

## THE VASCULAR FLORA OF RARĂU MASSIF (EASTERN CARPATHIANS, ROMANIA). NOTE I

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The present study is concerned with the flora of the Rarău Massif, an area lying in the north-eastern part of Romania, nearby the town of Câmpulung Moldovenesc.

This study attempt to list all the vascular plants (*i.e.* ferns, conifers, and flowering plants) from the whole area of Rarău Massif. Till now, there are published several papers on this area, but no paper deals with the whole surface of Rarău Massif.

The research was carried out between 2000 to 2011. During the study period, 1377 taxa (1089 species and 288 subspecies), belonging to 95 families and 411 genera; 43 of the species belong to Pteridophytes, 8 belongs to Gymnosperms, and 1038 belongs to Angiosperms (835 Dicotyledons, 203 Monocotyledons) subdivisions. The largest families (in terms of the number of species and subspecies included) are: Asteraceae (167), Poaceae (78), Brassicaceae (53), Rosaceae and Lamiaceae (50), Scrophulariaceae and Cyperaceae (47), Caryophyllaceae and Ranunculaceae (42). The highest number of species, of a certain genus, is like the next: *Carex* L. (39), *Centaurea* L. (25), *Hieracium* L. (21), *Festuca* L. (19), *Senecio* L. (12), *Cirsium*, *Pilosella*, and *Poa* (11), etc.

Since the flora of the area is analysed according to Raunkiaer's life forms, the results are as follows: Hemicryptophytes 605 species (H=55.6%), Cryptophytes (also called Geophytes) 137 species (G=12.6%), Therophytes 120 species (11.0%), Phanerophytes 84 species (Ph=7.7%), Chamaephytes 57 species (Ch=5.2%), Hemitherophytes 77 species (Ht=7.1%), Holo-hydrotophytes 8 species (HH=0.7%), and Epiphytes 1 species (Ep=0.1%). The phytogeographic elements are the next ones: European=375 species (36.6%), Eurasian=349 species (34.0%), Circumboreal=148 species (14.8%), Cosmopolite=37 species (3.6%), Carpathians=31 species (3.0%), Pontics=19 species (1.9%), Mediterranean-submediterranean=11 species (1.1%), and Adventitious=2 species (0.2%). The number of endemic and near-endemic taxa (species and subspecies) within the study area is 53 (5.2%).

*Key words:* Vascular flora, Rarău Massif, Romania, zoological categories

### 1. INTRODUCTION

This study attempt to list all the vascular plants (*i.e.* ferns, conifers and flowering plants) from the whole area of Rarău Massif. Till now, there are published some papers on this area, but no paper deals with the entire surface.

This paper has been divided in two parts, due to the printing space constraints. The floristic conspectus in this part (I) is starting with the plant family of *Lycopodiaceae*, ending with the family of *Polemoniaceae*. Still, all the statistical analyses is referring to the whole flora registered in Rarău Massif.

Rarău Massif is situated in the central–northern part of Eastern Carpathians (Romania), having as limits the Moldova river valley in the northern part, the Șandru valley, Gemenea Gorge (883 m alt.), Babei valley, Slătioara and Gemenea streams, the saddle of Diacu Mountain (962 m alt.) along the eastern limits; the southern limit follow the Chiril valley; the western limit follows the course of Giupalău stream, over the deep gap (at 1295 m alt.) from Fundul Colbului, ending in the Colbului valley (this represents the border between Rarău and Giupalău Mountains). Thus delimited, the total area of Rarău Massif is of 162.35 km<sup>2</sup> [44].

From morphometrical point of view, Rarău Massif belongs to the middle and low mountains, being surrounded by large and deep valleys, fragmented by a dense valley network.

From hypsometrical point of view, this massif is situated between 590 m alt. (the confluence of Șandru stream with Moldova river) and 1650.5 m alt. (in Rarău Summit). The average altitude is of 939.82 m, corresponding thus to the upper limit of the low mountains [44].

The Rarău Massif corresponds, from geologically point of view, to the “external marginal syncline” of the crystallino-mesozoic area. This “syncline” is filled up with mesozoic deposits, and the flanks are made up of the metamorphic pre-alpine deposits. The mesozoic deposits are represented by dolomites, calcarous-dolomitic facieses and jaspers, or sandstone-conglomerates. The metamorphic rocks include dolomites and dolomitic limestones, as well as limestones, marl-clay and clay deposits (as pelitic rocks), jaspers and clastic rocks (sandstones, conglomerates). Very seldom, magmatic intrusive rocks appear. The general appearance of the Rarău Massif is of limestone rocks [44].

The prevalent soils are represented by cambisols (eu-mesobasic brown soils and acid brown soils), molisols (rendzinas), spodosols (ferri-illuvial brown soils and podzols), umbrisols (typical black acid soils), underdeveloped, fragmented soils (lithosols, regosols, erodisols, alluvial protosols and alluvial soils) [44].

The Rarău Massif is situated in the climatic province sector of Baltic influences, as are the whole North-east part of the Eastern Carpathians. The yearly average of air temperature range between 6.4 °C at Câmpulung Moldovenesc and 2.2 °C at Rarău meteo station. The annual average precipitation of Rarău area ranges between 663.4 mm at Pojorâta and 901.5 mm at Rarău meteo station. This area includes altitudes of two complex topoclimates, namely: the Rarău–Bistriței Mountains and the Câmpulung Moldovenesc Depression. A Walter-Lieth ombrothermic diagram was prepared according to the climatic data from meteorological stations in Câmpulung Moldovenesc, Pojorâta (situated at the base of this massif) and Rarău Summit [44].

This area belongs to the alpine biogeographical area (accordingly to the Habitat Directive 92/43/EEC [62]), being placed in the same time in the Euro-Siberian phytogeographical region. For this reason, and many others, the Rarău Massif bears interesting characteristics in terms of both flora and phytogeography.

Flora of the Rarău Massif was investigated, by some of the well-known botanists, as: Herbich (1859) [10], Knapp (1872) [13], Rehmann (1873) [42, 43], Pax (1898, 1908 [25]), Brândză (1879–1883) [1], Grecescu (1898, 1909) [6–7], Wołoszczak (1904) [60], Hurmuzaki (1901) [11], Prodan (1930, 1931, 1939) [26–28], Guşuleac (1930, 1937) [8–9], Răvăruţ, 1938 [41], and so on. New floristic data have been published by other botanists, as: Leandru et Stanciu (1967) [15], Morariu (1952, 1965, 1972, 1979) [18–20, 22], Morariu et Beldie (1976) [21], Raclaru (1967, 1970, 1973, 1974, 1977, 1979, 1980) [29–38], Raclaru et Ştefureac (1980) [39], Seghedin et Răducu (1969) [48], Seghedin (1983) [49], Ştefureac (1965, 1970) [51–52], Ştefureac *et al.* (1978, 1979) [12, 53–54], Țopa (1932, 1969) [57–58], Sokolowski (1973) [50], Mititelu *et al.* (1978–1980, 1989) [16–17], and so forth.

## 2. OVERVIEW OF THE VEGETATION

The main vegetation types occurred in the Rarău Massif are:

a) Forests cover 65–70% from the whole area. The structure of the forests are like the next: the norwegian spruce forests (Ass. *Hieracio transsilvanicae–Piceetum* Pawłowski et Br.-Bl. 1939) and the fir forests (Ass. *Hieracio transsilvanico–Abietetum* (Borhidi 1971) Coldea 1991), distributed between 600–650 and 1600 m alt. [16–17, 30]; the spruce and fir forests are to be found mainly on the North-eastern side of Rarău Massif and the mixed forests (coniferous and broad-leaved species) [17, 30], Ass. *Pulmonario rubrae–Fagetum* (Soó 1964) Taüber 1987, with an uneven distribution, mainly on South and East slopes; the beech (*Fagus sylvatica* L.) forests (Ass. *Symphyto cordati–Fagetum* Vida 1963), are distributed up to 1200 m alt., here and there, and, in combination with spruce, up to 1400 m alt. [16–17, 30].

b) Meadows are mainly of secondary origin, the dominant ones are attributed Ass. *Festuco rubrae–Agrostietum capillaris* Horvát 1951 [17, 30].

c) Vegetation on limestone rocks is dominated by the phytocoenoses belonging to Ass. *Campanulo divergentiformis–Festucetum pallentis* Zolyomi 1966, as well as to Ass. *Diantho tenuifolii–Festucetum amethystinae* Coldea 1984 and Ass. *Festucetum saxatilis* Domin 1933.

d) Bush-like formations are made by the phytocoenoses belonging to Ass. *Calamagrostio villosae–Pinetum mugi* Popescu et Sanda 2002, Ass. *Campanulo abietinae–Juniperetum* Simon 1966, and Ass. *Vaccinietum uliginosi* Beldie 1967 [17, 30].

e) on small patches, on limestone rocks along the Bistrița valley are to be met phytocoenoses belonging to Ass. *Leucobryo–Pinetum* Matuszkiewicz 1962 sub-Ass. *betuletosum pendulae* (Burduja et Ștefan 1982) Coldea 1991 [17, 30].

From phytogeographic point of view, the Rarău Massif belongs to the Euro-Siberian region, Carpathian subregion, Dacian-Carpathians province, Eastern Carpathians sub-province, the area of Bistrița, Bârgău, and Călimani Mountains (the South-western parts of this massif), and the area of Transylvanian-Moldavian flysch (the North-Eastern parts of it) [30].

### 3. MATERIALS AND METHODS

The floristic syllabus in this paper has been made using a series of old and new data of various authors, dealing with this area. All the papers used are given in the references. Because these papers are too numerous, there are cited only those ones dealing with those taxa described in Rarău Massif, or for the rarest plant species in the same area. Still, the majority of the species cited here from literature were taken after: Raclaru (1967, 1970, 1973, 1974, 1977, 1979, 1980) [29–38], Mititelu *et al.* (1978–1980, 1989) [16–17], Morariu (1952, 1965, 1972, 1979) [18–20, 22], and Ștefureac (1965, 1970) [51–52], etc.

This study attempt to register the vascular plant species, all of them collected from the area of Rarău Massif, between 2000 and 2011. The research area lies at 47°23'47" and 47°32'32" Northern latitude and 25°28'06" and 25°39'30" Eastern longitude. Some of the specimens were collected by us from various places, and were dried using standard herbarium methods. Identifying the specimens of plants were made using the *Flora of Romania* (1952–1976) [45] and the *Flora Europaea* (1964–1980, 1993) [55–56]. The herbaria of Botanical Garden (IAGB), the University of Agricultural Sciences and Veterinary Medicine (IASI) and the Faculty of Biology in Iași (I) were used to check these specimens. Some of the plant specimens are stored in the Herbarium of Botanical Garden and the University of Agricultural Sciences and Veterinary Medicine in Iași.

Some critical taxa have been revised according to the central European authors [14].

The plant taxa of the Rarău Massif are listed in the appendix. All the taxa in the floristic list are given according to the order in the *Flora Europaea* (1964–1980, 1993) [55–56]. The authors of the taxa names are written according to Brummitt and Powell (2001) [2].

The following items are listed for each taxa: name, author (s), location (when a taxa is common it is given the name of the Rarău Massif, only), the degree of spreading and the altitude (in same cases), the habitats, ending with the the live's form and floristic element.

The live's forms, as well as the phytogeographic elements abbreviations, follow Ciocârlan (2000) [3].

#### 4. RESULTS AND DISCUSSION

As a result of our studies over the plant species identified by the authors in the last 12 years (2000 to 2011), there were registered plants from 95 families, as well as 1377 taxa belonging to 411 genera, occurred in the studied area (1089 species and 288 subspecies); 43 of the species belong to Polypodiophyta, 8 belong to Pinophyta, and 1038 belong to Magnoliophyta subdivisions (835 from Magnoliopsida and 203 from Liliopsida).

The largest families in terms of the number of species and subspecies are: Asteraceae (167), Poaceae (78), Brassicaceae (53), Rosaceae and Lamiaceae (50), Scrophulariaceae and Cyperaceae (47), Caryophyllaceae and Ranunculaceae (42). Genera represented by the highest number of species are: *Carex* L. (39), *Centaurea* L. (25), *Hieracium* L. (21), *Festuca* L. (19), *Senecio* L. (12), *Cirsium*, *Pilosella*, and *Poa* (11).

Raunkiaer's life forms spectrum acts as an indicator of the climate of the Rarău Massif [40]. Thus, that live's forms are as: Hemicryptophytes 605 (H=55.6%), Cryptophytes (also called Geophytes) 137 (G=12.6%), Therophytes 120 (11.0%), Phanerophytes 84 (Ph=7.7%), Chamaephytes 57 (Ch=5.2%), Hemitherophytes 77 (Ht=7.1%), Helo-hydathophytes 8 (HH=0.7%), and Epiphytes 1 (Ep=0.1%).

The distribution of phytogeographic elements is like the next: European=375 (36.6%), Eurasian=349 taxa (34.0%), Circumboreal=148 (14.8%), Cosmopolitan=37 (3.6%), Carpathians=31 (3.0%), Pontics=19 (1.9%), Mediterranean-submediterranean=11 (1.1%), and Adventitious=2 (0.2%). The number of endemic and near-endemic taxa (species and subspecies) within the study area is of 53 (5.2%).

*Botanical significance:* the Rarău Massif is a very important site by the fact that some of its forest stands is over 100 years-old, and inside of those ones have not made any silvicultural interventions. As a result, their ecosystem are now in a climax stade, in which the relationship of interdependence between the environment components are ideals for some thoroughly studies of ecology.

All the natural habitats included have a very good management as a scientific reserve over 60 years old; all the natural habitats are well preserved. There have been achieved complex scientific studies over the fauna and flora, thus being one of the best studied and protected area in Romania.

All the habitats inside the nature reserves are relatively well preserved, and its status as a protected area in Romania contribute to the maintaining in the future of the natural features as nowadays.

EUNIS G 1 Hab. New: South–East Carpathian beech forests, edified by: *Fagus sylvatica*, *Symphytum cordatum*, *Cardamine glanduligera*, *Euphorbia carniolica*, *Hepatica transsilvanica*, *Ranunculus carpaticus*. This natural habitat type is characteristic (typical) for the South-eastern Carpathians forests [46].

In the area of Rarău Massif are included three nature reserves, namely: “Pietrele Doamnei”, “Todiurescu hay meadows” and “Century old forest Slătioara”. Part of the area are circumscribed in an other nature reserve, namely “Cheile Zugreni” [48–49].

This site is also an important one by the concentration on a small area of a rich plant biodiversity. So, there were identified 53 endemic and subendemics (sensu lato) taxa, namely: *Achillea oxyloba* subsp. *schurii*, *Aconitum lycoctonum* subsp. *moldavicum*, *Aquilegia nigricans* subsp. *subscaposa*, *Asperula carpatica*, *Campanula abietina*, *C. carpatica*, *C. rotundifolia* subsp. *polymorpha*, *Cardamine glanduligera*, *Centaurea mollis* subsp. *maramarosiensis*, *C. phrygia* subsp. *carpatica*, *C. phrygia* subsp. *melanocalathia*, *C. phrygia* subsp. *rarauensis*, *C. pinnatifida* subsp. *pinnatifida*, *Cerastium lerchenfeldianum* ?, *Dianthus spiculifolius*, *D. tenuifolius*, *Eritrichium nanum* subsp. *jankae*, *Erysimum witmannii* subsp. *transsilvanicum*, *E. witmannii* subsp. *witmannii*, *Festuca carpatica*, *F. porcii*, *F. rupicola* subsp. *saxatilis*, *Hepatica transsilvanica*, *Heracleum carpaticum*, *Hesperis matronalis* subsp. *moniliformis*, *Hieracium pietroszense*, *H. pojoritense*, *H. praecurrens* subsp. *pelesii*, *Melampyrum saxosum*, *Onobrychis montana* subsp. *transsilvanica*, *Phyteuma tetramerum*, *Ph. vagneri*, *Poa laxa* subsp. *pruinosa*, *P. rehmannii*, *Primula elatior* subsp. *leucophylla*, *Pulmonaria filarszkyana*, *P. montana* subsp. *porciusii*, *Salix kitaibeliana*, *Scabiosa lucida* subsp. *barbata*, *Sesleria heufleriana*, *Silene nutans* subsp. *dubia*, *S. zawadzki*, *Symphytum cordatum*, *Thesium kernerianum*, *Thymus bihoriensis*, *Th. comosus*, *Th. pulcherrimus*, *Tozzia alpina* subsp. *carpatica*, *Trisetum macrotrichum*, and *Viola joó*i [3, 4, 5, 23, 45].

The site contains also 146 taxa as threatened on national red lists [24]. Among these, some are quite rare in Rarău Massif: *Allium victorialis*, *Aquilegia nigricans* subsp. *subscaposa*, *Arabis soyeri* subsp. *subcoriacea*, *Arnica montana*, *Asperula carpatica*, *Botrychium multifidum*, *B. virginianum*, *Cardamine enneaphyllos*, *Carex alba*, *C. brunnescens*, *C. capillaris* subsp. *capillaris*, *C. limosa*, *C. rupestris*, *Centaurea phrygia* subsp. *carpatica*, *C. phrygia* subsp. *melanocalathia*, *C. phrygia* subsp. *rarauensis*, *Epipogium aphyllum*, *Eritrichium nanum* subsp. *jankae*, *Festuca carpatica*, *Heracleum carpaticum*, *Lloydia serotina*, *Menyanthes trifoliata*, *Orchis laxiflora* subsp. *elegans*, *O. mascula* subsp. *signifera*, *O. militaris*, *Microstylis monophyllos*, *Pleurospermum austriacum*, *Rumex scutatus*, *Salix daphnoides*, *Swertia perennis* subsp. *alpestris*, *S. perennis* subsp. *perennis*, *Taxus baccata*, *Thesium kernerianum*, *Thymus bihoriensis*, *Th. comosus*, *Th. pulcherrimus*, *Tozzia alpina* subsp. *carpathica*, *Trisetum macrotrichum*, *Viola alpina*, *V. joó*i, *Woodsia ilvensis*, and so on.

On the other hand, the area of Rarău Massif includes 7 glacial relict species (*Carex appropinquata*, *C. limosa*, *Polemonium coreuleum*, *Ribes nigrum*, *Salix starkeana*, *Swertia perennis* subsp. *perennis*, *Vaccinium oxycoccos*) and 1 tertiary relict species (*Hepatica transsilvanica*) [45].

Some of the plant species are protected under the Habitat Directive 92/43/EEC [62], as they are: *Campanula serrata*, *Cypripedium calceolus*, *Lycopodium* spp., *Tozzia alpina* subsp. *carpatica*. All of these species are registered, also, under the national legislation concerning the Sites of Community Interest (SCI's) [64–65].

The nature reserve of “Pietrele Doamnei” include 22 taxa that are listed as threatened on national red list [24]: *Asperula carpatica*, *Campanula rotundifolia* subsp. *kladniana*, *Centaurea pinnatifida*, *Crepis jacquinii*, *Daphne cneorum*, *Doronicum carpaticum*, *Epipactis atrorubens*, *Erysimum wittmannii* subsp. *transsilvanicum*, *Gentiana acaulis*, *Hieracium pojoritense*, *Leontopodium alpinum*, *Melampyrum saxosum*, *Pinguicula alpina*, *Ranunculus carpaticus*, *Ribes alpinum*, *Silene zawadzki*, *Streptopus amplexifolius*, *Vaccinium uliginosum* subsp. *uliginosum*, *Thesium kernerianum*, *Traunsteinera globosa*, *Viola alpina* and *V. joói*.

The scientific reserve “Century old forest Slătioara” includes 17 taxa as threatened on national red lists list [24], as: *Allium schoenoprasum* subsp. *sibiricum*, *Crepis jacquinii*, *Daphne cneorum*, *Epipactis atrorubens*, *Epipogium aphyllum*, *Goodyera repens*, *Gymnadenia conopsea* subsp. *conopsea*, *Hieracium pojoritense*, *Monotropa hypopitys* subsp. *hypopitys*, *Phyteuma vagneri*, *Pinguicula alpina*, *Ranunculus carpaticus*, *Ribes alpinum*, *Streptopus amplexifolius*, *Swertia perennis* subsp. *perennis*, *Vaccinium oxycoccos* and *V. uliginosum* subsp. *uliginosum*.

The nature reserve “Todiurescu hay meadows” include 13 taxa as threatened on national red list [24]: *Centaurea phrygia* subsp. *carpatica*, *Cirsium decussatum*, *Crepis jacquinii*, *Dactylorhiza cordigera* subsp. *cordigera*, *Festuca amethystina*, *Gymnadenia conopsea* subsp. *conopsea*, *Menyanthes trifoliata*, *Phyteuma tetramerum*, *Silene zawadzki*, *Swertia perennis* subsp. *perennis*, *Trollius europaeus* subsp. *europaeus*, *Vaccinium uliginosum* and *Valeriana dioica* subsp. *simplicifolia*.

In 2005, the Rarău Massif has been elected as an Important Plant Area (IPA) [46] to be best preserved in Romania. Under the criteria and the methodology [59, 61, 63] there were identified the next plant species as important ones: *Campanula patula* subsp. *abietina*, *C. serrata*, *Cypripedium calceolus*, *Eritrichium nanum* subsp. *jankae*, *Hepatica transsilvanica*, *Larix decidua* subsp. *carpatica*, *Poa rehmannii*, *Primula elatior* subsp. *leucophylla* and *Trisetum macrotrichum*.

The existence of a motel near “Pietrele Doamnei” nature reserve, need a continuous supervision of tourists accessing into the area of the natural reserve. Also, it is necessary to stop harvesting the plant species inside those three nature reserves, as well as forbidding the grazing of the domestic animals.

It can be recommend as management measures, to keep the actual status as a scientific reserve of the Rarău Massif, without any human influence over this site.

## APPENDIX

## The vascular flora of Rarău Massif

## POLYPODIOPHYTA

## LYCOPODIACEAE

*Lycopodiella inundata* (L.) Holub; Rarău; Forests, 1400 m; Ch, Circ.

*Lycopodium annotinum* L.; Zimbrului stream, Todirescu res., Slătioara res.; Forests, bushes; Ch, Circ.

*L. clavatum* L.; Zimbrului stream, Todirescu res., Slătioara res.; Forests, edge of forests; Ch, Cosm.

*L. selago* L.; Rarău, Slătioara res., Zimbrului stream; Forests, wet meadows; Ch, Cosm.

## SELLAGINELLACEAE

*Selaginella selaginoides* (L.) P. Beauv. ex Schrank et Mart.; Rarău, Doamnei stream, Todirescu res.;  
Rocks, ± wet meadows; Ch, Circ.

*S. helvetica* (L.) Spring; Doamnei stream, Rarău, Zimbrului stream; Rocks, ± wet meadows; Ch, Euras.

## EQUISETACEAE

*Equisetum arvense* L.; Pojorâta, Izvorul Alb; Wet meadows, along the rivers and streams; G, Cosm.

*E. fluviatile* L.; Todirescu res.; Wet meadows, along the rivers and streams; HH, Circ.

*E. hyemale* L.; Izvorul Alb; Marshes, along the rivers and streams, in forests; G, Circ.

*E. palustre* L.; Slătioara res.; Marshes, along the rivers and streams; G, Circ.

*E. pratense* Ehrh.; Slătioara res.; Marshes, along the rivers and streams; G, Circ.

*E. sylvaticum* L.; Rarău; Marshes, along the rivers and streams, in forests; G, Circ.

*E. telmateia* Ehrh.; Rarău; Along the rivers and streams; G, Circ.

## OPHIOGLOSSACEAE

*Botrychium lunaria* (L.) Swartz; Rarău, Zimbrului stream, Doamnei stream, Todirescu res.; Wet  
meadows; G, Cosm.

? *B. matricariifolium* (Retz.) A. Braun ex W. D. J. Koch; Rarău [30]; G, Eur.–North Am.

*B. multifidum* (S. G. Gmel.) Rupr.; between Rarău chalet and Chiril; Meadows; G, Circ.

*B. virginianum* (L.) Sw.; Pojorâta [28]; Forest clearings and meadows; G, Eur.–Siberia–North Am.

*Ophioglossum vulgatum* L.; Bodea, Rarău; Meadows; G, Circ.

## POLYPODIACEAE

*Polypodium vulgare* L.; Runc, La Floace, Măgura, Rarău, rez. Slătioara, Câmpulung Moldovenesc;  
Forests, on rocks; G, Circ.

## DENNSTAEDTIACEAE

*Pteridium aquilinum* (L.) Kuhn; Rarău, Izvorul Alb; Xerophyllous meadows; G, Cosm.

## ASPLENIACEAE

*Asplenium adulterinum* Milde; Rarău; H, Eur. (± Centr. eur)

*A. × germanicum* Weiss.; Runc, Prașca, Cojoci; Rocks crevices

*A. ruta-muraria* L.; Rarău, Eva, Adam, Slătioara res.; Rocks crevices; H, Euras.

*A. scolopendrium* L.; Rarău, Slătioara res., the waterfalls of Muncelul Rarăului, Pojorâta-Fundul Văii;  
Forests, rocks; G, Circ.

*A. septentrionale* (L.) Hoffm.; Chiril, Popii Rarăului, Zâmbului stream, Doamnei stream, Rarău;  
Rock crevices; H, Circ.



- A. trichomanes* L.; Runc, Măgura, Rarău, Slătioara res.; Rocks; H, Cosm.  
*A. trichomanes-ramosum* L.; Rarău, Doamnei stream, Zâmbului stream, Slătioara res., Măgura, Runc; Rocks; H, Circ.

## POLYPODIACEAE

- Athyrium filix-femina* (L.) Roth.; Rarău, Slătioara res., Măgura, Runc, Câmpulung Moldovenesc; Forests; H, Cosm.  
*A. distentifolium* Tausch ex Opiz; Rarău; Forests; H, Circ.  
*Cystopteris fragilis* (L.) Bernh.; Rarău, Runc, Prașca, Slătioara res., between Colbul hill and Doamnei stream; Forests, rocks; H, Cosm.  
*C. montana* (Lam.) Desv.; Rarău, Doamnei stream; Spruce forests, rocks; G, Circ.–arct.–alp.–euram.  
*C. sudetica* A. Br. et Milde; Câmpulung Moldovenesc; Spruce forests; G, Euras.  
*Dryopteris carthusiana* (Vill.) H. P. Fuchs; Rarău, Slătioara res.; Forests; H, Circ.  
*D. dilatata* (Hoffm.) A. Gray; Rarău, Bâta Neagră, Doamnei stream, Slătioara res.; Forests; H, Circ.  
*D. filix-mas* (L.) Schott; Rarău, Runc, Măgura, Câmpulung Moldovenesc, Zimbrului stream, Slătioara res., Toance hill; Forests; H, Euras.  
*Gymnocarpium dryopteris* (L.) Newman; Rarău, Slătioara res., between Colbu hill and Doamnei stream; Forests; G, Circ.  
*G. robertianum* (Hoffm.) Newman; Rarău, Măgura, Doamnei stream, Slătioara res.; Forests, screes, rocks; G, Circ.  
*Matteuccia struthiopteris* (L.) Tod.; Moldova river valley; Along the river, on banks; H, Circ.  
*Phegopteris connectilis* (Michx.) Watt; Rarău; Forests; G, Circ.  
*Polystichum aculeatum* (L.) Roth; Rarău; Forests; H, Euras.  
*P. braunii* (Spenn.) Fée; Rarău, Slătioara res.; Forests; H, Circ.  
*P. lonchitis* (L.) Roth; Rarău, Doamnei stream, Slătioara res.; Rocks; H, Circ.  
*P. setiferum* (Forssk.) Woy.; Rarău; Pojorâta; Rocks; H, Cosm.  
*P. × illyricum* (Borbás) Hahne; Rarău; Rocks  
*P. × luerissenii* (Dörfl.) Hahne; Rarău; Rocks  
*Woodsia ilvensis* (L.) R. Br.; Rarău, Colbului valley; Rocks; H, Circ.–alp.

## PINOPHYTA

## PINACEAE

- Abies alba* Mill.; Rarău, Câmpulung Moldovenesc, Slătioara res., Runc, Măgura, Pojorâta, between Colbul hill and Doamnei stream; Forests; Ph, Centr. Eur.–mont.  
*Larix decidua* Mill. subsp. *carpatica* (Domin) Šiman (cult. ?); Slătioara res.; Forests; Ph, End. Carp.  
*Picea abies* (L.) Karst.; Rarău, Doamnei stream, Slătioara res., Câmpulung Moldovenesc, Pojorâta, between Colbul hill and Doamnei stream; Forests; Ph, Centr. - north eur.  
*Pinus mugo* Turra; Pietrele Doamnei; Bushes; Ph, Centr. eur. – mont.  
*P. sylvestris* L.; Pojorâta, on Adam and Eva, Slătioara res., Toance; Forests, rocks; Ph, Euras.

## CUPRESSACEAE

- Juniperus communis* L. var. *communis*; Slătioara res., Rarău, Pojorâta, Obcina Flocenilor; Forest edges; Ph, Circ.  
*J. sibirica* Lodd. in Burgsd.; Rarău, Doamnei stream, Muncel, Todirescu res.; Bushes; Ph, Arct.–alp.

## TAXACEAE

- Taxus baccata* L.; Câmpulung Moldovenesc, Moara Dracului, Slătioara res. along the “Ion” stream, Rarău, on northern slope; Bushes; Ph, Atl.–Medit.–centr. eur./Protected species as a “Nature Monument” in Romania.

## MAGNOLIOPHYTA

## MAGNOLIOPSIDA

## RANUNCULACEAE

- Aconitum anthora* L.; Rarău, Pojorâta, Doamnei stream, Zimbrului stream, Șoimul stream; Rocks; H, Euras.
- A. lasianthum* (Rchb.) Simonk.; Rarău; Meadows on rocks; H, West - centr. eur.
- A. lycoctonum* L. em. Koelle subsp. *moldavicum* (Hacq.) Jalas; Valea Seacă, Rarău, Adam; Forest edges, forests; H, Endemics in Carpathian Mts.
- A. napellus* L. subsp. *fissurae* (Nyár.) W. Setz (*A. romanicum* Wolf.); Pojorâta on Adam and Eva; Forest edges, forests; H, Centr.–east eur.
- A. napellus* L. subsp. *tauricum* (Wulfen) Gayer; Rarău, Doamnei stream, Colbul hill, Muncel; Rocky places; H, Centr.–east eur.
- A. toxicum* Rchb.; Rarău; Rocky places; H, Carp.–Balk.
- A. variegatum* L. subsp. *variegatum*; Rarău; Forest edges, rocky places; H, Alp.–carp.
- A. variegatum* L. subsp. *paniculatum* (Arcang.) Greuter et Burdet; Slătioara res., Câmpulung Moldovenesc, Rarău, Pietrele Doamnei; Meadows, rocky places; H, Alp.–carp.
- A. × abnormae* Grinț.; Pojorâta, between Adam and Eva; Forest edges
- Actaea spicata* L.; Slătioara res., Rarău; Forests; G, Euras.
- Anemone narcissifolia* L. subsp. *narcissifolia*; Rarău, Doamnei stream, Zimbrului stream, Todirescu res.; Meadows; G, Circ.–arct.–alp.
- A. nemorosa* L.; Slătioara res., Rarău; Forests, forest edges; G, Circ.
- A. ranunculoides* L.; Slătioara res., Câmpulung Moldovenesc; Forests, forest edges; G, Eur.
- Aquilegia nigricans* Baumg. subsp. *nigricans*; Rarău, Doamnei stream, Eva, Todirescu res.; Meadows, forest edges, rocky places; H, Eur.
- A. nigricans* Baumg. subsp. *subscaposa* (Borbás) Soó; Doamnei stream, Măgura; Rarău, Doamnei stream, Eva, Todirescu res.; Meadows, forest edges, rocky places; H, Dacic (Endemics for romanian carpathians)
- A. vulgaris* L.; Câmpulung Moldovenesc; Meadows; H, Eur.
- Caltha palustris* L.; Rarău, Slătioara res.; Marshes, along the streams; H, Circ.
- Cimicifuga europaea* Schipcz.; Rarău; Forests; G, Euras. cont.
- Clematis alpina* (L.) Mill.; Rarău, Zimbrului stream, Izvorul Alb, Slătioara res.; Forests, rocky places; Ph, Euras.–arct.–alp. eur.
- Consolida regalis* Gray subsp. *regalis*; Pojorâta, Valea Seacă, Câmpulung Moldovenesc; Along the fences, segetal places; T, Eur.
- Delphinium elatum* L. subsp. *elatum*; Valea Seacă; Meadows; H, Euras.
- Helleborus purpurascens* Waldst. et Kit.; Pojorâta, Rarău; Forests; H, Carp.–balk.–pan.
- Hepatica nobilis* Schreb.; Rarău, Izvorul Alb, Sadova; Forests; H, Circ.
- H. transsilvanica* Fuss; Pojorâta on Adam and Eva; Forests; H, Endemics for romanian carpathians/Tertiary relict species
- Isopyrum thalictroides* L.; Pojorâta, Câmpulung Moldovenesc, Slătioara res.; Forests; H, Centr. eur.
- Pulsatilla montana* (Hoppe) Rchb. subsp. *dacica* Rummelsp. (*P. montana* (Hoppe) Rchb. subsp. *jankae* (F. W. Schultz) Zămelis); Câmpulung Moldovenesc; Meadows; H, Centr. and South–east eur.
- Ranunculus acris* L. subsp. *acris*; Rarău, Bodea, Izvorul Alb, Hăgimiș; Wet meadows; H, Euras.
- R. auricomus* L.; Câmpulung Moldovenesc; Forests; H, Euras.
- R. carpaticus* Herbich; Doamnei stream, Slătioara res., Runc, Măgura, Rarău; Forests; H, Dacic
- R. ficaria* L. subsp. *calthifolius* (Rchb.) Arcang.; Șandru stream, Izvorul Alb, Valea Seacă; Forests; H, Centr. eur.
- R. lanuginosus* L.; Doamnei stream; Forest edges, bushes; H, Centr. eur.

- R. montanus* Willd. subsp. *pseudomontanus* (Schur) Beldie; Todirescu res., Rarău; Meadows; H, Carp.-Balk.
- R. serpens* Schrank subsp. *nemorosus* (DC.) G. López; Todirescu res., Rarău, Preluca, Bodea; Wet meadows; H, Eur.
- R. oreophilus* M. Bieb.; Doamnei stream; Meadows; H, Alp. eur.
- R. platanifolius* L.; Doamnei stream, Rarău, Muncel; Forest edges, rocky places; H, Eur.
- R. polyanthemus* L. subsp. *polyanthemoides* (Boreau) Ahlfv.; Rarău; Meadows; H, Eur.
- R. repens* L.; Rarău; Wet places, along the streams, marshes; H, Euras., North Afr.
- R. sardous* Crantz; Valea Seacă; Wet meadows; T, Euras.-Afr. (North)
- Thalictrum aquilegifolium* L.; Rarău, Câmpulung Moldovenesc, Slătioara res., between Colbul hill and Doamnei stream; Meadows, forest edges; H, Eur.
- Th. lucidum* L.; Izvorul Alb, Câmpulung Moldovenesc, Pojorâta; Wet meadows, marshes; H, Eur. cont.
- Th. minus* L. subsp. *minus*; Rarău, Todirescu res.; Meadows, rocky places; H, Euras. cont.
- Th. simplex* L. subsp. *simplex*; Câmpulung Moldovenesc; Wet meadows, bushes, along the streams; H, Euras. cont.
- Trollius europaeus* L. subsp. *europaeus*; Rarău, Izvorul Alb, Câmpulung Moldovenesc; Wet meadows; G, West and north eur.

## PAPAVERACEAE

*Chelidonium majus* L.; Rarău, Pojorâta, Câmpulung Moldovenesc; Ruderal places; H, Euras.

## FUMARIACEAE

- Corydalis capnoides* (L.) Pers; Câmpulung Moldovenesc, Runc, Măgura; Forests, screens; T-Ht, Euras.
- C. cava* (L.) Schweigg. et Körte subsp. *cava*; Slătioara res.; Forests; G, Centr. eur.
- C. cava* (L.) Schweigg. et Körte subsp. *marschalliana* (Pall.) Chater; Slătioara res.; Forests; G, Pont.-getic-taur.-balk.-anat.
- C. solida* (L.) Clairv. subsp. *solida*; Slătioara res., Câmpulung Moldovenesc; Forests; G, Eur.

## ULMACEAE

- Ulmus glabra* Huds.; Slătioara res.; Forests; Ph, Euras.
- U. laevis* Pall. (*U. effusa* Willd.); Moldova valley; Forests; Ph, Eur.
- U. minor* Mill. var. *minor* f. *suberosa* Henry; Câmpulung Moldovenesc; Forests; Ph, Eur.

## CANNABACEAE

*Humulus lupulus* L.; Câmpulung Moldovenesc; Bushes along the stream valleys; H, Euras., North Am.

## URTICACEAE

- Urtica dioica* L. subsp. *dioica*; Câmpulung Moldovenesc, Rarău, Pojorâta; Ruderal places; H, Cosm.
- U. urens* L.; Câmpulung Moldovenesc, Pojorâta; Ruderal places; T, Cosm.

## FAGACEAE

- Fagus sylvatica* L.; Slătioara res., Rarău, Izvorul Alb, Câmpulung Moldovenesc, between Colbul hill and Doamnei stream; Forests; Ph, Centr. eur. – atl.
- Quercus robur* L.; Câmpulung Moldovenesc (cult.?): Forests; Ph, Eur.

## BETULACEAE

- Alnus glutinosa* (L.) Gaertn.; Moldova river valley and subsequent valleys, Pojorâta; Along the rivers; Ph, Euras.
- A. × pubescens* Tausch (*A. glutinosa* × *incana*); Câmpulung Moldovenesc
- A. incana* (L.) Moench; Slătioara res., Rarău, Izvorul Alb, Câmpulung Moldovenesc, between Colbul hill and Doamnei stream; Along the rivers; Ph, Eur.

- A. viridis* (Chaix) DC.; Rarău; At the higher limit of the forests; Ph, Alp.–Eur.  
*Betula pubescens* Ehrh. subsp. *carpatica* (Willd.) Asch. et Graebn.; between Colbul hill and Doamnei stream; Acid, peaty places; Ph, Eur. arctic and mountainous regions, from Pyrenees to Carpathians  
*B. pendula* Roth; Rarău, Câmpulung Moldovenesc; Forests; Ph, Euras.

## CORYLACEAE

- Carpinus betulus* L.; Slătioara res., along the Moldova river valley, Câmpulung Moldovenesc (cult. ?), Bodea; Forests; Ph, Centr. eur.  
*Corylus avellana* L.; Câmpulung Moldovenesc, Rarău, Izvorul Alb, Slătioara res., Pojorâta; along the stream valleys; Ph, Eur.

## LORANTHACEAE

- Viscum laxum* Boiss. et Reuter subsp. *abietis* (Wiesb.) O. Schwarz.; Slătioara on Prihodiște; Parasitic on *Abies* and *Picea*; Ep, Centr. eur.–Medit.

## SANTALACEAE

- Thesium alpinum* L. (incl. *Th. tenuifolium* Saut. ex W. D. J. Koch); Zimbrului stream, Doamnei stream, Rarău, Todirescu res., pojorâta on Adam and Eva; Meadows; H, Eur. (mont.)  
*Th. kernerianum* Simonk.; Pietrele Doamnei [47]; Rocky places; G-H, Dacic/Endemics in romanian flora

## CARYOPHYLLACEAE

- Arenaria biflora* L.; Rarău; on screes and snow beds; Ch, Euras.–arct.–alp. eur.  
*A. serpyllifolia* L.; Pietrele Doamnei, Rarău, Câmpulung Moldovenesc; Xero-mesophyllous meadows; T, Circ.  
*Cerastium arvense* L. subsp. *arvense*; Popii Rarăului; Rocky places; Ch, Circ.  
*C. fontanum* Baumg. subsp. *lucorum* (Schur) Soó; Rarău; Rocky places; Ch-H, Euras.  
*C. holosteoides* Fries; Rarău; Rocky places; Ch-H, Euras.  
*C. lichenfeldianum* Schur; Câmpulung Moldovenesc; Rocks, screes; Ch, Subendemics (Eastern & Southern Carpathians Mts., Jugoslavie)  
*C. sylvaticum* Waldst. et Kit.; Slătioara res., Rarău; Wet places, forest edges; H (T), Centr. eur.-Submedit.  
*Dianthus armeria* L. subsp. *armeria*; Diacul, Preluca, Măgura; Meadows; T, Eur.  
*D. barbatus* L. subsp. *compactus* (Kit.) Heuff.; Rarău, Pietrele Doamnei, Muncel, Pârâul Limpede, Preluca; Wet meadows; Ch, Alp.–carp.–Balk.  
*D. carthusianorum* L. subsp. *carthusianorum*; Pojorâta on Adam and Eva, Zimbrului stream, Rarău, Colbul hill, Pietrele Doamnei, Muncel, Todirescu res., Câmpulung Moldovenesc, Pojorâta; ± Dry meadows; H, Eur.  
*D. deltoides* L.; Izvorul Alb, Valea Seacă, Câmpulung Moldovenesc; Wet meadows; Ch, Euras.  
*D. spiculifolius* Schur; Șoimului Rock, Pietrele Doamnei, Rarău; Limestone rocks; H (Ch), Endemics on romanian carpathians  
*D. superbus* L. subsp. *superbus*; Sadova, Rarău; Wet meadows; H, Euras.  
*D. tenuifolius* Schur; Rarău, Pietrele Doamnei Colbu hill, Șoimului Rock; Meadows; H, Subendemics (Carpathians)  
*D. × bucovinensis* Prodan; Izvorul Alb; Meadows  
*Gypsophila petraea* (Baumg.) Rchb.; Rarău, at Pietrele Doamnei; on limestone rocks; Ch, Carp.–Balk.  
*Herniaria glabra* L.; Moldova valley, Câmpulung Moldovenesc; Wet sandy places; T-H, Euras.  
*Lychnis coronaria* (L.) Desr.; Câmpulung Moldovenesc; Forest edges, forest clearings; H, Medit. (cult.)  
*L. flos-cuculi* L.; Câmpulung Moldovenesc, Slătioara, Izvorul Alb; Wet meadows, marshes; H, Euras.  
*L. viscaria* L. subsp. *viscaria*; Câmpulung Moldovenesc, Piciorul Scurt; Meadows, rocky places; H, Euras.  
*Myosoton aquaticum* (L.) Moench; Câmpulung Moldovenesc; Wet meadows; H, Euras.

- Minuartia setacea* (Thuill.) Hayek subsp. *setacea*; Rarău, Rarău ridge, Slătioara res.; Rocky places; Ch, Centr. eur.–balk.–pont.
- M. verna* (L.) Hiern. subsp. *verna*; Rarău, Pietrele Doamnei; Rocky places; Ch, Circ.(mont.)
- M. verna* (L.) Hiern. subsp. *collina* (Neilr.) Domin; Rarău, Popii Rarăului; Rocky places; Ch, Centr. eur.
- Moehringia muscosa* L.; Rarău, Slătioara res.; Meadows, wet places, forests; H, Centr. eur.
- M. trinervia* (L.) Clairv.; Câmpulung Moldovenesc, Todirescu res.; Forests, forest edges; T-H, Euras.
- Sagina procumbens* L.; Slătioara res.; Meadows, rocky places, ruderal places; H (Ch), Circ.
- S. saginoides* (L.) H. Karst.; Rarău, Pietrele Doamnei; Rocky meadows, rocky places; H (Ch), Circ.–arct.–alp.
- Saponaria officinalis* L.; Moldova valley, Câmpulung Moldovenesc; River banks, forest glades; H, Euras.
- Scleranthus annuus* L. subsp. *annuus*; Rarău; Dry meadows, rocky places; T, Euras.
- S. uncinatus* Schur; Cojoci, Rarău; Dry meadows, rocky places; T, Carp.–balk.–cauc.–anat.
- Silene armeria* L.; Rarău; Rocky places, screes; T-Ht, Centr. eur.
- ? *S. chlorantha* (Willd.) Ehrh.; Rarău, Pojorâta; Meadows, rocky meadows; H, Euras. cont. [30]
- S. dioica* (L.) Clairv.; Câmpulung Moldovenesc, Slătioara res., Rarău, Izvorul Alb; Forests, forest edges, wet meadows; H, Euras.
- S. italica* (L.) Pers. subsp. *italica*; Rarău; Meadows, rocks; Ht-H, Medit.
- S. noctiflora* L.; Câmpulung Moldovenesc; Bushes, forest edges, ruderal places; T, Euras.
- S. nutans* L. subsp. *nutans*; Câmpulung Moldovenesc, Rarău; ± Dry meadows; H, Euras.
- S. nutans* L. subsp. *dubia* (Herbich) Zapał. (*S. dubia* Herbich); Pietrele Doamnei, Rarău, Muncel, Todirescu res., Pojorâta on Adam and Eva, Colbul stream, Măgura, Bodea, Doamnei stream; Wet or dry meadows, rocks, rocky meadows; H, Endemics in romanian carpathians
- S. pusilla* Waldst. et Kit. subsp. *pusilla*; Doamnei stream; Rocky and wet places, along the streams; Ch, Alp.–Eur.
- S. vulgaris* (Moench) Garcke subsp. *vulgaris*; Rarău, Pietrele Doamnei; Wet meadows; H, Euras.
- S. zawadzki* Herbich (*Melandrium zawadzki* (Herbich) A. Braun); Pietrele Doamnei, Rarău, Zimbrului rock, Slătioara res.; Limestone rocks; Ch, Endemics in Eastern Carpathians
- Stellaria graminea* L.; Rarău, Izvorul Alb; Wet meadows; H, Euras.
- S. holostea* L.; Câmpulung Moldovenesc, Rarău; Forests, bushes; H, Euras.
- S. media* (L.) Vill.; Rarău; ± Wet ruderal and segetal places; T-Ht, Cosm.
- S. nemorum* L.; Rarău, Câmpulung Moldovenesc; Forests, forest edges, forest glades; H, Eur.
- S. uliginosa* Murray (*S. alsine* Grimm., nom. inval.); Rarău, Pietrele Doamnei; Wet places, along the streams, wet meadows; H, Circ.

#### AMARANTHACEAE

- Amaranthus albus* L.; Pojorâta, Câmpulung Moldovenesc; Ruderal and segetal places; T, Adv. (North Am.)
- A. blitoides* S. Watson subsp. *blitoides*; Câmpulung Moldovenesc; Ruderal and segetal places; T, Adv. (South part of North Am.)
- A. cruentus* L.; Câmpulung Moldovenesc; Ruderal places; Adv. (Centr. Am.)
- A. hypochondriacus* L.; Câmpulung Moldovenesc; Ruderal places; T, Adv. (North Am.)
- A. retroflexus* L.; Câmpulung Moldovenesc; Ruderal and segetal places; T, Adv. (North Am.)

#### CHENOPODIACEAE:

- Atriplex patula* L.; Câmpulung Moldovenesc; Ruderal and segetal places; T, Circ.
- A. tatarica* L.; Câmpulung Moldovenesc; Ruderal places; T, Euras.
- Chenopodium album* L.; Câmpulung Moldovenesc; Ruderal and segetal places; T, Cosm.
- Ch. bonus-henricus* L.; Rarău, Câmpulung Moldovenesc; Ruderal meadows; H, Eur.
- Ch. foliosum* (Moench) Asch.; Bistrița valley, Valea Seacă, Pietrele Doamnei, Rarău; Ruderal places; T, Adv. (Medit.)

- Ch. glaucum* L. f. *wolffii* (Simonk.) Negrean et Dihoru; Câmpulung Moldovenesc; Ruderal and segetal places; T, Adv. (? South Am.)
- Ch. opulifolium* Schrad. ex W. D. J. Koch et Ziz; Câmpulung Moldovenesc; Ruderal and segetal places, forest clearings, on sandy soils; T, Centr. Eur., South-West of Asia, Afr., North Am.

## ARISTOLOCHIACEAE

*Asarum europaeum* L.; Rarău, Slătioara res., Runc, Măgura; Forests; H, Euras.

## POLYGONACEAE

- Fallopia convolvulus* (L.) Á. Löve; Câmpulung Moldovenesc; Ruderal and segetal places; T, Circ.
- Polygonum aviculare* L.; Câmpulung Moldovenesc; Ruderal and segetal places; T, Cosm.
- P. bistorta* L.; Rarău, Izvorul Alb; Wet meadows, marshes; G, Euras.
- P. hydropiper* L.; Câmpulung Moldovenesc; Ruderal places, flooded places, marshes; T, Circ.
- P. persicaria* L.; Câmpulung Moldovenesc; Ruderal places, flooded places, marshes; T, Cosm.
- P. viviparum* L.; Pietrele Doamnei, Rarău Summit; Limestone meadows; G, Circ.–arct.–alp.
- Rumex acetosa* L.; Câmpulung Moldovenesc; Dry meadows; H, Cosm.
- R. acetosella* L. subsp. *acetosella*; Rarău; Dry or wet meadows; H, Centr. and north–west eur.
- ? *R. acetosella* L. subsp. *acetoselloides* (Balansa) den Nijs; Runc; Dry or wet meadows; South-east eur.
- R. alpestris* Jacq.; “Părete” Rarău; Meadows, weeds, bushes, forest clearings; H, Euras. (mont.)
- R. alpinus* L.; Rarău, Pietrele Doamnei; Ruderal places; H, Alp.–eur.
- R. confertus* Willd.; Câmpulung Moldovenesc, Sadova, Deia; Ruderal places and meadows; H, Euras. cont.
- R. conglomeratus* Murray; Rarău; Ruderal and wet places; H, Circ.
- R. crispus* L.; Rarău; Ruderal and wet places; H, Euras.
- R. obtusifolius* L. subsp. *obtusifolius*; Rarău; Wet places, wet meadows; H, Centr. and west eur.
- R. obtusifolius* L. subsp. *subalpinus* (Schur) Čelak.; Todirescu res.; Wet meadows; H, Carp.–Balk.
- R. obtusifolius* L. subsp. *transiens* (Simonk.) Rech. fil.; Pietrele Doamnei; Wet and rocky meadows; H, Centr. eur.
- R. patientia* L. subsp. *patientia*; Pojorâta, Valea Seacă, Câmpulung Moldovenesc; Ruderal and segetal places; H, Euras. cont.
- R. scutatus* L.; Pietrele Doamnei; Limestone screes; H, Alp. Eur.

## GROSSULARIACEAE

- Ribes alpinum* L.; Slătioara res., Rarău, between Colbul hill and Pietrele Doamnei; Forests, forest edges, rocky places; Ph, Eur. (mont.)
- R. aureum* Pursh (cult. and subspons.); Câmpulung Moldovenesc; Ph, North Am.
- R. nigrum* L.; Câmpulung Moldovenesc; Forests, along the rivers, marshes, bushes; Ph, Euras./Glacial relict into Romanian flora (Mititelu *et al.*, 1989)
- R. petraeum* Wulfen; Rarău; Forests, bushes, eutrophic marshes; Ph, Alp.–eur.
- R. rubrum* L. s. str.; Câmpulung Moldovenesc; Forests, bushes, along the rivers, marshes; Ph, West Eur.
- R. uva-crispa* L. (*R. grossularia* L.) subsp. *uva-crispa*; Slătioara res., Rarău, Câmpulung Moldovenesc, Pojorâta; Forests, forest edges; Ph, Eur.

## CRASSULACEAE

- Jovibarba globifera* (L.) J. Parn. subsp. *globifera*; Zimbrului Rock, Rarău; Rocky places; Ch, Carp.
- J. heuffelii* (Schott) Á. Löve et D. Löve; Rarău; on limestone rocks; Ch, Carp.–Balk. (Dacic)
- Rhodiola rosea* L.; Rarău; Meadows, on limestone rocks and screes; H, Circ.–arct.–alp.–euram.
- Sedum acre* L.; Rarău; Rocky places; H, Euras.
- S. annuum* L.; Pojorâta; Rocky places; T–Ht, Euras.–arct.–alp.–Eur.
- S. atratum* L.; Rarău, Gemenea; Rocks, screes, stony soils, windy places; T, Alp.–eur.
- S. hispanicum* L.; Colbul, Pojorâta; Rocks, rocky places; T–Ht, South – east eur. (naturalized in North eur.)
- S. telephium* L. subsp. *maximum* (L.) Krock.; Pojorâta on Eva Mt.; Forests, rocky places; H, Eur.

*S. telephium* L. subsp. *fabaria* (W. D. J. Koch) Kirschl. (*S. fabaria* W. D. J. Koch); Rarău; Rocky places; H, West and Centr. eur. (mont.)

#### SAXIFRAGACEAE

*Chrysosplenium alternifolium* L.; Câmpulung Moldovenesc, Slătioara res., Rarău, Todirescu res., Pietrele Doamnei; Forests, forest edges, stream valleys, wet places; H, Circ.

*Parnassia palustris* L.; Câmpulung Moldovenesc, Izvorul Alb, Rarău, Pietrele Doamnei, Slătioara res., Todirescu res., Pojorâta; Marshes, wet meadows; H, Circ.

*Saxifraga adscendens* L. subsp. *adscendens*; Pietrele Doamnei, Piatra Zimbrului, Rarău; Stony places, wet rocks; Ht, Circ. arct.–alp.–euram.

*S. androsacea* L.; Rarău; Rocks, screes; Ch, Euras. alp.

*S. aizoides* L.; Popii Rarăului, Șoimului Rock; Rocks, screes, stony soils, near springs and along the streams; Ch, Euras. arct.–alp.–eur.

*S. corymbosa* Boiss.; Pietrele Doamnei, Rarău; Limestone rocks; Ch, Carp.–Balk.

*S. oppositifolia* L. subsp. *oppositifolia*; Pietrele Doamnei, Rarău; Limestone rocks; H, Circ.–arct.–alp.

? *S. oppositifolia* L. subsp. *rudolphiana* (Hornsch.) Engl. et Irmsch.; Colbul hill; Limestone rocks; Alp.–carp. (this taxa must be confirmed by herbarium material) [30]

*S. paniculata* Mill.; Pietrele Doamnei, Rarău, Zimbrului Rock, Slătioara res.; Limestone rocks; Ch, Euras. arct.–alp.–eur.

*S. rotundifolia* L. subsp. *heucherifolia* (Griseb. et Schrenk.) Engl. et Irmsch. (*S. heucherifolia* Griseb. et Schrenk.); Between Colbul hill and Pietrele Doamnei; Wet valleys, wet meadows; H, Centr. eur. (mont.)

#### ROSACEAE

*Agrimonia eupatoria* L. subsp. *eupatoria*; Câmpulung Moldovenesc; Meadows, road sides; H, Euras.

? *Alchemilla acutidens* Buser; Todirescu res., Rarău; Wet meadows; H, Orig. ? [17]

*A. glaucescens* Wallr.; Rarău; Wet meadows; H, Eur. (mont.)

*A. monticola* Opiz; Rarău, Pietrele Albe, Bodea; Wet meadows, weeds, forest edges; H, Euras.

*A. vulgaris* L. em. Fröhner; Rarău, Pietrele Doamnei, Izvorul Alb; Wet meadows; H, Eur.

*A. xanthochlora* Rothm.; Valea Seacă, Rarău; Wet meadows, weeds, forest edges; H, Eur.

*Aruncus dioicus* (Walter) Fernald; Rarău; Forests, along the streams; H, Euras. (mont.)

*Cerasus avium* (L.) Moench; Pojorâta; Forests; Ph, Submedit.

*Cotoneaster integerrimus* Medik.; Pietrele Doamnei, Pojorâta, Slătioara res., Rarău, Câmpulung Moldovenesc; Rocky places, forest edges, stony soils; Ph, Euras. cont.

*C. niger* (Thunb.) Fr. (*C. melanocarpus* G. Lodd. ex C. K. Schneid.); Pojorâta on Adam and Eva, Rarău, Câmpulung Moldovenesc; Rocky places, forest edges, stony soils; Ph, Euras. cont. (mont.)

*Crataegus monogyna* Jacq. subsp. *monogyna*; Moldova valley, Câmpulung Moldovenesc; Forests, bushes; Ph, Euras.

*Dryas octopetala* L.; Pietrele Doamnei, Zimbrului Rock, Todirescu res., Rarău; Rocks, rocky places rocky meadows; Ch, Circ.–arct.–alp.

*Filipendula ulmaria* (L.) Maxim. subsp. *ulmaria*; Câmpulung Moldovenesc, Rarău, Pojorâta; Wet places, marshes, wet valleys; H, Euras.

*F. vulgaris* Moench; Rarău, Câmpulung Moldovenesc; Dry meadows; H, Euras.

*Fragaria vesca* L.; Câmpulung Moldovenesc, Pojorâta; Forest clearings, meadows; H, Euras.

*F. viridis* Duchesne subsp. *viridis*; Câmpulung Moldovenesc, Pojorâta, Rarău; ± Dry meadows; H, Euras.

*Geum aleppicum* Jacq.; Valea Seacă; Ruderal places, bushes, forest edges; H, Circ.

*G. montanum* L.; between Colbul hill and Pietrele Doamnei, Rarău; Meadows; H, Alp.–eur.

*G. rivale* L.; Rarău; Wet places, marshes; H, Circ.

*G. urbanum* L.; Rarău, Câmpulung Moldovenesc; Forests, ruderal places; Circ.

*G. × intermedium* Ehrh.; Pojorâta; Wet places

*Malus sylvestris* Mill.; Piciorul Scurt, Rarău, Moldova valley; Forest edges; Ph, Eur.

- Prunus padus* L. subsp. *padus*; Câmpulung Moldovenesc, Pojorâta; Forests, bushes, forest edges and clearings; Ph, Euras.
- Potentilla anserina* L. subsp. *anserina*; Câmpulung Moldovenesc, Izvorul Alb; Road sides, ruderal places, stream valleys; H, Cosm.
- P. argentea* L.; Rarău, Pojorâta on Adam and Eva Mts., Câmpulung Moldovenesc; Dry meadows; H, Euras.
- P. aurea* L.; Muncel, Pietrele Doamnei, Rarău, Todirescu res., Zimbrului Rock; Meadows; H, Alp.–Eur.
- P. chrysantha* Trev.; Deia; Meadows, bushes; H, Pont.–Balk.
- P. cinerea* Chaix ex Vill.; Rarău, Bodea; Dry meadows; H, Eur.
- P. erecta* (L.) Rausch.; Rarău, Slătioara res., Izvorul Alb; Wet meadows, peat bogs; H, Euras.
- P. inclinata* Vill.; Pojorâta, Pojorâta on Adam and Eva; Limestone rocks; H, Centr. eur.
- P. norvegica* L.; Câmpulung Moldovenesc, Pojorâta; Wet meadows, temporary wet meadows, ruderal meadows; T-H, Circ.bor.
- P. recta* L. subsp. *recta*; Câmpulung Moldovenesc, Pojorâta, Pojorâta along the “Pârâul Cailor”; ± Dry meadows; H, Cont. euras.
- P. reptans* L.; Valea Seacă, Câmpulung Moldovenesc; ± Wet meadows; H, Euras.
- P. ternata* K. Koch; Rarău, Pietrele Doamnei; Meadows; Balk., South–east carpathians
- P. thuringiaca* Bernh. ex Link; Rarău, Pojorâta on Adam, Câmpulung Moldovenesc, Măgura, Deia, Bodea; Rocky meadows; H, Centr. eur.
- P. × okensis* Petunn.; Deia; ± Dry meadows
- Prunus spinosa* L. subsp. *spinosa*; Valea Seacă; Bushes, dry meadows, forest edges; Ph, Eur.
- Pyrus pyraeaster* Burgsd.; Moldova valley; Forest edges; Ph, Eur.
- Rosa canina* L. subsp. *canina*; Moldova valley, Pojorâta, Măgura; Bushes, meadows; Ph, Eur.
- R. pendulina* L.; Câmpulung Moldovenesc, Rarău, Pietrele Doamnei; Forests, forest edges, screes; Ph, Centr. eur. (mont.)
- R. villosa* L. subsp. *villosa* (*R. pomifera* J. Hermann; *R. villosa* L. subsp. *pomifera* (J. Hermann) Hook. fil.; *R. mollis* Buia, non Sm.); Pojorâta on Muncel Mt.; Forest edges; Ph, Eur.
- Rubus caesius* L.; Slătioara res., Moldova valley, Rarău; Along the stream valleys; Ph, Eur.
- R. hirtus* Waldst. et Kit.; Slătioara res., Rarău, Câmpulung Moldovenesc; Forests; Ph, Centr. and west Eur., Crimea, Caucasus
- R. idaeus* L.; Câmpulung Moldovenesc, Slătioara res., Rarău, Pojorâta, between Colbul hill and Pietrele Doamnei; Forest clearings; Ph, Circ.
- R. koehleri* Weihe et Nees subsp. *koehleri*; Pojorâta; Forest edges, bushes; Ph, Centr. and West eur.
- R. plicatus* Weihe et Nees; Câmpulung Moldovenesc; Forest clearings; Ph, Centr. and North-West eur.
- R. saxatilis* L.; Câmpulung Moldovenesc, Rarău, Pojorâta on Eva, Slătioara res.; On limeston rocks; Ph, Euras.
- Sanguisorba officinalis* L.; Rarău; Wet meadows; H, Circ.
- S. minor* Scop. subsp. *minor* (*S. vulgaris* Hill); Rarău; Dry meadows; H, Euras.
- Sorbus aucuparia* L. subsp. *aucuparia*; Pietrele Doamnei, Rarău, Pojorâta on Adam, Slătioara res., between Colbu hill and Pietrele Doamnei, Câmpulung Moldovenesc; Forests, forest clearings; Ph, Eur.
- S. austriaca* (Beck) Prain et al. subsp. *austriaca*; Câmpulung Moldovenesc (cult. ?); Ph, Alp.–Carp.–Balk.
- S. torminalis* (L.) Crantz; Măgura, Preluca; Rocky places, limestone rocks; Ph, Centr. eur.
- Spiraea chamaedryfolia* L.; Izvorul Alb, Rarău, Pojorâta on Adam and Eva Mts., rez. Slătioara, between Colbul hill and Pietrele Doamnei, Câmpulung Moldovenesc; Rocky places in forests; Ph, Euras.

#### FABACEAE

- Anthyllis vulneraria* L. subsp. *vulneraria*; Pojorâta pe Eva, Todirescu res., Rarău, Izvorul Alb, Bodea; Dry meadows; H, Atl.
- A. vulneraria* L. subsp. *alpestris* (Hegetschw.) Asch. et Graebn.; Todirescu res., Pojorâta on Adam and Eva Mts., Rarău, Zimbrului Rock, Pietrele Doamnei; Rocky meadows; H, Alp.–carp.–balk.



- A. vulneraria* L. subsp. *polyphylla* (DC.) Nyman; Bodea; Dry meadows; H, Eur. cont.  
*Astragalus cicer* L.; Rarău, Măgura; Meadows, forest edges; H, Euras.  
*A. glycyphyllos* L.; Izvorul Alb, Valea Seacă, Câmpulung Moldovenesc; Bushes, forests; H, Euras.-Submedit.  
*A. onobrychis* L. subsp. *onobrychis*; Rarău; Dry meadows; H, Cont. euras.  
*Chamaecytisus supinus* (L.) Link; Pojorâta; Ph, Centr. and South-East eur. [17]  
*Coronilla elegans* Pančić; Pojorâta; Bushes, forest edges; H, Carp.-Balk.  
*C. varia* L.; Măgura, Mărcușan Summit, Runc; Meadows; H, Centr. eur.-Submedit.  
*Cytisus nigricans* L.; Câmpulung Moldovenesc; Rocky places; Ph, Centr. and south-east eur.  
*Dorycnium pentaphyllum* Scop. subsp. *herbaceum* (Vill.) Rouy; Rarău; Dry meadows; Ch, Centr. and south-east eur.  
*Genista tinctoria* L. subsp. *tinctoria*; Pojorâta, Câmpulung Moldovenesc, Izvorul Alb, Valea Seacă; Dry meadows; Ch, Eur. & South-west Asia  
*Lathyrus aureus* (Steven) Brândză; Pojorâta; shadow places, bushes, forests; H, Pont.  
*L. laevigatus* (Waldst. et Kit.) Gren.; Izvorul Alb; Wet meadows; H, Centr. and east eur.  
*L. pratensis* L.; Rarău, Câmpulung Moldovenesc, Măgura, Todirescu res.; Wet meadows, marshes; H, Euras.  
*L. vernus* (L.) Bernh.; Slătioara res., Rarău, Șoimului Rock; Forests, forest edges; G, Euras.  
*Lotus corniculatus* L.; Todirescu res., Rarău, Pietrele Doamnei, Izvorul Alb, Popii Rarăului, Bodea; Wet or dry meadows; H, Euras.  
*Medicago falcata* L.; Rarău; Dry meadows; H, Euras.  
*M. lupulina* L.; Pojorâta, Rarău, Bodea; Dry meadows; T-H, Euras.  
*Melilotus alba* Medik.; Câmpulung Moldovenesc; Valleys, rocky places; Ht, Euras.  
*M. officinalis* (L.) Pall.; Caselor stream, Izvorul Alb; Meadows, bushes, ruderal places; Ht, Euras.  
*Onobrychis viciifolia* Scop.; Rarău; Dry meadows; H, Euras.  
*Ononis arvensis* L. subsp. *arvensis*; Câmpulung Moldovenesc, Pojorâta, Runc; Wet meadows; H, Cont. euras.  
*Trifolium alpestre* L.; Rarău, Todirescu res.; Wet meadows; H, Centr. and south-east eur.  
*T. aureum* Pollich; Chiril, Pojorâta stream, Valea Seacă; Meadows, bushes, forest edges; T-Ht, Eur.  
*T. campestre* Schreb.; Rarău, Câmpulung Moldovenesc, Măgura; Wet meadows; T, Eur.  
*T. dubium* Sibth. (*T. minus* Sm.; *T. filiforme* auct.); Rarău; Meadows; T, Eur.  
*T. hybridum* L. subsp. *hybridum*; Câmpulung Moldovenesc, Slătioara res.; Wet places along the walleys; H, Atl. – Eur.  
*T. medium* L. subsp. *medium*; Câmpulung Moldovenesc, Rarău, Slătioara res., Bodea; Wet meadows; H, Euras.  
*T. medium* L. subsp. *banaticum* (Heuff.) Hendrych; Rarău; meadows, bushes; H, Pan.  
*T. montanum* L.; Câmpulung Moldovenesc, Rarău, Slătioara-Prihodiște; Dry or wet meadows; H, Euras. cont.  
*T. ochroleucon* Huds.; Izvorul Alb, Diac, Valea Seacă; Meadows, bushes; H, Centr. eur.  
*T. pannonicum* Jacq.; Câmpulung Moldovenesc, Rarău, Slătioara-Prihodiște, Bodea, Măgura; Dry or wet meadows; H, Pont.-Medit.  
*T. pratense* L. subsp. *pratense*; Rarău; Wet meadows; H, Euras.  
*T. pratense* L. subsp. *nivale* (Koch) Cesati; Muncel, Popii Rarăului; Meadows, bushes, forest edges; H, Alp.-Eur.  
*T. repens* L. subsp. *repens*; Rarău, Pietrele Doamnei, Pojorâta, Slătioara res., Izvorul Alb; Wet and dry meadows; H, Euras.  
*Vicia cracca* L.; Rarău, Băta Hohenilor, Bodea, Todirescu res.; Wet and dry meadows; H, Euras.  
*V. sativa* L. subsp. *sativa*; Rarău; Wet meadows; T, Medit.  
*V. sativa* L. subsp. *cordata*; Rarău, Slătioara res.; Wet meadows; T, Medit.  
*V. sepium* L.; Rarău, Todirescu res.; Forests, wet meadows; H, Euras.  
*V. sylvatica* L.; Câmpulung Moldovenesc, Rarău, Pietrele Doamnei; Forests, forest edges; H, Euras.  
*V. tenuifolia* Roth (*V. elegans* Guss.); Valea Seacă; Meadows, bushes, forest edges; H, Euras.

## LYTHRACEAE

*Lythrum salicaria* L.; Rarău; Marshes, wet meadows; H, Circ.

*L. virgatum* L.; Sadova; Marshes, wet meadows, stream banks; H, Euras. cont.

## ONAGRACEAE

*Circaea alpina* L.; Rarău, Pietrele Doamnei, Slătioara res.; Forests; G, Circ.

*C. lutetiana* L.; Slătioara res., Rarău; Forests; G, Euras.–Medit.

*C. × intermedia* Ehrh.; Izvorul Alb; Forests; G, Eur.–Medit.

*Epilobium alpestre* (Jacq.) Krock.; Rarău; weeds, bushes of *Pinus mugo*, wet and shadow places; H, Alp. eur.

*E. alsinifolium* Vill.; Rarău; sporadically, from spruce to subalpine belts of vegetation, along the streams; H, Arct.–alp.–eur. [17]

*E. angustifolium* L. (*Chamaenerion angustifolium* (L.) Scop.); Câmpulung Moldovenesc, Rarău, between Colbul hill and Pietrele Doamnei, Rarău Monastery; Forests clearings; H, Circ.

*E. collinum* C. C. Gmel.; Câmpulung Moldovenesc, Pietrele Doamnei, Bodea, Valea Seacă; Forests, forests clearings, rocks, screes; H, Eur.

*E. dodonaei* Vill.; Pojorâta; Rocky places, sandy places, screes, alluvia; H, Centr. Eur.–Submedit.

*E. hirsutum* L.; Slătioara res., Rarău; Wet places, marshes, stream banks; H, Euras.

*E. × montaniforme* Knaf; Câmpulung Moldovenesc uphill of „Moara Dracului”; Wet places

*E. montanum* L.; Câmpulung Moldovenesc, Pojorâta, Izvorul Alb; Wet places, meadows, forests; H, Euras.

*E. obscurum* Schreb.; Rarău; wet places, springs, streams; H, Eur.

*E. palustre* L.; Rarău, Sadova, Slătioara res., Câmpulung Moldovenesc, Izvorul Alb; Wet places; H, Circ.

*E. parviflorum* Schreb.; Câmpulung Moldovenesc; Wet places; H, Euras.

*E. roseum* Schreb.; Câmpulung Moldovenesc; Wet places; H, Euras.

*Oenothera biennis* L.; Câmpulung Moldovenesc; Along the valleys on alluvia, railways embankments; Ht, Adv. (North Am.)

## HALORAGACEAE

*Myriophyllum spicatum* L.; Sadova; Still waters or slowly running waters; H, Circ.

## THYMELEACEAE

*Daphne cneorum* L.; Slătioara res. – Pârâul lui Ion „La Lătoace”; Forest clearings, meadows, rocky places, bushes; Ph, Circ.

*D. mezereum* L.; Rarău, Slătioara res., Câmpulung Moldovenesc, Pietrele Doamnei, Izvorul Alb; Forests, forest edges; Ph, Euras.

## EUPHORBIACEAE

*Euphorbia amygdaloides* L.; Câmpulung Moldovenesc, Runc, Măgura, Slătioara res., Rarău, Pietrele Doamnei, between Colbul hill and Pietrele Doamnei; Forests, forest clearings; Centr. eur.-subatl.-Submedit.

*E. carniolica* Jacq.; Rarău, Pietrele Doamnei; Forests; H, Alp.–carp.–Balk.

*E. cyparissias* L.; Câmpulung Moldovenesc, Izvorul Alb; Ruderal places; H, Euras.

*E. helioscopia* L.; Câmpulung Moldovenesc; Ruderal places; T, Euras.

*E. platyphyllos* L.; Câmpulung Moldovenesc, Pojorâta; Ruderal places; T, Centr. eur.

*Mercurialis perennis* L.; Câmpulung Moldovenesc, Runc, Măgura, Pojorâta on Adam, Slătioara res.; Forests; G (H), Eur.

## CELASTRACEAE

*Euonymus europaeus* L.; Izvorul Alb, Valea Seacă, Câmpulung Moldovenesc, Moldova valley; Forests, forest edges, bushes; Ph, Eur.

*E. verrucosus* Scop.; Câmpulung Moldovenesc, Măgura; Forests, forest edges, bushes; Ph, South-east eur.

## RHAMNACEAE

*Frangula alnus* Mill.; Slătioara res.; Wet meadows, along the stream banks, marshes, bushes; Ph, Euras.

## TILIACEAE

*Tilia cordata* Mill.; Bistrița valley, Chiril stream, Câmpulung Moldovenesc; Forests, forest edges; Ph, Eur.

*T. platyphyllos* Scop. subsp. *platyphyllos*; Câmpulung Moldovenesc; Forests; Ph, Centr. eur.

## MALVACEAE

*Malva sylvestris* L.; Pojorâta, Câmpulung Moldovenesc; Ruderal places; Ht-H, Euras.

*M. pusilla* Sm.; Câmpulung Moldovenesc; Railway embankments; T, Euras.

*M. neglecta* Wallr. (*Malva rotundifolia* auct. plur., non L.); Câmpulung Moldovenesc; Ruderal places; T, Euras.

*M. verticillata* L. var. *crispa* L.; Câmpulung Moldovenesc; Spontaneous on ruderal places; T-Ht, East Asia

## ACERACEAE

*Acer campestre* L. subsp. *campestre*; Câmpulung Moldovenesc; Forest edges; Ph, Eur.

*A. platanoides* L.; Chiril, Câmpulung Moldovenesc, Slătioara res., Rarău; Forests; Ph, Eur.

*A. pseudoplatanus* L.; Slătioara res., Rarău, Câmpulung Moldovenesc, Pojorâta, between Colbul hill and Pietrele Doamnei, Izvorul Alb, Chiril; Forests; Ph, Centr. eur.

## OXALIDACEAE

*Oxalis acetosella* L.; Slătioara res., Câmpulung Moldovenesc, Rarău, Pietrele Doamnei, Izvorul Alb; Forests; H (G), Circ.

## GERANIACEAE

*Erodium cicutarium* (L.) L'Hér.; Valea Seacă, Câmpulung Moldovenesc; Ruderal places; T, Cosm.

*Geranium columbinum* L.; Pojorâta; forest clearings, bushes, meadows; T, Euras. [17]

*G. palustre* L.; Rarău, Slătioara res.; Marshes; H, Euras. cont.

*G. phaeum* L.; Rarău, Câmpulung Moldovenesc, Slătioara res.; Forests; H, Centr. eur.

*G. pratense* L.; Câmpulung Moldovenesc, Runc; Meadows, forest edges, forest clearings; H, Euras. cont.

*G. robertianum* L.; Rarău, Slătioara res.; Forest, forest clearings, weeds; T-Ht, Cosm.

*G. pusillum* L.; Câmpulung Moldovenesc; Ruderal places; H, Eur.

*G. sylvaticum* L.; Pietrele Doamnei, Rarău, Slătioara res., Todirescu res.; Wet meadows, weeds; H, Euras. mont.

## BALSAMINACEAE

*Impatiens noli-tangere* L.; Câmpulung Moldovenesc; Forests, forest edges, wet places; T, Euras.

## LINACEAE

*Linum catharticum* L. subsp. *catharticum*; Rarău, Câmpulung Moldovenesc, Izvorul Alb, between Colbul hill and Pietrele Doamnei; Dry and wet meadows; T-H, Eur.

*L. austriacum* L.; Câmpulung Moldovenesc; Railway embankments; H, Euras.

## POLYGALACEAE

*Polygala amara* L. subsp. *amara*; Câmpulung Moldovenesc, Muncel, Rarău, Izvorul Alb, Todirescu res.; Wet meadows; H (Ch), West Carpathians - East Alps

*P. amarella* Crantz; Rarău; Wet meadows, marshes, along the streams; H (Ch), Eur. (mont.)

- P. comosa* Schkuhr; Valea Seacă, Rarău, Todirescu res., Bodea; Meadows; H, Eur.  
*P. vulgaris* L. subsp. *vulgaris*; Rarău, Pojorâta pe Eva, Valea Seacă; Wet meadows, bushes; H (Ch), Eur.  
*P. vulgaris* L. subsp. *oxyptera* (Rchb.) Lange; Todirescu res.; Meadows, bushes; H (Ch), Subatl.–centr. eur.

## ARALIACEAE

- Hedera helix* L.; Rarău, Caselor stream; Forests, shadowed places, along the stream banks; Ph, Atl.–Medit.

## APIACEAE

- Aegopodium podagraria* L.; Runc, Măgura, Rarău; Forests, weeds, wet places; H (G), Euras.  
*Aethusa cynapium* L. subsp. *cynapium*; Câmpulung Moldovenesc; Bushes, ruderal and segetal places; T, Euras.  
*Angelica sylvestris* L. subsp. *montana* (Brot.) Arcang.; Rarău, Câmpulung Moldovenesc, Slătioara stream; Forests, forest edges, along the valleys, on wet places; Ht-H, Alp. eur.  
*Anthriscus sylvestris* (L.) Hoffm.; Câmpulung Moldovenesc, Bistrița valley; Forests, meadows, along the valleys; Ht-H, Euras.  
*Astrantia major* L. subsp. *major*; Rarău, Slătioara res., Izvorul Alb; Wet meadows; H, Centr. Eur. (mont.)  
*Bupleurum longifolium* L. subsp. *vapincense* (Vill.) Jáv.; Rarău, Pietrele Doamnei, Muncel; Forest edges, bushes, meadows on rocks; H, Euras. (mont.) [17]  
*B. ranunculoides* L.; Rarău, Todirescu res., Popii Rarăului; Alpine and subalpine meadows, on rocky and sunny slopes; H, Alp.–Eur. [17]  
*B. falcatum* L. subsp. *falcatum*; Pojorâta, Pojorâta on Eva, Runc, Rarău, Muncel; Meadows, on skeletal soils; H, Alp.–Eur.  
*B. falcatum* L. subsp. *cernuum* (Ten.) Arcang.; Câmpulung Moldovenesc; Meadows on steep slopes; H, Carp.–Balk.  
*Carum carvi* L.; Rarău, Câmpulung Moldovenesc, Izvorul Alb, Pojorâta, Todirescu res., Slătioara res., Muncel; Wet meadows; Ht–H, Euras.  
*Chaerophyllum aromaticum* L.; Rarău; Weeds, along the stream valleys, ruderal places; H, Centr. Eur.  
*Ch. aureum* L.; Rarău, Todirescu res.; Wet meadows, marshes; H, Centr. and south Eur.  
*Ch. hirsutum* L.; Rarău, Pietrele Doamnei, Todirescu res., Zimbrului Rock; Weeds, wet meadows; H, Centr. Eur. (mont.)  
*Conium maculatum* L.; Câmpulung Moldovenesc, Pojorâta; Ruderal places; T-Ht, Euras.  
*Daucus carota* L. subsp. *carota*; Moldova valley; Dry meadows, ruderal places; Ht, Euras.  
*Eryngium planum* L.; Rarău; Dry meadows; H, Euras.  
*Heracleum carpaticum* Porcius; Rarău, Slătioara res.; Meadows on slopes; H, Dacic/Eur. endemics  
*H. sphondylium* L. subsp. *sphondylium*; Rarău, Pietrele Doamnei, Zimbrului Rock; Wet meadows, weeds; Ht–H, Euras.  
*H. sphondylium* L. subsp. *montanum* (Schleich. ex Gaudin) Briq.; Rarău; Wet meadows, weeds; Ht–H, Alp. Eur.  
*H. sphondylium* L. subsp. *sibiricum* (L.) Simonk. (*H. flavescens* Willd.); Rarău; Wet meadows, weeds; Ht–H, Eur.  
*Laser trilobum* (L.) Borkh.; Câmpulung Moldovenesc; Forests, forest edges, forest clearings, bushes; H, South–east Eur.  
*Laserpitium latifolium* L.; Todirescu res., Rarău; Wet meadows, on skeletal soils; H, Eur. (mont.)  
*Ligusticum mutellina* (L.) Crantz; Pietrele Doamnei; Rocky meadows; H, Alp.-eur.  
*Pastinaca sativa* L. subsp. *sylvestris* (Mill.) Rouy et E. G. Camus (*Pastinaca sylvestris* Mill.); Rarău; Wet meadows; Ht, Centr.–West Eur.  
*Peucedanum palustre* (L.) Moench; Bodea, Sadova; Wet places along the valleys; Ht–H, Euras.  
*Pimpinella major* (L.) Huds. var. *major*; Rarău, Câmpulung Moldovenesc, Pietrele Doamnei, Pojorâta, Bodea; Wet meadows; H, Eur.

- P. saxifraga* L. subsp. *saxifraga*; Rarău, Măgura, Bodea, Runc; Dry meadows; H, Euras. (Submedit.)  
*Pleurospermum austriacum* (L.) Hoffm.; Muncel, Slătioara res.; Forest edges, bushes, weeds, along the streams; Ht–H, Centr. Eur. (mont.)  
*Sanicula europaea* L.; Rarău, Runc, Măgura, Slătioara res.; Forests; H, Euras.  
*Seseli annuum* L.; Rarău, Măgura; Dry meadows; Ht–H, Eur. cont.  
*S. libanotis* (L.) W. D. J. Koch (*Libanotis montana* Crantz subsp. *libanotis*); Pietrele Doamnei, Măgura, Pojorâta on Adam and Eva, Slătioara res., Rarău, Bistrița valley, Rarău Summit, Pietrele Albe; Rocks, herbaceous rocky slopes; Ht–H, Euras. cont.  
*Torilis japonica* (Houtt.) DC. (*T. rubella* Moench, *T. anthriscus* (L.) C. C. Gmel., non Gaertn.); Rarău; Ruderal and segetal places; T, Euras.

## HYPERICAEAE

- Hypericum hirsutum* L.; Rarău; Frequently, from low to high altitudes, on meadows; H, Euras.  
*H. maculatum* Crantz subsp. *maculatum*; Rarău; Frequently, from low to high altitudes, on meadows; H, Euras.  
*H. montanum* L.; Rarău; Frequently, from low to high altitudes, on meadows and rocky places; H, Eur.  
*H. perforatum* L.; Pojorâta; Sporadically, at low altitudes, on meadows; H, Euras.  
*H. richeri* Vill. subsp. *grisebachii* (Boiss.) Nyman; Rarău; Rare, from middle to high altitudes, on meadows, bushes, rocks, and weeds; H, Alp.–carp.–balk.

## VIOLACEAE

- Viola alpina* Jacq.; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on limestone rocks; H, Alp.–Carp.  
*V. ambigua* Waldst. et Kit.; Rarău; Rare, from low to middle altitudes, on rocky places and sunny meadows; H, Pont.–pan.  
*V. biflora* L.; Rarău, at Pietrele Doamnei, Slătioara reserve; Sporadically, at high altitudes, on rocky places, limestones, wet and shadowed places; H, Circ.  
*V. collina* Besser; Rarău, at Câmpulung Moldovenesc; Rare, from low to middle altitudes, on meadows; H, Euras.  
*V. declinata* Waldst. et Kit.; Rarău, at Pietra Zimbrului, Pietrele Doamnei, Todirescu res., and Izvorul Alb; Sporadically, from low to high altitudes, on wet meadows; H, Carp.–Balk.  
*V. hirta* L.; Rarău, incl. Bodea; Sporadically, from low to middle altitudes, on meso-xerophylous meadows; H, Euras.  
*V. joóii* Janka; Rarău; Rare, from low to middle altitudes, on rocky places and limestone screes; H, Subendemics (Romania, Ukraine)  
*V. odorata* L.; Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on gardens and river meadows; H, Atl. – Medit.  
*V. reichenbachiana* Jordan ex Boreau; Rarău, in Slătioara reserve, Runc, Măgura; Frequently, from low to high altitudes, on forests, forest edges, and bushes; H, Euras.  
*V. tricolor* L. subsp. *tricolor*; Rarău, incl. Câmpulung Moldovenesc; Rare, at low altitudes, on meadows; T-H, Euras.  
*V. tricolor* L. subsp. *subalpina* Gaudin var. *polychroma* (A. Kern.) Gams; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on limestone rocks; T-H, Eur. (mont.)

## BRASSICACEAE

- Alliaria petiolata* (M. Bieb.) Cavara et Grande; Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on bushes and weeds; Ht-H, Euras.  
*Alyssum alyssoides* (L.) L.; Rarău, at Pojorâta, Câmpulung Moldovenesc, Măgura; Rare, at low altitudes, on dry meadows; T-Ht, Euras. cont.  
*A. montanum* L. subsp. *montanum*; Rarău, at Pojorâta on Eva Mt.; Rare, at middle altitudes, on limestone rocks; H, Centr. eur.–Medit. (Orophyte)  
*A. petraeum* Ard.; Rarău, at Pojorâta; Rare, at middle altitudes, on limestone rocks; H, Carp.–Balk.  
*A. repens* Baumg. subsp. *repens*; Rarău; Limestone rocks; Ch, Carp.–Balk.

- A. saxatile* L. (*Aurinia saxatilis* (L.) Desv.) subsp. *saxatile*; Rarău, incl. Pojorâta on Adam Mt.; Rare, at middle and high altitudes, on limestone rocks; Ch, Cont. Eur.
- Arabis alpina* L.; Rarău, at Piatra Zimbrului, Pietrele Doamnei, and Izvorul Alb; Rare, at middle and high altitudes, on rocks and wet places; H, Euras. arct.–alp.–eur.
- A. glabra* (L.) Bernh.; Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on rocks; Ht, Circ.
- A. hirsuta* (L.) Scop.; Rarău, between Colbul hill and Doamnei stream; Rare, at middle altitudes, on ± dry meadows and rocks; Ht-H, Euras. Medit.
- A. planisiliqua* (Pers.) Rchb.; Rarău; on limestone rocks; Ht, Eur.
- A. sagittata* (Bertol.) DC. subsp. *sagittata* (Bertol.) Rchb.; Rarău, at Piatra Șoimului; Rare, at middle altitudes, on rocks; Ht-H, Centr. Eur.–Medit.
- A. sagittata* (Bertol.) DC. subsp. *hornungiana* (Schur) Asenov; Rarău, in Todirescu reserve; Rare, at middle and high altitudes, on rocks; Ht-H, Carp. - North Balk.
- A. soyeri* Reut. et A. Huet subsp. *subcoriacea* (Gren.) Breistr. (*A. soyeri* Reut. et A. Huet subsp. *jacquinii* (Beck) B. M. G. Jones); Rarău, at Pietrele Doamnei; Rare, at high altitudes, on rocks; Ch (H), Pirinees
- Armoracia rusticana* P. Gaertn., B. Meyer et Scherb.; Rarău, at Câmpulung Moldovenesc and Pojorâta; Rare, at low altitudes, on ± wet meadows; H (G), Adv. (South-east Eur., West Asia)
- Barbarea vulgaris* R. Br. subsp. *vulgaris*; Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on ± wet meadows; Ht-H, Euras.
- Berteroa incana* (L.) DC.; Rarău, along the Moldova river valley; Rare, at low altitudes, on dry meadows; T–Ht, Euras.
- Biscutella laevigata* L. subsp. *laevigata*; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on limestone rocks and screes; H, Centr. Eur. (mont.)
- Bunias orientalis* L.; Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on ruderal places; Ht–H, Euras. cont.
- Camelina alyssum* (Mill.) Thell.; Rarău, at Pojorâta; Rare, at low altitudes, on ruderal places; T, Euras. cont.
- Capsella bursa-pastoris* (L.) Medik.; Rarău, at Izvorul Alb and Câmpulung Moldovenesc; Rare, at low altitudes, on ruderal places; T–Ht, Cosm.
- Cardamine amara* L. subsp. *amara*; Rarău; Sporadically, at low altitudes, on forests, forest edges, and in wet places; H, Euras.
- C. amara* L. subsp. *opicii* (J. Presl et C. Presl) Čelak.; Rarău, at Izvorul Alb; Sporadically, at low altitudes, on forests, forest edges, and in wet places; H, Centr. Eur. (mont.)
- C. bulbifera* (L.) Crantz; Rarău; Sporadically, at low altitudes, on beech forests and mixed forests; G, Centr. Eur.
- C. enneaphyllos* (L.) Crantz; Rarău, at Câmpulung Moldovenesc; Cult.?.; G, Centr. Eur.
- C. flexuosa* With.; Rarău, at Runc, Măgura - Câmpulung Moldovenesc; Rare, at low altitudes, on wet places; T–Ht, Euras.
- C. hirsuta* L.; Rarău, at Bodea and Izvorul Alb; Sporadically, at low altitudes, on forests and ± wet places; T–Ht, Euras.
- C. glanduligera* O. Schwarz; Rarău, at Pietrele Doamnei; Sporadically, at low altitudes, on forests; G, Endemics in Carpathian Mts.
- C. impatiens* L.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on forests; Ht, Euras.
- C. pratensis* L. subsp. *pratensis*; Rarău; Wet places; H, Circ.
- C. pratensis* L. subsp. *matthioli* (Moretti) Nyman; Rarău (more or less common); Sporadically, at low altitudes, on wet places; H, Eur.
- C. pratensis* L. subsp. *rivularis* (Schur) Nyman; Rarău; More or less common, at middle altitudes, on wet places; H, Alp.–carp.–Balk.
- Cardaminopsis arenosa* (L.) Hayek subsp. *arenosa*; Rarău, incl. Pietrele Doamnei; Sporadically, from low to high altitudes, on limestone rocks and dry meadows; T-Ht, Centr. Eur.

- C. halleri* (L.) Hayek subsp. *halleri*; Rarău, at Pietrele Doamnei and in Slătioara res.; More or less common, from middle to high altitudes, on ± wet meadows; H, Centr. Eur.
- C. halleri* (L.) Hayek subsp. *ovirensis* (Wulfen) Hegi et Em. Schmid; Rarău; Common from low to high altitudes, on wet meadows; H, Alp.–carp.–balk.
- Cardaria draba* (L.) Desv.; Rarău; Sporadically, at low altitudes, on ruderal places; H, Euras.-Medit.
- Descurainia sophia* (L.) Webb ex Prantl (*Sisymbrium sophia* L.); Rarău; Sporadically, at low altitudes, on ruderal places; T–Ht, Euras.
- Diplotaxis muralis* (L.) DC.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on ruderal places; T–Ht, Centr. Eur.–Medit.
- Draba muralis* L.; Pojorâta; Meadows; T–Ht, Eur.–North Afr.–Anat.–Cauc.
- D. siliquosa* M. Bieb. (*D. carinthiaca* Hoppe); Rarău; Sporadically, at high altitudes, on limestone rocks; Ch, Pyr., Alpi, Carp., Balk., Cauc., North-West Anat. (Iran)
- D. nemorosa* L.; Rarău, at Pojorâta and Câmpulung Moldovenesc; Sporadically, at low altitudes, on dry meadows; T, Circ.
- Erophila verna* (L.) Chevall. subsp. *verna*; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on ruderal places; T, Eur.
- Erysimum odoratum* Ehrh. (*E. pannonicum* var. *pannonicum* Crantz); Rarău, at Valea Seacă and Câmpulung Moldovenesc; Very rare, at low altitudes, on dry meadows, bushes, and forest edges; Ht, Pont.
- E. witmannii* Zaw. subsp. *witmannii*; Rarău, at Pietrele Doamnei, in Todirescu res., Pojorâta on Eva Mt., Slătioara res., Piatra Zimbrului; More or less common, at middle and high altitudes, on limestone rocks; Ht, Endemics in Eastern Carp.
- E. witmannii* Zaw. subsp. *transilvanicum* (Schur) P. W. Ball; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on limestone rocks; Ht, Endemics in Eastern & Southern Carp.
- Hesperis matronalis* L. subsp. *candida* (Kit.) Hegi et Em. Schmid; Rarău; Rare, at middle altitudes, on bushes, forest edges, meadows, and along the valleys; Ht–H, Centr. Eur. (mont.)
- H. matronalis* L. subsp. *moniliformis* (Schur) Borza; Rarău; Sporadically, at middle and high altitudes, on limestone rocks, meadows, and on steep slopes; Ht–H, Endemics in Eastern & Southern Carp.
- Isatis tinctoria* L. subsp. *tinctoria*; Rarău; dry meadows; Ht–H, Euras. cont.
- Kerneria saxatilis* (L.) Rchb.; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on limestone rocks; H, Alp.–Eur.
- Lepidium campestre* (L.) R. Br.; Rarău, at Câmpulung Moldovenesc, along the Moldova river valley; Sporadically, at low altitudes, on ruderal and segetal places and meadows; T–Ht, Eur.
- Lunaria rediviva* L.; Rarău, at Bodea, Pietrele Albe and Cascadele Muncelului Rarăului; Sporadically, at middle altitudes, on forests; H, Eur.
- Rorippa sylvestris* (L.) Besser subsp. *sylvestris*; Rarău; Sporadically at low and middle altitudes, on ± wet places; H, Euras.
- R. palustris* (L.) Besser; Rarău, at Izvorul Alb and along the Moldova river valley; Sporadically at low and middle altitudes, on wet places; T–Ht, Cosm.
- R. × barbareaoides* (Tausch) Čelak. (*R. sylvestris* subsp. *sylvestris* × *R. palustris*); Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, on wet places; T–Ht
- Sinapis arvensis* L. var. *arvensis*; Rarău, at Câmpulung Moldovenesc on Măgura; Sporadically, at low altitudes, on ruderal places and along the roads and railways; T, Euras.
- Sisymbrium officinale* (L.) Scop.; Rarău, at Valea Seacă, Câmpulung Moldovenesc, and Pojorâta; Sporadically, at low altitudes, on ruderal places; T–Ht, Euras.
- Thlaspi arvense* L.; Rarău; Sporadically, at low altitudes, on ruderal places; T–Ht, Euras.
- Th. kovatsii* Heuff.; Rarău; Sporadically, at middle altitudes, on dry meadows; H, Carp.–Balk.

## CISTACEAE

- Helianthemum nummularium* (L.) Mill. subsp. *nummularium*; Rarău, in Todirescu res., Pojorâta, and Câmpulung Moldovenesc; Sporadically, at middle and low altitudes, on meadows, bushes, and grassy rocks; Ch, Eur.
- H. nummularium* (L.) Mill. subsp. *obscurum* (Čelak.) Holub; Rarău, at Câmpulung Moldovenesc, Pojorâta, and Pietrele Doamnei; Sporadically, from low to high altitudes, on dry and limestone places; Ch, Centr. Eur.
- H. oelandicum* (L.) DC. subsp. *alpestre* (Jacq.) Breistr.; Rarău, at Pietrele Doamnei, Rarău Summit, Todirescu res., Popii Rarăului, and Muncel; Sporadically, at middle and high altitudes, on rocky and dry meadows; Ch, Alp.–Eur.
- H. oelandicum* (L.) DC. subsp. *rupifragum* (A. Kern.) Breistr.; Rarău, at Pietrele Doamnei and Rarău Summit; Sporadically, at high altitudes, on rocky and dry meadows; Ch, Centr. - East Eur. (mont.)

## TAMARICACEAE

- Myricaria germanica* (L.) Desv.; Rarău, at Pojorâta and Câmpulung Moldovenesc; Sporadically, at low altitudes, along the great river valleys; Ph, Eur., South–West Asia

## SALICACEAE

- Populus tremula* L.; Rarău, at Pojorâta and Câmpulung Moldovenesc; Sporadically, at low and middle altitudes, on forests; Ph, Euras.
- Salix alba* L.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, along the great river valleys; Ph, Euras.
- S. aurita* L.; Rarău, at Bodea and Runc; Rare, at middle altitudes, on wet places; Ph, Eur.
- S. bicolor* Willd.; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on bushes and wet places; Ph, Alp.-West and Centr. Eur./Endemic Eur.
- S. caprea* L.; Rarău, incl. Câmpulung Moldovenesc, between Colbul hill and Pietrele Doamnei, and Izvorul Alb; Frequently, from low to high altitudes, on forests and forest clearings; Ph, Euras.
- S. cinerea* L.; Rarău, incl. in Slătioara res., Bodea, Măgura; Sporadically, from low to middle altitudes, along the river valleys; Ph, Euras.
- S. daphnoides* Vill.; Rarău, at Bodea; Very rare, at low altitudes, on river shingles; Ph, Centr. Eur./Endemics Eur.
- S. elaeagnos* Scop.; Rarău; Sporadically, at low altitudes, along the river valleys; Ph, Centr. Eur.
- S. fragilis* L.; Rarău, at Câmpulung Moldovenesc and Pojorâta; Sporadically, at low altitudes, along the river valleys; Ph, Euras.
- S. kitaibeliana* Willd.; Rarău, in Slătioara res.; Rare, at low and middle altitudes, in meadows on rocky substrate; Ph, Endemics into Carpathian Mts.
- S. pentandra* L.; Rarău, at Izvorul Alb, Slătioara res., Limpede stream, Bodea, below the Rarău Summit; Sporadically, from low to high altitudes, along the river valleys; Ph, Euras.
- S. purpurea* L. subsp. *purpurea*; Rarău, at Câmpulung Moldovenesc, Izvorul Alb, Bodea, Pojorâta, Runc, Măgura; Common, at low and middle altitudes, along the river valleys; Ph, Euras.
- S. silesiaca* Willd.; Rarău, at Pietrele Doamnei, Slătioara res., between Colbul hill and Pietrele Doamnei, Câmpulung Moldovenesc; Common, at low and middle altitudes, on forests, forest clearings and rocks; Ph, Carp.–Balk.–Sudety
- S. starkeana* Willd. (*S. livida* Wahlenb.); Rarău, on Șandru stream, Bodea, Măgura – at the origin of Mesteacăn stream; Very rare, at low and middle altitudes, in marshes and eutrophic bogs; Ph, Circ.bor./Glacial relict into the romanian flora/the world southern limit in Romania
- S. triandra* L. subsp. *triandra*; Rarău, at Câmpulung Moldovenesc - near Bunești bridge (planted here maybe); Rare, at low altitudes, on riversides, and river banks; Ph, Euras.
- S. viminalis* L.; Rarău, at Câmpulung Moldovenesc, Izvorul Giupalău, below the Rarău Summit, Sadova (planted here maybe); Sporadically, at low altitudes, along the river valleys; Ph, Euras.
- S. × smithiana* Willd. (*S. caprea* × *S. viminalis*); Rarău, along the Deia stream; Rare, at low altitudes, along the river valleys; Ph



- S. × rubens* Schrank (*S. alba* × *S. fragilis*); Rarău, at Câmpulung Moldovenesc; Rare, at low altitudes, along the river valleys; Ph
- S. × subaurita* Andersson (*S. aurita* × *S. silesiaca*); Bodea; Rare, at low altitudes, along the river valleys; Ph
- S. × subcaprea* Andersson (*S. caprea* × *S. silesiaca*); Pietrele Doamnei, between Colbul hill and Pietrele Doamnei; Rare, at middle and high altitudes; Ph

## ERICACEAE

- Vaccinium myrtillus* L.; Rarău, at Câmpulung Moldovenesc, Slătioara res., between Colbul hill and Pietrele Doamnei, Pojorâta; Common, from low to high altitudes, on forests, forests clearings, bushes, and meadows; Ch (Ph), Circ.
- V. oxycoccus* L. (*Oxycoccus quadripetalus* Braun-Blanq., *O. palustris* Pers.); Rarău, in Slătioara res. (sporadically); Rare, from middle to high altitudes, on oligotrophic peat-bogs; Ch, Circ.bor./ Relict species into the romanian flora
- V. uliginosum* L. subsp. *uliginosum*; Rarău, in Slătioara res.; Sporadically, from middle to high altitudes, on forests clearings; Ch (Ph), Circ.bor.
- V. vitis-idaea* L.; Rarău, in Slătioara res., Pojorâta, between Colbul hill and Pietrele Doamnei; Common, from low to high altitudes, on forests, forests clearings, bushes, and meadows; Ch (Ph), Circ.

## EMPETRACEAE

- ? *Empetrum nigrum* L. subsp. *hermaphroditum* (Hagerup) Böcher; Rarău, at Pietrele Doamnei; Rare, at high altitudes, on meadows, bushes, and peat-bogs; Ch (Ph), Circ.–arct.–alp./Glacial relict species into the romanian flora [30]

## PYROLACEAE

- Moneses uniflora* (L.) A. Gray; Rarău, in Slătioara res., Runc, Măgura, Todirescu res., Muncel, Pietrele Doamnei, Pojorâta; Sporadically, from low to middle altitudes, on forests; H (G), Circ.
- Orthilia secunda* (L.) House; Rarău, Pojorâta on Eva Mt., Slătioara res.; Sporadically, from low to middle altitudes, on forests; Ch, Circ.
- Pyrola minor* L.; Rarău, at Runc, Măgura, and in Slătioara res.; Sporadically, from low to middle altitudes, on forests; H, Circ.
- P. rotundifolia* L.; Rarău, at Câmpulung Moldovenesc; Sporadically, from low to middle altitudes, on forests; H, Circ.

## MONOTROPACEAE

- Monotropa hypopitys* L. subsp. *hypopitys*; Rarău, at Caselor stream, Izvorul Malului, Bâta Lesă, and in Slătioara res.; Rare, from low to middle altitudes, on forests; G, Circ.
- M. hypopitys* L. subsp. *hypophegea* (Wallr.) Holmboe; Rarău, at Pojorâta on Adam and Eva Mts.; Rare, from low to middle altitudes, on forests; G, Eur.

## PRIMULACEAE

- Androsace lactea* L.; Rarău, at Pietrele Doamnei; Sporadically, at high altitudes, on limestone rocks and screes; H, Alp.–Eur.
- A. villosa* L. subsp. *arachnoidea* (Schott, Nyman et Kotschy) Nyman; Rarău, at Pietrele Doamnei; Sporadically, at high altitudes, on limestone rocks and screes; Ch, End. in Romanian Carpathians.
- Cortusa matthioli* L.; Rarău, at Pietrele Doamnei, Slătioara res., between Colbul hill and Pietrele Doamnei, Câmpulung Moldovenesc – Gura Flocii; Sporadically, from low to high altitudes, on wet rocks and shadowed forests; H, Euras. mont.
- Lysimachia punctata* L.; Rarău, at Sadova; Sporadically, at low altitudes, on forests, bushes, river banks and marshes; H, Centr. & South–east Eur.

- L. vulgaris* L.; Rarău, in Todirescu res., Șandru stream; Sporadically, at middle altitudes, on wet places; H, Euras.
- ? *L. thyrsoflora* L.; Cited from Rarău, at Valea Caselor [30] but not yet identified by us; Wet places; H, Circ.bor./Glacial relict species into the romanian flora.
- Primula elatior* (L.) L. subsp. *leucophylla* (Pax) H. Harison ex W. W. Sm. et Fletcher; Rarău, at Pietrele Doamnei, Todirescu res., Bodea, Colbul hill, Deia valley; Frequently, from low to high altitudes, in meadows on calcicolous substrate; H, Endemics of Eastern Carpathians.
- P. halleri* J. F. Gmel.; Rarău; meadows; H, Alp.–Eur.
- P. veris* L. subsp. *veris*; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on forest edges and meadows; H, Euras.
- P. veris* L. subsp. *columnae* (Ten.) Lüdi (*P. columnae* Ten.); Rarău, at Piatra Zimbrului; Rare, at middle altitudes, on forest edges and meadows; H, Médit.
- Soldanella major* (Neilr.) Vierh.; Rarău, at Pietrele Doamnei, Slătioara res.; Sporadically, at high altitudes, on forests; H, East Alps & Southern Carpathians.
- S. marmarossiensis* Klášť.; Rarău, at Pietrele Doamnei; Sporadically, at high altitudes, on forests; H, Earstern Carp., Ukraine, Tatra Mountains.

## MENYANTHACEAE

- Menyanthes trifoliata* L.; Rarău; Rare, at low altitudes, on marshes; H, Circ.

## GENTIANACEAE

- Centaurium erythraea* Rafn subsp. *erythraea* (*C. umbellatum* auct.); Rarău, at Pojorâta; Rare, at low and middle altitudes, on forest clearings and meadows; T–Ht, Centr. Eur.
- C. pulchellum* (Sw.) Druce; Rarău, at Pojorâta; Rare, at low and middle altitudes, on wet meadows (sometimes salty meadows), gravels, stream banks; T–Ht, Euras.
- Gentiana acaulis* L. (*G. excisa* C. Presl; *G. kochiana* E. P. Perrier et Songeon); Rarău, at Pietrele Doamnei, Todirescu res., Pojorâta; Rare, at middle and high altitudes, on meadows; H, Alp.–Eur.
- G. asclepiadea* L.; Rarău, at Pojorâta on Adam Mt., Mărcușan, and Bodea; Sporadically, from low to middle altitudes, on meadows and forest edges; H, Centr. Eur. (mont.)
- G. clusii* E. P. Perrier et Songeon (*G. acaulis* pro parte); Rarău, at Pietrele Doamnei; Rare, at high altitudes, on meadows and rocks; H, Alp.–carp.
- G. cruciata* L.; Rarău, on Limpede stream and Pojorâta on Eva Mt.; Rare, at middle altitudes, on ± dry meadows, calcicolous; H, Euras.
- G. nivalis* L.; Rarău; Rare, at high altitudes, in meadows, on skeletal soils; T, Circ.–arct.–alp.–euram.
- G. pneumonanthe* L.; Rarău; Rare, at low altitudes, on dry to wet meadows; H, Euras.
- G. punctata* L.; Rarău; on bushes of *Pinus mugo* and *Alnus viridis*; H, Alp.–Eur.
- G. utriculosa* L.; Rarău, at Izvorul Alb; Rare, at high altitudes, on wet meadows; T, Alp.–Eur.
- Gentianella austriaca* (A. Kern. et Jos. Kern.) Holub (*G. praecox* p. p.; *G. lutescens* p. p.); Rarău, at Câmpulung Moldovenesc, Pojorâta, Todirescu res., Preluca, Runc, and Pietrele Doamnei; Sporadically, from low to high altitudes, on meadows, calcicolous; Ht, Alp.–Carp.–Balk.
- ? *G. germanica* (Willd.) E. F. Warb.; Rarău, at the homonymous hermitage; Meadows; Ht, Centr. Eur. (mont.)
- G. praecox* (A. Kern. et Jos. Kern.) Dostál (*G. lutescens* (Velen) Holub.); Rarău; Sporadically, at middle altitudes, on meadows, calcicolous; Ht, Centr. and South–east Eur. (mont.)
- Gentianopsis ciliata* (L.) Ma (*Gentiana ciliata* L.; *Gentianella ciliata* (L.) Borkh.); Rarău, at Deia; Rare, at low altitudes, on mesophilic meadows; Ht–H, Centr. Eur.–Submedit.
- Swertia perennis* L. subsp. *alpestris* (Baumg.) Simonk.; Rarău, in Todirescu res.; Rare, at middle altitudes, on marshes; H, Alp. – Carp.
- S. perennis* L. subsp. *perennis*; Rarău, at Pietrele Doamnei and Todirescu res.; Rare, at middle and high altitudes, on marshes; H, Circ.– bor./Glacial relict into the romanian flora
- S. perennis* L. subsp. *punctata* (Baumg.) Ciocârlan; Rarău; marshy meadows; H, Carp.–Balk.

## ASCLEPIADACEAE

*Vincetoxicum hirundinaria* Medik.; Rarău; Sporadically, at low and middle altitudes, on dry and rocky places; H, Euras. cont.

## OLEACEAE

*Fraxinus excelsior* L.; Rarău, along the Moldova river valley; Sporadically, at low altitudes, on forests; Ph, Eur.

## SOLANACEAE

*Atropa bella-donna* L.; Rarău, at Bodea and Pojorâta; Sporadically, at low altitudes, on forests; H, Centr. Eur.–atl.–medit. (mont.)

*Datura stramonium* L.; Rarău, at Pojorâta; Sporadically, at low altitudes, on ruderal places; T, Adv. from North Am. (Cosm. nowadays)

*Hyoscyamus niger* L.; Rarău, at Pojorâta; Sporadically, at low altitudes, on ruderal places; Ht, Euras.

*Solanum dulcamara* L.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on forests; Ch, Euras.

## CONVOLVULACEAE

*Calystegia sepium* (L.) R. Br.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on wet meadows, marshes, bushes, forest edges, and reed thickets; G (H), Euras.

*Convolvulus arvensis* L.; Rarău, at Câmpulung Moldovenesc; Sporadically, at low altitudes, on ruderal places; G (H), Cosm.

## CUSCUTACEAE

*Cuscuta epithymum* (L.) L. subsp. *epithymum*; Rarău, at Preluca; Sporadically, at low altitudes, parasite on *Thymus pulegioides*; T (Vp), Euras.

*C. epithymum* (L.) L. subsp. *trifolii* (Bab.) Berher; Rarău, in Todirescu res.; Sporadically, at middle altitudes, parasite on *Teucrium montanum*, *Rhinanthus alecterolophus*, etc.; T (Vp), Euras.

*C. europaea* L. subsp. *europaea*; Rarău, at Bodea; Sporadically, at low altitudes, parasite on *Vicia cracca*; T (Vp), Euras.

## POLEMONIACEAE

*Polemonium caeruleum* L.; Rarău, at Izvorul Malului; Rare, at low altitudes, on wet meadows and forest edges; H, Circ./Glacial relict species into the romanian flora

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