subsp. *lerchenfeldianum*							+					+																								
Cerastium tatrae		+		+			+		+			+		+				+								+									
Cerastium transsilvanicum												+						+		+															
Chrysosplenium alpinum		+		+		+		+	+					+										+											
Clinopodium pulegium								+					+																							
Cochlearia borzaeana			+																																	
Cochlearia tatrae				+					+					+																						
Cota tinctoria subsp. *fussii*										+																										+
Crocus banaticus																	+																+			
Crocus discolor												+	+	+	+	+	+								+											
Cyanus dominii subsp. *dominii*								+					+																+							
Cyanus dominii subsp. *slovenicus*								+					+																+							
Cyanus dominii subsp. *sokolensis*								+					+								+										+					
Cyanus maramarosiensis																+	+							+							+		+			
Cyanus mollis								+				+	+			+	+			+				+		+					+					+
Cyanus pinnatifidus subsp. *pinnatifidus*							+	+				+	+																							
Cyanus pinnatifidus subsp. *sooanus*												+																								

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i												
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Cyclamen purpurascens subsp. *immaculatum*																														+			+		
Dactylorhiza cordigera subsp. *siculorum*				+	+																														
Dactylorhiza maculata subsp. *schurii*					+																														
Daphne arbuscula								+					+																+						
Delphinium elatum subsp. *nacladense*								+				+				+	+																		
Delphinium oxysepalum							+	+				+		+			+	+				+				+	+								
Delphinium simonkaianum								+					+		+																+					
Dianthus callizonus							+					+																								
Dianthus carthusianorum subsp. *tenuifolius*							+	+				+	+	+																	+					
Dianthus giganteus subsp. *banaticus*													+												+						+					
Dianthus glacialis subsp. *gelidus*							+		+			+		+				+																		
Dianthus henteri									+	+					+																					
Dianthus nitidus												+	+					+		+									+						
Dianthus praecox subsp. *praecox*							+	+				+	+					+											+					+		
Dianthus praecox subsp. *lumnitzeri*								+					+																							
Dianthus praecox subsp. *pseudopraecox*													+																							
Dianthus spiculifolius							+	+				+	+							+										+					
Doronicum carpaticum		+		+			+	+	+		+	+		+								+		+			+						+		
Draba dorneri									+																											
Draba haynaldii							+					+																								
Draba kotschyi							+																													
Draba lasiocarpa subsp. *klasterskyi*								+					+																							
Draba simonkaiana									+																											
Erigeron hungaricus							+					+		+																						
Eritrichium jankae							+																													
Erysimum hungaricum													+																							
Erysimum pieninicum													+																							
Erysimum wahlenbergii							+	+				+	+								+					+					+			+		
Erysimum witmannii subsp. *witmannii*								+					+													+			+		+					
Erysimum witmannii subsp. *pallidiflorum*													+																		+					
Erysimum witmannii subsp. *transsilvanicum*								+					+																							
Euphorbia carpatica					+			+						+			+																+			
Euphorbia sojakii						+											+																+			
Euphrasia exaristata			+										+																					+		
Euphrasia slovaca subsp. *slovaca*												+		+			+		+																	
Euphrasia stipitata													+																							
Euphrasia tatrae							+					+	+	+			+	+						+												
Ferula sadlerana								+					+		+						+									+						
Festuca amethystina subsp. *orientalis*												+																								
Festuca bucegiensis												+		+																						
Festuca carpatica		+	+				+	+	+			+	+	+						+		+		+		+				+					

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i													
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Festuca gautieri subsp. *lutea*												+	+																						
Festuca nitida subsp. *flaccida*							+					+																							
Festuca pachyphylla							+					+	+																						
Festuca porcii			+									+		+			+										+								
Festuca saxatilis							+	+				+		+														+							
Festuca tatrae							+	+				+	+							+								+		+			+		
Festuca versicolor subsp. *versicolor*							+	+				+	+	+		+				+					+										
Festuca versicolor subsp. *dominii*												+																							
Galium abaujense																															+				
Galium album subsp. *suberectum*							+					+																							
Galium baillonii																															+				
Galium kitaibelianum																															+	+			
Galium transcarpaticum								+																											
Genista tinctoria subsp. *oligosperma*												+		+				+																	
Gentiana cruciata subsp. *phlogifolia*												+	+												+										
Gentiana laciniata												+		+	+			+																	
Gentianella amarella subsp. *reussii*												+		+																					
Gentianella fatrae								+				+	+							+								+		+					
Gentianella lutescens subsp. *tatrae*							+					+		+		+																			
Gypsophila petraea							+					+																							
Helictotrichon decorum								+					+								+							+							
Hepatica transsilvanica								+																						+		+			
Heracleum carpaticum								+				+		+								+													+
Heracleum sphondylium subsp. *transsilvanicum*								+				+		+			+					+		+											+
Hesperis matronalis subsp. *schurii*												+								+															
Hesperis matronalis subsp. *vrabelyiana*																																+			
Hesperis slovaca																	+			+															
Hylotelephium argutum							+	+		+		+	+	+			+	+		+	+			+		+	+	+			+		+	+		+
Jovibarba globifera subsp. *preissiana*							+	+		+		+	+																+						
Jurinea transylvanica													+																						
Knautia kitaibelii subsp. *kitaibelii*			+				+	+				+	+				+												+		+				
Knautia slovaca								+					+																+						
Koeleria macrantha subsp. *transsilvanica*							+					+	+																						
Koeleria tristis													+																+					+	
Lathyrus transsilvanicus													+		+																+		+		
Leontodon kulczynskii												+		+																					
Leucanthemopsis alpina subsp. *tatrae*				+					+					+				+																	
Leucanthemum rotundifolium		+		+	+	+	+			+	+	+	+	+			+	+		+	+	+		+		+	+	+			+		+	+		+
Linum extraaxilare							+	+				+	+	+				+		+											+				
Linum uninerve								+					+																+						
Luzula alpinopilosa subsp. *obscura*		+		+			+	+	+			+		+				+				+		+			+								

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i													
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Melampyrum saxosum					+							+		+	+	+	+		+								+	+		+						
Minuartia oxypetala							+	+				+																								
Minuartia pauciflora							+					+		+																						
Nigritella carpatica								+				+	+			+																				
Noccaea banatica								+																					+							
Noccaea caerulescens subsp. *tatrensis*												+	+		+		+																		
Noccaea dacica subsp. *dacica*							+	+				+		+		+		+																		
Noccaea jankae													+																		+					
Onosma pseudarenaria subsp. *pseudarenaria*													+		+																					
Onosma viridis													+		+																+					
Ophrys holubyana			+										+																		+					
Ornithogalum orthophyllum subsp. *acuminatum*													+																							
Oxytropis campestris subsp. *tatrae*												+																								
Oxytropis carpatica							+	+				+																								
Papaver corona-sancti-stephani							+																													
Papaver tatricum subsp. *tatricum*							+		+			+																								
Papaver tatricum subsp. *fatraemagnae*								+																												
Pedicularis baumgartenii													+																							
Peucedanum rochelianum						+																														
Phyteuma tetramerum																	+																			
Phyteuma vagneri												+	+	+		+		+				+														
Pietrosia laevitomentosa									+																											
Plantago atrata subsp. *carpatica*							+					+		+		+																				
Poa babiogorensis															+																					
Poa carpatica subsp. *carpatica*							+					+	+																							
Poa granitica subsp. *granitica*				+					+					+																						
Poa granitica subsp. *disparilis*		+		+			+	+	+			+		+		+		+				+													
Poa margilicola								+																												
Poa nobilis									+																											
Poa pannonica subsp. *scabra*															+																	+				
Poa rehmannii								+				+																								
Poa sejuncta							+	+				+																								
Prangos carinata													+																							
Primula auricula subsp. *hungarica*							+	+				+	+															+		+						
Primula auricula subsp. *serratifolia*								+					+																							
Primula leucophylla												+				+	+																			
Primula wulfeniana subsp. *baumgarteniana*												+																								
Pulmonaria rubra subsp. *filarszkyana*				+										+				+				+				+									+	
Pulsatilla slavica								+				+	+															+		+						
Pulsatilla subslavica								+					+															+		+						
Pyrola carpatica												+		+				+						+		+			+							

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i												
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Ranunculus altitatrensis				+										+																				
Ranunculus carpaticus														+									+				+			+		+			
Ranunculus flabellifolius																																	+			
Ranunculus malinovskii						+						+																								
Ranunculus pseudomontanus		+		+			+	+	+			+	+	+		+	+			+		+		+			+								+
Rosa coziae																												+								
Salix kitaibeliana				+			+		+			+		+				+				+					+								
Salvia transsylvanica													+																							
Saussurea porcii		+		+		+						+																								
Saxifraga moschata subsp. *dominii*		+										+						+																		
Saxifraga moschata subsp. *kotulae*									+					+																						
Saxifraga mutata subsp. *demissa*							+					+																								
Saxifraga wahlenbergii							+	+	+			+	+	+				+								+										
Scabiosa lucida subsp. *barbata*								+				+		+																						
Scabiosa columbaria subsp. *banatica*													+															+		+						
Scilla kladnii												+												+	+					+	+	+				
Scorzoneroides pseudotaraxaci		+			+		+		+			+		+				+				+													+
Sempervivum carpathicum subsp. *carpathicum*								+	+	+		+		+				+						+												
Sempervivum carpathicum subsp. *heterophyllum*										+																										
Sempervivum matricum								+		+			+																	+						
Senecio dacicus																								+				+								
Senecio ucranicus																								+				+								
Sesleria heuflerana subsp. *heuflerana*								+				+	+									+						+		+						
Sesleria heuflerana subsp. *hungarica*													+																	+						
Sesleria rigida							+	+				+	+							+	+							+								
Sesleria tatrae		+	+				+	+				+		+				+		+					+										
Silene dinarica									+																											
Silene nivalis									+			+		+		+		+																		
Silene nutans subsp. *dubia*							+	+		+	+	+		+		+																				+
Silene zawadzkii							+	+				+																								
Soldanella carpatica		+	+	+			+	+	+			+	+	+		+	+	+		+		+		+		+	+		+		+		+	+		+
Stipa crassiculmis subsp. *heterotricha*													+																							
Stipa danubialis													+																							
Swertia punctata				+				+				+										+														
Symphytum cordatum																+	+							+			+			+		+			+
Syringa josikaea																									+							+				
Tephroseris longifolia subsp. *moravica*													+				+																			
Thalictrum minus subsp. *carpaticum*												+		+																						
Thesium kernerianum							+					+																								
Thymus alternans										+							+																			
Thymus bihoriensis							+	+					+																							

	↑	W_c		W_s			R_c		R_s			G_c		G_s		G_i		D_s		S_c		S_s		S_i												
Taxon	↓		W_c		W_s	W_i		R_c		R_s	R_i		G_c		G_s		G_i		D_s		S_c		S_s		S_i	F_{mc}	F_{ms}	F_{mi}	F_{pc}	F_{ps}	F_{dc}	F_{ds}	F_{di}	H_c	H_s	H_i
Thymus comosus								+		+		+	+		+					+	+				+			+							
Thymus dacicus																	+																		
Thymus pulcherrimus subsp. *pulcherrimus*							+	+	+			+		+		+								+		+									+
Thymus pulcherrimus subsp. *sudeticus*		+					+	+				+	+			+				+	+					+			+		+				
Trifolium orbelicum subsp. *monticolum*							+					+		+		+																			
Trifolium pratense subsp. *kotulae*							+					+	+	+																			+		
Trifolium sarosiense													+		+		+													+	+	+			
Trisetum flavescens subsp. *tatricum*												+	+																						
Trisetum fuscum		+		+					+			+		+								+		+			+								
Trisetum macrotrichum												+	+																						
Tulipa hungarica													+								+														
Valeriana tripteris subsp. *heterophylla*						+											+								+								+		
Viola declinata							+			+		+		+		+	+	+				+						+							
Viola jooi								+					+																						

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Electronic Appendix 7. – Overview of higher syntaxa with the occurrence of vascular plants endemic and subendemic to the Carpathians and classification of phytosociological alliances to habitat groups and habitats. Habitat preferences of individual taxa is shown in Appendix 6.

Abbreviations:

Habitat groups: W – wetlands, R – rocky habitats, G – grasslands, D – dwarf shrubs, S – shrubs, F – forests, H – human-made (anthropogenic) habitats

Vertical distribution:↓ – submontane and montane vegetation, ↑ – subalpine and alpine vegetation

Geological bedrock: c – vegetation on calcareous bedrock, s – vegetation on silicate (non-calcareous) bedrock (incl. effusive rocks, mylonites, schists etc.), i – vegetation indifferent to the substrate

Subdivision of forest habitats: Fm – montane spruce forests, Fp – pine forests, Fd – deciduous and mixed forests

a) wetlands (W)

Scheuchzerio palustris-Caricetea fuscae Tx. 1937
- *Caricetalia davallianae* Br.-Bl. 1949
  - ↓**Wc** *Caricion davallianae* Klika 1934
- *Caricetalia fuscae* Koch 1926
  - ↑**Ws** *Drepanocladion exannulati* Krajina 1933
  - ↓**Ws** *Caricion fuscae* Koch 1926
  - (Syn.: *Caricion canescenti-nigrae* Nordhagen 1936)
  - ↓**Ws** *Caricion lasiocarpae* Vanden Berhen in Lebrun et al. 1949
  - ↓**Ws** *Sphagno-Caricion canescentis* Passarge (1964) 1978
- *Scheuchzerietalia palustris* Nordhagen 1936
  - ↑**Ws** *Sphagnion cuspidati* Krajina 1933

Oxycocco-Sphagnetea Br.-Bl. et Tx. ex Westhoff et al. 1946
- *Sphagnetalia medii* Kästner et Flössner 1933
  - ↑**Ws** *Oxycocco microcarpi-Empetrion hermaphroditi* Nordhagen ex Hadač et Váňa 1967
  - ↓**Ws** *Sphagnion medii* Kästner et Flössner 1933
  - (Syn.: *Sphagnion fusci* Br.-Bl. 1926)

Montio-Cardaminetea Br.-Bl. et Tx. ex Klika et Hadač 1944
- *Montio-Cardaminetalia* Pawłowski in Pawłowski et al. 1928
  - ↑**Ws** *Cardamino-Montion* Br.-Bl. 1926
  - ↑**Ws** *Cratoneuro filicini-Calthion laetae* Hadač 1983
  - ↑**Wc** *Cratoneurion commutati* Koch 1928
  - ↓**Wc** *Lycopodo europaei-Cratoneurion commutati* Hadač 1983
- *Cardamino-Chrysosplenietalia* Hinterlang 1992
  - ↓**Wi** *Caricion remotae* Kästner 1941

Phragmito-Magnocaricetea Klika in Klika et Novák 1941
- *Phragmitetalia* Koch 1926
  - ↓**Wi** *Magnocaricion elatae* Koch 1926

b) rocky habitats (R)

Asplenietea trichomanis (Br.-Bl. in Meier et Br.-Bl. 1934) Oberd. 1977
- *Potentilletalia caulescentis* Br.-Bl. in Br.-Bl. et Jenny 1926
  - ↑**Rc** *Potentillion caulescentis* Br.-Bl. in Br.-Bl. et Jenny 1926
  - ↑**Rc** *Gypsophilion petraeae* Borhidi et Pócs in Borhidi 1957
  - ↓**Rc** *Cystopteridion* Richard 197
  - (Syn.: *Moehringion muscosae* Horvat & Horvatić 1962 p. p.)
  - ↓**Rc** *Micromerion pulegii* Boșcaiu (1971) 1979
  - (Syn.: *Micromerion banaticum* Boșcaiu 1971; *Moehringion muscosae* Horvat & Horvatić 1962 p. p.)
- ↓*Tortulo-Cymbalarietalia* Segal 1969
  - ↓**Rc** *Cymbalario-Asplenion* Segal 1969
- *Androsacetalia vandelii* Br.-Bl. 1934
  - ↑**Rs** *Silenion lerchenfeldianae* Simon 1958
  - ↓**Rs** *Asplenion septentrionalis* Gams in Oberd. 1938
  - (Syn.: *Androsacion vandelii* sensu Coldea 1991)
  - ↓**Rs** *Hypno-Polypodion vulgaris* Mucina 1993

  - ↓**Rc** *Erysimo witmannii-Hackelion deflexae* Bernátová 1986
  - (Note: The alliance is ordered within the *Artemisietea vulgaris* class, but it includes natural relic communities)

Thlaspietea rotundifolii Br.-Bl. 1948
- *Thlaspietalia rotundifolii* Br.-Bl. in Br.-Bl. et Jenny 1926
  - ↑**Rc** *Papaverion tatrici* Pawłowski et al. 1928 corr. Valachovič 1995

↑**Rc** *Papavero-Thymion pulcherrimi* Pop 1968
Androsacetalia alpinae Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Rs** *Androsacion alpinae* Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Rs** *Veronicion baumgartenii* Coldea 1991
(Syn.: *Androsacion alpinae* auct. roman.)
Galio-Parietalia officinalis Boşcaiu et al. 1966
↓**Rc** *Stipion [Achnatherion] calamagrostis* Jenny-Lips ex Br.-Bl. et al. 1952
(Syntax. syn.: *Teucrion montani* Csűrös et Pop 1965)
↓**Rc** *Arabidion alpinae* Béguin 1972
↓**Rc** *Parietarion officinalis* Gergely et al. 1966
Epilobietalia fleischerii Moor 1958
↓**Ri** *Epilobion fleischerii* G. Br.-Bl. ex Br.-Bl. 1949
(Syn.: *Salicion incanae* Aichinger 1933)

Sedo-Scleranthetea Br.-Bl. 1955
Sedo-Scleranthetalia Br.-Bl. 1955
↓**Rs** *Sedo-Scleranthion biennis* Br.-Bl. 1955
↓**Rs** *Arabidopsidion thalianae* Passarge 1964
↓**Rs** *Hyperico perforati-Scleranthion perennis* Moravec 1967
Alysso-Sedetalia Moravec 1967
↓**Rc** *Alysso alyssoidis-Sedion albi* Oberd. et Th. Müller in Th. Müller 1961

c) graslands (G)
Festuco-Brometea Br.-Bl. et Tx. ex Soó 1947
Stipo pulcherrimae-Festucetalia pallentis Pop 1968
↓**Gs** *Asplenio septentrionalis-Festucion pallentis* Zólyomi 1936 corr. Soó 1957
↓**Gc** *Bromo pannonici-Festucion pallentis* Zólyomi 1966
(Syn. *Seslerio-Festucion pallentis* Klika 1931 corr. Zólyomi 1966; Syntax. syn.: *Thymo comosi-Festucion rupicolae* Pop 1968)
↓**Gc** *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993
↓**Gc** *Chrysopogono-Festucion pseudodalmaticae* Coldea et Sârbu in Coldea 2012
↓**Gc** *Pimpinello-Thymion zygoidi* Dihoru et Doniţa 1970
Festucetalia valesiacae Soó 1947
↓**Gc** *Festucion valesiacae* Klika 1931
(Syntax. syn.: *Festucion rupicolae* Soó 1940 corr. 1964)
↓**Gc** *Stipion lessingianae* Soó 1947
↓**Gc** *Jurineo arachnoideae-Euphorbion stepposae* (Dobrescu 1970) Coldea et Sârbu in Coldea 2012
Brometalia erecti Br.-Bl. 1936
↓**Gc** *Bromion erecti* Koch 1926
↓**Gc** *Cirsio-Brachypodion pinnati* Hadač et Klika ex Klika 1951
(Syn.: *Danthonio-Stipion stenophyllae* Soó 1947; Syntax. syn.: *Danthonio-Brachypodion pinnati* Boşcaiu 1970)
↓**Gs** *Chrysopogono-Danthonion calycinae* Kojić 1959

Festucetea vaginatae Soó ex Vicherek 1972
Festucetalia vaginatae Soó 1957
↓**Gi** *Festucion vaginatae* Soó 1929
↓**Gc** *Bassio laniflorae-Bromion tectorum* (Soó 1957) Borhidi 1996

Koelerio-Corynephoretea Klika in Klika et Novák 1941
Corynephoretalia canescentis Klika 1934
↓**Gs** *Corynephorion canescentis* Klika 1931

Trifolio-Geranietea sanguinei Th. Müller 1962
Origanetalia vulgaris Th. Müller 1962
↓**Gi** *Geranion sanguinei* Tx. in Th. Müller 1962
↓**Gi** *Trifolion medii* Th. Müller 1962

Molinio-Arrhenatheretea Tx. 1937
Arrhenatheretalia elatioris Tx. 1931
↓**Gi** *Arrhenatherion elatioris* Luquet 1926
↓**Gi** *Cynosurion cristati* Tx. 1947
Poo alpinae-Trisetetalia Ellmauer et Mucina 1993
↓**Gc** *Polygono bistortae-Trisetion flavescentis* Br.-Bl. et Tx. ex Marshall 1947
↑**Gi** *Poion alpinae* Gams ex Oberd. 1950
Molinietalia caerulae Koch 1926
↓**Gi** *Molinion caerulae* Koch 1926
↓**Gi** *Calthion palustris* Tx. 1937 (incl. *Filipendulenion*)
↓**Gi** *Deschampsion caespitosae* Horvatić 1930

Nardetea strictae Rivas Goday in Rivas Goday et Rivas-Mart. 1963
Nardetalia strictae Oberd. ex Preising 1949
↑**Gs** *Nardion strictae* Br.-Bl. 1926
↑**Gs** *Potentillo ternatae-Nardion* Simon 1958
↓**Gi** *Nardo-Agrostion tenuis* Sillinger 1933
↓**Gi** *Violion caninae* Schwickerath 1944

Mulgedio-Aconitetea Hadač et Klika in Klika et Hadač 1944
(Syn. *Betulo-Adenostyletea* Br.-Bl. 1948)
Calamagrostietalia villosae Pawłowski et al. 1928
↑**Gs** *Calamagrostion villosae* Pawłowski et al. 1928
excl. *Calamagrostio villosae-Salicetum helveticae* Dúbravcová et Šeffer 1992 → ↑Ss
excl. *Triseto fusci-Salicetum hastatae* Coldea (1986) 1990 → ↑Ss
↑**Gs** *Trisetion fusci* Krajina 1933
(Syntax. syn.: *Aconition firmi* Krajina 1933)
excl. *Deschampsio cespitosae-Salicetum helveticae* (Krajina 1933) Dúbravcová et Šeffer 1992 → ↑Ss
Gc *Calamagrostion arundinaceae* (Luquet 1926) Oberd. 1957
↑*Helianthemo grandiflorae-Calamagrostietum arundinaceae*
↑*Anemono narcissiflorae-Laserpitietum latifolii*
↑*Allio victorialis-Calamagrostietum villosae*
↓other associations of alliance *Calamagrostion arundinaceae*
(see Kliment & Valachovič 2007 for details)
Gc *Calamagrostion variae* Sillinger 1932
↑*Geranio sylvatici-Calamagrostietum variae*
↓*Convallario-Calamagrostietum variae*
↑**Gc** *Festucion carpaticae* Bělohlávková et Fišerová 1989
Adenostyletalia alliariae Br.-Bl. 1930
Adenostylion alliariae Br.-Bl. 1926
excl. *Salici silesiacae-Alnetum viridis* Colić et al. 1962 → ↑Si (*Alnion viridis*)
excl. *Pulmonario filarszkyanae-Alnetum viridis* Pawłowski et Walas 1949 → ↑Ss (*Alnion viridis*)
↑**Gs** *Adenostylenion alliariae* Klika in Klika et Hadač 1944
↑**Gc** *Delphinienion elati* (Hadač ex Hadač et al. 1969) Boşcaiu et Mihăilescu 1997
Petasito-Chaerophylletalia Morariu ex Kopecký 1969
↓**Gi** *Petasition officinalis* Sillinger 1933

Elyno-Seslerietea Br.-Bl. 1948
Seslerietalia coerulae Br.-Bl. in Br.-Bl. et Jenny 1926
Gc *Astero alpini-Seslerion calcariae* Hadač ex Hadač et al. 1969
↑*Astero alpini-Seslerienion calcariae* Kliment et al. 2005
↓*Pulsatillo slavicae-Caricenion humilis* Uhlířová in Kliment et al. 2010
↑**Gc** *Seslerion tatrae* Pawłowski 1935 corr. Klika 1955
↑**Gc** *Caricion firmae* Gams 1936
↑**Gc** *Festuco saxatilis-Seslerion bielzii* (Pawłowski et Walas 1949) Coldea 1984
↑**Gc** *Bellardiochloion violaceae* Sanda et al. 2001
↓**Gc** *Seslerion rigidae* Zólyomi 1939

Carici rupestris-Kobresietea bellardii Ohba 1974
Oxytropido-Elynetalia Oberd. ex Albrecht 1969
↑**Gc** *Oxytropido-Elynion myosuroidis* Br.-Bl. (1948) 1949
↑**Gs** *Festucion versicoloris* Krajina 1933

Caricetea curvulae Br.-Bl. 1948 nom. cons. propos.
(Syntax. syn.: *Juncetea trifidi* Hadač in Klika et Hadač 1944 p. p.)
Caricetalia curvulae Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Gs** *Juncion trifidi* Krajina 1933
↑**Gs** *Caricion curvulae* Br.-Bl. 1925

Salicetea herbaceae Br.-Bl. in Br.-Bl. et Jenny 1926
Salicetalia herbaceae Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Gs** *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Gs** *Festucion picturatae* Krajina 1933 corr. Dúbravcová 2007
Arabidetalia caerulae Br.-Bl. 1948
↑**Gc** *Arabidion caerulae* Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Gc** *Salicion retusae* Horvat 1949

d) dwarf shrubs (D)
Loiseleurio procumbentis-Vaccinietea Eggler ex Schubert 1960
Rhododendro ferruginei-Vaccinietalia Br.-Bl. in Br.-Bl. et Jenny 1926
↑**Ds** *Loiseleurio procumbentis-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926

(syn.: *Cetrario-Loiseleurion* (Br.-Bl. et al. 1939) Schubert 1960)
↑**Ds** *Vaccinion myrtilli* Krajina 1933
↑**Ds** *Rhododendro-Vaccinion* Br.-Bl. ex Schnyder 1930
↑**Ds** *Junipero-Bruckenthalion spiculifoliae* (Horvat 1949) Boşcaiu 1971
↑**Ds** *Juniperion nanae* Br.-Bl. in Br.-Bl. et al. 1939

Calluno-Ulicetea Br.-Bl. et Tx. ex Klika et Hadač 1944
Vaccinio myrtilli-Genistetalia pilosae Schubert ex Passarge 1964
↓**Ds** *Genisto pilosae-Vaccinion* Br.-Bl. 1926

e) scrubs (S)
Crataego-Prunetea Tx. 1956
(Syn.: *Rhamno-Prunetea* Rivas Goday et Borja Carbonell ex Tx. 1962)
Prunetalia spinosae Tx. 1952
↓**Si** *Prunion fruticosae* Tx. 1952
↓**Si** *Berberidion vulgaris* Br.-Bl. 1950
(Syn.: *Prunion spinosae* Soó 1931)
↓**Si** *Corylo avellanae-Populion tremulae* Br.-Bl. ex Jurko 1964

Betulo carpaticae-Alnetea viridis Rejmánek in Huml et al. 1979
Alnetalia viridis Rübel ex Huml et al. 1979
↑**Si** *Alnion viridis* Schnyder 1930
Salici silesiacae-Alnetum viridis Colić et al. 1962
Pulmonario filarszkyanae-Alnetum viridis Pawłowski et Walas 1949
↑**Sc** *Salicion silesiacae* Rejmánek et al. 1971
Note: The following associations belong to subalpine shrubs, too:
↑**Ss** *Calamagrostio villosae-Salicetum helveticae* Dúbravcová et Šeffer 1992
↑**Ss** *Deschampsio cespitosae-Salicetum helveticae* (Krajina 1933) Dúbravcová et Šeffer 1992
↑**Ss** *Triseto fusci-Salicetum hastatae* Coldea (1986) 1990

Roso pendulinae-Pinetea mugo Theurillat in Theurillat et al. 1995
Junipero-Pinetalia mugo Boşcaiu 1971
↑**Si** *Pinion mugo* Pawłowski in Pawłowski et al. 1928
(RO: only the association *Rhododendro myrtifolii-Pinetum mugo* Coldea 1991)
excl.: *Campanulo abietinae-Juniperetum nanae* → ↑Ds, *Campanulo abietinae-Vaccinietum myrtilli* → ↑Ds, *Rhododendro myrtifolii-Vaccinietum gaultherioidis* → ↑Ds
excl.: *Rhododendro myrtifolii-Piceetum* → Fms, *Bruckenthalio-Piceetum* → Fms
excl. *Saxifrago cuneifoliae-Laricetum* → Fmi

f) forests (F)
Quercetea pubescentis Doing Kraft ex Scamoni et Passarge 1959
Quercetalia pubescenti-petraeae Klika 1933
↓**Fdc** *Quercion pubescenti-petraeae* Br.-Bl. 1932
↓**Fdi** *Aceri tatarici-Quercion* Zólyomi et Jakucs 1957
↓**Fds** *Quercion petraeae* Issler 1931
↓**Fdi** *Quercion confertae-cerris* Horvat 1954
↓**Fdc** *Syringo-Carpinion orientalis* Jakucs (1959) 1960
↓**Fdi** *Querco-Carpinion orientalis* Csűrös et al. 1968

Quercetea robori-petraeae Br.-Bl. et Tx. ex Oberd. 1957
↓**Fds** *Quercetalia roboris* Tx. 1931
↓**Fds** *Pino-Quercion* Medwecka-Kornaś et al. 1959

Alnetea glutinosae Br.-Bl. et Tx. ex Westhoff et al. 1946
Alnetalia glutinosae Tx. 1937
↓**Fdi** *Alnion glutinosae* Malcuit 1929

Carpino-Fagetea sylvaticae Jakucs ex Passarge 1968
(Syn.: *Querco-Fagetea* Br.-Bl. et Vlieger in Vlieger 1937 p. p.)
Fagetalia sylvaticae Pawłowski in Pawłowski et al. 1928
↓**Fdi** *Alnion incanae* Pawłowski in Pawłowski et al. 1928
(Syn.: *Alno-Ulmion* Br.-Bl. et Tx. ex Tschou 1948)
Alnenion glutinoso-incanae Oberd. 1953
excl. *Arunco vulgaris-Salicetum capreae* Hadač et al. ex Petrášová et Jarolímek 2014 → ↓Sc, ↓Ss
↓**Fdi** *Carpinion betuli* Issler 1931
↓**Fdi** *Lathyro hallersteinii-Carpinenion* (Boşcaiu 1974) Boşcaiu et al. 1982
(Syn.: *Lathyro hallersteinii-Carpinion* Boşcaiu 1974)
↓*Fagion sylvaticae* Luquet 1926
Fdc *Cephalanthero-Fagenion* Tx. in Tx. et Oberd. 1958

Fdi *Eu-Fagenion* Oberd. 1957
Fdi *Acerenion* Oberd. 1957
Fdi *Galio-Abietenion* Oberd. 1962
↓**Fdi** *Symphyto cordati-Fagion* (Vida 1963) Täuber 1982
Fdi *Symphyto cordati-Fagenion* Vida 1963
Fdc *Moehringio muscosae-Acerenion* Boşcaiu et al. 1982
Fdc *Epipactido-Fagenion* Boşcaiu et al. 1982
Fds *Calamagrostio-Fagenion* Boşcaiu et al. 1982
↓**Fds** *Luzulo-Fagion sylvaticae* Lohmeyer et Tx. in Tx. 1954
↓**Fdi** *Tilio platyphylli-Acerion* Klika 1955

Erico-Pinetea Horvat 1959
Erico-Pinetalia Horvat 1959
↓**Fpc** *Pulsatillo slavicae-Pinion* Fajmonová 1978
↓**Fpc** *Seslerio rigidae-Pinion* Coldea 1991

Piceetea excelsae Klika 1948
(Syn.: *Vaccinio-Piceetea* Br.-Bl. in Br.-Bl. et al. 1939)
Piceetalia excelsae Pawłowski in Pawłowski et al. 1928
↓**Fms** *Piceion excelsae* Pawłowski in Pawłowski et al. 1928
(Syntax. syn.: *Athyrio alpestris-Piceion* Sýkora 1971)
incl.: *Chrysanthemo rotundifolii-Piceetum* Krajina 1933 (sensu orig.), *Hieracio rotundati-Piceetum* Pawłowski et Br.-Bl. 1939
Athyrio filicis-feminae-Piceetalia Hadač ex Hadač et al. 1969
↓**Fmc** *Oxalido-Piceion* Hadač et al. 1969
(see Kučera 2012 for details)
Vaccinio-Pinetalia Scamoni et Passarge 1959
↓**Fps** *Dicrano-Pinion sylvestris* (Libbert 1932) Matuszkiewicz 1962
(Syn.: *Vaccinio-Pinion* (Libbert 1933) Passarge 1968)

Robinietea Jurko ex Hadač et Sofron 1980
↓**Fdi** *Chelidonio-Robinietalia* Jurko ex Hadač et Sofron 1980
Robinietum pseudacaciae auct.

h) human-made habitats: anthropogenic vegetation (H)
Epilobietea angustifolii Tx. et Preising ex von Rochow 1951
Atropetalia Vlieger 1937
↓**Hi** *Carici piluliferae-Epilobion angustifolii* Tx. 1950
↓**Hi** *Atropion* Br.-Bl. ex Aichinger 1933

Galio-Urticetea Passarge ex Kopecký 1969
Lamio albi-Chenopodietalia boni-henrici Kopecký 1969
↓**Hi** *Impatienti noli-tangere-Stachyion sylvaticae* Görs ex Mucina in Mucina et al. 1993
↓**Hi** *Carduo-Urticion dioicae* Hadač ex Hadač et al. 1969
↓**Hi** *Rumicion alpini* Scharfetter 1938

Artemisietea vulgaris Lohmeyer et al. ex von Rochow 1951
Agropyretalia repentis Görs 1966
↓**Hi** *Convolvulo arvensis-Agropyrion repentis* Görs 1966