

GLOBALLY AND EUROPEAN THREATENED PLANTS PRESENT IN DOBROGEA (SOUTH- EASTERN ROMANIA)

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Abstract: The present work is the result of research carried out within the framework of IPAs project, a practical application of the Global Strategy for Plant Conservation (2002 Hague) in Romania. The data provided constitute a scientific basis support for enlargement of the national network of protected areas and for selection of Natura 2000 sites in Romania. A significant part is occupied by studies performed in Dobrogea. New information regarding 16 threatened taxa at Global (4 species) or European (12 species) level, that still occur in Dobrogea, are provided.

Introduction

The project “Important Plant Areas (IPAs) in Romania” is an integrated part of the European IPAs Programme, co-ordinated by Plantlife International and financed by the Ministry of Agriculture, Nature Management and Fisheries of the Netherlands. This European programme has been deployed in seven Central and East European countries. The programme objective is to identify a network of the best sites throughout Europe using consistent criteria: threatened plants, threatened habitats and botanical richness.

Some of the major results of the Romania IPAs project can be summarized as follows: updating the information on threatened flora and vegetation according to the international legislation (EUNIS, Bern Convention, Habitat Directive, etc.); identification of 276 IPAs as a key element for threatened plants and habitats protection and conservation; and development of a data base including information, maps and images [24].

The Dobrogea province is part of the Balkan Peninsula, located in the eastern sub-Mediterranean zone. Its rather small area, geological past, frequent climatic changes and present-day physical-geographical conditions have determined a high concentration of endemic plant taxa. The characteristic plant taxa are termed “Dobrogean elements”.

Material and Methods

In order to reach a good evaluation of the real situation of endangered plants (threatened at Global and European level) still present in Dobrogea, a series of field investigations, collecting and preparing for herbarium use have been carried out between 2002 and 2004, and a vast array of specialized bibliographical references has been consulted. Botanical nomenclature is in accordance with the

Flora of Romania [23] and *Flora Europaea* [28, 29]. The international abbreviation for herbaria follows Index Herbariorum [9].

Results and Discussions

In Dobrogea 16 endangered plant species at Global and European level have been found, of which 6 are endemic and near-endemic: *Aldrovanda vesiculosa* L., *Alyssum borzaeanum* Nyár., *Campanula romanica* Săvul., *Centaurea jankae* Brandza, *Centaurea pontica* Prodan & Nyár., *Echium russicum* J.F. Gmelin, *Fritillaria orientalis* Adams, *Liparis loeselii* (L.) L.C.M. Richard, *Marsilea quadrifolia* L., *Moehringia jankae* Griseb. ex Janka, *Ornithogalum ortophyllum* Ten. subsp. *psammophilum* (Zahar.) Zahar., *Paeonia tenuifolia* L., *Potentilla emilii-popii* Nyár., *Salvinia natans* L., *Trapa natans* L., *Zostera marina* L.

Campanula romanica Săvul. (Globally threatened species – IUCN Red List, Habitats Directive and Bern Convention) is an endemic taxon from Dobrogea, occurring only in the Romanian part of this region. It is probably a paleoendemic species, evolved in the early Pleistocene, when the continental Dobrogea was connected northwards with the Carpathian chain, where other taxa of section *Linophylloides* also occur. It is a saxicolous plant, indifferent with respect to the type of substrate (Jurassic limestones, green shales, sandstone, granite). It thrives in saxicolous associations of the *Pimpinello* - *Thymion* alliance. **Chorology:** This species is present from the Munții Măcin as far as Adamclisi, with a higher density north of Valea Cara-Su [17]. Information on its occurrence at Adamclisi has not been confirmed for over 50 years. Likewise the citation in the Flora of Romania [17] of this plant as being present at Hagieni is erroneous. According to our observations this species seems to thrive solely on ancient highlands, but not on loess or sarmatic or other types of rock, south of Cara-Su. From the number of sites at which this species occurs, it could be considered to be rather widespread, but actually it forms small populations in rock crevices. It could become endangered by digging of new quarries for the exploitation of the stone on which the plant is growing.

Centaurea jankae Brandza (Globally threatened species – IUCN Red List, Habitats Directive and Bern Convention) is a Dobrogean paleoendemic taxon, evolved probably at the end of the Tertiary period. It belongs to section *Hyalolema* as a unique representative in Europe; there are close-related taxa beyond the Ural Mountains. This species thrives on stony slopes, preferentially calcareous, from the Platoul Babadag to the border with Bulgaria. **Chorology:** On the Platoul Babadag it is found at 4–5 sites, beginning with the classic spot from the south of Pădurea Babadag towards Caugagia (where have been no reports since 1960). The densest population exists at Capul Doloșman, where individuals grow in optimal conditions; here we have counted almost 300 plants, mostly in bloom. In 2003 we detected a small population about 2 km NW of Capul Doloșman. Other localities

to the south were found after the publication of the Flora of Romania: Palazul Mic [11], Pădurea Dumbrăveni [21] and Cotul Văii [BUC] [18].

Centaurea pontica Prodan & Nyár. (Globally threatened species – IUCN Red List, Habitats Directive and Bern Convention) is an arenicolous endemic species from the Danube Delta. Along with *C. calcitrapa* and *C. iberica* it belongs to the section *Jacea*. Its taxonomic position is rather controversial, the present status being probably the most adequate. Extant populations are extremely reduced in number, the one in Sulina town being threatened by extinction. Appropriate measures for its rescue are imperative. Chorology: The area of distribution is concentrated around Sulina, on the streets and in the peripheral zones. This taxon was also found in the south of Braşul Sf. Gheorghe on the sands of Ciotic, leg. G. Negrean [BUCA] [6].

Ornithogalum ortophyllum Ten. subsp. *psammophilum* (Zahar.) Zahar. (Globally threatened species – IUCN Red List, Habitats Directive and Bern Convention) is an arenicolous endemic taxon, originally described at Platoneşti, Ialomiţa County [30, 31]. Afterwards it was found also at Hanul Conachi and Lieşti [15]. Owing to its morphological peculiarities and special ecology, this taxon should deserve the rank of species. Chorology: It was found on Grindul Lupilor [5]. We lack information regarding the state of the population from this site. Nevertheless its presence on saline sands of the lagoon complex Razim-Sinoe is very strange. It could be another taxon, maybe a completely unknown one. Cultivation of this plant is necessary to allow more detailed morphological, genetic and biochemical studies.

Moehringia jankae Griseb. ex Janka (European threatened species – Habitats Directive and Bern Convention) is a Dobrogean sub-endemic plant, taxonomically close to *M. grisebachii*, but much rarer. It is a basophilous plant [28]. Chorology: In Tulcea County it has been found on the mountains between Greci and Măcin, on Dealul Consul, at Topolog and on Dealul Tuşan-Măgurele. It was also reported in Hârşova, Dealul Moşul, Stâncile Călugăreni – Colţanii Mari and Cheia (Constanţa County). Populations comprise always a very small number of plants.

Potentilla emilii-popii Nyár. (European threatened species – Habitats Directive and Bern Convention) is a Dobrogean endemic plant [Bu Rm], a member of section *Rectae* of the genus. Its taxonomic status is uncertain, as in *Flora Europaea* it is included in the *Taurica* group. This species is present only in the south of Dobrogea, within plant associations of the *Pimpinello-Thymion* alliance. Populations are extremely poor in number of individuals, because of reproduction difficulties. Establishment of new quarries or pastures will endanger this species. Chorology: The plant has been reported in Topolog, Dealul Tuşan-Măgurele, Valul lui Traian, Adamclisi, Coroana, Pădurea Dumbrăveni Reserve, Pădurea Canaraua Fetii Reserve, Pădurea Esehioi Reserve, Independenţa, Dealul Alah-Bair Reserve, Pădurea Hagieni Reserve [8, 11, 1, 16, 2, 3, 4].

Alyssum borzaeanum Nyár. (European threatened species – Habitats Directive and Bern Convention) is a Critically Endangered sub-endemic species; it

is a littoral, east sub-Mediterranean element. This species is conserved within the Danube Delta Biosphere Reserve and in the Agigea Reserve, being threatened by habitat changes caused by the intense tourism. Chorology: It occurs on Grindul Lupilor, at Cetatea Histria on the shore of Lacul Sinoe, on Grindul Saele-Istria, at Gargalâc, Mamaia, Capul Midia, between Tuzla and the sea-shore, at Techirghiol, Agigea, Eforie Sud and Mangalia [20, 7]. In spite of these numerous reports this plant has no longer been found at some of the sites (Mangalia, Mamaia, Eforie Sud), most probably because of the intense management of beaches for tourism.

Echium russicum J.F. Gmelin (European threatened species – Habitats Directive and Bern Convention) is a continental element extending westwards to eastern Austria. This plant is growing on certain steppic grasslands in almost all Romanian provinces. It was not registered yet in any national Red Lists, but is conserved in Măcin National Park. Chorology: In Dobrogea it is extremely rare. It has been found in the following sites: Măcin, Greci, Luncavița, Telița, Malcoci, Teche, Platoul Babadag, Dobromir, Canaraua Fetii, Esechioi, Hagieni and Pădurea Dumbrăveni [22, 1]. However, we have not found it at the previously mentioned sites.

Fritillaria orientalis Adams (European threatened species – Habitats Directive and Bern Convention) is a sub-Mediterranean geophyte, reported from all regions of Romania except Maramureș. National Red Lists mention it as being Vulnerable and Rare. It is endangered mainly because of its decorative aspect, being collected for commerce. Chorology: This species is extremely rare in Dobrogea, reported solely from Platoul Babadag [23]. It is imperative to include its populations into a natural reserve.

Paeonia tenuifolia L. (European threatened species – Habitats Directive and Bern Convention) is a steppic species that is very rare in Romania. Due to the beauty of its large flowers, it is intensively collected for commerce. The national Red Lists assess it as a Vulnerable taxon. It is protected in the natural reserves of Fântânița-Murfatlar, Cheia, Hagieni and in the Măcin National Park. Chorology: This species is indicated as occurring in Greci, Cheia, Palazul Mic, Basarabi, Pădurea Dumbrăveni, Cotul Văii, Canaraua Fetii and Pădurea Hagieni [19, 10, 11, 12, 21, 18, 1]. We have not confirmed its presence in some sites considered as important protection areas for plants, *e.g.* Măcin National Park.

Marsilea quadrifolia L. (European threatened species – Habitats Directive and Bern Convention) is a rather rare plant, being reported from Crișana, Banat, Oltenia and Muntenia provinces. This species has become vulnerable owing to extended drainage carried out to yield new land for crops. Chorology: In Dobrogea this plant occurs extremely rarely. It has been reported at “Măcin, Iglia” [25] and in the Danube Delta from Sulina and Gârla Madgearu [6], the latter being under protection. Populations of this species are very poor in number of individuals.

Salvinia natans L. (European threatened species – Habitats Directive and Bern Convention) is an aquatic fern recorded from several localities, especially in the south and west of Romania. It is Endangered by the reclamation of ponds.

Chorology: In the Danube Delta it is rather frequent. Further south it has been reported only in Lacul Mamaia and Lacul Gârlița [26].

Trapa natans L. (European threatened species – Habitats Directive and Bern Convention) is considered a Vulnerable species; its presence is reported in all Romanian provinces, except Maramureș [23]. **Chorology:** It is distributed solely from northern Dobrogea at Măcin and Crapina-Jijila, and is known to be rather frequent in some ponds within the Danube Delta.

Aldrovanda vesiculosa L. (European threatened species – Habitats Directive and Bern Convention) is a submerged carnivorous plant, considered to be Critically Endangered. It has been reported from several localities in Crișana, Oltenia and Muntenia. In Dobrogea, the brothers Sintenis collected it the first time, in 1873 at Caraorman [13]. **Chorology:** It was observed in the Lacul Babadag, in the Danube Delta and in several other localities, with fluctuating appearances: Gârla Porcului near Sulina, Canalul Madgearu, Mila 23, Pardina, Perișor, Heracle, Gârla Împuțita, Canalul Litcov, Carasuhat, Dranov, Obretinul Mare, Lacul Roșu and Balta Somova [6, 14].

Zostera marina L. (European threatened species – Habitats Directive and Bern Convention) is a circumboreal sub-littoral element. This plant is extremely rare and vulnerable because of seawater pollution near the coast, and as a consequence of human disturbance of beaches. **Chorology:** The plant is present in the Lacul Sinoe, near Cetatea Histria, and between Mamaia and Eforie Sud [27]. It was also reported in the Danube Delta, but reliable confirmation is needed.

Conclusions

Dobrogea represents a floristically interesting region, as it shelters a relatively large number of endangered species, and offers a mosaic of unique habitats, some of which are little-known at European and Global level.

Among the plant species mentioned, some have been found in new localities during our field investigations (*Campanula romanica*, *Centaurea jankae*, *Potentilla emilii-poppii*, *Echium russicum*) [18]. In some instances we could not reconfirm the presence of some taxa in Dobrogea, as in the case of *Liparis loeselii*, reported from the Danube Delta [13]. There is a stringent need for effective protection and conservation of these species and their habitats, as they are exposed to growing human impact: intensification of tourism (beach zone), opening of new quarries for exploitation of building materials (limestone, granite), expansion of agricultural land (cleaning by fire around settlements), and extensive cutting of wooded land strips.

All taxa presented in this paper are already included in the IPAs network. Our data will be available to the Ministry for Environment and Water Management – Commission for Nature Monuments, and will constitute the scientific background for requesting the statute of national protection for those sites that are not already included in the National System of Protected Areas.

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