

PLANTS SPECIES WITH DECORATIVE VALUE FROM ROMANIAN RED LISTS CULTIVATED IN „ANASTASIE FĂTU” BOTANIC GARDEN OF IAȘI

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Abstract: The wild flora of Romania includes a lot of species presenting decorative value, some of them being already taken in cultivation and other could represent new and important horticultural resources in the future. Numerous species under this category are rare and vulnerable because of their very small growing areas, habitats destruction or collection in commercial uses. The paper presents 31 species from this categories cultivated in “Anastasia Fatu” Botanic Garden of Iași. For each species, the biological and ecological particularities as well as the frequency, endemic character and national, European or global zoological category, are presented.

Key words: plants, red lists, botanic garden, decorative value

Introduction

The wild flora of our country includes approximately 170 ligneous and herbaceous species having decorative value [POP, 1982] some of them very appreciated for their beautiful aspect or the colouring and perfume of their flowers, other presenting a peculiar importance in the moments of leisure or being used to decorate parks and gardens. Some of them are included in various directives, conventions, red lists aiming their protection in the circumstances of the decline of their populations under the influence of numerous environmental and human factors.

Ex situ conservation of species from Romanian Red Lists, Romanian environment legislation, international conventions and European Commission directives represents a maximum importance target for “Anastasia Fătu” Botanic Garden of Iași. This institution has in its collections many plant species included under these documents, species presenting a special decorative value also (ex. *Paeonia romanica*, *Dictamnus albus*, *Campanula carpatica* etc.).

Material and method

In order to elaborate the ecological and biological data sheets of the plant species, we will take into consideration the following aspects: *systematic classification*: phylum, class, subclass, order, family, subfamily [CIOCĂRLAN, 2000]; *common name*; *bioform* [CIOCĂRLAN, 2000]: the knowledge of this last parameter for a certain species offers informations on the mode in which this plant is protecting its regenerative parts (ex. vegetative buds, generative formations) during unfavourable seasons for vegetation (cold or dry seasons) [CRISTEA, 2004]; *floristic element* [CIOCĂRLAN, 2000]: gives information

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on macro and micro-climate where a certain species is developing, illustrating even the role of environment in the growing of a species outside their main geographical areal [CRISTEA, 2004]; *ecological characterization*: for each species are presented some particular information regarding ecological preferences (light, temperature, humidity, soil pH etc.) [CIOCÂRLAN, 2000], [ELLENBERG, 1992]; *syntaxa including current species*: offers information about coenotaxa including in their floristic composition a certain species [CHIFU & al. 2006]; *frequency in Romania*: common, frequent, rare [CIOCÂRLAN, 2000]; *sozological category of species*: presents the threatening degree at national, european or global levels: National threatened – Romanian Red Lists [BOȘCAIU, 1994], [DIHORU & al., 1994], [OLTEAN, 1994]: EX (extinct), EN (endangered), VU (vulnerable), R (rare), I (indeterminata), NT (not threatened); European threatened: Habitats Directive 92/43/EEC Ann. II b and V and Bern Convention Ann. I: LR (low risk), CR (critically endangered), VU (vulnerable); Global threatened – Global Red List: CR (critically endangered), EN (endangered), VU (vulnerable); *decorative elements*: aspect, leaves, flowers, fruits etc. [PÂRVU 2002 – 2005]; *uses*: the mode of use in parks and gardens [PÂRVU 2002 – 2005]; *propagation modalities*: by seeds, bulbs, rhizomes etc. [PÂRVU 2002 – 2005]

Results and discussion

Abies alba Mill. – *systematic classification*: Pinophyta, Pinatae, Pinales, Pinaceae, Abietoideae; *common name*: fir; *bioform*: phanerophyte; *floristic element*: central european (mountainous); *ecological characterization*: mesophyte-mesohygrophite, mesotherme, heliophyte-sciophyte and moderate acidophilous-neutrophilous, mesotrophic; *syntaxa including current species*: *Abieti-Piceion*, *Symphyto-Fagion*, *Piceion excelsae*; *frequency in Romania*: frequent; *sozological category*: RRL: EN (endangered); *decorative elements*: compact cylindrical-pyramidal habitus, leaves and cones; *uses*: indicated to be cultivated (isolated, in groups or large massifs) in parks and public gardens from mountainous to hilly regions; *propagation modalities*: by seeds, cuttings and grafting cuttings.

Acanthus balcanicus Heywood et I. B. K. Richardson – *systematic classification*: Magnoliophyta, Magnoliatae, Asteridae, Scrophulariales, Acanthaceae; *common name*: bear's breech; *bioform*: hemicyptophyte; *floristic element*: balkanic; *ecological characterization*: xerophyte, thermophyte; *syntaxa including current species*: *Orno – Cotinetalia*; *frequency in Romania*: rare; *sozological category*: RRL: VU (vulnerable); *decorative elements*: great leaves and white or white-blue flowers grouped in dense terminal inflorescences; *uses*: species used to frame the flowers beds. It can also be used in the middle of a large landscape, at the margins of arborescent massifs or isolated in lawns; *propagation modalities*: by seeds and cuttings.

Amygdalus nana L. – *systematic classification*: Magnoliophyta, Magnoliatae, Rosidae, Rosales, Rosaceae, Prunoideae; *common name*: dwarf almond; *bioform*: phanerophyte; *floristic element*: eurasiatic (continental); *ecological characterization*: xerophyte, thermophilous, mesotrophic; *syntaxa including current species*: *Prunion spinosae*; *frequency in Romania*: sporadic; *sozological category*: RRL: VU (vulnerable); *decorative elements*: inflorescences with pink flowers; *uses*: ornamental shrub cultivated in massifs by a remarkable effect in spring when it abundantly blooms. It resists perfectly to drought and can be cultivated in arid or rocky grounds; *propagation modalities*: by seeds.

Asphodeline lutea (L.) Rchb. – *systematic classification*: Magnoliophyta, Liliatae, Liliidae, Liliales, Liliaceae, Asphodeloideae; *common name*: king's spear; *bioform*: hemicyptophyte; *floristic element*: mediterranean; *ecological characterization*: heliophyte, thermophyte, xerophyte; *syntaxa including current species*: *Festucion valesiaca*; *frequency in Romania*: rare; *sozological category*: RRL: EN/R (endangered and rare); *decorative elements*: green-yellow flowers grouped in a

racemiform inflorescence; uses: can be cultivated in groups in flowered lawns; propagation modalities: by seeds.

Bellevalia sarmatica (Pall. ex Georgi) Woronow – systematic classification: *Magnoliophyta, Liliatae, Liliidae, Liliales, Liliaceae, Lilioideae*; common name: -; bioform: geophyte; floristic element: pontic; ecological characterization: heliophyte, sub-thermophyte, xerophyte-mesoxerophyte; syntaxa including current species: *Festucion valesiacae*; frequency in Romania: rare; sozological category: RRL: EN/R (endangered and rare); decorative elements: lilac campanulated flowers disposed in ovoid racemiform inflorescences; uses: can be cultivated in groups in flowered lawns; propagation modalities: by bulbs and seeds.

Campanula carpatica Jacq. – systematic classification: *Magnoliophyta, Magnoliatae, Asteridae, Campanulales, Campanulaceae*; common name: censer; bioform: hemicryptophyte; floristic element: endemic (Eastern and Southern Carpathians); ecological characterization: mesophyte, saxicolous, calcicolous; syntaxa including current species: *Asplenietea, Thlaspietea*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: big blue flowers; uses: the species can be used to decorate calcareous rockeries and abrupt embankments; propagation modalities: by seeds.

Cephalanthera damasonium (Miller) Druce – systematic classification: *Magnoliophyta, Liliatae, Liliidae, Orchidales, Orchidaceae, Orchidoideae*; common name: white helleborine; bioform: geophyte; floristic element: european; ecological characterization: mesophyte, helosciaphyte-sciaphyte; syntaxa including current species: *Epipactido-Fagenion, Quercetea pubescentis*; frequency in Romania: sporadic; sozological category: RRL: NT (not threatened); decorative elements: white flowers disposed in racemiform inflorescences; uses: can be cultivated in the herbaceous layer of arborescent massifs; propagation modalities: by rhizomes.

Cerastium transilvanicum Schur – systematic classification: *Magnoliophyta, Magnoliatae, Caryophyllidae, Caryophyllales, Caryophyllaceae, Caryophylloideae*; common name: -; bioform: chamaephyte; floristic element: endemic (Eastern and Southern Carpathians); ecological characterization: heliophyte, mesophyte, neutrophilous; syntaxa including current species: *Seslerion albicantis*; frequency in Romania: rare; sozological category: RRL: R (rare); decorative elements: white flowers grouped in inflorescences; uses: species used to decorate rockeries; propagation modalities: by seeds.

Crocus reticulatus Steven – systematic classification: *Magnoliophyta, Liliatae, Liliidae, Liliales, Iridaceae*; common name: -; bioform: geophyte; floristic element: pontic-mediterranean; ecological characterization: heliophyte, xerophyte-mesoxerophyte, neutrophilous; syntaxa including current species: *Festucion vaginatae, Aceri – Quercion, Festucion valesiacae*; frequency in Romania: sporadic; sozological category: RRL: VU (vulnerable); decorative elements: leafs and flowers; uses: the species can be cultivated in lawns, alone or mixed with other plants presenting the same flowering period; propagation modalities: by seeds and bulbs.

Dianthus spiculifolius Schur – systematic classification: *Magnoliophyta, Magnoliatae, Caryophyllidae, Caryophyllales, Caryophyllaceae, Caryophylloideae*; common name: -; bioform: hemicryptophyte; floristic element: endemic (Carpathians); ecological characterization: heliophyte, xerophyte, neutrophilous, calcicolous; syntaxa including current species: *Seslerion albicantis*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: flowers; uses: species cultivated to decorate rockeries from gardens and parks; propagation modalities: by seeds.

Dictamnus albus L. ssp. *albus* – systematic classification: *Magnoliophyta, Magnoliatae, Rosidae, Rutales, Rutaceae, Rutoideae*; common name: dittany; bioform: hemicryptophyte; floristic element: central european-submediterranean; ecological characterization: xerophyte-mesoxerophyte, sub-thermophyte; syntaxa including current species: *Geranion sanguinei, Quercion pubescentis*; frequency in Romania: sporadic; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: inflorescences presenting pink coloured or white flowers; uses: dittany can be cultivated in groups, in lawns or at the limit of arborescent groups; propagation modalities: by seeds.

Digitalis ferruginea L. – systematic classification: *Magnoliophyta, Magnoliatae, Asteridae, Scrophulariales, Scrophulariaceae*; common name: rusty foxglove; bioform: hemitherophyte-hemicryptophyte; floristic element: balkanic; ecological characterization: heliosciaphyte, xerophyte-

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mesoxerophyte, sub-thermophyte, neutrophilous; syntaxa including current species: *Quercetalia pubescentis*; frequency in Romania: rare; sozological category: RRL: VU (vulnerable); decorative elements: inflorescences presenting yellow at the exterior and brown at the interior flowers; uses: rusty foxglove can be cultivated in groups at the limit of arborescent groups; propagation modalities: by seeds.

Echinops banaticus Rochel ex Schrad. – systematic classification: Magnoliophyta, Magnoliatae, Asteridae, Asterales, Asteraceae; common name: great globe thistle; bioform: hemicryptophyte; floristic element: balkanic-caucasian; ecological characterization: xeromesophyte, sub-thermophyte; syntaxa including current species: *Syringo-Carpinion orientalis*; frequency in Romania: rare; sozological category: RRL: R (rare); decorative elements: blue flowers disposed in big globular inflorescences; uses: can be cultivated in small groups in flowered lawns or at the margin of arborescent massifs; propagation modalities: by seeds.

Ephedra distachya L. – systematic classification: Pinophyta, Gnetatae, Ephedrales, Ephedraceae; common name: jointfir; bioform: phanerophyte; floristic element: eurasiatic (continental); ecological characterization: xerophyte, mesothermophyte, heliophyte; syntaxa including current species: *Scabiosion argenteae*, *Festucetalia vaginatae*, *Festucion valesiacae*; frequency in Romania: rare; sozological category: RRL: R (rare); decorative elements: curious aspect; uses: in parks and gardens it can be cultivated on sandy soils; propagation modalities: by seeds.

Evonymus nanus M. Bieb. – systematic classification: Magnoliophyta, Magnoliatae, Rosidae, Celastrales, Celastraceae; common name: -; bioform: phanerophyte; floristic element: eurasiatic; ecological characterization: mesohygrophite, mesotrophic; syntaxa including current species: *Alnion incanae*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: persistent linear leaves, 1 – 3 disposed brown-purple flowers and fruits – pink capsules; uses: this shrub is recommended to be planted on rockeries in order to make them green; propagation modalities: by grafting cuttings on *Evonymus europaeus*.

Galanthus nivalis L. – systematic classification: Magnoliophyta, Liliatae, Liliidae, Liliales, Amaryllidaceae; common name: snowdrop; bioform: geophyte; floristic element: central european-submediterranean; ecological characterization: mesophyte, heliosciaphyte; syntaxa including current species: *Fagetalia*; frequency in Romania: frequent; sozological category: RRL: NT (not threatened), Bern Convention (Ann. Vb); decorative elements: white, campanulated and solitary flowers; uses: decorative species cultivated in arborescent massifs, in turfs (in groups) etc.; propagation modalities: by bulbs.

Hepatica transsilvanica Fuss – systematic classification: Magnoliophyta, Magnoliatae, Magnoliidae, Ranunculales, Ranunculaceae, Ranunculoideae; common name: -; bioform: hemicryptophyte; floristic element: endemic (Eastern and Southern Carpathians); ecological characterization: mesophyte; syntaxa including current species: *Symphyto – Fagion*; frequency in Romania: sporadic; sozological category: RRL: NT (not threatened); decorative elements: blue flowers and the shape of leaves; uses: can be cultivated as prevernal species in parks and gardens; propagation modalities: by seeds.

Iris brandzae Prodan – systematic classification: Magnoliophyta, Liliatae, Liliidae, Liliales, Iridaceae; common name: -; bioform: geophyte; floristic element: pontic (west part); ecological characterization: heliophyte, thermophyte, xerophyte, neutrophilous; syntaxa including current species: *Festucion valesiacae*; frequency in Romania: sporadic; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: blue flowers; uses: can be cultivated in small groups in flowered lawns; propagation modalities: by rhizomes and seeds.

Larix decidua Miller ssp. *carpatica* (Domin) Šiman – systematic classification: Pinophyta, Pinatae, Pinales, Pinaceae, Laricoideae; common name: larch; bioform: phanerophyte; floristic element: Carpathian and Sudets mountains; ecological characterization: mesophyte, mesothermophyte, microtherme, moderate acidophilous, mesotrophic; syntaxa including current species: *Piceion excelsae*, *Pinion mugi*; frequency in Romania: rare; sozological category: RRL: R (rare); decorative elements: it's aspect especially in autumn; uses: the species can be cultivated in parks and gardens isolated or grouped. Makes special effect if is planted near rockeries or greenswards; propagation modalities: by seeds or grafting cuttings.

Leucojum aestivum L. – systematic classification: Magnoliophyta, Liliatae, Liliidae, Liliales, Amaryllidaceae; common name: summer snowflake; bioform: geophyte; floristic element: central european-mediterranean-atlantic; ecological characterization: mesohygrophyte-hygrophyte; syntaxa including current species: *Ulmenion*, *Salicion albae*; frequency in Romania: sporadic; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: inflorescences with white flowers; uses: the species can be cultivated in humid or swampy arborescent massifs, or grouped in flowered lawn. Sometimes is cultivated in flowerpots; propagation modalities: by bulbs.

Menyanthes trifoliata L. – systematic classification: Magnoliophyta, Magnoliatae, Asteridae, Solanales, Menyanthaceae; common name: bogbean; bioform: hydrohelophyte; floristic element: circumpolar; ecological characterization: hygrophyte; syntaxa including current species: *Caricenion rostratae*, *Scheuchzerio-Caricetea fuscae*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: tri-foiled leafs and white-rose flowers in inflorescences; uses: indicated to be cultivated around lakes, aboard rivulets or in places where the water is at soil surface; propagation modalities: by seeds.

Paeonia peregrina Mill. – systematic classification: Magnoliophyta, Magnoliatae, Dilleniidae, Paeoniales, Paeoniaceae; common name: romanian peony; bioform: hemicyptophyte; floristic element: balkanic; ecological characterization: xeromesophyte; syntaxa including current species: *Quercetalia pubescentis*; frequency in Romania: rare; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: very decorative by its big red flowers; uses: this plant can be cultivated in small groups in flowered lawns; propagation modalities: by seeds.

Paeonia tenuifolia L. – systematic classification: Magnoliophyta, Magnoliatae, Dilleniidae, Paeoniales, Paeoniaceae; common name: peony; bioform: hemicyptophyte; floristic element: balkanic; ecological characterization: xeromesophyte; syntaxa including current species: *Festucetalia valesiaca*, *Quercetalia pubescentis*; frequency in Romania: sporadic; sozological category: RRL: VU/R (vulnerable and rare), Bern Convention Ann. I; decorative elements: very decorative by its red or pink flowers; uses: can be cultivated in small groups in flowered lawns; propagation modalities: by seeds.

Pinus cembra L. – systematic classification: Pinophyta, Pinatae, Pinales, Pinaceae; common name: arrola pine; bioform: phanerophyte; floristic element: eurasiatic-arctic-alpine; ecological characterization: mesophyte, microtherme, heliophyte, moderate acidophilous, oligotrophic; syntaxa including current species: *Pinion mugii*, *Piceion excelsae*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: remarkable by the ovoid-compact habitus and by its green foliage; uses: can be cultivated solitary or in groups in parks and gardens; propagation modalities: by seeds.

Pinus sylvestris L. – systematic classification: Pinophyta, Pinatae, Pinales, Pinaceae; common name: scots pine; bioform: phanerophyte; floristic element: eurasiatic; ecological characterization: euryphyte, eurythermic, heliophyte, moderate acidophilous, oligotrophic; syntaxa including current species: *Dicrano-Pinion*, *Betulion pubescentis*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: red-brown rhytidome and general aspect; uses: can be cultivated in massifs, groups or solitary in lawns or aboard alleys; propagation modalities: by seeds.

Pulsatilla grandis Wenderoth – systematic classification: Magnoliophyta, Magnoliatae, Magnoliidae, Ranunculales, Ranunculaceae, Ranunculoideae; common name: pasque flower; bioform: hemicyptophyte; floristic element: central and western European; ecological characterization: heliophyte, xerophyte; syntaxa including current species: *Festucetalia valesiaca*; frequency in Romania: rare; sozological category: RRL: R (rare), European threatened – Habitats Directive Ann. II b and Bern Convention Ann. I; decorative elements: solitary, violet big flowers; uses: can be cultivated in groups in flowered lawns; propagation modalities: by seeds.

Ruscus aculeatus L. – systematic classification: Magnoliophyta, Liliatae, Liliidae, Liliales, Liliaceae, Asparagoideae; common name: butcher's broom; bioform: geophyte; floristic element: pontic-mediterranean; ecological characterization: mesotrophic-eutrophic, xeromesophyte-mesophyte, thermophilous, sciaphyte-heliosciaphyte; syntaxa including current species: *Quercetalia pubescentis* – *Fagetalia*; frequency in Romania: rare; sozological category: LRR: R (rare); Bern Convention Ann. Vb;

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decorative elements: particular aspect when fructified; uses: can be cultivated on rockeries or rocky soils; propagation modalities: by seeds.

Sorbus dacica Borbás – systematic classification: *Magnoliophyta, Magnoliatae, Rosidae, Rosales, Rosaceae, Maloideae*; common name: -; bioform: phanerophyte; floristic element: endemic; ecological characterization: mesoxerophyte, thermophilous, calcicolous; syntaxa including current species: *Orno-Cotinetalia*; frequency in Romania: rare; sozological category: RRL: R (rare); decorative elements: leaves, inflorescences with white flowers and red fruits; uses: species indicated to be cultivated on sunny calcareous rockeries; propagation modalities: by seeds.

Tanacetum macrophyllum (Waldst. et Kit.) – systematic classification: *Magnoliophyta, Magnoliatae, Asteridae, Asterales, Asteraceae*; common name: large leafed tansy; bioform: hemicryptophyte; floristic element: carpathian-balkan; ecological characterization: sciophyte, mesophyte, moderate acidophilous; syntaxa including current species: *Fraxino-Cotinion*; frequency in Romania: sporadic; sozological category: RRL: R (rare); decorative elements: white flowers arranged in corymbiferous inflorescences; uses: can be cultivated in small groups at the margin of arborescent massifs; propagation modalities: by seeds.

Taxus baccata L. – systematic classification: *Pinophyta, Pinatae, Taxales, Taxaceae*; common name: yew; bioform: phanerophyte; floristic element: atlantic-mediterranean-central european; ecological characterization: mesophyte, mesothermophilous, sciaphyte, eutrophic; syntaxa including current species: *Quercu-Fagetea*; frequency in Romania: rare; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: decorative by the green colouring, red aril and general aspect; uses: can be cultivated isolated, grouped, as green walls or green hedges. Its habitus can be shaped in various ways; propagation modalities: by seeds and (vegetative) by cutting graftings.

Tulipa sylvestris L. ssp. *australis* (Link) Pamp. – systematic classification: *Magnoliophyta, Liliatae, Liliidae, Liliales, Liliaceae, Lilioideae*; common name: -; bioform: geophyte; floristic element: pontic-mediterranean; ecological characterization: helio-sciophyte, sub-thermophyte, neutrophilous; syntaxa including current species: *Quercu-Fagetea*; frequency in Romania: sporadic; sozological category: RRL: VU/R (vulnerable and rare); decorative elements: yellow solitary flowers; sometimes, at the end of the flowering period, they are changing the colour of flowers in pink; uses: the species can be cultivated in the illuminated places inside arborescent massifs; propagation modalities: by bulbs.

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