

## FLORAL TREASURES IN FĂGĂRAȘ MASSIF (ARGEȘ COUNTY)

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**ABSTRACT:** Plants play a key role for the global natural inheritance, as an essential resource for life on Earth; consequently preserving the biodiversity has been the subject of several international meetings including a significant number of species in the international reference documents, too: The Global Red List, Directiva Habitate, The Convention from Berna, The Red List of superior plants in Romania. The floristic richness of the area is impressive; that's why this paper presents the categories of endangered plants in Făgăraș Massif (Argeș County). From studies 15 vulnerable species (VU) were identified.

**Key words:** vulnerable species, Făgăraș Massif.

**REZUMAT:** Comori floristice în Masivul Făgăraș (județul Argeș). Plantele joacă un rol-cheie pentru moștenirea naturală la nivel mondial, ca o resursă esențială pentru viața de pe Pământ; în consecință, conservarea biodiversității a fost subiectul mai multor reuniuni internaționale, ce au inclus un număr semnificativ de specii în documente internaționale de referință: Lista Roșie Globală, Directiva Habitate, Convenția de la Berna, Lista Roșie a plantelor superioare din România. Bogăția floristică a zonei este impresionantă; de aceea această lucrare prezintă categoriile de plante amenințate din Masivul Făgăraș (județul Argeș). Studiile au identificat 15 specii vulnerabile (VU).

**Cuvinte cheie:** specii vulnerabile, Masivul Făgăraș.

### INTRODUCTION

In a broad geographical sense, speaking about Făgăraș Massif we mean the entire mountain complex from the Southern Carpathians between the Olt river at the west and Dâmbovița river at the east. In this space, there are two almost parallel rows of mountains, one in the northern part named Făgăraș Massif and a southern one, formed from the mountain chain Cozia-Frunți-Ghițu, towards Iezer-Păpușa Mountain.

Făgăraș Mountains includes a great number of peaks and ridges with heights below 2000 meters to the extremities towards the Olt pass and the contact hollow of Dâmbovița de Sus. There are over 20 peaks higher than 2000 m, 12 of

which exceeding 2500 m (Negoiu, Lespezi, Vânătaea lui Buteanu, Viștea Mare, Moldoveanu, Dara, etc.).

The territory we are studying is included in the Site of community importance called Făgăraș Mountains (ROSCI0122) a protected area of 198512 ha and lies on the territory of Argeș, Brașov, Sibiu and Vâlcea.

The site is located in the Alpine biogeographical region. The habitats are very varied: grasslands, forests, subalpine shrubs and alpine meadows. The flora is well represented. There were recorded over 900 species of plants, the highest floristic diversity is observed in wet meadows - over 450 species.

The IUCN Red List of Threatened Species, founded in 1948, is the world's most comprehensive inventory of the global conservation status of plant and animal species. Species are classified in nine groups, set through criteria such as rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation.

- Extinct (EX) - plant species extinct, extinguished.
- Extinct in the Wild (EW) - species missing spontaneous, but kept in culture.
- Critically Endangered (CR) - species with extremely high risk of extinction in the near future state spontaneous.
- Endangered (EN) - species with very high risk of extinction in the near future spontaneous state.
- Vulnerable (VU) - species with high risk of extinction in the near future state spontaneous.
- Lower Risk (LC) - low risk of extinction.
- Data Deficient (DD) - deficient information on species.
- Not Evaluated (NE) - has not yet been evaluated against the criteria.
- Not Threatened (NT) - rare species, less threatened, but may enter in one of the categories above in future.

## MATERIAL AND METHOD

Knowing the presence of different vulnerable species in Făgăraș Mountains, after personal research in situ, after the determination of a significant number of floristic species and the processing of data taken from the specific literature on cormophyte monographs of Argeș mountains: Făgăraș (Alexiu, 2003, 2004, 2008, 2011; Pușcaru-Soroceanu & Pușcaru, 1971), Buda-Râiosu (Buia & Todor, 1943, 1948; Stancu, 2003, 2005) is possible to find further such species.

The establishment of the protected plants was made by using the following works: **Red List of extinct endangered, vulnerable and rare higher plants of Romania flora** “Lista roșie a plantelor vasculare dispărute, periclitare, vulnerabile și rare din flora României” (Boșcaiu et al., 1994), **Rare vulnerable and endemic plants of Romania flora – The Red List** “Plante rare, periclitare și endemice în flora României – lista roșie” (Dihoru & Dihoru, 1994), **The Red**

**List of higher plants of Romania flora “Lista roșie a plantelor superioare din România”** (Oltean et al., 1994), **Critical list of vascular plants in Romania “Lista critică a plantelor vasculare din România”** (Oprea, 2005), **Red book of vascular plants in Romania “Cartea Roșie a plantelor vasculare din Romania”** (Dihoru & Negrean, 2009), **Argeș county cormflora “Cormoflora județului Argeș”** (Alexiu, 2008), **Sozological categories of the Argeș county “Categoriile sozologice din cormoflora județului Argeș”** (Alexiu, 2011).

Floristic list includes:

- scientific name and author (**Flora Europaea** - <http://rbg-web2.rbge.org.uk/FE/fe.html> - and **The illustrated flora of Romania. Pteridophyta et Cormophyta “Flora ilustrată a României. Pteridophyta et Cormophyta**, Ciocârlan, 2009).
- synonyms;
- family;
- vernacular name (in Romanian);
- frequency in Romania;
- biological forms (Sanda et al., 2003; Ciocârlan, 2009; Cristea et. al., 2004): hemychryptophytes (H), therophytes (T), geophytes (G) and chamephytes (Ch);
- geographical distribution (Sanda et al., 2003; Ciocârlan, 2009; Cristea et. al., 2004): Adv = Adventitious, Atl-Med = Atlantic-Mediterranean, Circ = Circumboreal, Cosm = Cosmopolit, Eur = European, Euc = Central-European, Eua = Eurasian, Med = Mediterranean, Pont = Pontic;
- ecological affinity:
  - the humidity scale (Sanda et al., 2003): 1-1.5 = Xerophytes; 2-2.5 = Xeromesophytes; 3-3.5 = Mesophytes; 4-4.5 = Mesohygrophytes; 5-5.5 = Hygrophytes; 6 = Hydrophytes; 0 = Euryphytes;
  - the heat scale (Sanda et al., 2003): 1-1.5 = Cryophytes; 2-2.5 = Microthermophytes; 3-3.5 = Micro-mesothermophytes; 4-4.5 = Moderately-thermophytes; 5-5.5 = Thermophytes; 0 = Eurythermophytes;
  - the acidity scale (Sanda et al., 2003): 1 = High-acidophytes; 2 = Acidophytes; 3 = Acid-neutrophytes; 4 = Lean acid-neutrophytes; 5 = Neutro-alkalinophytes; 0 = Euryacidophytes;
- IUCN Category: Vulnerable (VU) - species with high risk of extinction in the near future state spontaneous;
- located in Argeș: each species is indicated locations literature accompanied by bibliographic informations or locations for the species indentified in the field by the author of this paper.

**RESULTS AND DISCUSSIONS**

Until now, 15 species included in Red List as vulnerable species in Făgăraș Massif (Argeș County).

Red list of plants recorded in Făgăraș Massif (Argeș County):

*Alopecurus pratensis* L. subsp. *laguriformis* (Schur) Tzvelev (*Alopecurus laguriformis* Schur; *Alopecurus brachystachyus* auct. Roman., non M. Bieb.).

|                            |   |
|----------------------------|---|
| Family:                    | Poaceae   |
| Vernacular name:           | Coada vulpii  |
| Frequency in Romania:      | Rare  |
| Biological forms:          | H   |
| Geographical distribution: | Carp  |
| Ecological affinity:       | U4T1R2  |
| IUCN Category:             | VU  |
| Located in Argeș:          | Râiosu-Buda Mountains (Alexiu, 2011, Buia et al., 1946-1947, Stancu & Alexiu, 1995, Stancu, 2005), Negoiu Peak, “Capra Budei” in “Căldarea Mieilor” (Buia et al., 1946-1947, Stancu, 2005). |

*Angelica archangelica* L. (*Archangelica officinalis* Hoffm.), (Photo 1).



Photo 1 - *Angelica archangelica* L. (original).

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Family: Apiaceae  
 Vernacular name: Angelică, anghelică, anghelină, buceniş, buciniş, cucută mare.  
 Frequency in Romania: Occasionally  
 Biological forms: TH-H  
 Geographical distribution: Eua-bor  
 Ecological affinity: U4.5T2.5R0  
 IUCN Category: VU  
 Located in Argeș: Zârna Valley (Flora României); Capra Fall (Vintilă, 2014, 1673 m altitude).

***Aquilegia nigricans* Baumg.**, subsp. ***nigricans***.

Family: Ranunculaceae  
 Vernacular name: -  
 Frequency in Romania: Occasionally  
 Biological forms: H  
 Geographical distribution: Eur  
 Ecological affinity: U2.5T1.5R3  
 IUCN Category: VU  
 Located in Argeș: Râiosu-Buda Mountains (Stancu, 2005).

***Campanula transsilvanica* Schur** (*Campanula thyrsoides* Baumg., *Campanula capitata* Schur).

Family: Campanulaceae  
 Vernacular name: -  
 Frequency in Romania: Occasionally  
 Biological forms: TH-H  
 Geographical distribution: Carp-Balc  
 Ecological affinity: U3T2R5  
 IUCN Category: VU  
 Located in Argeș: Râiosu Mountain: Brânele Râiosului, Capra Budei (Buia & Todor, 1948).

***Daphne cneorum* L.** (*Daphne julia* Koso-Pol.).

Family: Thymelaeaceae  
 Vernacular name: Broștean de pădure, tămâiță de pădure, melin de pădure, tulichină.  
 Frequency in Romania: Occasionally  
 Biological forms: nPh  
 Geographical distribution: Euc  
 Ecological affinity: U2.5T3.5R4  
 IUCN Category: VU  
 Located in Argeș: Râiosu-Buda Mountains (Stancu, 2005).

***Festuca bucegiensis* Markgraf-Dannenb.** (*Festuca glacialis* auct., non (Miégev. ex Hack.) K. Richt.).

Family: Poaceae  
 Vernacular name: -

Frequency in Romania: Occasionally  
 Biological forms: H  
 Geographical Distribution: Carp  
 Ecological affinity: U2T1R2  
 IUCN Category: VU, Endemic in Southern Carpathians  
 Located in Argeş: Râiosu-Buda Mountains (Buia et al., 1946-1947, Buia & Todor, 1948, Stancu & Alexiu, 1995).

***Galanthus nivalis* L.**

Family: Amaryllidaceae  
 Vernacular name: Ghiocci, aişoare, cloconeii, clocoţei de omăt, ghiorele, luşte, primăvăruţă.  
 Frequency in Romania: Common  
 Biological forms: G  
 Geographical Distribution: Eur  
 Ecological affinity: U3.5T2R4  
 IUCN Category: VU  
 Located in Argeş: Râiosu-Buda Mountains, Buda Valley (Stancu, 2005).

***Gentiana punctata* L.**

Family: Gentianaceae  
 Vernacular name: Enţură, ghinţură pătată, ochincea.  
 Frequency in Romania: Occasionally  
 Biological forms: H (G)  
 Geographical Distribution: Alp-Carp  
 Ecological affinity: U3T1.5R4  
 IUCN Category: VU  
 Located in Argeş: Râiosu-Buda Mountains (Buia & Todor, 1948, Săvulescu, 1952-1976), Negoiu Peak, "Capra Budei" (Săvulescu, 1952-1976).

***Iris aphylla* L.** (*Iris polonica* Blocki ex Asch. et Graebn.; *Iris hungarica* Waldst. et Kit.; *Iris benacensis* A. Kern.; *Iris nudicaulis* Lam.; *Iris furcata* M.Bieb.).

Family: Iridaceae  
 Vernacular name: Stânjenei  
 Frequency in Romania: Occasionally  
 Biological forms: G  
 Geographical distribution: Pont-Pan  
 Ecological affinity: U2T0R0  
 IUCN Category: VU  
 Located in Argeş: Râiosu-Buda Mountains: Buda Valley (Stancu, 2005); Viaduct toward the

Vidraru Lake (Vintilă, 2014, 750 m altitude).

***Leontopodium alpinum* Cass.** (*Antennaria leontopodium* (L.) Gaertn.).

Family: Asteraceae  
 Vernacular name: Albumeală, albumiță, floare de colț, floare de colți, floare de stâncă, floare domească, floarea reginei, flocoșele, linărică, mucezea, prescurele, semenic, studelițe, talpa mâței.  
 Frequency in Romania: Occasionally  
 Biological forms: H  
 Geographical distribution: Eua  
 Ecological affinity: U2T1.5R4  
 IUCN Category: VU  
 Located in Argeș: Râiosu-Buda Mountains (Buia & Todor, 1948, Stancu, 2005).

***Nigritella nigra* (L.) Reich. f. subsp. *nigra*.**

Family: Orchidaceae  
 Vernacular name: Sângele voinicului  
 Frequency in Romania: Occasionally  
 Biological forms: G  
 Geographical distribution: Eur  
 Ecological affinity: U2.5T1.5R4  
 IUCN Category: VU  
 Located in Argeș: Râiosu Mountain (Pușcaru et al., 1981).

***Nigritella nigra* (L.) Reich. f. subsp. *rubra* (Wettst.) Beauverd.**

Family: Orchidaceae  
 Vernacular name: -  
 Frequency in Romania: Occasionally  
 Biological forms: G  
 Geographical distribution: Eur  
 Ecological affinity: U2.5T0R4  
 IUCN Category: VU  
 Located in Argeș: Râiosu-Buda Mountains: Polița lui Vodă (Alexiu, 2008, 2011, Stancu, 2005).

***Papaver alpinum* L. subsp. *corona-sancti-stephani* (Zapal.) Borza** (*Papaver rhaeticum* Leresche; *Papaver pyrenaicum* (L.) Willd. subsp. *sendtneri* (A.Kern. ex Hayek) Fedde; *Papaver corona-sancti-stephani* Zapal.; *Papaver alpinum* L. subsp. *degenii* (Urum. et Jáv.) Markgr.

Family: Papaveraceae  
 Vernacular name: -  
 Frequency in Romania: Rare  
 Biological forms: H  
 Geographical distribution: Carp

|                      |  |
|----------------------|--|
| Ecological affinity: | U2T2R4   |
| IUCN Category:       | VU   |
| Located in Argeş:    | Râiosu Mountain: Râiosu Peak, Capra Budei (Buia et al., 1946-1947), Poliţa lui Vodă (Stancu & Alexiu, 1995, Stancu, 2005). |

***Rhododendron myrtifolium* Schott et Kotschy** (*Rhododendron kotschyi* Simonk.; *Rhododendron ferrugineum* L. subsp. *kotschyi* (Simonk.) Hayek). (Photo 2).

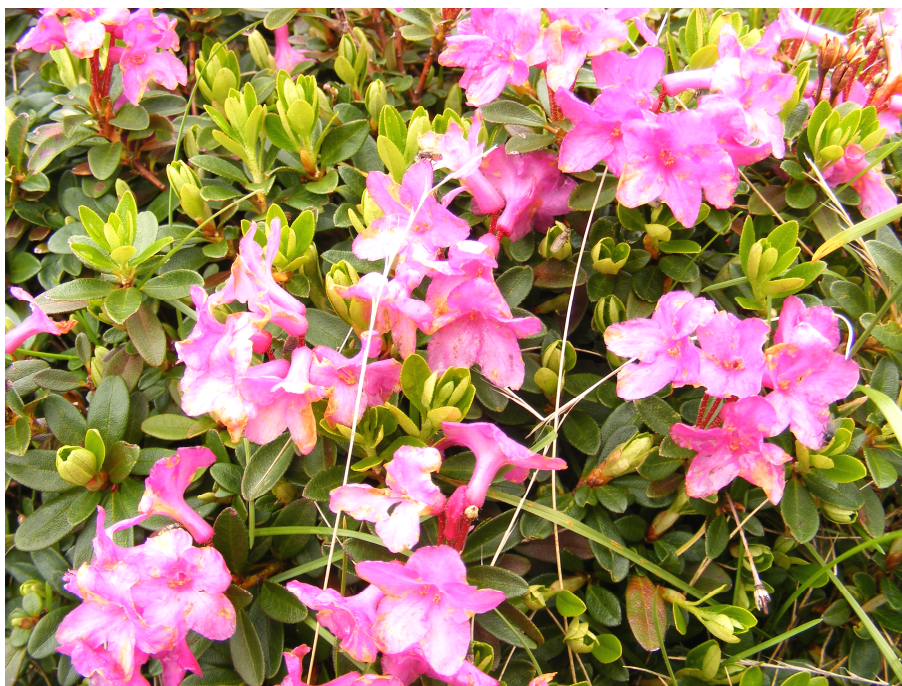


Photo 2 - *Rhododendron myrtifolium* Schott et Kotschy. (original).

|                            |  |
|----------------------------|--|
| Family:                    | Ericaceae  |
| Vernacular name:           | Bujor de munte, smârdar, perişoare, popdele, tulpin, vase munte.   |
| Frequency in Romania:      | Occasionally   |
| Biological forms:          | nPh  |
| Geographical distribution: | Carp-Balc  |
| Ecological affinity:       | U3T0R2   |
| IUCN Category:             | VU   |
| Located in Argeş:          | Râiosu-Buda Mountains (Buia & Todor, 1948, Puşcaru et. al., 1981, Stancu, 2005); Capra Chalet (Vintilă, 2014). |



***Taxus baccata* L.**

|                            |   |
|----------------------------|---|
| Family:                    | Taxaceae  |
| Vernacular name:           | Tisă  |
| Frequency in Romania:      | Occasionally  |
| Biological forms:          | MPh   |
| Geographical distribution: | Eur   |
| Ecological affinity:       | U3T3.5R4  |
| IUCN Category:             | VU  |
| Located in Arges:          | Oești-Ungureni, on Argeș Valley (Comes & Täuber, 1977; Sanda, 2003); subalpine slab stones (Vintilă, 2014). |

### CONCLUSIONS

From the studies performed until now 15 vulnerable species were identified in Făgăraș Massif: Orchidaceae (2), Poaceae (2), Amaryllidaceae, Apiaceae, Asteraceae, Campanulaceae, Ericaceae, Gentianaceae, Iridaceae, Papaveraceae, Ranunculaceae, Taxaceae and Thymelaeaceae have a single species. Lately, the flora was more & more threatened by human actions. The degree of human intervention in our study area is low; the only human activities influencing the environment are livestock, logging and tourism.

Transit tourism has developed along with the construction of Vidraru Lake and the modernization of the road DN 7C, known as Transfăgărășan.

This form of tourism is practiced only in the hot season, from June to September because of the large quantities of snow and avalanches in the winter season which typically occur in the area of Piscul Negru, the road is closed.

The presentation of endangered species spread in the area and the habitats in which they grow, based on the Convention from Berna and Directiva Habitate, is the start to monitor the listed taxons in this paper.

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