

Erich Hübl

## Caucasus and Alps a floristical comparison

### Abstract

Hübl, E.: Caucasus and Alps a floristical comparison. — *Bocconea* 29: 121-156. 2021 — ISSN: 1120-4060 printed, 2280-3882 online.

Caucasus and Alps are the highest mountains which pass through Western Eurasia. In this area they are the only mountains with glaciers. Both mountain ranges were glaciated in the glacial period. Glaciers are still existing. Around the Alps on places of former glaciers lakes often determine the aspect of the landscape. The glaciers of the Caucasus did not reach the foreland. Therefore, there are no lakes. The role of conifers is minor in Caucasus. The subalpine zone, which is often specified by *Pinus mugo* in the Eastern Alps, is more or less specified by *Betula* in the Caucasus. But there are also many floristic differences, which are not so evident. The article shows some differences by comparison of the two families *Ericaceae* and *Caryophyllaceae*.

*Key words:* Caucasus, Alps, floristical, comparison, *Ericaceae*, *Caryophyllaceae*

### Introduction

The vegetation of Caucasus and Alps was compared by different authors, for instance Ozenda (1988) and Nakhutsrishvili (2013). This article tries to compare two plant families, which play an important role in both mountain ranges.

Caucasus and Alps are the highest mountains which pass through Western Eurasia (Fig. 1). In this area they are the only mountains with glaciers. The Great Caucasus runs from NW to SE. It is situated between the Black Sea in the W and the Caspian Sea in the E (about 38°35'N and between 36°37' and 50°22'E). The Great Caucasus is situated about between 39° and 50° Eastern length. The Caucasus can be subdivided into the plain in the North, the Great Caucasus, the Transcaucasian Depression, the Small Caucasus and the Talish Mountains. In the Great Caucasus there are the highest and glaciated mountains (Elbrus 5650 m, Kazbek 5633 m). The highest mountain in the Alps is Mount Blanc (4810 m). The Alps run from the Mediterranean Sea in the SW to the Western border of the Hungarian Plain in NE. The Alps extend from SW to East about 5° and 15° Eastern length and about 43° and 48° Northern latitude. In the SW and the S and also at the Eastern border they are influenced by the Mediterranean climate.

Both mountain ranges were glaciated in the glacial period. Glaciers are still existing. Around the Alps on places of former glaciers lakes often determine the aspect of the landscape. The glaciers of the Caucasus did not reach the foreland. Therefore, there are no lakes. Vegetation and flora are similar in both mountain ranges, but some differences are evident. The role of conifers is minor in Caucasus. The subalpine zone, which is often specified by *Pinus mugo* in the Eastern Alps, is more or less specified by *Betula* in the Caucasus. But there are also many floristic differences, which are not so evident. I try to show some differences by comparison of the two families *Ericaceae* and *Caryophyllaceae*.

In Caucasus, among the *Ericaceae*, *Rhododendron* is more developed than in the Alps. In the Alps *Rhododendron* is only subalpine spread, which corresponds to *Rhododendron caucasicum* in the Caucasus. The other *Rhododendron* species of the Caucasus grow in the underwood of forests from hill up to subalpine zone. *Rhodothamnus chamaecistus* is an endemic plant of the Eastern Alps.

Of the genus *Erica* only the Mediterranean species *Erica arborea* grows at the coast near Caucasus. Of the four species growing in the Alps, *Erica carnea* is the most important, because it is growing in the most parts of the Alps and determines the aspect of pine forests on limestone.

A near relative of the alpine *Arctostaphylos uva-ursi* is growing in the Caucasus (*Arctostaphylos caucasica*).

In the genus *Vaccinium* the Caucasian *Vaccinium arctostaphylos* differs from the other species, because it grows up to 6 m maximum.

*Calluna vulgaris* often determines the aspect on acid soil in the Alps, but is missing in the Caucasus.

The *Caryophyllaceae* are an extensive family with many common genera. There are many common *Stellaria* species. Among the genus *Stellaria* there are also forest species. For instance *Stellaria holostea* and *Stellaria nemorum* are growing in forest of both mountain ranges.

Among the extensive genus *Cerastium* there are many species common to both mountain ranges. The snowbed species *Cerastium cerastoides* is interesting, because it is an arctic alpine plant, which also grows in the Caucasus. The arctic alpine plants are rare in the Caucasus.

In the genus *Sagina*, *Sagina saginoides* is an alpine arctic plant, which grows in Caucasus and Alps.

In the genus *Minuartia*, some species reach subalpine or alpine zone in both mountain ranges, one of these is *Minuartia verna* (in the Alps subsp. *verna*).

Among the genus *Arenaria*, different species reach the alpine zone in Caucasus as well as in the Alps.

In the genus *Moehringia* there are many species in the Alps, but only one in Caucasus and Alps (*Moehringia trinervia* in shady forests).

*Silene* is a very extensive genus, with many species in the Caucasus and in the Alps, which reach the alpine zone in both mountain ranges, for instance *Silene suecica* in the Alps and *S. alpicola* in Caucasus.

The genus *Gypsophila* is mainly developed in Caucasus.

*Dianthus* is an important genus for both mountain ranges. There are only two species common to both mountain ranges (*Dianthus armeria* and *D. barbatus*).

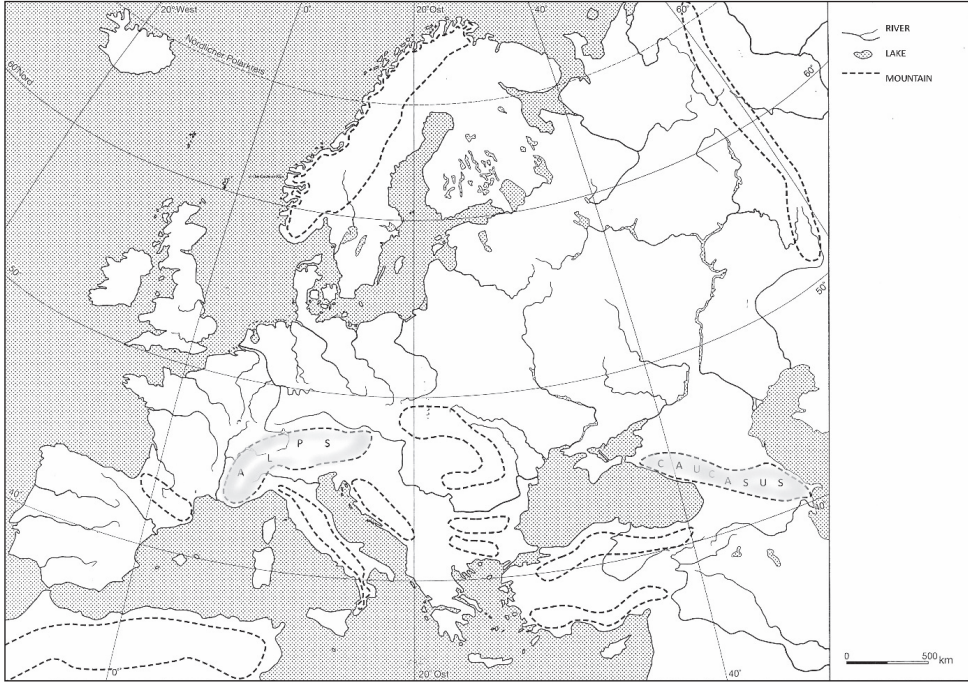


Fig. 1. Map of Europe with Alps and Caucasus.

## Materials and Methods

The information of the flora of both mountain ranges is collected from Gagnidze (2005), Sernov (2006), Pils (2006), Holubec & Krivka (2006), Gabrielian & Fragman-Sapir (2008), Solomon & al. (2014), Aeschiman & al. (2004). The information about genera is taken from Mabberley (2008).

In order to be able to compare the habitats Pils (2006) is quoted, because the list of the Caucasian plants is not complete. The “Vascular Plants of Georgia” (Gagnidze 2005) contain only the names of the plants, but no further informations. In contrast to the list of the plants in the Alps is more or less complete by using “Flora alpina” (Aeschiman & al. 2004). In the taxonomic review, for each genus, the overall number of specific and subspecific taxa is reported.

### Taxonomic review

#### ERICACEAE

ERICACEAE JUSS. (incl. *Empetraceae*, *Epicridaceae*, *Monotropaceae*, *Pyrolaceae*) – Ericales 117/2850: Cosmop. exc. deserts, usually montane in tropics.

***Rhododendron*** L. (incl. *Ledum*): ca. 1100 temp. N hemisph. (Eur. 7, China 650 esp. Himalaya; SE As. + Mal. mts (155 endemic in NG), Aus (2)

| In the Caucasus only   | In the Alps only   | In the Alps and Caucasus   |
|--|--|--|
| <p><b><i>Rhododendron smirnowii</i></b><br/>Trautv. ex Regel<br/>Cauc.: open forests on hills and mountains to 1200 m</p>  | <p><b><i>Rhododendron tomentosum</i></b><br/>Harmaja (= <i>Ledum palustre</i> L.) (eastern part of E Alps only introduced; extinct)</p>          | <p><b><i>Rhododendron luteum</i></b> Sweet.<br/>(<i>Luzulo-Fagion</i>; hill in SE Alps in question if it is indigenous; Cauc./E-Eur.)<br/>Cauc.: in the underwood of deciduous forests; up to the alpine zone (Pils: 400-2000 m, forest mountain pastures N)</p> |
| <p><b><i>Rhododendron ungerii</i></b><br/>Trautv.<br/>Cauc.: open deciduous forests from hills to subalpine zone, 700-1700 m</p>   | <p><b><i>Rhododendron ferrugineum</i></b> L. (<i>Piceion excelsae</i>; subalpine, alpine; acidophile Alps S-Eur.-Mont.)</p>                      |  |
| <p><b><i>Rhododendron ponticum</i></b> L.<br/>Cauc.: in the underwood of deciduous forests; from lowland to subalpine zone, up to 2000 m<br/>(Pils: (Rh. <i>ponticum</i> subsp. <i>ponticum</i>) &lt;1800 m, humid forests; N)</p> | <p><b><i>Rhododendron hirsutum</i></b> L.<br/>(<i>Rhododendro hirsuti-Pinenion mugo</i>; subalpine; calciphile; central and E-Alps; E.-Alp.)</p> |  |
| <p><b><i>Rhododendron caucasicum</i></b><br/>Pall. Cauc.: in subalpine meadows; from open forests around treeline to upper alpine zone, 1600-3000 m<br/>(Pils: 2000-3000 m, acid tundra; NE)</p>                                   |  |  |

**Rhodothamnus** Reichb.: only 2 (1 in the Alps, 1 in NE Turkey)

| In the Caucasus only | In the Alps only  | In the Alps and Caucasus |
|----------------------|---|--------------------------|
|                      | <p><b>Rhodothamnus chamaecistus</b> (L.) Rchb.<br/>(<i>Ericion carneae</i>; subalpine, alpine; E Alps E-Alps) (endemic)</p> |                          |

**Loiseleuria** Desv. = *Kalmia* L. (incl. *Leiophyllum*, *Loiseleuria*)

**Kalmia** L. (incl. *Leiophyllum*, *Loiseleuria*, 1 circumpolar (*K. procumbens* L.): 10 N America (2 natur. Europe), Cuba

| In the Caucasus only | In the Alps only  | In the Alps and Caucasus |
|----------------------|---|--------------------------|
|                      | <p><b>Kalmia (Loiseleuria) procumbens</b> (L.) Desv.<br/>(<i>Loiseleurio-Vaccinion</i>, subalpine, alpine; Alps; Eurosib./N-Am)</p> |                          |

**Erica** L.: 860 (South Africa 770, SW Cape 658 [635 endemic]; Madagascar; Mediterran, Macaronesia)

| In the Caucasus only | In the Alps only   | In the Alps and Caucasus   |
|----------------------|--|--|
|                      | <p><b>Erica cinerea</b> L.<br/>(<i>Calluno-Ulicetea</i>; hill, mountain; SW Alps W-Eur./Medit.)</p>                                      | <p><b>Erica arborea</b> L. (<i>Ericion arboreae</i>; hill; S/SW-Alps Medit.)<br/>Cauc.: near coast in Caucasus (Pils: &lt;900 m; maquis in Turkey; not SS)</p> |
|                      | <p><b>Erica carnea</b> L.<br/>(<i>Erico-Pinetalia</i>, mountain, subalpine; most parts of the Alps except parts of SW; S-Eur.-Mont.)</p> |  |
|                      | <p><b>Erica scoparia</b> L.<br/>(<i>Cisto-Lavanduletea</i>; hill; SW only; Medit.)</p>   |  |
|                      | <p><b>Erica tetralix</b> L.<br/>(<i>Oxycocco-Sphagnetes</i>; mountain; Central Alps; W.-Eur.)</p>  |  |

*Epigaea* L.: 3 (Asia)

| In the Caucasus only  | In the Alps only | In the Alps and Caucasus |
|---|------------------|--------------------------|
| <i>Epigaea gaultherioides</i><br>(Boiss.) Takht.;<br>Caucasus and Eastern Asia<br>Minor |                  |                          |

*Arbutus* L.: 10 in Western North America; 2 in W Eur. to Medit.

| In the Caucasus only   | In the Alps only   | In the Alps and Caucasus |
|--|--|--------------------------|
| <i>Arbutus andrachne</i> L.<br>Near the coast in Caucasus<br>(Pils: < 800 m, maquis,<br>forests) | <i>Arbutus unedo</i> L.<br>( <i>Pistacio lentisci-Rhamnetea</i><br><i>alaterni</i> ; hill most south<br>western parts only; Medit.)<br>(Pils: <300 m; maquis in<br>Turkey) |                          |

*Arctostaphylos* Adans.: about 60 in Western N-Am.; 2 circumpolar; 2 in Eur.

| In the Caucasus only  | In the Alps only  | In the Alps and Caucasus |
|---|---|--------------------------|
| <i>Arctostaphylos caucasica</i><br>( <i>Kvaratzchelia</i> ) Lipsch. ( <i>A.</i><br><i>uva-ursi</i> (L.) Spreng. subsp.<br><i>caucasica</i> )<br>Cauc.: in subalpine shrub | <i>Arctostaphylos uva-ursi</i> (L.)<br>Spreng.<br>( <i>Juniperion nanae</i> ; moun-<br>tain, subalpine, alpine, Alps;<br>Eurosib./N-Am.)                      |                          |
|   | <i>Arctostaphylos alpina</i> (L.)<br>Spreng.<br>( <i>Loiseleurio-Vaccinion</i> sub-<br>alpine, alpine; Alps except<br>most south western parts<br>Arct.-Alp.) |                          |

*Vaccinium* L.: about 140; 4 circumpolar + N temp. (Eur. 8, Japan 22, N-Am. 65) + Central and Southeastern African mountains + Madagascar 6, trop. Am. 30 heterogeneous?

| In the Caucasus only   | In the Alps only   | In the Alps and Caucasus  |
|--|--|---|
| <i>Vaccinium arctostaphylos</i> L.<br>In deciduous forests and in<br>Cauc. subalpine shrub<br>(Pils: <1830 m, humid forests;<br>N) | <i>Vaccinium oxycoccos</i> L.<br>( <i>Sphagnion medii</i> ; hill,<br>mountain; absent in SW<br>Alps; Eurosib/N-Am.)  | <i>Vaccinium vitis idea</i> L. ( <i>Vaccinio-<br/>Piceetea-excelsae</i> ; mountain, subalpi-<br>ne, alpine, Alps; Eurosib./N-Am.)<br>Cauc.: subalpine scrub<br>(Pils: subalpine scrub; NE r)                              |
|  | <i>Vaccinium microcarpum</i><br>(Rupr.) Schmalh.<br>( <i>Oxycocco-Empetrion-her-<br/>maphroditi</i> ; mountain, sub-<br>alpine; absent in south<br>western parts of the Alps;<br>Eurosib./N-Am.) | <i>Vaccinium myrtillus</i> L.<br>(Pils: 1280-2700 m, acid scrub N)<br>( <i>Vaccinio-Piceetea excelsae</i> ; mountain,<br>subalpine, alpine, Alps; Eurosib.)<br>Cauc.: subalpine scrub<br>Pils: 1280-2700 m, acid scrub; N |
|  | <i>Vaccinium gaultherioides</i><br>Bigelow ( <i>Loiseleurio-<br/>Vaccinietae</i> ; subalpine, alpi-<br>ne; Alps; Arct.-Alp.)   | <i>Vaccinium uliginosum</i> L. ( <i>Oxycocco-<br/>Sphagnetetae</i> ; hill, mountain; Alps<br>Eurosib./N-Am.) (Pils: 1200-3000 m;<br>damp acid tundra, NW, NE)   |

*Andromeda* L.: 1-2 N temp. (Eur. 1)

| In the Caucasus only | In the Alps only   | In the Alps and Caucasus |
|----------------------|--|--------------------------|
|                      | <i>Andromeda polifolia</i> L.<br>( <i>Oxycocco-Sphagnetetae</i> ;<br>mountain, subalpine; absent<br>in south western Alps;<br>Eurosib/N-Am.) |                          |

*Calluna* Salisb.: 1 Eur. and Asia Minor, natur. in N-Am.

| In the Caucasus only | In the Alps only   | In the Alps and Caucasus |
|----------------------|--|--------------------------|
|                      | <i>Calluna vulgaris</i> (L.) Hull<br>( <i>Juniperion nanae</i> ; moun-<br>tain, subalpine, alpine; Alps<br>(Pils: 100-1000 m; acid<br>scrub; NW, NE) |                          |

**Empetrum** L.: 2 N temp. (Eur. 1 + Arctic; S-Andes, Falkland Is., Tristan da Cunha Is.)

| In the Caucasus only | In the Alps only  | In the Alps and Caucasus |
|----------------------|---|--------------------------|
|                      | <b>Empetrum nigrum</b> subsp. <b>nigrum</b> L.<br>( <i>Ocycocco-Sphagnetea</i> ;<br>mountain, subalpine; NE<br>Alps mostly; Eurosib.)   |                          |
|                      | <b>Empetrum nigrum</b> subsp. <b>hermaphroditum</b> (Hagerup)<br>Böcher<br>( <i>Rhododendro-Vaccinietalia</i> ;<br>subalpine, alpine; Alps;<br>absent most north eastern<br>part; Eurosib./N-Am.) |                          |

**Pyrola** L.: 35 North hemisph. (Eur. 7 to Sumatra, temp. S-America)

| In the Caucasus only | In the Alps only | In the Alps and Caucasus   |
|----------------------|------------------|--|
|                      |                  | <b>Pyrola minor</b> L.<br>( <i>Piceion- excelsae</i> ; subalpine; Alps;<br>Eurosib./N-Am.)<br>Cauc.: in shady forests and subalpine<br>coppices<br>(Pils: 1650-2300 m; forests, NW, NN<br>scat.)               |
|                      |                  | <b>Pyrola media</b> Sw.<br>( <i>Piceion excelsae</i> ; subalpine; Alps<br>absent in south western part, Eurosib.)<br>Cauc.: in shady forests and subalpine<br>coppices   |
|                      |                  | <b>Pyrola chlorantha</b> Sw.<br>( <i>Erico-Pinetea</i> mountain, subalpine;<br>Alps; Eurosib./N-Am)<br>Cauc.: in shady forests and subalpine<br>coppices<br>(Pils: 1200-2100 m, forests)                       |
|                      |                  | <b>Pyrola rotundifolia</b> L.<br>( <i>Vaccinio-Piceetea excelsae</i> ; subalpine<br>Alps Eurosib./N-Am.)<br>Cauc.: in shady forests and subalpine<br>coppices<br>(Pils: 1350-2100 m, forests; NN, NE<br>scat.) |



**Orthilia** Ruf.: 1 circumboreal

| In the Caucasus only | In the Alps only | In the Alps and Caucasus  |
|----------------------|------------------|---|
|                      |                  | <b>Orthilia secunda</b> (L.) House ( <i>Piceetalia excelsae</i> ; mountain, subalpine; Alps; Eurosib./N-Am.)<br>Cauc.: in shady forests and subalpine coppices<br>(Pils: 1000-2300 m; forests N (-C) scat.) |

**Moneses** Salisb. ex Gray.: 2 cool N temp.

| In the Caucasus only | In the Alps only | In the Alps and Caucasus   |
|----------------------|------------------|--|
|                      |                  | <b>Moneses uniflora</b> (L.) A. Gray ( <i>Piceion excelsae</i> ; mountain, subalpine; Alps; Eurosib./N-Am.)<br>Cauc.: in shady forests; mountain to subalpine<br>(Pils: 1500-2000 m, forests, NW,NN(-C) r) |

**Chimaphila** Pursh.: 5 Euras. Eur. 1 N & trop. America

| In the Caucasus only | In the Alps only   | In the Alps and Caucasus |
|----------------------|--|--------------------------|
|                      | <b>Chimaphila umbellata</b> (L.) W. Barton ( <i>Dicrano-Pinion</i> ; hill; most eastern parts of the Alps; Eurosib./N-Am.) |                          |

**Monotropa** (*Hypopitys*): 2 N temp.

| In the Caucasus only | In the Alps only   | In the Alps and Caucasus   |
|----------------------|--|--|
|                      | <b>Monotropa hypophegea</b> Wallr. ( <i>Quercetea roboris-sessiliforae</i> ; hill, mountain; most parts of the Alps; Eurosib./N-Am.) | <b>Monotropa hypopitys</b> L. ( <i>Hypopitys monotropa</i> ) ( <i>Piceion excelsae</i> ; hill, mountain, subalpine; Alps; Eurosib./N-Am.);<br>Cauc.: in shady forests<br>(Pils: 450-1800 m, forests) |

## CARYOPHYLLACEAE

CARYOPHYLLACEAE JUSS. Magnoliopsida – Caryophyllales. 85/2630: Cosmop. esp. Temp. & warm N-hemisph.

*Stellaria* L.: ca. 120 cosmop. (Eur. 18, n-Am. 29 incl. 1 introduced)

| In the Caucasus only   | In the Alps only  | In the Caucasus and Alps   |
|--|---|--|
| <i>Stellaria persica</i> Boiss.<br>Cauc.: in moist subalpine meadows, on banks of brooks (Pils: 1500-2800 m; moist; NE-SE scat.) | <i>Stellaria pallida</i> (Dumort.) Crép.<br>( <i>Sisymbrietalia</i> ; hill, mountain; Alps; Medit.)   | <i>Stellaria media</i> (L.) Vill. [ <i>Stellarietea mediae</i> ; hill, mountain; Alps; Medit. (-Cosmop.)]<br>Cauc.: ruderal plant (Pils:<2100 m)   |
| <i>Stellaria anagalloides</i> C. A. Mey. ex Rupr.<br>Cauc.: in moist subalpine meadows, on banks of brooks                       | <i>Stellaria palustris</i> Hoffm.<br>( <i>Caricetalia fuscae</i> ; hill, mountain, subalpine; mostly S Alps; Eurosib.)  | <i>Stellaria neglecta</i> Weihe<br>( <i>Geo-Alliarion</i> ; hill; Alps; S-Eur./W-Asiat.)   |
|  | <i>Stellaria alsine</i> Grimm (= <i>S. uliginosa</i> )<br>( <i>Montio-Cardaminetea</i> ; hill, mountain; Alps; Eurosib/N-Am.)   | <i>Stellaria holostea</i> L.<br>( <i>Carpinion betuli</i> ; hill, mountain; SW-S- E-Alps; Eur./W-Asiat.)<br>Cauc.: in shady and light forests (Pils: <1600 m; forests,N)                 |
|  | <i>Stellaria longifolia</i> Willd.<br>(= <i>S. diffusa</i> )<br>( <i>Vaccinio-Piceetea excelsae</i> ; subalpine; central and E-Alps; Eurosib.)                        | <i>Stellaria nemorum</i> L. ( <i>Fraxinetalia</i> ; mountain, subalpine; Alps; Eur.)<br>Cauc.: in shady forests and in moist mountain meadows (Pils: moist; shady forests; NE r)         |
|  | <i>Stellaria nemorum</i> subsp. <i>nemorum</i> L.<br>( <i>Fraxinetalia</i> ; mountain, subalpine; Alps; Eur.)   | <i>Stellaria graminea</i> L.<br>( <i>Molinio-Arrhenatheretea</i> ; hill, mountain; Alps; Eurasiat.)<br>Cauc.: mountain meadows and edges of forests (Pils: 300-2000 m meadows, NW, NE r) |
|  | <i>Stellaria nemorum</i> subsp. <i>montana</i> (Pierat) Berher in Louis<br>( <i>Epilobion angustifolii</i> ; hill, mountain; SW to the SE parts of the Alps; W.-Eur.) |  |

***Pseudostellaria*** Pax.: 21 Eur. (1) & C As., Afghanistan to Jap. & N Am. (3)

| In the Caucasus only | In the Alps only   | In the Caucasus and Alps |
|----------------------|--|--------------------------|
|                      | <b><i>Pseudostellaria europaea</i></b><br>Schaeffl. ( <i>Fraxinetalia</i> ; hill;<br>southern parts of E Alps and<br>parts of S Alps; E-Alp./Illyr.) |                          |

***Myosoton*** Moench: 1 temp. Eur.

| In the Caucasus only | In the Alps only | In the Caucasus and Alps   |
|----------------------|------------------|--|
|                      |                  | <b><i>Myosoton aquaticum</i></b> (L.) Moench<br>( <i>Convolvulion sepium</i> ; hill, mountain;<br>Alps except most southern western<br>parts; Eurasiat.)<br>Cauc.: in moist shady forests, on banks<br>of brooks<br>(Pils: < 100 m damp places, N) |

***Cerastium*** L.: ca. 100 almost cosmop. (Eur. 58, N-Am. 27)

| In the Caucasus only   | In the Alps only   | In the Caucasus and Alps   |
|--|--|--|
| <b><i>Cerastium undulatifolium</i></b><br>Somm. & Levier (endemic)   | <b><i>Cerastium tomentosum</i></b> L.<br>( <i>Onopordetalia acanthii</i> ;<br>hill, mountain; Alps; S-<br>Apen.)             | <b><i>Cerastium cerastoides</i></b> (L.) Britton<br>( <i>Salicion herbaceae</i> ; subalpine, alpine;<br>Alps; Arct.-Alp.)<br>(Pils: 1800- 2800 m; moist tundra;<br>snowbeds; not WW, SW, SE)   |
| <b><i>Cerastium kasbek</i></b> Parrot<br>(endemic)   | <b><i>Cerastium lineare</i></b> All.<br>( <i>Trifolion medii</i> ; subalpine;<br>small parts in W-Alps; W-<br>Alp.)          | <b><i>Cerastium dubium</i></b> (Bastard) Guépin<br>( <i>Potentillo-Polygonetalia</i> ; hill; small<br>parts of W-Alps; Medit.)   |
| <b><i>Cerastium multiflorum</i></b> C. A.<br>Mey. (endemic)<br>Cauc.: on edges of forests and<br>subalpine meadows | <b><i>Cerastium julicum</i></b> Schellm.<br>( <i>Potentillenion caulescentis</i> ;<br>subalpine, alpine; SE-Alps;<br>E-Alp.) | <b><i>Cerastium arvense</i></b> L. ( <i>Agropyretea<br/>intermedii-repentis</i> ; hill, mountain;<br>Alps; Eurasiat.)  |
| <b><i>Cerastium salatavicum</i></b> Rupr.<br>(endemic)   | <b><i>Cerastium alpinum</i></b> L.<br>( <i>Carici-Kobresieta</i> ; alpine;<br>Alps; Arct.-Alp.)                              | <b><i>Cerastium brachypetalum</i></b> subsp.<br><b><i>brachypetalum</i></b> ( <i>Cerastium brachype-<br/>tatum</i> subsp. <i>tauricum</i> ) Pers.<br>( <i>Alysso-Sedion albi</i> ; hill; Alps except<br>some northern parts; Medit.) |
| <b><i>Cerastium hemschinicum</i></b><br>Schischk.  | <b><i>Cerastium eriophorum</i></b> Kit.<br>( <i>Juncetea trifidi?</i> ; subalpine,<br>alpine; E-Alps; SE-Eur.-<br>Mont.)     | <b><i>Cerastium glomeratum</i></b> Thuill.<br>[ <i>Stellarietea mediae</i> ; hill, mountain;<br>Alps Medit. (-Cosmop.)]<br>(Pils: <850 m; ruderal)   |

|  |  |   |
|--|--|---|
| <i>Cerastium oreades</i> Schischk.<br>(= <i>C. davuricum</i> Fisch. ex. Sp. s. l.)<br>Cauc.: on edges of forests, subalpine and alpine meadows | <i>Cerastium uniflorum</i> Clairv. ( <i>Androsacion alpinae</i> ; alpine, nival; Alps Alp./Carpat.)  | <i>Cerastium semidecandrum</i> L. ( <i>Alyssosedion albi</i> ; hill, mountain; Alps except some northern parts; Eur./W.-Asiat.)<br>(Pils: <200 m, sandy, NW, WW)  |
| <i>Cerastium svanicum</i> Charadze (endemic)   | <i>Cerastium latifolium</i> L. ( <i>Thlaspion rotundifolii</i> ; alpine; W- and Central Alps S.-Eur.-Mont.)  | <i>Cerastium glutinosum</i> Fr. ( <i>SedoScleranthetalia</i> ; hill; Alps; Medit.)  |
| <i>Cerastium holosteum</i> Fisch. ex Hornem. (endemic)<br>Cauc.: on edges of forests, in shrubbery   | <i>Cerastium pedunculatum</i> Gaudin ( <i>Androsacion alpinae</i> ; alpine; Alps except most eastern parts; Alp.)  | <i>Cerastium fontanum</i> subsp. <i>fontanum</i> Baumg. ( <i>C. holosteoides</i> Fries) ( <i>Arrhenatheretalia elatioris</i> ; subalpine, alpine; Central and E-Alps; Arct.-Alp.)<br>(Pils: <1700 m; grassland; N, SS, SSE) |
| <i>Cerastium nemorale</i> Bieb.<br>Cauc.: on edges of forests  | <i>Cerastium carinthiacum</i> subsp. <i>carinthiacum</i> Vest ( <i>Thlaspietalia rotundifolii</i> ; subalpine, alpine; E-Alps; E.-Alp.)                  | <i>Cerastium pumilum</i> Curtis ( <i>C. glutinosum</i> Fries) ( <i>Alyssosedion albi</i> ; hill, Alps except some northern and eastern parts; Medit.)<br>(Pils: <1300 m; sandy, NW, NN (-C), SS scat.)                      |
| <i>Cerastium purpurascens</i> Adams<br>Cauc.: on subalpine stony meadows<br>(Pils: 1800-3800 m; tundra, N)                                     | <i>Cerastium carinthiacum</i> subsp. <i>australpinum</i> (Kunz) Janch. ( <i>Seslerion variae</i> ; subalpine, alpine; southern parts of E-Alps; E.-Alps) |   |
| <i>Cerastium pseudokasbek</i> Vysokostr.<br>Cauc.: on dry grassy and stony slopes  | <i>Cerastium subtriflorum</i> (Rchb.) Pacher ( <i>Cystopteridion fragilis</i> ; mountain, subalpine, alpine; most southern parts of E-Alps; E-Alps)      |   |
| <i>Cerastium polymorphum</i> Rupr. (endemic)<br>Cauc.: on rocky subalpine and alpine meadows   | <i>Cerastium sylvaticum</i> Waldst. & Kit. ( <i>Carpino-Fagetea sylvaticae</i> ; hill, mountain; S- and E.-Alps; SE.-Eur.)                               |   |
| <i>Cerastium ponticum</i> Albov ( <i>C. annae</i> I. Sokolova) (endemic)<br>Cauc.: in coniferous forests, rocky subalpine and alpine meadows   | <i>Cerastium fontanum</i> subsp. <i>lucorum</i> (Schur) Soó ( <i>Carpino-Fagetea sylvaticae</i> ; hill, mountain, subalpine; Central and E-Alps; Eur.)   |   |

|  |   |  |
|--|---|--|
| <p><i>Cerastium argenteum</i> Bieb.<br/>(endemic)</p>  | <p><i>Cerastium fontanum</i> subsp. <i>vulgare</i> (Hartm.) Greuter &amp; Burdet<br/>[<i>Arrhenatheretalia elatioris</i>; hill, mountain subalpine; Alps; Eurasiat. (-Cosmop.)]</p> |  |
| <p><i>Cerastium sosnowskyi</i><br/>Schischk.</p>   | <p><i>Cerastium brachypetalum</i> subsp. <i>tenoreanum</i> (Ser.) Soó &amp; Jáv.<br/>(<i>Alysso-Sedion albi</i>; hill S- and E-Alps; S-Eur.)</p>                                    |  |
| <p><i>Cerastium araraticum</i> Rupr.</p>   | <p><i>Cerastium ligusticum</i> Viv.<br/>(<i>Koelerio-Corynephoretea</i>; hill; some parts in the S- and SW Alps; Medit.)</p>  |  |
| <p><i>Cerastium ruderale</i> Bieb.</p>   | <p><i>Cerastium arvense</i> subsp. <i>arvense</i> L.<br/>(<i>Agropyretea internedii-repentis</i>; hill, mountain; Alps; Eurasiat.)</p>  |  |
| <p><i>Cerastium diffusum</i> Pers.<br/>Cauc.: on dry grassy slopes [Pils: &gt;150 m; open places; NW (Istanbul)]</p> | <p><i>Cerastium arvense</i> subsp. <i>strictum</i> (W. D. J. Koch) Schinz &amp; R. Keller<br/>(<i>Sedo-Scleranthion</i>; mountain; subalpine, alpine; Alps; S-Eur-Mont.)</p>        |  |
| <p><i>Cerastium perfoliatum</i> L.<br/>Cauc.: on dry grassy slopes (Pils: &lt;1300 m; ruderal; NW, NN)</p>           | <p><i>Cerastium arvense</i> subsp. <i>suffruticosum</i> (L.) Ces. in Cattaneo<br/>(<i>Genistion lobelii</i>; hill, mountain, mostly SW and S parts of the Alps; W.-Alp./Apen.)</p>  |  |
|  | <p><i>Cerastium arvense</i> subsp. <i>molle</i> (Vill.) Arcang. (<i>Elyno-Seslerietea</i>; mountain, subalpine; most parts of the Alps; SE.-Eur.)</p>                               |  |

**Holosteum** L.: 3-4 temp. Euras. (Eur. 1)

| In the Caucasus only  | In the Alps only  | In the Caucasus and Alps  |
|---|---|---|
| <b><i>Holosteum glutinosum</i></b><br>(Bieb.) Fisch. & C. A. Mey.                     | <b><i>Holosteum umbellatum</i></b><br>subsp. <i>umbellatum</i> L.<br>( <i>Koelerio-Corynephoretea</i> ;<br>hill, mountain; absent in<br>some northern parts of the<br>Alps; Medit./SW-Asiat.)         | <b><i>Holosteum umbellatum</i></b> L.<br>Cauc.: on rocks near the coast and in<br>ruderal vegetation, on moist places<br>(Pils: 300-1700 m; fields etc.; wdsp.) |
| <b><i>Holosteum marginatum</i></b><br>Fisch. & C. A. Mey.<br>(Pils: <1000 m; stony N) | <b><i>Holosteum umbellatum</i></b><br>subsp. <i>hirsutum</i> (Mutel)<br>Beistr. in Candollea<br>( <i>Alyssso-Sedion albi</i> ?; hill,<br>mountain; only most<br>western part of the Alps; W-<br>Alp.) |   |

**Moenchia** Ehrh.: 3 W & C Eur (3), Medit.

| In the Caucasus only | In the Alps only   | In the Caucasus and Alps |
|----------------------|--|--------------------------|
|                      | <b><i>Moenchia erecta</i></b> (L.) P. Gaertn.<br>& al.<br>( <i>Cerastium erectum</i> Coss. &<br>Germ.) ( <i>Koelerio-</i><br><i>Corynephoretea</i> ; hill; southwe-<br>stern parts of W Alps; W-<br>Eur./Medit.)     |                          |
|                      | <b><i>Moenchia mantica</i></b> (L.) Bartl.<br>( <i>Cerastium manticum</i> L.)<br>( <i>Arrhenatherion elatioris</i> ; hill;<br>southern parts of W, S, E Alps;<br>Medit.)<br>(Pils: <1200 m; dry grassland,<br>wdsp.) |                          |

**Sagina** L.: 15 – 20 N temp. (Eur. 12, N-Am. 10) trop. mountains 4

| In the Caucasus only   | In the Alps only   | In the Caucasus and Alps  |
|--|--|---|
| <b>Sagina oxysepala</b> Boiss.<br>Cauc.: along railways;<br>Western Caucasus | <b>Sagina nodosa</b> (L.) Fenzl<br>( <i>Isoeto-Nanojuncetea</i> ; hill;<br>W- and E-Alps; Eurosib./N-<br>Am.)  | <b>Sagina saginoides</b> (L.) H. Karst.<br>( <i>Saliceta herbaceae</i> ; subalpine, alpine;<br>Alps; Arct. –Alp.)<br>(Pils: 1600-2500 m; tundra; NE)  |
|  | <b>Sagina glabra</b> (Willd.)<br>Fenzl ( <i>Poion alpinae</i> ; subal-<br>pine; W-Alps; S.-Eur.-<br>Mont.)   | <b>Sagina procumbens</b> L. [ <i>Polygonion<br/>avicularis</i> ; hill, mountain, subalpine;<br>Alps; Eurosib./N-Am (-Cosmop.)]<br>Cauc.: on moist places<br>(Pils: <2300 m; open, moist; N) |
|  | <b>Sagina subulata</b> (Sw.) C.<br>Presl ( <i>Potentillo-<br/>Polygonetalia</i> ; hill, moun-<br>tain; southern and eastern<br>parts of the Alps; W.-Eur.) | <b>Sagina apetala</b> Ard.<br>( <i>Polygonion avicularis</i> ; hill, mountain;<br>Alps except some eastern parts;<br>Medit.)<br>(Pils: <2000 m; open places)                                |
|  | <b>Sagina apetala</b> subsp. <i>ape-<br/>tala</i> Ard.<br>( <i>Polygonion avicularis</i> ; hill,<br>mountain; Alps except some<br>eastern parts; Medit.)   |   |
|  | <b>Sagina apetala</b> subsp. <i>erect-<br/>ta</i> F. Herm.<br>( <i>Isoeto-Nanojuncetea</i> ; hill,<br>mountain; Alps except some<br>eastern parts; Medit.) |   |

**Corrigiola** L.: 10 cosmop. (Eur. 1-2)

| In the Caucasus only | In the Alps only  | In the Caucasus and Alps |
|----------------------|---|--------------------------|
|                      | <b>Corrigiola litoralis</b> L.<br>( <i>Chenopodion rubri</i> ; hill;<br>most western parts of W<br>Alps; W-Eur./Medit.) |                          |

***Paronychia*** Mill.: 110 cosmop.

| In the Caucasus only  | In the Alps only   | In the Caucasus and Alps |
|---|--|--------------------------|
| <b><i>Paronychia kurdica</i></b> Boiss.                               | <b><i>Paronychia argentea</i></b> Lam. ( <i>Thero-Brachyopodion?</i> ; hill; some parts in south parts of W and S Alps; Medit.)<br>(Pils: <500 m; rocky; SW, SS)   |                          |
| <b><i>Paronychia cephalotes</i></b> (Bieb.) Besser<br>On rocky slopes | <b><i>Paronychia polygonifolia</i></b> (Vill.) DC. In Lam.<br>( <i>Androsacetalia alpinae</i> ; W Alps; SW-Eur.-Mont.)   |                          |
|   | <b><i>Paronychia kapela</i></b> subsp. <b><i>kapela</i></b> (Hacq.) A. Kern ( <i>Ononidetalia</i> ; mountain, subalpine; south western parts of the Alps; S-Eur.-Mont.) <b><i>Paronychia kapela</i></b> subsp. <b><i>serpyllifolia</i></b> (Chaix.) Graebn. ( <i>Ononidetalia</i> ; subalpine; south western parts of the Alps; SW-Eur.-Mont.) |                          |
|   | <b><i>Paronychia kapela</i></b> subsp. <b><i>galloprovincialis</i></b> P. Küpfer ( <i>Ononidetalia</i> ; mountain, subalpine; most western parts of W Alps; W-Alp.)  |                          |

***Herniaria*** L.: 48 Eur (17) & Afr. to Ind., 1 N Arg. & Bolivia

| In the Caucasus only                     | In the Alps only  | In the Caucasus and Alps   |
|--|---|--|
| <b><i>Herniaria caucasisca</i></b> Rupr. | <b><i>Herniaria alpina</i></b> Chaix.<br>( <i>Drabion hoppeanae</i> ; alpine; W Alps and some parts of E Alps; Alp./Pyr.) | <b><i>Herniaria glabra</i></b> L.<br>( <i>Koelerio-Corynephoratea</i> ; hill, mountain; most parts of the Alps; Eur./W-Asiat.)<br>(Pils: 1200-2770 m; stony; wdsp.)                                    |
|  |   | <b><i>Herniaria incana</i></b> Lam.<br>( <i>Stipo-Poion xerophilae</i> ; hill, mountain; most western and southern parts of W Alps; Medit.)<br>Cauc.: on rocky slopes<br>(Pils: <2285 m; stony; wdsp.) |
|  |   | <b><i>Herniaria hirsuta</i></b> L.<br>( <i>Koelerio-Corynephoratea</i> ; hill, mountain; W and S Alps; and southern and most eastern parts of E Alps Medit.)<br>(Pils: <170 m; stony; not NN, NE)      |



**Illecebrum** L.: 1 Canary Is, W Eur., Medit.

| In the Caucasus only | In the Alps only   | In the Caucasus and Alps |
|----------------------|--|--------------------------|
|                      | <b>Illecebrum verticillatum</b> L.<br>( <i>Isoeto-Nanojuncetea</i> ; hill;<br>small parts in S Alps; W-<br>Eur.) |                          |

**Scleranthus** L.: ca. 10 Eur. (3), As., Afr., Aus.

| In the Caucasus only  | In the Alps only  | In the Caucasus and Alps   |
|---|---|--|
| <b>Scleranthus uncinatus</b> Schur.<br>(Pils: 1800-3200 m; open places; NN,C,E) | <b>Scleranthus annuus</b> subsp. <b>annuus</b> L.<br>( <i>Scleranthion annui</i> ; hill, mountain; Alps except some northern parts; Medit.)   | <b>Scleranthus perennis</b> L. ( <i>Koelerio-Coorynephoretea</i> ; hill, mountain, W Alps and western parts of E Alps; Medit.)<br>(Pils: <2130 m; stony; NW, NE) |
|   | <b>Scleranthus annuus</b> subsp. <b>polycarpus</b> (L.) Bonnier & Layens<br>( <i>Thero-Airion</i> ; mountain, subalpine; Alps except some northern parts; Medit.)   | <b>Scleranthus annuus</b> L.<br>(Pils: <2100 m; open places; C)  |
|   | <b>Scleranthus annuus</b> subsp. <b>verticillatus</b> (Tausch) Arcang. ( <i>Sedo albi-Veronicion dillenii</i> ; hill, mountain, southern parts of W Alps, S Alps and most eastern part of E Alps; S-Eur.) |  |

**Bufonia** L.: 20 Medit. (Eur. 7) Canary Is.

| In the Caucasus only | In the Alps only  | In the Caucasus and Alps   |
|----------------------|---|--|
|                      | <b>Bufonia paniculata</b> Dubois in Delarbre<br>( <i>Thero-Brachypodion</i> ; hill; W-Alps; Medit.) | <b>Bufonia tenuifolia</b> L.<br>( <i>Thero-Brachypodion</i> ; hill; some parts in the SW Alps; Medit.)<br>Cauc.: on rocky slopes |

**Lepyrodiclis** Fenzl: 3 W- As.

| In the Caucasus only   | In the Alps only | In the Caucasus and Alps |
|--|------------------|--------------------------|
| <b>Lepyrodiclis holosteoides</b> (C. A. Mey.) Fenzl introduced<br>Ger. serious weed of wheat and peas in NW US |                  |                          |

**Queria** L.: ?

| In the Caucasus only                                      | In the Alps only | In the Caucasus and Alps |
|---|------------------|--------------------------|
| <b>Queria hispanica</b> L.<br>Cauc.: on dry grassy slopes |                  |                          |

**Minuartia** Loefl.: ca. 175 Arct. to Mex. (N-Am 33; Ethiopia + Himal. (Eur. 53), 1 Chile)

| In the Caucasus only  | In the Alps only  | In the Caucasus and Alps   |
|---|---|--|
| <b>Minuartia abchasica</b><br>Schischk. (endemic)   | <b>Minuartia mediterranea</b><br>(Link) K. Malý<br>( <i>Thero-Brachypodium</i> ); hill;<br>some parts in W ans S Alps;<br>Medit.)<br>(Pils: <600 m; sandy; NW,<br>SW r) | <b>Minuartia viscosa</b> (Schreb.) Schinz & Thell.<br>( <i>Koelerio-Corynephoretea</i> ; hill, mountain; S and SW Alps; E.-Eur.)<br>Cauc.: on moist places                 |
| <b>Minuartia buschiana</b><br>Schischk. (endemic)<br>Cauc.: on rocky slopes, subalpine and alpine meadows | <b>Minuartia rubra</b> (Scop.) McNeill<br>( <i>Alysso-Sedion albi</i> ); hill,<br>mountain; parts of SW, S<br>and E Alps; S.-Eur.)                                      | <b>Minuartia hybrida</b> (Vill.) Schischk.<br>( <i>Koelerio-Corynephoretea</i> ; SW, S, SE Alps; Medit.)<br>Cauc.: on dry slopes<br>(Pils: <2200 m; stony pastures; wdsp.) |
| <b>Minuartia micrantha</b><br>Schischk.<br>(Pils: 700-1200 m; rocks; NN-NE)                               | <b>Minuartia rostrata</b> (Pers.) Rchb.<br>( <i>Potentilletalia caulescentis</i> ;<br>mountain, subalpine; SW, W<br>and central Alps; S.-Eur.-Mont.)                    | <b>Minuartia verna</b> (L.) Hiern<br>Cauc.: on rocky places in subalpine and alpine meadows<br>(Pils: <2750 m; stony pastures; N)  |
| <b>Minuartia woronowii</b><br>Schischk.<br>Cauc: on rocky or gravely slopes                               | <b>Minuartia setacea</b> (Thuill.) Hayek<br>( <i>Festucion valesciacae</i> ; hill;<br>E Alps; SE.-Eur./SW-Asiat.)   |  |

|  |  |  |
|--|--|--|
| <p><b><i>Minuartia akinfiewii</i></b><br/>(Schmalh.) Woronow</p>   | <p><b><i>Minuartia recurva</i></b> (All.) Schinz &amp; Thell.<br/>(<i>Caricion curvulae</i>; alpine; Alps except some northern and southern parts; S.-Eur.-Mont.)<br/>[Pils: 2000-4000 m; tundra; S, E (-C)]</p> |  |
| <p><b><i>Minuartia wiesneri</i></b> (Stapf) Schischk.<br/>Cauc.: on rocky or gravelly slopes</p>   | <p><b><i>Minuartia graminifolia</i></b> (Ard.) Jáv. In Sched.<br/>(<i>Physoplexido-Potentillion caulescentis</i>; subalpine; one part in the SE-Alps; E.-Alp.)</p>   |  |
| <p><b><i>Minuartia intermedia</i></b> (Boiss.) Hand.-Mazz.<br/>(Pils: &lt;1300 m; open ground; NW, NN, SS)</p>                                       | <p><b><i>Minuartia rupestris</i></b> subsp. <b><i>rupestris</i></b> (Scop.) Schinz &amp; Thell.<br/>(<i>Potentillion caulescentis</i>; alpine; Alps except most E part; Alp.)</p>                                |  |
| <p><b><i>Minuartia glomerata</i></b> (Bieb.) Degen<br/>Cauc.: on rocky or gravelly slopes</p>  | <p><b><i>Minuartia rupestris</i></b> subsp. <b><i>clementei</i></b> (Huter) Greuter &amp; Burdet<br/>(<i>Potentillion caulescentis</i>; alpine; SW Alps; W. Alp.)</p>  |  |
| <p><b><i>Minuartia oreina</i></b> (Mattf.) Schischk.<br/>Cauc.: on rocky places in subalpine and alpine meadows</p>                                  | <p><b><i>Minuartia grignensis</i></b> (Rchb.) Mattf.<br/>(<i>Physoplexido-Potentillion caulescentis</i>; subalpine; small part in southern central Alps; E.-Alp.)</p>  |  |
| <p><b><i>Minuartia biebersteinii</i></b> (Rupr.) Schischk.<br/>Cauc.: on rocky places of the upper forest zone</p>                                   | <p><b><i>Minuartia cherlerioides</i></b> subsp. <b><i>cherlerioides</i></b> (Hoppe) Bech.<br/>(<i>Potentillion caulescentis</i>; alpine; E Alps; E.-Alp.)</p>  |  |
| <p><b><i>Minuartia aizoides</i></b> (Boiss.) Bornm.<br/>Cauc.: on rocky places in subalpine and alpine meadows</p>                                   | <p><b><i>Minuartia cherlerioides</i></b> subsp. <b><i>riionii</i></b> (Gremli) Friedrich<br/>(<i>Androsacenion vandellii</i>; alpine; Central Alps; Alp.)</p>  |  |
| <p><b><i>Minuartia circassica</i></b> (Albov) Woronow<br/>Cauc.: on rocky places in subalpine and alpine meadows (Pils: 2000-3800 m; tundra; NE)</p> | <p><b><i>Minuartia austriaca</i></b> (Jacq.) Hayek<br/>(<i>Thlaspion rotundifolii</i>; subalpine, alpine; E Alps; E.-Alp.)</p>   |  |

|   |  |  |
|---|--|--|
| <p><b><i>Minuartia imbricata</i></b> (Bieb.)<br/>Woronow<br/>Cauc.: in stony meadows of<br/>subalpine and alpine zone</p>       | <p><b><i>Minuartia villarii</i></b> (Balb.) Wilczek &amp;<br/>Chenevard (<i>Potentilletalia caulescentis</i>;<br/>mountain, subalpine; W Alps; SW.-Eur.-<br/>Mont.)</p>  |  |
| <p><b><i>Minuartia rhodocalyx</i></b> (Albov)<br/>Woronow<br/>Cauc.: on rocky places in the<br/>subalpine and alpine zone</p>   | <p><b><i>Minuartia verna</i></b> subsp. <b><i>verna</i></b> (L.) Hiern<br/>(<i>Seslerion variae</i>; subalpine, alpine; Alps;<br/>Eur.-Mont.)</p>  |  |
| <p><b><i>Minuartia broteriana</i></b><br/>(Trautv.) Woronow<br/>Cauc.: on rocky places of the<br/>subalpine and alpine zone</p> | <p><b><i>Minuartia verna</i></b> subsp. <b><i>collina</i></b> (Neilr.)<br/>Domin<br/>(<i>Festucetalia valesiaca</i>; hill, mountain;<br/>SE and E Alps; SE.-Eur.-Mont.)</p>                                    |  |
|   | <p><b><i>Minuartia capillacea</i></b> (All.) Graebn.<br/>(<i>Ononidetalia</i>; mountain, subalpine; W, S<br/>Alps; S.-Eur.-Mont.)</p>  |  |
|   | <p><b><i>Minuartia laricifolia</i></b> subsp. <b><i>laricifolia</i></b><br/>(L.) Schinz &amp; Thell. (<i>Deschampsio-<br/>Pinion</i>; mountain, subalpine; W and<br/>Central Alps; Alp./Pyr.)</p>              |  |
|   | <p><b><i>Minuartia laricifolia</i></b> subsp. <b><i>kitaibelii</i></b><br/>(Nyman) Mattf. (<i>Kernerio saxatilis-<br/>Potentillenion caulescentis</i>; mountain, sub-<br/>alpine; E Alps; E.-Alp./Carpat.)</p> |  |
|   | <p><b><i>Minuartia biflora</i></b> (L.) Schinz &amp; Thell.<br/>(<i>Carici-Kobresietea</i>; alpine; central Alps;<br/>Arct.-Alp.)</p>  |  |
|   | <p><b><i>Minuartia sedoides</i></b> (L.) Hiern (<i>Drabion<br/>hoppeanae</i>; alpine; Alps; Eur.-Mont.)</p>  |  |

*Arenaria* L.: ca. 210 N temp., consp. mnts + artic (Eur. 54, N-Am. 9)

| In the Caucasus only  | In the Alps only  | In the Caucasus and Alps  |
|---|---|---|
| <i>Arenaria lychnidea</i> Bieb.<br>Cauc.: on rocky places of subalpine and alpine meadows | <i>Arenaria purpurascens</i> DC.<br>( <i>Elyno-Seslerietea varia</i> ; subalpine, alpine; only small part in SW Alps; SW-Eur.-Mont.)        | <i>Arenaria serpyllifolia</i> L. s. l.<br>( <i>Koelerio-Corynephoretea</i> ; hill, mountain.; Alps; S.-Eur. (-cosmop.)<br>Cauc.: in felled area and stony slopes (Pils: <2500 m; ruderal; not SE) |
| <i>Arenaria steveniana</i> Boiss.   | <i>Arenaria aggregata</i> (L.) Loisel. ( <i>Ononidetalia</i> ; hill, mountain; only most SW part of the Alps; Medit.-Mont.)                 | <i>Arenaria leptoclados</i> (Rchb.) Guss.<br>( <i>Koelerio-Corynephoretea</i> ; hill, mountain; Alps except some northern parts Medit.)<br>(Pils: <1500 m; dry, open; not SE)                     |
| <i>Arenaria dianthoides</i> Smith<br>(Pils: 1800-2450 m; dry mountain steppe; NE, EE)     | <i>Arenaria grandiflora</i> L.<br>( <i>Ononidetalia</i> ; SW, W and E Alps; mountain, subalpine; S.-Eur.-Mont.)                             |   |
| <i>Arenaria holostea</i> Bieb.<br>(endemic)   | <i>Arenaria huteri</i> A. Kern.<br>( <i>Physoplexido-Potentillenion caulescentis</i> ; mountain, subalpine; some parts in SE Alps; E.-Alp.) |   |
| <i>Arenaria rotundifolia</i> Bieb.<br>(Pils: 1000-2750 m; rocky; not SE)                  | <i>Arenaria biflora</i> L.<br>( <i>Salicion herbaceae</i> ; alpine; Alps except some parts in N and S; S.-Eur.-Mont.)                       |   |
| <i>Arenaria longifolia</i> Bieb.<br>Cauc.: in steppes, on salty places                    | <i>Arenaria ciliata</i> L.<br>( <i>Carici-Kobresietea</i> ; alpine; Alps; S.-Eur.-Mont.)  |   |
|   | <i>Arenaria multicaulis</i> L.<br>( <i>Seslerion varia</i> ; alpine; Alps except E Alps; S.-Eur.-Mont.)                                     |   |
|   | <i>Arenaria cinerea</i> DC.<br>( <i>Avernion sempervirentis</i> ; hill, mountain; SW Alps; W.-Alp.)   |   |
|   | <i>Arenaria marschlinsii</i> W. D. Koch<br>( <i>Juncetea trifidi</i> ; alpine; W and Central Alps; Alp./Pyr.)                               |   |

*Moehringia* L.: ca. 25 N temp. (Eur. 25; N-Am. 3)

| In the Caucasus only | In the Alps only   | In the Caucasus and Alps  |
|----------------------|--|---|
|                      | <i>Moehringia trinervia</i> subsp. <i>trinervia</i> (L.) Clairv.<br>( <i>Carpino-Fagatea</i> ; hill, mountain; Alps Eur./W.-Asiat.)                    | <i>Moehringia trinervia</i> (L.) Clairv.<br>Cauc.: in shady forests<br>(Pils: <2300 m; forests N) |
|                      | <i>Moehringia diversifolia</i> W.D.J. Koch<br>( <i>Androsacion vandellii</i> ; mountain, subalpine; E Alps; E.-Alp.)                                   |   |
|                      | <i>Moehringia lebrunii</i> Merxm.<br>( <i>Saxifragenion lingulatae</i> ; mountain; only small SW part of the Alps; W.-Alp.)                            |   |
|                      | <i>Moehringia villosa</i> (Wulfen) Fenzl ( <i>Physoplexido-Potentillenion caulescentis</i> ; mountain, subalpine; only small part in SE Alps; E.-Alp.) |   |
|                      | <i>Moehringia muscosa</i> L.<br>( <i>Cystoperidion fragilis</i> ; mountain, subalpine; Alps; S.-Eur.-Mont.)  |   |
|                      | <i>Moehringia intermedia</i> Panizzi<br>( <i>Saxifragenion lingulatae</i> ; hill, mountain; only small part in SW Alps; W.-Alp.)                       |   |
|                      | <i>Moehringia markgrafii</i> Merxm. & Gutermann<br>( <i>Cystoperidion fragilis</i> ; hill; small part in the Southern Alps; E.-Alp.)                   |   |
|                      | <i>Moehringia ciliata</i> (Scop.) Dalla Torre<br>( <i>Thlaspietalia rotundifolii</i> ; subalpine, alpine Alps; S.-Eur.-Mont.)                          |   |

|  |  |  |
|--|--|--|
|  | <p><b><i>Moehringia concarenae</i></b> F. Fen. &amp; F. Marini<br/> <i>(Thlaspion rotundifolii</i>; alpine; only small part in the Southern Alps; E.-Alp.)</p>                                 |  |
|  | <p><b><i>Moehringia glaucovirens</i></b> Bertol.<br/> <i>(Physoplexido- Potentillienion caulescentis</i>; mountain, subalpine; parts of E Alps; E.-Alp.)</p>                                   |  |
|  | <p><b><i>Moehringia bavarica</i></b> subsp. <i>bavarica</i> (L.) Gren. <i>(Physoplexido-Potentillienion caulescentis</i>; hill, mountain; parts of E Alps; E.-Alpp./Illyr.)</p>                |  |
|  | <p><b><i>Moehringia bavarica</i></b> subsp. <i>insubrica</i> (Degen) W. Sauer <i>(Physoplexido-Potentillienion caulescentis</i>; hill, mountain; some parts in the Southern Alps; E.-Alp.)</p> |  |
|  | <p><b><i>Moehringia dielsiana</i></b> Mattf.<br/> <i>(Physoplexido-Potentillienion caulescentis</i>; mountain; some part in the southern Alps; E.-Alp.)</p>                                    |  |
|  | <p><b><i>Moehringia sedoides</i></b> (Pers.) Loisel.<br/> <i>(Saxifragenion lingulatae</i>; mountain, subalpine; SW Alps W.-Alp.)</p>  |  |

***Spergula*** L.: temp. (Eur. 4; 1 endemic N Patagonia)

| In the Caucasus only | In the Alps only  | In the Caucasus and Alps   |
|----------------------|---|--|
|                      | <p><b><i>Spergula pentandra</i></b> L.<br/> <i>(Sedo-Veronicion dillenii</i>; hill; W and S Alps; Medit.)</p> | <p><b><i>Spergula arvensis</i></b> L.<br/> <i>(Centaureetalia cyani</i>; hill; mountain; Alps; Cosmop.)<br/>                     Cauc.: ruderal<br/>                     (Pils: &lt;500 m; fields etc.; W scat.)</p> |

*Spergularia* (Pers.) J. & C. Presl: ca. 60 cosmop., esp. Halophytes (Eur. 17, N-Am. 11)

| In the Caucasus only   | In the Alps only   | In the Caucasus and Alps   |
|--|--|--|
| <i>Spergularia diandra</i> (Guss.) Boiss.<br>(Pils: <300 m; saline; NW, SSE r) | <i>Spergularia segetalis</i> (L.)<br>( <i>Nanocyperion flavescens</i> ;<br>hill; some parts in the W Alps; W.-Eur.)  | <i>Spergularia rubra</i> (L.) J. Presl<br>[ <i>Polygono aviculari-Poetalia annuae</i> ;<br>hill, mountain, subalpine; Alps except some parts in N and S; Eurasiat. (-Cosmop.)]<br>Cauc.: on moist ruderal places<br>(Pils: <2500 m; sandy; W, SS, C scat.) |
|  | <i>Spergularia bocconei</i> (Scheele) Graebn.<br>( <i>Sisymbrietalia</i> ; hill; some parts in W and E Alps; Subcosmop.)<br>(Pils: ( <i>Spergularia bocconii</i> ) coastal areas; saline; NW, W, SS) | <i>Spergularia media</i> (L.) C. Presl<br>( <i>Spergularia marginata</i> (DC.) Kitt)<br>[ <i>Onopordetalia acanthii</i> ; hill; part in the W-Alps; Eurasiat./Afr.(-Cosmop.)]<br>Cauc: in meadows on solontshak, on the seacoast in salty estuaries        |
|  |  | <i>Spergularia salina</i> J. Presl<br>( <i>Spergularia marina</i> (L.) Griseb.)<br>( <i>Chenopodion rubrii</i> ; hill; parts of the E Alps; Subcosmop.)<br>Cauc.: in meadows on solontshak, in salty estuaries<br>(Pils: coastal, saline W, SS)            |

*Telephium* L.: 5 medit. (Eur. 1), Madag.

| In the Caucasus only  | In the Alps only   | In the Caucasus and Alps |
|---|--|--------------------------|
| <i>Telephium orientale</i> Boiss.<br>[Pils: <i>Telephium imperati</i> subsp. orientale (400-2200 m stony; wdsp.)] | <i>Telephium imperati</i> L.<br>( <i>Stipo-Poion xerophilae</i> ;<br>hill, mountain; W Alps and some part in E Alps; Medit.) |                          |

*Polycarpon* L.: 9 or 15 cosmop. (Eur. 2)

| In the Caucasus only | In the Alps only | In the Caucasus and Alps   |
|----------------------|------------------|--|
|                      |                  | <i>Polycarpon tetraphyllum</i> (L.) L.<br>[ <i>Polygonion avicularis</i> ; hill; W and S Alps; Medit. (Subcosmop.)]<br>(Pils: <1000 m; stony; W, SS) |



*Agrostemma* L.: 2 Medit.

| In the Caucasus only | In the Alps only | In the Caucasus and Alps  |
|----------------------|------------------|---|
|                      |                  | <b><i>Agrostemma githago</i></b> L. ( <i>Stellarietea mediae</i> ; hill, mountain; Alps; Medit.)<br>Cauc.: in crop and on waysides<br>(Pils: <1750 m; (corn-)fields; wdsp.) |

*Coronaria* (Hill) Guett = *Silene* L.

| In the Caucasus only | In the Alps only | In the Caucasus and Alps  |
|----------------------|------------------|---|
|                      |                  | <b><i>Coronaria coriacea</i></b> (Moench) Shischk.<br>Ex. Gorschk. ( <i>Lychnis coriacea</i> Moench)<br>( <i>Silene coronaria</i> (L.) Clairv.)<br>( <i>Geranion sanquini</i> ; hill, mountain; E and W Alps) |

*Melandrium* Roehl. = *Silene* L.

| In the Caucasus only  | In the Alps only | In the Caucasus and Alps  |
|---|------------------|---|
| <b><i>Melandrium viscosum</i></b> (L.)<br>Celak. ( <i>Silene viscosa</i> (L.) Pers.)<br>(Pils: ( <i>Silene viscosa</i> ) 900-2150 m; stony; NE, SE) |                  | <b><i>Melandrium noctiflorum</i></b> (L.) Fries<br>( <i>Silene noctiflora</i> L.) ( <i>Caucalidion Iappulae</i> ; hill, mountain; Alps; Eur./W.-Asiat.)<br>Cauc.: in shady forests and clearings, sometimes on waysides   |
| <b><i>Melandrium balanse</i></b> Boiss.<br>( <i>Melandrium album</i> s. l.)<br>Cauc: on edges of forests, clearings and along of ways               |                  | <b><i>Melandrium rubrum</i></b> (Weig.) Garcke<br>( <i>Silene dioica</i> (L.) L Clairv.)<br>( <i>Arunco-Petasion</i> ; mountain, subalpine; Alps; Eurosib.)   |
| <b><i>Melandrium boissieri</i></b><br>Schischk.   |                  | <b><i>Melandrium album</i></b> (Mill.) Garcke<br>( <i>Silene latifolia</i> subsp. <i>alba</i> (Mill.) Greuter & Burdet) ( <i>Artemisietea vulgaris</i> ; hill, mountain; Alps; Eurasiat.)<br>(Pils: ( <i>Silene alba</i> ) 500-3500 m; semi-ruderal etc.; not WW, SW) |

**Charesia** E. Busch

| In the Caucasus only  | In the Alps only | In the Caucasus and Alps |
|---|------------------|--------------------------|
| <b><i>Charesia akinfievii</i></b><br>(Schmalh.) E. Busch (= <i>Silene akinfievii</i> Schmalh.)<br>(endemic) |                  |                          |

***Silene* L.:** ca. 700 N hemisph. (Eur. 199, N-Am 70 incl. introd.)

| In the Caucasus only  | In the Alps only   | In the Caucasus and Alps   |
|---|--|--|
| <b><i>Silene cserei</i></b> Baumg.<br>Cauc.: on rocks near the ocean  | <b><i>Silene flos-jovis</i></b> (L.) Clairv.<br>( <i>Festucion variae</i> ; mountain, subalpine; W and parts of S and E Alps; W.-Alp./Apen.) | <b><i>Silene coronaria</i></b> (L.) Clairv.<br>( <i>Geranium sanguinei</i> ; hill, mountain; most parts of the Alps; S.-Eur./W.-Asiat.)  |
| <b><i>Silene multifida</i></b> (Adams)<br>Rohrbach<br>Cauc.: on edges of forests and in subalpine meadows (Pils: 1600-3000 m; scrub, meadow; NE-SE) | <b><i>Silene flos-cuculi</i></b> (L.) Clairv.<br>( <i>Molinio-Arrhenatheretea</i> ; hill, mountain; Alps except some part in SW Alps; Eur.)  | <b><i>Silene italica</i></b> (L.) Pers. ( <i>Geranium sanguinei</i> ; hill; W Alps and some parts of the S and SE Alps; Medit./W-Asiat.)<br>Cauc.: on stony slopes, in open woods, on borders of ways (Pils: <2400 m; maquis etc.) |
| <b><i>Silene lacera</i></b> (Steven) Sims<br>(endemic)<br>Cauc.: on stony slopes on moraine in the alpine zone                                      | <b><i>Silene viscaria</i></b> (L.) Borkh.<br>( <i>Koelerio-Phleion</i> ; hill, mountain; Alps except most northern parts; Eur./W.-Asiat.)    | <b><i>Silene noctiflora</i> L.</b><br>( <i>Melandrium noctiflorum</i> (L.) Fries)<br>( <i>Caucalidion iappulae</i> ; hill, mountain; Alps; Eur./W-Asiat.)<br>Cauc.: in shady forests and clearings, sometimes on waysides          |
| <b><i>Silene pygmaea</i></b> Adams<br>(endemic)<br>Cauc.: on rocks  | <b><i>Silene suecica</i></b> (Lodd.)<br>Greuter & Burdet<br>( <i>Juncetea trifidi</i> ; alpine; Alps except NE and SE parts; N-Eur.-Alp.)    | <b><i>Silene latifolia</i> subsp. <i>alba</i></b> (Mill.)<br>Greuter & Burdet ( <i>Artimisietaea vulgaris</i> ; hill, mountain; Alps; Eurasiat.)   |
| <b><i>Silene lychnidea</i></b> C. A. Mey.<br>(endemic)<br>Cauc.: on rocks   | <b><i>Silene nemoralis</i></b> Waldst. & Kit. ( <i>Origanetalia vulgaris</i> ; hill, mountain; W and E Alps; S.-Eur.-Mont.)                  | <b><i>Silene gallica</i> L.</b><br>( <i>Stellarietea mediae</i> ; hill, mountain; most parts of the Alps; Medit.)<br>Cauc.: ruderal<br>(Pils: <400 m ruderal)  |
| <b><i>Silene alpicola</i></b> Schischk.<br>Cauc.: on rocks in the alpine zone   | <b><i>Silene paradoxa</i> L.</b><br>( <i>Festuco-Brometea</i> ? hill, mountain; SW Alps; Medit.-Mont.)                                       | <b><i>Silene conica</i> L.</b><br>( <i>Alysso-Sedion albi</i> ; hill; W Alps and southern parts of E Alps; Medit.)<br>Cauc.: on dry grassy and stony and sandy places<br>[Pils: <1620 m; sandy; N, W(-C)]                          |

|  |  |   |
|--|--|---|
| <p><i>Silene dianthoides</i> Pers.<br/>(?<i>Silene marcowiczii</i><br/>Schischk.) (endemic)<br/>Cauc.: on rocky alpine meadows</p>                       | <p><i>Silene nutans</i> subsp. <i>nutans</i><br/>L. (<i>Trifolio-Geranietaea</i>; hill,<br/>Mont.; Alps; Eurosib.)</p>   | <p><i>Silene conoidea</i> L.<br/><i>Stellarietea mediae</i>; hill; most south<br/>western parts of the Alps; Metit./W-<br/>Asiat.)<br/>(Pils: 500-800 m; fields; NW, SS)</p>  |
| <p><i>Silene saxatilis</i> Sims (Bieb.)<br/>(<i>Silene ruprechtii</i> Schischk.)<br/>Cauc.: on rocky slopes<br/>(Pils: 200-3400 m; stony;<br/>NE-SE)</p> | <p><i>Silene nutans</i> subsp. <i>insubrica</i><br/>(Gaudin) Soldano<br/>(<i>Geranion sanguinei</i>; hill,<br/>mountain; SW, S, SE Alps;<br/>SE.-Eur.-Mont.)</p>   | <p><i>Silene vulgaris</i> subsp. <i>vulgaris</i><br/>(Moench) Garcke (<i>Mesobromion</i>; hill,<br/>mountain, subalpine; Alps; Eurasiat.)<br/>(Pils: (<i>Silene vulgaris</i>) &lt;3000 m;<br/>grassland etc.; wdsp.)</p>            |
| <p><i>Silene boissieri</i> Panjut<br/>(<i>Silene panjutinii</i> Kolak.)<br/>(endemic)</p>  | <p><i>Silene viridiflora</i> L.<br/>(<i>Quercetea pubescentis</i>; hill;<br/>some parts in S, E and SE<br/>Alps; SE-Eur./SW-Asiat.)</p>  | <p><i>Silene dichotoma</i> Ehrh. (<i>Sisymbrium</i>;<br/>hill, mountain; Alps; E-Eur.)<br/>Cauc.: on dry grassy or stony slopes<br/>(Pils: (<i>Silene dichotoma</i> subsp. <i>dichotoma</i>) &lt;2100 m; pastures etc.; not SE)</p> |
| <p><i>Silene compacta</i> Fisch. ex<br/>Hornem.<br/>Cauc.: in meadows and edges<br/>of forests<br/>(Pils: &lt;2100 m; stony; wdsp.)</p>                  | <p><i>Silene multiflora</i> (Ehrh.)<br/>Pers. (<i>Potentillo-<br/>Polygonetalia</i>; hill; most<br/>eastern part of the Alps; E.-<br/>Eur./W.-Asiat.)</p>  | <p><i>Silene pendula</i> L. (rare in the Alps S<br/>Alps)<br/>Cauc.: on ruderal places</p>  |
| <p><i>Silene wolgensis</i> (Hornem.)<br/>Bess. ex. Spreng.<br/>Cauc.: on dry grassy and<br/>stony slopes</p>   | <p><i>Silene otites</i> (L.) Wibel<br/>(<i>Festuco-Brometea</i>; hill,<br/>mountain; Alps except some<br/>parts in N and E S-Eur.)<br/>(Pils: &lt;1600 m; steppe, dunes<br/>etc.; NW, C (-EE), SW, SS)</p> |   |
| <p><i>Silene densiflora</i> D'Urv<br/>Cauc.: on dry grassy and<br/>stony slopes and in forests</p>   | <p><i>Silene elisabethae</i> Jan<br/>(<i>Physoplexido-Potentillenion<br/>caulescentis</i>; subalpine; some<br/>parts in SE Alps; E.-Alp.)</p>  |   |
| <p><i>Silene borysthena</i> (Grun.)<br/>Walters<br/>Cauc.: on grassy and stony<br/>slopes</p>  | <p><i>Silene cordifolia</i> All.<br/>(<i>Saxiifragenion pedemontanae</i>;<br/>mountain, subalpine; some<br/>parts in SW Alps W.-Alp.)</p>  |   |
| <p><i>Silene wallichiana</i> Klotzsch</p>  | <p><i>Silene vulgaris</i> subsp. <i>glareosa</i><br/>(Jord.)<br/>(<i>Thlaspietalia rotundifolii</i>;<br/>hill, mountain, subalpine;<br/>Alps except some parts in SW<br/>and S, S.-Eur.-Mont.)</p>         |   |

|  |   |  |
|--|---|--|
| <i>Silene alexeji</i> Kolak. (endemic)   | <i>Silene vulgaris</i> subsp. <i>prostrata</i> (Gaudin) Schinz & Thell.<br>( <i>Thlaspietea rotundifolii</i> ; subalpine, alpine; W Alps; W-Alp./Pyr.)              |  |
| <i>Silene physocalyx</i> Ledeb.  | <i>Silene vallesia</i> L.<br>( <i>Festucion variae</i> ; subalpine, alpine; W Alps; W.-Alp.)  |  |
| <i>Silene lazica</i> Boiss.<br>(Pils: 950-2100 m; rocks; NE)                                       | <i>Silene petrarchae</i> Ferrarini & Cecchi<br>( <i>Avernion montanae</i> ; mountain, subalpine parts in W Alps; W.-Alp.)   |  |
| <i>Silene daghesthanica</i> Rupr.<br>(endemic)   | <i>Silene campanula</i> Pers.<br>( <i>Saxifragenion lingulatae</i> ; mountain, subalpine, southern part of W Alps; W-Alp.)  |  |
| <i>Silene lasiantha</i> C. Koch<br>(Pils: 1500-3300 m; stony; (C-) NE-SE)                          | <i>Silene saxifraga</i> L.<br>( <i>Potentillion caulescentis</i> ; mountain, subalpine; W and southern parts of E Alps; S-Eur.-Mont.)                               |  |
| <i>Silene propinqua</i> Schischk.  | <i>Silene hayekiana</i> Hand. – Mazz. & Janch.<br>( <i>Physoplexido-Potentillenion caulescentis</i> ; mountain, subalpine; southern parts of E Alps; E-Alp./Illyr.) |  |
| <i>Silene solenantha</i> Trautv.   | <i>Silene acaulis</i> (L.) Jacq.<br>( <i>Seslerion variae</i> ; alpine, Alps, Arti.-Alp.)   |  |
| <i>Silene chlorifolia</i> Smith<br>(Pils: 850-3100 m; stony; wdsp.)                                | <i>Silene exscapa</i> All.<br>( <i>Caricion curvulae</i> ; alpine, nival; S.-Eur.-Mont.)  |  |
| <i>Silene spergulifolia</i> (Willd.) Bieb.<br>(Pils: 800-3100 m; steppe, rocks; NE-SE, C, (SW-)SS) | <i>Silene pusilla</i> Waldst. & Kit.<br>( <i>Cystoperidion fragilis</i> ; subalpine; Alps; S.-Eur.-Mont.)   |  |
| <i>Silene brotheriana</i> Sommier & Levier   | <i>Silene pudibunda</i> Hoffmanns<br>( <i>Cardamino-Montion</i> ; mountain, subalpine; most parts of E Alps; E.-Alp.)   |  |

|  |   |  |
|--|---|--|
| <i>Silene cephalantha</i> Boiss.   | <i>Silene veselskyi</i> (Janka) Neumayer<br>( <i>Physoplexido-Potentillenion caulescentis</i> ; mountain, subalpine; E Alps except northern parts; E.-Alp.)             |  |
| <i>Silene humilis</i> C. A. Mey. (endemic)   | <i>Silene quadrifida</i> (L.) L. ( <i>Petasition paradoxii</i> ; mountain, subalpine; E Alps; E-Alp./Illyr.)  |  |
| <i>Silene linearifolia</i> Otth. (endemic)   | <i>Silene armeria</i> L.<br>( <i>Koelerio-Corynephoretea</i> ; hill, mountain; W Alps and southern parts of E Alps; S.-Eur.)<br>(Pils: 1200-1500 m; forest borders; NE) |  |
| <i>Silene caucasica</i> (Bunge) Boiss. (endemic)   | <i>Silene dioica</i> (L.) Clairv. ( <i>Arunco-Petasition</i> ; mountain, subalpine; Alps; Eurosib.)   |  |
| <i>Silene cyri</i> Schischk.   | <i>Silene muscipula</i> L. ( <i>Caucalidion Iappulae</i> ; hill; most western part of the Alps; Medit.)   |  |
| <i>Silene roopiana</i> Kleop.  | <i>Silene nocturna</i> L.<br>( <i>Thero-Brachypodietalia</i> ; hill; most western parts of the Alps; Medit.)  |  |
| <i>Silene iberica</i> Bieb.  | <i>Silene rupestris</i> L.<br>Sedo-Scleranthion; mountain, subalpine; Alps except most western and northeastern part; Eur.-Mont.)                                       |  |
| <i>Silene euxina</i> (Rupr.) Hand.-Mazz. ( <i>Silene dichotoma</i> Ehrh. var. <i>euxina</i> Rupr.)<br>(Pils: ( <i>Silene dichotoma</i> subsp. <i>euxinia</i> ) coastal sands; N) |   |  |

***Cucubalus* L. = *Silene* L.**

| In the Caucasus only | In the Alps only | In the Caucasus and Alps   |
|----------------------|------------------|--|
|                      |                  | <b><i>Cucubalus baccifer</i> L.</b> ( <i>Convolvulion sepium</i> ; hill; Alps except some parts in the North; Eurasiat.)<br>Cauc.: in scrubs on waysides (Pils: <1400 m; moist scrub etc; scat.) |

***Drypis* L.: 1 S Eur Lebanon**

| In the Caucasus only | In the Alps only  | In the Caucasus and Alps |
|----------------------|---|--------------------------|
|                      | <b><i>Drypis spinosa</i> subsp. <i>jacquiniana</i></b> Wettst. & Murb.<br>( <i>Petasitenion paradoxi</i> ; hill, mountain; most southeastern part of E Alps; Illyr./E-Alp.) |                          |

***Gypsophila* L.: 150 temp. Euras. (Eur. 27)**

| In the Caucasus only  | In the Alps only   | In the Caucasus and Alps   |
|---|--|--|
| <b><i>Gypsophila glandulosa</i></b> (Boiss.) Walp.                              | <b><i>Gypsophila repens</i> L.</b><br>( <i>Petasitenion paradoxi</i> ; subalpine, alpine; Alps; S-Eur.-Montan.)          | <b><i>Gypsophila paniculata</i> L.</b> ( <i>Festuco-Brometea</i> ; hill; southern parts of W and E Alps; E-Eur./W-Asiat.)<br>Cauc.: on dry grassy and stony slopes [Pils: 1500-2000 m; meadows; EE (Mt. Ararat)] |
| <b><i>Gypsophila bicolor</i></b> (Freyn & Sint.) Grossh.                        | <b><i>Gypsophila papillosa</i> Porta</b> ( <i>Xerobromion</i> ; hill; small part of the southern part of E Alps; E-Alp.) | <b><i>Gypsophila muralis</i> L.</b> ( <i>Nanocyperion flavescens</i> ; hill; Alps except most of the northern parts; Eurasiat.)<br>Cauc.: ruderal (Pils: <100 m; open soil; NW(Eu) r)                            |
| <b><i>Gypsophila acutifolia</i></b> Fisch. ex Spreng.<br>Cauc.: on rocky slopes |  |  |
| <b><i>Gypsophila stevenii</i></b> Fisch. ex Schrank (endemic)                   |  |  |
| <b><i>Gypsophila robusta</i></b> Grossh. (endemic)                              |  |  |

|  |  |  |
|--|--|--|
| <i>Gypsophila tenuifolia</i> Bieb.   |  |  |
| <i>Gypsophila steupii</i> Schischk. (endemic)  |  |  |
| <i>Gypsophila elegans</i> Bieb.<br>Cauc.: in scree in high mountains<br>(Pils: 650-2600 m; steppe; NE-SE)  |  |  |
| <i>Gypsophila silenoides</i> Rupr.<br>Cauc.: in alpine meadows   |  |  |
| <i>Gypsophila pallasii</i> Ikonn. ( <i>G. glomerata</i> Pallas ex Bieb.)<br>Cauc.: on dry rocky slopes<br>[Pils: ( <i>Gypsophila glomerata</i> ) <300 m; limestone steppe; NW(Eu)] |  |  |
| <i>Gypsophila perfoliata</i> L. ( <i>G. trichotoma</i> Wend)<br>Cauc: at the border of Caucasus also on sea-coast<br>[Pils: 350-1500 m; steppe, also saline; C, EE, (SW)]          |  |  |
| <i>Gypsophila meyeri</i> Rupr.<br>Cauc.: in rocky subalpine and alpine meadows   |  |  |

**Fiedleria** Reichenb. = *Petrorhagia* Link

| In the Caucasus only   | In the Alps only | In Caucasus and Alps |
|--|------------------|----------------------|
| <i>Fiedleria alpina</i> (Habl.) Ovcz.<br>( <i>Gypsophila alpina</i> Habl. <i>Tunica stricta</i> (Bunge) Fisch. & C. A. Mey.) |                  |                      |
| <i>Fiedleria cretica</i> (L.) Ovcz. ( <i>Saponaria cretica</i> L.)   |                  |                      |

**Petrorhagia** Link: 33 Canary Is. + Medit. (Eur. 18) to Cashmere [introd. S Afr., Aus., Hawaii, N- Am. (4)]

| In the Caucasus only | In the Alps only  | In the Caucasus and Alps   |
|----------------------|---|--|
|                      | <i>Petrorhagia prolifera</i> (L.) P. W. Ball & Heywood<br>( <i>Kohlrauschia prolifera</i> (L.) Kunth)<br>( <i>Koelerio Corynephoretea</i> ; hill, mountain; Alps except some northern parts; S-Eur.)<br>[Pils: 100-1200 m; dry: NW, NN, (SS)] | <i>Petrorhagia saxifraga</i> (L.) Link ( <i>Koelerio-Corynephoretea</i> ; hill, mountain W, SW, SE and most eastern part of the Alps; W-Eur./Medit.)<br>Cauc.: on rocky places (Pils: <1500 m; stony; N) |

*Vaccaria* Wolf.: 1 Euras., Medit.

| In Caucaus only | In the Alps only | In Caucaus and Alps   |
|-----------------|------------------|---|
|                 |                  | <i>Vaccaria hispanica</i> (Mill.) Rauschert<br>( <i>Caucalidion Iappulae</i> ; hill, mountain;<br>most parts of the Alps (rare)<br>Medit./W-Asiat.)<br>Cauc.: ruderal<br>(Pils: <2000 m; fields; wdsp.) |

*Dianthus* L.: ca. 320 Euras. (Eur. 115) to Afr. mts (few), N-Am. 1

| In the Caucasus only  | In the Alps only  | In the Caucasus and Alps  |
|---|---|---|
| <i>Dianthus pseudarmeria</i><br>Bieb.<br>Cauc.: in coniferous forests<br>and gravely slopes | <i>Dianthus balbisii</i> Ser. In DC.<br>( <i>Festuco-Brometea</i> ; hill; southern<br>parts in W and E Alps;<br>Medit.-Mont.)   | <i>Dianthus armeria</i> L. ( <i>Melampyrion<br/>pratensis</i> ; hill, mountain; Alps except<br>some parts in the North; S-Eur./W-<br>Asiat.)<br>Cauc.: in meadows and edges of<br>forests<br>(Pils: 150-1050 m; semiruderal; NW,<br>NN) |
| <i>Dianthus capitatus</i> Balb. ex<br>DC.<br>Cauc.: in meadows and borders<br>of forests    | <i>Dianthus pontederæ</i> A.<br>Kern. ( <i>Festucetalia valesiacae</i> ;<br>hill; most eastern part of<br>the E Alps; E-Eur.)   | <i>Dianthus barbatus</i> L.<br>( <i>Trifolion medii</i> ?; hill, mountain; Alps<br>except parts in the NE; S-Eur.-Mont.)<br>Cauc: cultivated<br>(Pils: 940 m; forest borders; NW (Eu) r)  |
| <i>Dianthus borbasii</i> Vandas<br>Cauc.: on dry slopes and<br>sandy places                 | <i>Dianthus carthusianorum</i><br>subsp. <i>carthusianorum</i> L.<br>( <i>Festuco-Brometea</i> ; most<br>parts of the Alps; Eur.)   |   |
| <i>Dianthus polymorhus</i> Bieb.<br>Cauc.: on dry slopes                                    | <i>Dianthus carthusianorum</i><br>subsp. <i>atrorubens</i> (All.) Pers.<br>( <i>Festuco-Brometea</i> ; mountain,<br>subalpine; W, S and southern<br>parts of E Alps; Alp./Apen.)                  |   |
| <i>Dianthus ruprechtii</i><br>Schischk.<br>Cauc.: on subalpine rocky<br>meadows             | <i>Dianthus carthusianorum</i><br>subsp. <i>capillifrons</i> (Borbás)<br>H. Neumayer<br>( <i>Avenulo adsurgentis-<br/>Festucion pallentis</i> ; mountain;<br>eastern parts of E Alps; E-<br>Alps) |   |



|  |   |  |
|--|---|--|
| <i>Dianthus caucaseus</i> Smith s.l. (endemic)<br>Cauc.: in coniferous forests, mountain meadows and scree | <i>Dianthus carthusianorum</i> subsp. <i>latifolius</i> (Griseb. & Schenk) Hegi<br>( <i>Festuco-Brometea</i> ; hill, mountain, subalpine; E Alps; E-Alp./Carpat.)   |  |
| <i>Dianthus kusnezovii</i> Marc. (endemic)<br>Cauc.: in subalpine and alpine meadows                       | <i>Dianthus carthusianorum</i> subsp. <i>vaginatus</i> (Chaix) Schinz & R. Keller<br>( <i>Stipo-Poion xerophilae</i> ; hill, mountain; S Alps and southern E Alps; Alp.)  |  |
| <i>Dianthus kubanensis</i> Schischk.   | <i>Dianthus sanguineus</i> Vis. ( <i>Scorzonerion villosae</i> ; hill; some part in the southern E Alps; Illyr/E-Alp.)  |  |
| <i>Dianthus acantholimmonoides</i> Schischk.<br>Cauc.: in coniferous forests and gravely slopes            | <i>Dianthus seguieri</i> subsp. <i>seguieri</i> Vill. ( <i>Diplachnion</i> ; hill, mountain, subalpine; southern parts of W Alps, S Alps and southern parts of E Alps; Alp./Apen.)<br>(Pils: ( <i>Dianthus seguieri</i> ) c. 2000 m; grassland; NE r) |  |
| <i>Dianthus pallidiflorus</i> Ser.<br>Cauc.: on slopes with steppe and meadows on solontshak               | <i>Dianthus seguieri</i> subsp. <i>glaber</i> Celak. ( <i>Melampyro-Holcetalia mollis?</i> ; mountain, small part in N Alps: Eur.-Mont.)  |  |
| <i>Dianthus fragrans</i> Adams<br>Cauc.: in coniferous forests   | <i>Dianthus furcatus</i> subsp. <i>furcatus</i> Balb. ( <i>Seslerion variae</i> ; mountain, subalpine; southern parts in W Alps; W-Alp.)  |  |
| <i>Dianthus cretaceus</i> Adams<br>Cauc.: in subalpine rocky meadows and coniferous forests                | <i>Dianthus furcatus</i> subsp. <i>lereschii</i> (Burnat) Pignatti ( <i>Festucion variae</i> ; mountain, subalpine; south eastern part of W Alps; W-Alp.)   |  |
| <i>Dianthus pallens</i> M. Bieb.<br>Cauc.: in coniferous forests and on gravely slopes                     | <i>Dianthus furcatus</i> subsp. <i>dissimilis</i> (Burnat) Pignatti ( <i>Avenion sempervirentis</i> ; mountain, subalpine; most south eastern part of W Alps; W-Alp.)   |  |
| <i>Dianthus subulosus</i> Freyn & Conrath  | <i>Dianthus hyssopifolius</i> L. ( <i>Brometalia erecti</i> ; hill, mountain; southern parts of W, S and E Alps; S-Eur.-Mont.)  |  |
| <i>Dianthus transcaucasicus</i> Scischk. (endemic)   | <i>Dianthus sternbergii</i> Capelli ( <i>Seslerion variae</i> ; mountain, subalpine, alpine; southern and eastern parts of E Alps; E-Alp.)  |  |

|  |   |  |
|--|---|--|
| <i>Dianthus calocephalus</i> Boiss.<br>(Pils: <2300 m; div; not SE)                | <i>Dianthus alpinus</i> L.<br>( <i>Caricion firmae</i> ; alpine; eastern parts of E Alps; E-Alp.)   |  |
| <i>Dianthus imereticus</i> (Rupr.) Schischk. (endemic) (=D. <i>montanus</i> Bieb.) | <i>Dianthus glacialis</i> Haenke<br>( <i>Carici-Kobresietea</i> ; alpine; E Alps except most northern and southern parts; E-Alp./Carpat.)                                 |  |
| <i>Dianthus abchasicus</i> Gvinianidze (endemic)                                   | <i>Dianthus pavonius</i> Tausch<br>( <i>Caricetalia curvulae</i> ; subalpine, alpine; W Alps; W-Alp.)   |  |
| <i>Dianthus charadzeae</i> Gagnidze & Gviniaschvili (endemic)                      | <i>Dianthus gratianopolitanus</i> Vill.<br>( <i>Seslerio-Xerobromion</i> ; hill, mountain; W Alps except southern parts; Eur.)  |  |
| <i>Dianthus inamoenus</i> Schischk. (endemic)                                      | <i>Dianthus sylvestris</i> subsp. <i>syvestris</i> Wulfen in Jacq.<br>( <i>Sedo-Slerantheta</i> ; hill, mountain, subalpine Alps except most eastern parts; S-Eur.-Mont.) |  |
| <i>Dianthus azkurensis</i> Sosn. (endemic)   | <i>Dianthus sylvestris</i> subsp. <i>longicaulis</i> (Ten.) Greuter & Burdet<br>( <i>Festuco-Brometea</i> ; hill; Western and southwestern parts of W Alps; Medit.-Mont.) |  |
| <i>Dianthus floribundus</i> Boiss.   | <i>Dianthus caryophyllus</i> L. (hill, mountain; S-Eur.)  |  |
| <i>Dianthus multicaulis</i> Boiss. & Huet<br>(Pils: 2000-3900 m; rocky; NE, EE)    | <i>Dianthus subacaulis</i> Vill.<br>( <i>Avernion sempervirentis</i> ; mountain, subalpine; Western parts of W Alps; W-Alp.)  |  |
| <i>Dianthus daghestanicus</i> Charadze (endemic)                                   | <i>Dianthus scaber</i> Chaix.<br>( <i>Festuco-Brometea</i> ; hill, mountain; western parts of W Alps; W-Alp./Pyr.)  |  |
| <i>Dianthus crinitus</i> Smith<br>(Pils: 50-2600 m; steppe; NE, SS)                | <i>Dianthus plumarius</i> L.<br>( <i>Festucetalia valesiaca</i> ; hill, mountain, subalpine; eastern parts of E Alps; E-Alp./Carpat.)                                     |  |
| <i>Dianthus orientalis</i> Smith<br>(Pils: 50-3160 m; rocky; NE-SE, SS)            | <i>Dianthus superbus</i> subsp. <i>superbus</i> L.<br>( <i>Molinion</i> ; hill; Alps except some parts in the south; Eurosib.)  |  |

|  |  |  |
|--|--|--|
| <b><i>Dianthus ketzhoveli</i></b><br>Makaschvili   | <b><i>Dianthus superbis</i></b> subsp. <b><i>alpestris</i></b><br>Celak.<br>( <i>Caricion Ferrugineae</i> ; subalpine;<br>Alps except some parts in SW, NE<br>and SE; S-Eur.-Mont.)  |  |
| <b><i>Dianthus cyri</i></b> Fisch. & C.<br>A. Mey. | <b><i>Dianthus deltoides</i></b> L.<br>( <i>Koelerio-Phleion</i> ; hill, mountain;<br>Alps except some parts in the<br>eastern W Alps and northern and<br>southern E Alps; Eurosib.) |  |

***Saponaria*** L.: 40 temp. Euras. (Eur. 10)

| In the Caucasus only  | In the Alps only   | In the Caucasus and Alps  |
|---|--|---|
| <b><i>Saponaria glutinosa</i></b> Bieb.<br>Cauc.: on grassy and rocky<br>slopes, in dry and open<br>forests<br>[Pils: 900-1700 m; rocky;<br>W of 37°E (-C)] | <b><i>Saponaria lutea</i></b> L.<br>( <i>Elyno-Seslerietea</i> ; subalpine, alpi-<br>ne; southeastern parts of W Alps, W-<br>Alp.)   | <b><i>Saponaria officinalis</i></b> L.<br>( <i>Convolvulion sepium</i> ; hill, moun-<br>tain; Alps except some small parts<br>in the north; Eur./W-Asiat.)<br>Cauc.: on dry slopes and waysides<br>[Pils: <1100 m; semiruderal; N(-C,<br>SS)] |
| <b><i>Saponaria prostrata</i></b><br>Willd.<br>(Pils: 320-1500 m; fields;<br>stony slopes etc; not SE)  | <b><i>Saponaria pumila</i></b> Janch.<br>( <i>Caricetalia curvulae</i> ; alpine; Alps<br>except most southern and northern<br>parts; E-Alp.-Carpat.)<br>(Pils: ( <i>Saponaria pumilio</i> ) 1800-<br>2400 m; rocky tundra; SW, SS) |   |
| <b><i>Saponaria cerastoides</i></b><br>Fisch. ex C. A. Mey.   | <b><i>Saponaria ocymoides</i></b> L. ( <i>Pyrolo-<br/>Pinetea</i> ; hill, mountain, subalpine;<br>Alps except eastern part of E Alps;<br>S-Eur.-Mont.)   |   |
| <b><i>Saponaria orientalis</i></b> L.   |  |   |

***Velezia*** L.: 6 Medit. (Eur. 2) to Afghanistan

| In the Caucasus only | In the Alps only | In the Caucasus and Alps  |
|----------------------|------------------|---|
|                      |                  | <b><i>Velezia rigida</i></b> L.<br>( <i>Thero-Brachypodion</i> ; hill, most<br>western parts of W Alps; Medit./W-<br>Asiat.)<br>Cauc.: on gravelly slopes<br>(Pils: <2000 m; stony; not SE) |

## Conclusions

In both mountain ranges there are almost all the same plant families and also many orders. Even many species are in common. For examples the families *Ericaceae* and *Caryophyllaceae* where chosen, because they are important families in the Caucasus as well as in the Alps.

Of the specific and subspecific taxa attributed to the two families examined – a total of 397 – 143 occur only in the Caucasus, 181 only in the Alps. The taxa common to the two great mountain systems of Europe amount to 73. Among the common genera, in the *Ericaceae* we find *Rhododendron* with only *R. luteum*, *Erica* with only *E. arborea*, then *Vaccinium* with 3, *Pyrola* with 4, *Orthilia*, *Moneses* and *Monotropa* with one respectively.

In the *Caryophyllaceae*, we find *Stellaria* with 5 taxa, therefore *Myosoton* (1), *Cerastium* (9), *Holosteum* (1), *Sagina* (1), *Herniaria* (3), *Scleranthus* (3), *Bufoia* (1), *Minuartia* (3), *Arenaria* (2), *Moehringia* (1), *Spergularia* (4), *Polycarpon* (1), *Agrostemma* (1), *Coronaria* (1), *Melandrium* (1), *Silene* (10), *Cucubalus* (1), *Gypsophila* (2), *Petrorrhahia*, *Vaccaria*, *Dianthus*, *Saponaria* and *Velezia* with one respectively.

In the first family the most represented genus is therefore *Pyrola*; in the second it is *Silene*.

## References

- Aeschimann, D., Lauber, K., Moser, D. M. & Theurillat, J. P. 2004: Flora alpina. – Bern.
- Fischer, M. A., Oswald, K. & Adler, W. 2008: Exkursionsflora für Österreich Liechtenstein Südtirol. – Biologiezentrum des Oberösterreichischen Landesmuseums. Auflage 3.
- Gabrielian, E. & Fragman-Sapir, O. 2008: Flowers of the Transcaucasus and Adjacent Areas. – Ruggell.
- Gagnidze, R. 2005: Vascular plants of Georgia A nomenclatural checklist. – Tbilisi.
- Holubec, V. & Krivka, P. 2006: The Caucasus and its Flowers – Praha.
- Mabberley, D. J. 2008: Mabberley's Plant – Book A portable dictionary of plants, their classification and uses. 3° ed. – Cambridge.
- Nakhutsrishvili, G. 2013: The Vegetation of Georgia (South Caucasus). – Berlin.
- , Gagnidze, R., Shetekauri, S., Manvelidze, Z., Memiadze, N., Kharazishvili, D. & Batsatshvili, K. 2014: Countries of the Caucasus Region Georgia in Red List of the Endemic Plants of the Caucasus Armenia, Azerbaijan, Georgia, Iran, Russia, and Turkey. – St. Louis.
- Ozenda, P. 1988: Die Vegetation der Alpen im europäischen Gebirgsraum. – Jena.
- Pils, G. 2006: Flowers of Turkey A photo guide. – St. Stefan.
- Sernov, A. S. 2006: Flora of the Northwestern Caucasus. – Moscow [in Russian].
- Solomon, J., Shulkina, T. & Schatz, G. (eds) 2014: Red List of the Endemic Plants of the Caucasus. – St. Louis.

Address of the author:

Erich Hübl,

Botanisches Institut, Universität für Bodenkultur – Wien, Austria. Email:

erich.huebl@chello.at