

TAXONOMY, CHOROLOGY, ECOLOGY AND COENOLOGY OF THE *ALCHEMILLA FLABELLATA* SPECIES

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Abstract: In most European countries, but also in Romania, taxonomic research over some smaller or larger groups of vascular plants is taking place continuously over a century and a half. In the last decades of the 20th century, and especially now at the beginning of the 21st century, the taxonomic criteria have diversified. However, for some polymorphic plants genus, with a wide spreading, the identification and recognition of components species is far for being regarded as concluded. One of these genus is *Alchemilla* (fam. Rosaceae), with about 1000 species spread across the globe. It can be said that the taxonomy of *Alchemilla* species is difficult because: apparently have the same habit; the organ which produces the most diagenes, the leaf, having generally the same form; the flower presents a simplified construction and its components have a low variability; the fruit does not offer qualitative diagenes. Monographic research on the *Alchemilla* genus are motivated by its complexity, that have not been specific research on this genre in the Romanian Carpathians in the light of current knowledge and that species which are very common in our geobotanical research and are generally difficult to recognize in the field. Often in herbarium there are mistakes in the species identifications. The aims of the study of the Southern Carpathians *Alchemilla* species were found in all aspects of their knowledge, by connecting to complex research projects in this field throughout Europe. In the delimitation and description of the species of these polymorph and complex genre, in addition to morphological criteria should be used and other criteria such as ecological, phytogeographic, genetical etc. In

order to make a research of the territory, many reshuffles have been made, from May to October. Parâng, Căpățâni, Lotru, Latoriței, Vâlcan and Ciucaș Mountains have been investigated. There has been established the presence of the following species: *Alchemilla acutiloba*, *A. connivens*, *A. crinita*, *A. flabellata*, *A. glabra*, *A. glaucescens*, *A. incisa*, *A. micans*, *A. mollis*, *A. monticola*, *A. straminea*, *A. xanthochlora*. At the beginning the species of this genus from the Southern Carpathians were thoroughly investigated, among them *A. flabellata*, which makes the subject of this paper. It is thoroughly analyzed from the taxonomic, chorologic, ecologic, coenologic and even blastogenic point of view. *A. flabellata* is a microspecies which separated from the aggregate species *A. hybrida* (L.) Mill. Besides the taxonomy information, the paper also presents the chorology, and the coeno-ecologic features of this taxon. There have been consulted and reviewed the important herbarium collections in the country (BUCA, BUAG, BUCF, CRAI, HBV, CL, I, IAGB, IAAG, SIB), with the purpose of set up the chorology of the species. *A. flabellata* is a sporadic to frequent species, which is found in meadows, ericaceae bushes, moderately inclined slopes, plateaus, ridges, valleys, from the boreal to the alpine floor. In the studied phytocoenoses in Parâng Mountains, Căpățâni and Vâlcan, we noticed that the species grows from the altitude of 1,600 m to almost 2,000 m, where it cohabitates especially with species from the boreal and subalpine floors and less with species from the alpine floor.

Key words: *Alchemilla flabellata*, Romania

INTRODUCTION

The *Alchemilla* species are mostly mountainous, subalpine and alpine plants – they are perennial, small to medium sized. Their identification is usually difficult to make. For a correct recognition of the species, one needs, beside a rich specialty literature, a material to compare and a rich personal collection of samples of mature plants.

The monographic research on this genus, with polymorph species, aims at finding new particularities and criteria for a precise delimitation of the various microspecies.

It was chosen Parâng Massif as a key area, from where were collected the species of *Alchemilla*, which can be found in other mountains in the Carpathians. Among the identified species from the Parâng Massif, there is also *A. flabellata*, which is the topic of this paper.

MATERIAL AND METHOD

The research was taken in the field in the Parang Massif, and in the stationary in the conditions offered by "Al. Buia" Botanical Garden in Craiova. We brought live material from the field and we planted it in the Botanical Garden to be studied.

The material was studied alive and was preserved by pressing it; it is stored in the Herbarium of the Botanical Garden of the University of Craiova (CRAI). Before pressing it, we analyzed the hairiness and we registered the dimension of some taxonomically important organs (basal leaves). For identification, we used the specialty literature and the genuine material in the collections for a comparison. The authors of the species are graphed according to present standards (BRUMMITT R. K. & POWELL C. E. 1992). For the studied herbariums, we used acronyms according to Index herbariorum (HOLMGREN PATRICIA K., HOLMGREN N. H. & BARNETT L. C. 1990).

For the *Alchemilla* species which were identified in the field, we carried out stational, ecologic, coenologic, chorologic complex studies. Chorology is taken on a type Atlas Florae Europaeae map, using modified UTM indexes (LEHRER A. Z. & LEHRER MARIA 1990). Abbreviated the counties with the respective choronyms are alphabetically classified. To note the cohabitants, it was necessary to study the same habitats several times. The gathering of the *A. flabellata* material was performed in different periods; autumn is the most appropriate period, when plants are fruits.

RESULTS AND DISCUSSIONS

Alchemilla flabellata Buser 1891, Not. Alchim.: 12.

Syn.: - *A. truncata* Rchb. 1832, Fl. Germ. Exc.: 609 p. p., non Tausch; - *A. pubescens* Koch 1837, Synopsis ed. 1: 231 p. p., non Lam. nec Willd.; - *A. pubescens* Lam. var. *flabellata* (Buser) Camus 1900, in Rouy et Camus, Fl. France 6: 449; - *A. pubescens* Lam. subsp. *montana* (Willd.) Asch. et Graebn. var. *flabellata* (Buser) Asch. et Graebn. 1902, Synopsis 6: 403; - *A. flabellata* Buser var. *genuina* Paulin 1907, Ber. Staatsgymn. Laibach 1907: 10; - *A. hybrida* L. em. Mill. subsp. *flabellata* (Buser) Gams var. *truncata* (Rchb.) Gams 1927, in Hegi, Ill. Fl. Mitteleur. 4(2): 961; - *A. hybrida* (L.) Mill. subsp. *flabellata* (Buser) Palitz l. c., A. Buia 1956 Fl. Rep. Pop. Române 4: 690.

Description: Small plant, rarely medium sized (fig. 1) with quite thin but rigid, erect stalks, of 10-20 (-34) cm, of 0.7-2 mm thick, covered with patent or erecto-patent hairs on the entire surface. The stipules, the stalk bottom and the petioles are brownish. The basal leaves (fig. 2) have petioles of 0.5-1.5 mm thick, poorly canaliculated or flat on the adaxial side, all covered with erecto-patent or patent hairs. The lamina is 1.5-7 cm wide, reniform, sometimes suborbicular, slightly funneled to plain or folded, adaxial, of a green-brownish color, thickly haired on both sides, lobed 1/4-1/3 (-2/5) in 5-7(9) lobes, which are almost always cut to the tip, rather broader than longer or almost squared, with long incisions among them, only to the tip with 4-8 (-12) little, obtuse teeth. Inflorescence (0.5)1-5 cm broad, with dense glomerulus. All the pedicels have dense hairs, ± equal to the densely haired hypanthium. Sepals ± ovate to triangular, obtuse to the tip, densely haired to the exterior, erect or extended in postanthesis, ± equal to the hypanthium. Episepals lanceolate to ovate-lanceolate, acute, with hairs to the

exterior and on the margin, shorter than sepals and obviously narrower than those. The achene is shorter or equal to the hypanthium, sometimes the achene tip exerted from the disk.

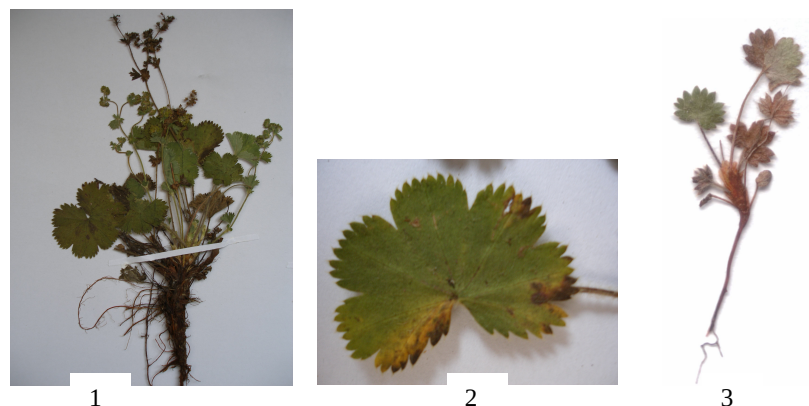


Fig. 1-3. *Alchemilla flabellata*: 1-general view, 2-basal leaf, 3-plantlet

The plantlet (fig. 3) presents opposed, petiolated, green on both sides, glabrous cotyledons, with elliptic lamina. Thickened, reddish hypocotyl. Protophyte with a 50% frequently lobed lamina or deeper into three simple lobes, resembling some teeth, generally separated, with patent hairs on both sides. The petiole is 3.5 mm long, it is reddish and is covered with patent hairs. The second leaf presents patent hairs on both sides of the lamina, which is trilobed. Abaxially, one can notice three clear nervures at the basis of the lamina. The petiole is 5 mm long, of a green color, with patent hairs. Stipules are yellowish, grown with the petiole. The plantlets were first noticed in August and September.

Taxonomy: *A. flabellata* is a microspecies which separated from the aggregate species *A. hybrida* (L.) Mill. In Romanian specialty literature is mentioned either under *A. flabellata* (PÓCS T. 1962., BORZA A. 1947, BELDIE A. 1977, CIOCÂRLAN V. 2000), or under *A. hybrida* (L.) Mill. subsp. *flabellata* (Buser) Palitz l.c. (BUIA A. 1956). Sometimes, it is mistaken for *A. glaucescens* Wallr.; the lobes make the difference – they are broader rather than longer, truncated to the edge, and with long incisions among them. In *A. glaucescens*, the foliary lobes are toothed from the base, without a full area or with short and unclear incisions between them; they are rounded to the edge, usually longer rather than broader.

Chorology: In Romania the species is known in the following locations (fig. 4):

AG: Dealul Sasului, experimental group, 28.VI.1988, G. Dihoru (BUCA 42217)-LL 4.

BC: Region Bacău, Țiganca Mt., June 1897, leg. et det. ? under *A. vulgaris* L. subsp. *pratensis* Camus, revised Violeta Boruz (I 12348) - MM 3; Mt. Ciuc (ANDREI M. 1963) - MM 2; Nemira Mountains, Nemira Peak, alt. 1,600 m, 1.VIII.1995, V. CIOCÂRLAN (BUAG 23220) - MM 4.

BV: Piatra Craiului Massif, on the southern slope (MIHĂILESCU SIMONA 2001) - LL 3.

BZ: Siriu Mountain (DIHORU G. 1975); Siriu, Fețele Mălăiei to wards the lake, 13.VIII.1972, G. DIHORU (BUCA 147482); Siriu Mountain, between Mălăia and Cura Muntelui, the first sheepfold in Bocârnea, 21.VI.1957, G. DIHORU (BUCA 147631; 147633); Colții Babei on the edge, G. DIHORU (BUCA 147 629) - ML 2.

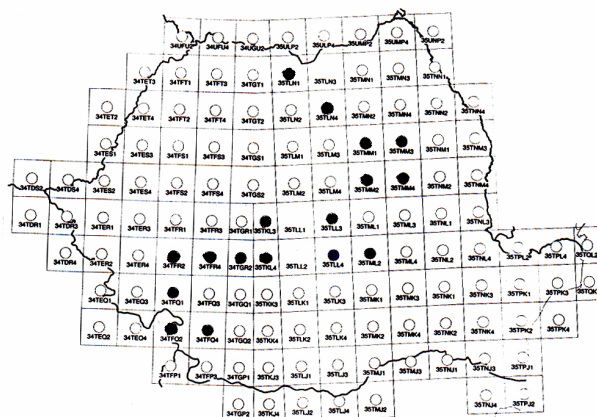


Fig. 4. Chorology of the species *A. flabellata*

CS: Globureu on Arjana Mountain (BUIA A. 1956); Banat, on Arjana Mountain, alt. cca. 1,300-1,500 m, 29.VI.1930, E. I. Nyárády under *A. hybrida* (L.) Mill. var. *plicata* Buser, revised A. Plocek (CL 195834) - FQ 1; Banat, on Țarcu Mountain, alt. cca. 1,700-1,900 m, 25.VI.1942, A. Borza & I. Todor under *A. hybrida* (L.) Mill., revised A. Plocek (CL 215838) - FQ 2.

GJ: Cioara Mountain, in the meadow, alt. cca. 2,050 m, 8.VII.2004, Violeta Boruz (CRAI); Iezerul Mountain, alt. 2,100 m, 6.VII.2004, Violeta Boruz (CRAI); Coasta Crucii, alt. 2,015 m, 6.VII.2003, Violeta Boruz (CRAI); Paltinul Mountain, in the junipers, alt. 1,900 m, 5.VII.2004, Violeta Boruz (CRAI); Dengheru Mountain, alt. cca. 2,000 m, 6.VII.2003, Violeta Boruz (CRAI); Dâlbanu Mountain, alt. cca. 1,600 m, 5.VII.2003, Violeta Boruz (CRAI); Păpușa Mountain, alt. 1,700 m, 8.VII.2004, Violeta Boruz (CRAI) -GR 2.

HD: Vâlcân Mountains on Straja Mountain (BUIA A. 1956); Straja Mountain, open, slightly weeded field, alt. 1,700 m, 25.VII.2004, Violeta Boruz (CRAI) - FR 4; Parâng Mountains on Găuri Mountain (BUIA A. 1956; BUIA A., PĂUN M., MALOȘ C. & OLARU MARIANA 1963; PÓCS T. 1962); Parâng Chalet, Parâng Peak, Gilortului Valley, Roșiile, Slăveiu, Cârja, Mândra (PÓCS T. 1962); Badea Mountain, alt. 1,700 m, 14.IX.2004, Violeta Boruz (CRAI); towards Roșiile Lake, alt. 1,925 m, 2.IX.2005, Violeta Boruz (CRAI); Coasta lui Rus, northern slope, alt. 1,945 m, 14.X.2006, Violeta Boruz (CRAI); Găuri Mountain, alt. cca. 2,000 m, 14.VIII.2006, Violeta Boruz (CRAI) - FR 4; Retezat Mountains on Paltina (BUIA A. 1956); Bucurii Valley, Valereasca (NYÁRÁDY E. I. 1958); Retezat Mountains on Paltina, alt. cca. 1,700-2,100 m, 18.VII.1924, E. I. Nyárády under *A. hybrida* (L.) Mill. subsp. *flabellata* Buser, revised Violeta Boruz (SIB 147243), revised A. Plocek (CL 195835, 195836); Transs., Retezat Mountain, 2.VIII.1948, Șt. Csűrös under *A. hybrida* (L.) Mill., revised A. Plocek (CL 562724); Transilvania, Retezat Mountain, in Piatra Iorgovanului Mountain, 5.IX.1985, G. Groza under *A. hybrida* (L.) Mill., revised A. Plocek (CL 647358) - FR 2.

MH: Baia de Aramă, between Cernei Valley and Gârdoman Sheepfold, alt. 1,240 m, 6.VIII.1955, leg. A. Buia, M. Păun & P. Badea, det. G. Popescu (CRAI); Măneasa Mountain, alt. 1,200 m, 7.VIII.1955, leg. A. Buia, M. Păun & P. Badea, det. G. Popescu (CRAI) - FQ 1; Oltenia, Mehedinți County, Oslea Mountain, alt. cca. 1,700 m, 24.VII.1928, E. I. Nyárády under *A. silvestris* Schm., revised A. Plocek (CL 156785) and under *A. hybrida* (L.) Mill., revised A. Plocek (CL 156786) - FQ 4.

MM: Rodnei Mountains (COLDEA G. 1990), on Pietrosul Mare (BUJA A. 1956); Cearcănu Mountain (RESMERIȚĂ I. 1985) - LN 1.

NT: Ceahlău Mountain (BUJA A. 1956); Ceahlău Mountain at Piatra Lată, 25.V.1898, I. Grințescu (BUCA 90524, 90525); Ceahlău Mountain, meadow, 9.VII.1980, leg. I. Pruteanu, det. C. Dobrescu under *A. vulgaris* L., revised Violeta Boruz (I 74117); Ceahlău, 30.VI.1961, leg. et det. ? under *A. vulgaris* L., revised Violeta Boruz (I 61057); Ceahlău, 1.VII.1955, C. Burduja (I 90242), 4.VII.1959, C. Burduja under *A. vulgaris* L., revised Violeta Boruz (I 89963); Ceahlău Peak, 8.VI.1898, leg. et det. ? under *A. vulgaris* L. subsp. *pratensis* Camus, revised Violeta Boruz (I 12349); Ceahlău, 15.VII.1914, leg. et det. ? under *A. hybrida* (L.) Mill. subsp. *pubescens* (Lam.) Gams, revised Violeta Boruz (I 26919); Ceahlău, 16.VII.1896, leg. et det. ? under *A. hybrida* (L.) Mill., revised Violeta Boruz (I 12335); Ceahlău Mountain, on the plateau, meadows in the subalpine floor, 15.VII.1987, I. Sârbu (IAGB 23684, 23685, 23686) - MM 1.

PH: Bucegi Mountains (BELDIE A. 1967, PUȘCARU-SOROCEANU EVDOCHIA & CIUCĂ MARIA 1976); “Jepii Mari, Cocora Peak, Obârșia, Caraiman, Omu, Doamnele, Schitul Peștera, Piatra Arsă, Babele” (BUJA A. 1956); Muntenia, Bucegi Mountains, in moist meadows at 2,000 m, 4.VIII.1985, G. Groza under *A. hybrida* (L.) Mill., revised A. Plocek (CL 642652); Muntenia, Bucegi Mountains, on “Jepii Mari” Mountain, alt. cca. 1,900-2,000 m, 10.VIII.1929, E. I. Nyárády under *A. hybrida* (L.) Mill., revised A. Plocek (CL 195838); on the Jepilor Valley plateau, 2,200 m alt., 21.VI.1942, A. Beldie (BUCF 1625); “Colții lui Barbeș” above Vânturișului Valley, to the forest skirt, VI.1938, A. Beldie (BUCF 1627); “Vârful cu Dor, Poiana Pustnicului”, 28.VI.1936, A. Beldie (BUCF 1631); Muntenia, Bucegi Mountains, alt. cca. 1,800-1,900 m, 10.VIII.1929, E. I. Nyárády under *A. hybrida* (L.) Mill. var. *flabellata* Buser, revised A. Plocek (CL 195837); Muntenia, Bucegi Mountains, alt. 1,800-2,400 m, 9.VII.1931, E. I. Nyárády under *A. hybrida* (L.) Mill. var. *flabellata* Buser, revised A. Plocek (CL 195839); Muntenia, Bucegi Mountains, alt. 2,000 m, 21.VII.1925, A. Borza under *A. hybrida* (L.) Mill. subsp. *flabellata* Buser, revised A. Plocek (CL 500963); Muntenia, Bucegi Mountains, “Casa Șil”, alt. 1,700-2,400 m, 4.VIII.1938, E. I. Nyárády under *A. hybrida* (L.) Mill. var. *flabellata* Buser, revised A. Plocek (CL 195832); Bucegi Mountains on Furnica Peak, 24.VII.1970, D. Parascan & M. Danciu (HBV 001460); Bucegi, Babele, 4.VII.1958, H. Heltman (HBV 001454); Babele, 12.VI.1947, A. Beldie (BUCF 1632); Bucegi Mountains on Caraiman, alt. cca. 2,100 m, 26-28.VIII.1959, I. Todor under *A. hybrida* (L.) Mill., revised V. Ciocârlan (BUAG 14570); Bucegi Mountains on Caraiman, near the chalet, 9.VII.1980, D. Parascan & M. Danciu (HBV 060040); Muntenia, Bucegi Mountains, Jepilor Valley, “Casa Șil, Babele”, alt. 1,700-2,400 m, 4.VIII.1938, E. I. Nyárády under *A. hybrida* (L.) Mill. var. *flabellata* Buser, revised Violeta Boruz (SIB 147242) - LL 4; Muntenia, Bucegi Mountains, “Valea Cerbului”, alt. 2,500-1,800 m, 9.VII.1931, E. I. Nyárády under *A. silvestris* Schm., revised A. Plocek [CL 195816] - LL 4; Ciucaș Massif (PAUCĂ ANA, PUȘCARU – SOROCEANU EVDOCHIA & CIUCĂ MARIA 1960, PUȘCARU-SOROCEANU EVDOCHIA & CIUCĂ MARIA 1976, CIUCĂ MARIA 1984); Tesla (CIUCĂ MARIA & BELDIE A. 1989) - ML 2; Baiului Mountains towards Rentea, through meadows, alt. cca. 1,100 m, 4.VI.1983, M. Danciu under *A. glaucescens* Wallr., revised Violeta Boruz (HBV 061921) - LL 4.

SB: Cindrel Mountains (DRAGULESCU C. 2003) - KL 3.

SV: Rarău Mountain (RACLARU P. 1967) - LN 4.

VL: Căpățâni Mountains on Piatra Mountain, alt. 1,600-1,800 m, 29.VI.2002, leg. G. Popescu, I. Costache, D. Răduțoiu & Violeta Boruz, det. Violeta Boruz (CRAI) - KL 4.

Ecology: It is a sporadic to frequent species, which is found in meadows, ericaceae bushes, moderately inclined slopes, plateaus, ridges, valleys, from the boreal to the alpine floor. It grows on moderately dry to moderately moist soils, rocky places but it is also found on

limestone or siliceous detritus, moderately to poorly acid and rich to poor in bases. Oligotrophic species. Mesotherm-microtherm. Mesoxerophyle-mesophyle.

Coenology: *A. flabellata* was identified in several floristic associations and combinations:

In *Dryadetum octopetalae* Csűrös et al. 1956 on Piatra Peak in the Căpățanii Mountains (1,890 m alt.), with the following floristic composition: *Dryas octopetala* 3, *Potentilla erecta* +-1, *Campanula serrata* +, *Helianthemum alpestre* +-1, *Alchemilla flabellata* +-1, *Gentianella bulgarica* +, *Cerastium arvense* subsp. *calcicola* +, *Trifolium repens* +, *Bupleurum falcatum* +, *Hieracium pilosella* +, *Galium album* subsp. *album* +, *Polygonum bistorta* +, *Pedicularis verticillata* +, *Anthyllis vulneraria* subsp. *alpestris* +, *Asperula capitata* +, *Koeleria macrantha* subsp. *transsilvanica* 1, *Polytrichum* spp. +.

In open habitats, detritus, along the paths to juniper bushes towards the Roșiile Lake (Parâng Mountains), it grows in the following floristic combination: *Alchemilla flabellata* +, *A. connivens* 1-2, *A. monticola* +, *Veratrum album* +, *Rumex alpinus* +, *Campanula abietina* +, *Gnaphalium sylvaticum* +, *Senecio ovatus* +, *Geranium sylvaticum* +, *Knautia dipsacifolia* +, *Cicerbita alpina* +, *Athyrium filix-femina* +, *Calamagrostis arundinacea* +, *Ranunculus platanifolius* var. *platanifolius* +, *Hypericum maculatum* subsp. *maculatum* +, *Poa nemoralis* +, *Ligusticum mutellina* +, *Phleum alpinum* subsp. *alpinum* +, *Vaccinium vitis-idaea* +, *Rhododendron myrtifolium* +, *Gentiana asclepiadea* +, *Cirsium waldsteinii* +.

In *Cetrario – Loiseleurietum procumbentis* Br.-Bl. et al. 1939 (lower alpine floor), on Iezerul Peak (2,100 m) in Parâng Mountains, with the following floristic composition: *Loiseleuria procumbens* 2-3, *Cetraria islandica* +-1, *Nardus stricta* +-1, *Vaccinium gaultherioides* 1-2, *Agrostis rupestris* +-1, *Festuca airoides* +-1, *Alchemilla flabellata* +, *Campanula alpina* +, *Homogyne alpina* +, *Phyteuma confusum* +, *Geum montanum* +, *Primula minima* +, *Ligusticum mutellina* +.

In *Seslerio bielzii – Caricetum sempervirentis* Pușcaru et al. 1956, it was identified in the juniper floor (1,760-1,840 m alt.), on the southern slopes, in Parâng Mountains: Păpușa, Coasta Crucii, Cracul Săliștenilor, Coasta lui Rus. On Coasta Crucii we noticed it in the following floristic composition: *Carex sempervirens* +-1, *Sesleria bielzii* 1-2, *Alchemilla flabellata* +-1, *Hieracium alpinum* subsp. *alpinum* +, *Vaccinium myrtillus* +-1, *V. gaultherioides* 1-2, *Bruckenthalia spiculifolia* +-1, *Campanula serrata* +, *Thymus balcanus* +-1, *Homogyne alpina* +, *Agrostis rupestris* +-1.

In *Junipero – Bruckenthalietum* Horv. 1936, in Parâng Mountains: Dâlbanul, Păpușa, Paltinul (1,670–1,800 m), on Păpușa Mountain with the following floristic composition: *Bruckenthalia spiculifolia* 3, *Antennaria dioica* +-1, *Juniperus sibirica* +, *Vaccinium myrtillus* 1, *V. vitis-idaea* +, *V. gaultherioides* +, *Picea abies* (juvenile) +, *Alchemilla flabellata* 1, *Phyteuma confusum* +, *Veratrum album* +, *Deschampsia flexuosa* +, *Avenula versicolor* +, *Centaurea nervosa* +, *Luzula campestris* +, *Trifolium repens* +, *Juncus trifidus* +.

In *Campanulo abietinae–Vaccinietum* (BUJA et al. 1962) BOȘCAIU 1971, in the juniper floor and spruce tree clearings in Parâng Mountains: Dengherul (1,700–1,850 m alt.), with the following floristic composition: *Vaccinium myrtillus* 2-3, *Campanula abietina* +-1, *Vaccinium vitis-idaea* +-1, *Bruckenthalia spiculifolia* +-1, *Rhododendron myrtifolium* +, *Potentilla aurea* subsp. *chrysocraspeda* +, *Campanula serrata* +, *Alchemilla flabellata* +.

In *Potentillo chrysocraspedae – Festucetum airoidis* BOȘCAIU 1971, juniper floor, in Parâng Mountains, on “Păpușa Mountain, Cioara, Coasta Crucii, Găuri Sheepfold, Coasta lui Rus”, Mija Peak, towards Mija Lake, Parângul Mic. On Cioara Mountain it was identified with the following floristic composition: *Festuca airoides* 2-3, *Potentilla aurea* subsp. *chrysocraspeda* 1-2, *Agrostis rupestris* +-1, *Anthoxanthum odoratum* +-1, *Phyteuma confusum*

+, *Thamnolia vermicularis* +1, *Hieracium alpinum* subsp. *alpinum* +, *Festuca nigrescens* +, *Alchemilla flabellata* +1, *Trifolium repens* +, *Viola declinata* +, *Campanula serrata* +.

In *Viola declinatae*-*Nardetum* Simon 1966, it was identified in Parâng Mountains (between 1,600-1,850 m alt.) on "Coasta lui Rus", Găuri Sheepfold, Mija Mountain, between Parângul Mic and Cârja Peak, Badea Mountain at IEFS Chalet, "Groapa Dengherului" and Vâlcan Mountains (Constantinescu Plateau, Straja Mountain). In Vâlcan Mountains, Constantinescu Plateau, we noticed it with the following floristic composition: *Nardus stricta* 2-3, *Viola declinata* +, *Vaccinium myrtillus* 1, *V. vitis-idaea* +, *Alchemilla flabellata* +, *A. connivens* +, *Phyteuma confusum* +, *Veratrum album* +, *Trifolium repens* +, *Festuca rubra* 2, *Agrostis capillaris* subsp. *capillaris* +, *Euphrasia stricta* subsp. *stricta* +, *Leontodon autumnalis* subsp. *pratensis* +, *Potentilla aurea* subsp. *chrysocraspeda* +1, *P. erecta* +, *Campanula serrata* +. On Parângul Mic Mountain, at Terminus Teleski Station, on trodden ruderalized field (1,790 m alt.), *A. flabellata* grows together with the following species: *Bruckenthalia spiculifolia* 1, *Juniperus sibirica* +, *Vaccinium myrtillus* +, *V. vitis-idaea* +, *A. connivens* 1-2, *A. crinita* +, *Trifolium repens* +, *Festuca rubra* 1, *Nardus stricta* 2, *Agrostis capillaris* subsp. *capillaris* 1, *Leontodon autumnalis* subsp. *pratensis* +, *Potentilla aurea* subsp. *chrysocraspeda* +, *Campanula abietina* +, *Cerastium fontanum* subsp. *fontanum* +, *Hieracium pilosella* 1, *Bellis perennis* +, *Geum montanum* +, *Deschampsia flexuosa* +.

In *Carici leporinae* -*Deschampsietum cespitosae* (BORZA 1934) BELDIE 1967 in the boreal floor (1,600-1,800 m), in Vâlcan Mountains (Constantinescu Plateau, Straja Mountain) with the following floristic composition: *Deschampsia cespitosa* 2-3, *Carex ovalis* +1, *Taraxacum officinale* +, *Trifolium repens* +, *Alchemilla flabellata* +1, *Euphrasia stricta* subsp. *stricta* +, *Geum montanum* +, *Festuca nigrescens* +.

Spreading area: It is an Alpicolous-European species.

CONCLUSIONS

The *Alchemilla flabellata* species can be easily recognized even in the field, due to its tipped cut lobes and obvious incisions among lobes. Besides the taxonomy information, the paper also presents the coeno-ecologic features of this taxon. In the studied phytocoenoses in Parâng Mountains, Căpățâni and Vâlcan, we noticed that the species grows from the altitude of 1,600 m to almost 2,000 m, where it cohabitates especially with species from the boreal and subalpine floors and less with species from the alpine floor. In these mountains, *A. flabellata* was identified in eight associations (belonging to six alliances) of meadows and bushes, starting from the boreal floor and up to the lower alpine floor. One can conclude that it is a frequent species in many of the studied mountains.

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