

The colours of the wild: the case study of Dealul Cetatii Lempes-Mlastina Harman Natura 2000 site

Ciceoi Roxana¹; Khapardey Adriana²; Badulescu, Liliana³

1. Research Centre for Studies of Food Quality and Agricultural Products, University of Agronomy
2. Theoretical High school "Johannes Honterus",
3. Faculty of Horticulture, Department of Horticultural Systems Bioengineering, University of Agriculture and Veterinary Medicine "Vasile Lascu" Iași

1. Research Centre for Studies of Food Quality and Agricultural Products, University of Agronomic Sciences and Veterinary Medicine of Bucharest
2. Theoretical High school "Johannes Honterus",
3. Faculty of Horticulture, Department of Horticultural Systems Bioengineering, University of Agronomic Sciences and Veterinary Medicine of Bucharest

Introduction

The Natura 2000 Network represent the EU breakthrough initiative for the conservation of natural habitats and of wild fauna and flora for the future generation, the cornerstone of Community politics for environment protection. In Romania, at the beginning of the year 2016, the Natura 2000 Barometer states a total number of 531 N2K sites, on a total area of 238.391 km². The Special Areas of Conservation, created under the EU Habitats Directive covers 16.68% of the total area of our country, being the 7th in Europe by the proportion of land area under protection.

The "Fortress-hill Lempes – Harman marsh" site (ROSCI 0055 Dealul Cetății Lempes - Mlaștina Hărman) is located in the centre of the Brașov Basin, between the Carpathians and Transylvania hills, at the eastern limit of „Țara Barsei”, on the river Olt’s plain terrace. Among the rich flora, two of the species are listed in Annex II of Directive 92/43/EEC as endangered species: *Ligularia sibirica* - rare and *Liparis loeselli* – very rare. Beside these, another 37 species are cited as being important species of flora for Europe, among which *Adonis vernalis*, *Amygdalus nana*, *Armeria maritima* ssp. *barcensis*, *Carex davalliana*, *Drosera longifolia*, *Epipactis palustris*, *Hyacinthella leucophaea*, *Pedicularis sceptrum-carolinum*, *Pinguicula vulgaris*, *Primula farinosa*, *Pulsatilla montana*, *Salix rosmarinifolia*, etc.

Materials and methods

In the period 2015 - 2016 we constantly went in the reservation and photograph those plants that we consider attractive and interesting from the point of view of a potential tourist. The first photographs made in the months of May and June 2015 were made with camera Samsung L700 and since June 2015 with Nikon Coolpix P610 camera.

The plant determination was done using two books, the "Wildpflanzen Siebenbürgens" of Speta Elise și Rákossy László and the "Flora ilustrată a României" of Ciocârlan Vasile.

For the easiness of colour appreciations we chose to use the three primary colours – **red**, **blue** and **green** (greenish) and the secondary colours – **yellow**, **violet**, **pink** and **white** colour.

Results and discussions

Among the 84 species that we consider attractive, 55 species have spring flowering time and 29 summer flowering time.

In the spring, of the 55 species, 2 are considered rare, 22 have a sporadic prevalence and one is critically endangered. Of the 29 summer flowering taxons, 4 are considered rare, 13 have a sporadic occurrence in Romania and 5 are critically endangered.

Regarding the colour, 3 species have greenish flowers, 6 blue, 10 red, 12 pink, 16 violet, 17 yellow and 20 white.

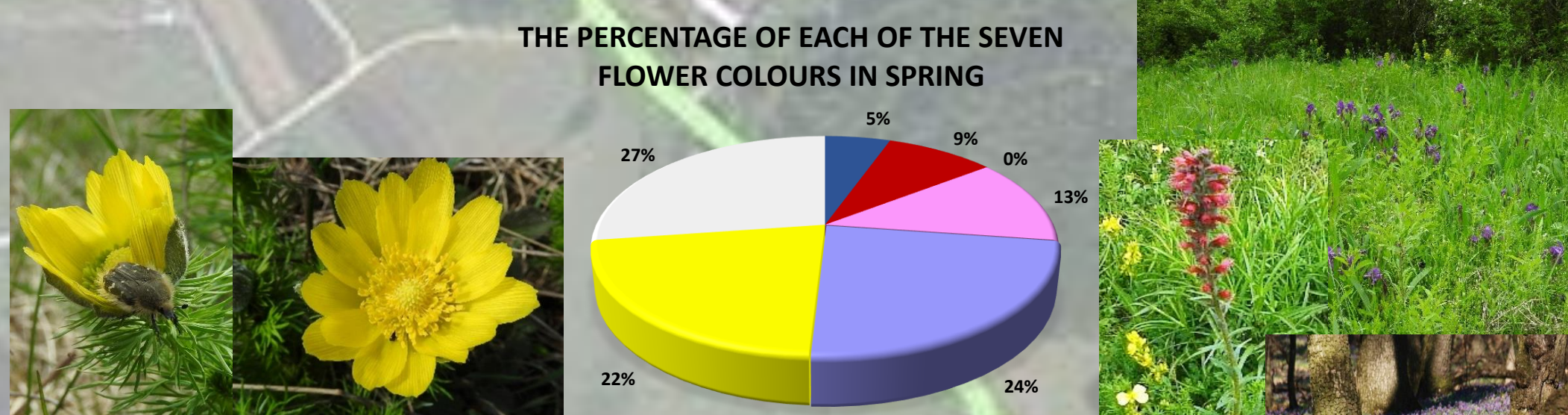
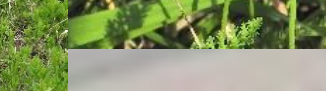


Table 1. The list of plants flowering in the spring, presenting the flowering period and the flower colours

No. crt.	Flowering starts	1	2	3	4	5	6	7	8	9	10	11	Scientific name	Family name	Prevalence degree	Ecological status	
1	4 (III-IV)												<i>Hyacinthella leucophaea</i> (K. Koch) Schu	Liliaceae	Sporadic	Common	
2	4 (IV-V)												<i>Veronica chamaedrys</i> L.	Scrophulariaceae	Frequent		
3	5 (VI-VII)												<i>Linum nervosum</i> Waldst. et Kit.	Linaceae	Sporadic		
4	5 (VI-VII)												<i>Echium russicum</i> J. F. Gmelin	Boraginaceae	Sporadic		
5	5 (V-VII)												<i>Cynoglossum officinale</i>	Boraginaceae	Frequent		
6	5 (V-VII)												<i>Melilotus melissophyllum</i> L.	Lamiaceae	Sporadic		
7	5 (V-VII)												<i>Nonea pulla</i> (L.) DC.	Boraginaceae	Sporadic		
8	5 (V-VIII)												<i>Bizia media</i>	Poaceae	Frequent		
9	4 (IV - V)												<i>Amygdalus nana</i>	Rosaceae	Sporadic		
10	5 (V-VI)												<i>Dictamnus albus</i>	Rutaceae	Sporadic		
11	5 (V-VI)												<i>Primula farinosa</i> L.	Primulaceae	Rare	Critically Endangered	
12	5 (V-VI)												<i>Vicia angustifolia</i> L.	Fabaceae	Sporadic		
13	5 (V-VII)												<i>Campanula sibirica</i> L.	Campanulaceae	Frequent	Common	
14	5 (V-VII)												<i>Cirsium rivulare</i> (Jacq.) All.	Asteraceae	Frequent		
15	5 (V-VIII)												<i>Scorzonera rosea</i> Waldst. et Kit.	Asteraceae	Sporadic		
16	5 (V-VII)												<i>Ajuga genevensis</i> L.	Lamiaceae	Frequent		
17	2 (II-IV)												<i>Helleborus purpurascens</i> Waldst. et Kit.	Ranunculaceae	Frequent		
18	3 (III-V)												<i>Viola hirta</i> L.	Violaceae	Frequent		
19	4 (III-IV)												<i>Corydalis solida</i> (L.) Clairv.	Fumariaceae	Frequent		
20	4 (III-IV)												<i>Pulsatilla montana</i> (Hoppe) Reichenb.	Ranunculaceae	Sporadic		
21	4 (IV-VI)												<i>Veronica prostrata</i> L.	Scrophulariaceae	Frequent		
22	4 (V-VI)												<i>Iris aphylla</i> L.	Iridaceae	Sporadic		
23	5 (VI-VII)												<i>Astragalus onobrychis</i> L.	Fabaceae	Frequent	Common	
24	5 (V-IX)												<i>Geranium robertianum</i> L.	Geraniaceae	Frequent		
25	5 (V-VII)												<i>Anchusa officinalis</i>	Boraginaceae	Frequent		
26	5 (V-VII)												<i>Salvia nutans</i> L.	Lamiaceae	Sporadic		
27	5 (V-VII)												<i>Verbascum phoeniceum</i> L.	Scrophulariaceae	Frequent		
28	5 (V-VIII)												<i>Geranium sanguineum</i> L.	Geraniaceae	Sporadic		
29	3 (III-IV)												<i>Gagea lutea</i> (L.) Ker Gawl.	Liliaceae	Frequent		
30	3 (IV-V)												<i>Primula veris</i> L.	Primulaceae	Frequent		
31	4 (IV-V)												<i>Adonis vernalis</i> L.	Ranunculaceae	Frequent		
32	4 (IV-VI)												<i>Cytisus procumbens</i>	Fabaceae	Rare		
33	4 (V-VI)												<i>Scorzonera austriaca</i> Willd.	Asteraceae	Sporadic		
34	5 (IV-VI)												<i>Euphorbia cyparissias</i> L.	Euphorbiaceae	Frequent	Common	
35	5 (VI-IX)												<i>Inula hirta</i> L.	Asteraceae	Frequent		
36	5 (V-IX)												<i>Melampyrum nemorosum</i> L.	Scrophulariaceae	Sporadic		
37	5 (V-VI)												<i>Berberis vulgaris</i> L.	Berberidaceae	Sporadic		
38	5 (V-VI)												<i>Euphorbia villosa</i> Waldst et Kit. Ex Willa	Euphorbiaceae	Frequent		
39	5 (V-VII)												<i>Tetragonolobus maritimus</i> (L.) Roth.	Fabaceae	Sporadic		
40	5 (V-VIII)												<i>Stachys recta</i> L.	Lamiaceae	Frequent		
41	3 (III-IV)												<i>Salix caprea</i> L.	Salicaceae	Frequent		
42	3 (IV-V)												<i>Salix triandra</i> L.	Salicaceae	Frequent		
43	4 (IV - VI)												<i>Carex davalliana</i>	Cyperaceae	Sporadic		
44	4 (IV-V)												<i>Ornithogalum orthophyllum</i> Ten. ssp. kor.	Liliaceae	Frequent		
45	4 (V-VI)												<i>Fragaria viridis</i> Weston	Rosaceae	Frequent		
46	5 (VI-VII)												<i>Galium glaucum</i> L.	Rubiaceae	Frequent		
47	5 (V-VI)												<i>Convallaria majalis</i> L.	Liliaceae	Frequent		
48	5 (V-VI)												<i>Crataegus monogyna</i> Jacq.	Rosaceae	Frequent		
49	5 (V-VI)												<i>Polygonatum multiflorum</i> (L.) All.	Liliaceae	Frequent		
50	5 (V-VI)												<i>Stipa pennata</i> L.	Poaceae	Sporadic		
51	5 (V-VI)												<i>Valeriana sambucifolia</i> Mikan fil.	Valerianaceae	Frequent		
52	5 (V-VI)												<i>Viburnum opulus</i> L.	Caprifoliaceae	Frequent		
53	5 (V-VII)												<i>Menyanthes trifoliata</i> L.	Menyanthaceae	Sporadic		
54	5 (V-VIII)												<i>Cerastium arvense</i> L.	Caryophyllaceae	Frequent		
55	5 (V-VIII)												<i>Plantago lanceolata</i> L.	Plantaginaceae	Frequent		



The purpose of the study

Instead of being focused on plants systematics and botanical aspects, our main criteria was the plants attractiveness, induced mainly by the flower colour; we captured what triggered our attention and curiosity, bearing in mind the touristic development potential of the site. The scientist demonstrate that flowers, mainly by their colours, have an emotional influence on social perception, memory, relaxation, wellbeing and influence the human mood (Babolhavaeji, 2015).

We aimed a categorisation by the flower colour, on the spring and summer, in order to have a better overview of what the site has to offer, beside the great botanical interest of some critically endangered and rare species that can be found on this area.

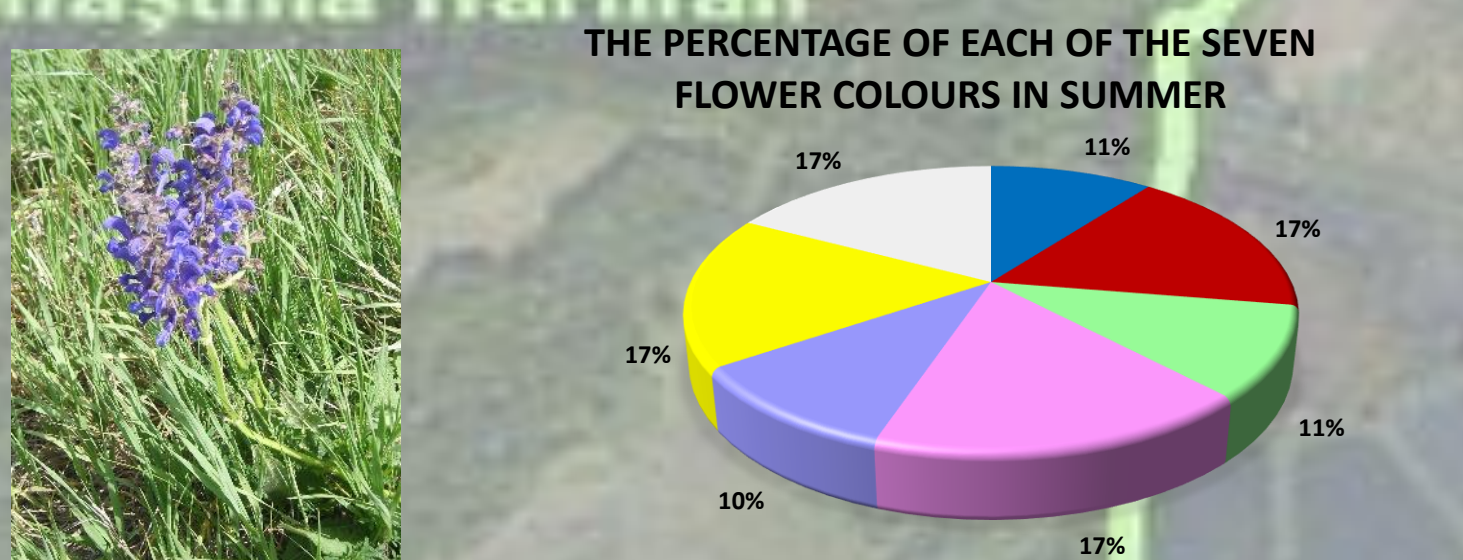
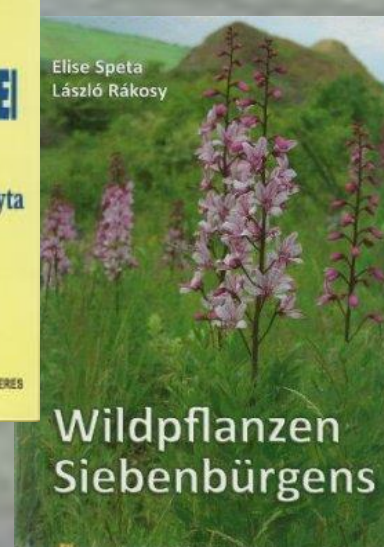


Table 1. The list of plants flowering in the summer, presenting the flowering period and the flower colours

No	Flowering starts	1	2	3	4	5	6	7	8	9	10	11	12	Scientific name	Family name	Prevalence degree	Sozological status	
1	6 (VI-VII)													<i>Myosotis laxa</i> subsp. <i>caespitosa</i> (C.F.Schultz) Nordh.	Boraginaceae	Sporadic		
2	6 (VI-VIII)													<i>Echium vulgare</i> L.	Boraginaceae	Frequent		
3	8 (VI-VIII)													<i>Teucrium chamaedrys</i> L.	Lamiaceae	Frequent		
4	6 (VI - VIII)													<i>Drosera longifolia</i>	Droseraceae	Rare	Critically Endangered	
5	6 (VI - VIII)													<i>Epipactis palustris</i> (L.) Crantz	Orchidaceae	Sporadic		
6	6 (VI-VII)													<i>Allium vineale</i>	Aliiaceae	Sporadic		
7	6 (VI-VII)													<i>Orobanche alba</i> Stephan ex Willd.	Orobanchaceae	Frequent		
8	6 (VI-VIII)													<i>Sanguisorba officinalis</i> L.	Rosaceae	Frequent		
9	6 (VI-VIII)													<i>Pedicularis sceptrum-carolinum</i> L.	Orobanchaceae	Rare	Critically Endangered	
10	6 (VI-VIII)													<i>Sesleria caerulea</i> (L.) Ard.	Poaceae	Rare	Critically Endangered	
11	6 (V-VI)													<i>Liparis loeselii</i> (L.) Richard	Orchidaceae	Sporadic	Critically	
12	6 (VI-VII)													<i>Onobrychis arenaria</i> (Kit.) DC.	Fabaceae	Sporadic		
13	6 (VI-VIII)													<i>Leonurus cardiaca</i> L.	Lamiaceae	Frequent		
14	7 (VII-VIII)													<i>Thymus</i> sp.	Lamiaceae	Frequent		
15	7 (VI-VII)													<i>Armeria maritima</i> ssp. <i>barcensis</i>	Plumbaginaceae	Rare, Endemic	Critically Endangered	
16	7 (VI-VII)													<i>Dianthus carthusianorum</i> L	Caryophyllaceae	Frequent		
17	6 (VI - VIII)													<i>Pinguicula vulgaris</i> L.	Lentibulariaceae	Frequent		
18	6 (VI-VIII)													<i>Knautia arvensis</i> (L.) Coulter	Dipsacaceae	Frequent		
19	8 (VI-VIII)													<i>Salvia transsilvanica</i> (Schur ex Griseb.) Schur	Lamiaceae	Sporadic		
20	6 (VI-VII)													<i>Lathyrus pratensis</i> L.	Fabaceae	Frequent		
21	7 (VII-VIII)													<i>Senecio glaberrimus</i> (Rochel) Simonkai	Asteraceae	Sporadic		
22	7 (VI-VIII)													<i>Filipendula vulgaris</i> Moench.	Rosaceae	Frequent		
23	7 (VI-VIII)													<i>Ligularia sibirica</i> (L.) Cass.	Asteraceae	Sporadic		
24	7 (VI-VII)													<i>Potentilla ternata</i> C. Koch	Rosaceae	Frequent		
25	6 (VI - VIII)													<i>Calla palustris</i>	Calloideae	Sporadic		
26	6 (VI-VII)													<i>Cerastium sylvaticum</i>	Caryophyllaceae	Sporadic		
27	6 (VI-VII)													<i>Phlomis pungens</i> Willd.	Lamiaceae	Sporadic		
28	6 (VI-VII)													<i>Cerastium transsilvanicum</i>	Caryophyllaceae	Sporadic		
29	7 (VII - VIII)													<i>Peucedanum arenarium</i> Waldst. Et. Kit.	Apiaceae	Sporadic		

Conclusions

The predominant colours of the flowers were yellow (confidence and optimism) and white (purity, clarity, rebirth, space) and this distribution was more obvious in the spring period.

Some of the taxons mentioned in the official lists were difficult to find, which implies that protective and restorative measures should be continued.

Acknowledgments

Our sincere and special thanks to Prof.dr. Ioana Mihaela Georgescu (USAMV Bucharest), for her support and dedication towards our project. Special acknowledgments to Fundatia Carpati, the non-governmental organization which manage the Dealul Cetății Lemeș - Mlaștina Hărman site and which by the Project “Life for marsh”, LIFE 11 NAT / RO / 828, greatly contribute to the preservation of Romanian flora. The picture of *Ligularia sibirica* belongs to them.

References

Babolhavaei M., Vakilian M.A., Slamboitchi A., 2015. Color Preferences Based On Gender As a New Approach In Marketing, *Advanced Social Humanities and Management* 2(1) 2015:35-44;

Ciocărlan, V., 2000. *Flora ilustrată a României*, Ed. II, Ed. Ceres, București, 2000

Dihoru Gh., Negrean G., 2009. *Cartea roșie a plantelor vasculare din România*, Editura Academiei Române

Kaplan S., 1995. The Restorative Benefits Of Nature: Toward An Integrative Framework, *Journal of Environmental Psychology* 16, 169-182;

Sarbu A., Sarbu I., Oprea A., Bortas V., 2007. Arit special pentru protecția și conservarea plantelor în România, Ed. Victor B Victor.

Speta E., Răkosy L., 2010. *Wildpflanzen Siebenbürgens*. Pöchl Druck, Freistadt, Austria

Lohr, V.L., 2011. Greening the human environment: The untold benefits. *Acta Horticulturae* 916:159-170.

Mihăilescu S., Anastasiu P., Popescu A. 2015. Ghidul De Monitorizare A Speciei De Plante De Interes Comunitar Din România, Editura Dobreaga, p. 66-68.

****<http://www.fundatiacarpati.ro/formmarsh/noutati/?lang=en>

****<https://www.facebook.com/lifeformmarsh/>

*** <http://eunis.eea.europa.eu/sites/183836>

*** <http://natura2000.eea.europa.eu/Natura2000/SDE.aspx?site=ROSCI0055>

*** The long-lasting development strategy of Harman commune Part I – TERRITORIAL AUDIT AND DIAGNOSIS ANALYSIS