Notes concerning the vegetation from botanical reservation „Pădurea din Şes" from Orheiul Bistriţei (Bistriţa-Năsăud, Romania)

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Abstract. Botanical reservation „Pădurea din Șes" from Orheiul Bistriței, Bistrița-Năsăud county is listed as one of the protected areas from the county due to the presence of the chess flower *Frittilaria meleagris* within its territory. Even it is a small area, it has a complex of habitats which provide a proper environment for numerous plant and animal species. In this paper we present the results of two years of observations (September 2021 - August 2023) on vegetable species inhabiting this area. We found a number of 35 plant families comprising 80 species and one fungi family with one species, totaling 36 families and 81 species.
Key Words: environment, forest, habitat, oak, protected area, protected species.

Introduction. At 6 km south-east of Bistrița city, within the Cetate village territory, lies Orheiul Bistriței plain, covering an area of 1500 hectares; this plain is formed at the contact zone between Bistrița hills and Călimani piedmont (Figure 1). The area is crossed by the Budac rivulet and its tributaries, having a sinuous flow, which determined the formation of numerous humid areas. These areas have also formed due to the slow slooping of precipitation, caused by the absence of slopes or very low slopes (Chintăuan 2000; Chintăuan et al 2004).

Orheiului plain is characterized by the presence of the crop fields and pastures, the only wooded area being an oak forest called „Pădurea din Șes" (Figure 2), which consists of two tree species only, namely *Quercus petraea* and *Quercus robur* (Figure 3) (Rusu et al 2012; Gavriloaie et al 2016a) and dates back to the beginning of the 20th century (Radulovici 2004). The forest has a rare consistency, the trees representing around 30% from the entire surface of the Orheiului plain, being just a small fragment of an old forest which used to cover the whole surface of the Orheiului plain. So, from a dense forest during the period between the two world wars, it became almost a pasture with trees (Chintăuan et al 2004), due to the abusive or illegal tree cutings (Rusu et al 2012). The forest has been declared a protected area due to the presence of the chess flower *Frittilaria meleagris* (Figure 4).

Only few studies were made in this area. Chintăuan (2000) studied the vegetation within the area, presenting a number of 50 species. Chintăuan et al (2004) studied the flora and fauna of the area, mentioning around 70 species of plants, species of invertebrates and a few bird species. Radulovici (2004) and Gavriloaie et al (2016b) focused mainly on bird species, Rusu et al (2012) and Gavriloaie et al (2016a) highlighted some aspects concerning the anthropic impact in the forest.

The aim of our research was to elaborate an updated inventory of the plant species living within the „Pădurea din Șes" forest from the Orheiului plain.

Figure 1. Cetate village, Bistriţa-Năsăud county.

Figure 2. The location of „Pădurea din Şes" area (Google Maps).

Figure 3. Pădurea din Şes (*Quercus robur* and *Quercus petrea*) (photo by C. Gavriloaie).

Figure 4. Specimens of *Fritillaria meleagris* in Pădurea din Şes (photo by C. Gavriloaie).

Material and Method. The study took place between September 2021 to August 2023. We made one trip per month from October to January and two trips per month from February to September. We performed direct observations on the field, covering the entire area of the forest; we used a small digital camera (Technika SH-Z625 6MP) for taking photos. During the study we used both primary and secondary data. The primary data were obtained directly from the field while the secondary data were obtained from the previous published studies within the area and discussions with researchers from the county museum. The obtained data were structured in a table. The plants were determined up to the species level, using available literature (Beldie 1953; Paucă & Roman 1959; Șerbănescu 1959; Prodan & Buia 1966; Todor 1968; Moruzi & Toma 1971; Simionescu 1973; Vaczy 1974; Eliade & Toma 1977; Voiculescu 1978; Sălăgeanu & Sălăgeanu 1985; Rădulescu & Voican 1986; Andrei 2000; Vicol 2008; Locsmándi & Vasas 2013; Eisenrich et al 2018). We followed the most recent valid scientific names using a number of reliable online databases. Concerning the common Romanian names, we used both old and recent literature (Panțu 1906; Borza 1968; Papp 1972; Drăgulescu 2018).

Results and Discussion. A number of 35 families of plants, comprising 80 species and one fungi family with one species (totaling 36 families and 81 species) has been found (Table 1).

Table 1

Species noticed in „Pădurea din Şes" protected area

No.	*Family*	*Species*		
		Scientific name	*English common name*	*Romanian common name*
1	Pleurotaceae	*Pleurotus ostreatus*	Oyster mushroom	Burete negru; păstrăv
2	Teloschistaceae	*Xanthoria parietina*	Common orange lichen	Lichen galben
3	Brachytheciaceae	*Brachythecium rutabulum*	Rough-stalked feather-moss	Mușchi
4	Climaciaceae	*Climacium dendroides*	Tree climacium moss	Mușchi de copac
5	Dicranaceae	*Dicranum scoparium*	Broom forkmoss	Mușchi de pădure; două capuri
6	Leucodontaceae	*Leucodon sciuroides*	Squirrel-tail moss	Mușchi de copac
7	Polytrichaceae	*Polytrichastrum alpinum*	Alpine haircap	Mușchi
8	Equisetaceae	*Equisetum sylvaticum*	Wood horsetail	Coada calului; rușinea ursului
9	Typhaceae	*Typha angustifolia*	Narrowleaf cattail	Papură mică; papură îngustă
10	Alismataceae	*Alisma plantago-aquatica*	Common water-plantain	Limbariță; pătlagină de apă
11	Poaceae	*Agrostis capillaris*	Common bent	Iarba fânațului; fân subțire
12		*Agrostis stolonifera*	Creeping bentgrass	Iarbă de luncă
13		*Briza media*	Common quaking grass	Tremurătoare; grâul păsărilor
14		*Cynosurus cristatus*	Crested dog's-tail	Pieptănariță; codița ierbii
15		*Deschampsia caespitosa*	Tufted hairgrass	Iarbă lungă; iarbă tare; păiș subțâre
16		*Glyceria maxima*	Great manna grass	Dulceața apei; iarbă dulce
17		*Lolium arundinaceum*	Tall fescue	Raigras, zizanie
18		*Lolium pratense*	Meadow fescue	Raigras englez
19		*Phleum pratense*	Common cat's tail	Timoftică
20		*Poa nemoralis*	Wood bluegrass	Firuță de pădure
21		*Poa palustris*	Woodland bluegrass	Firuță de livezi
22	Cyperaceae	*Carex buekii*	Banat sedge	Rogoz
23		*Carex pilosa*	Hairy sedge	Rogoz păros
24		*Carex sylvatica*	Sedge	Rogoz de pădure
25		*Carex vulpina*	True fox sedge	Rogoz roșcat; coada vulpii
26		*Cyperus fuscus*	Brown flatsedge	Căprișor oacheș; murguleț
27		*Eleocharis palustris*	Common spike-rush	Pipirig pitic
28		*Scirpus sylvaticus*	Wood clubrush	Rogoz lat; țipirig
29	Juncaceae	*Juncus articulatus*	Jointleaf rush	Pipirig cu noduri
30		*Juncus conglomeratus*	Compact rush	Pipirig bătut
31		*Juncus effusus*	Common rush	Mândreața bălții; mocioară
32		*Juncus tenuis*	Path rush	Pipirig american; pipirig subțire

33	Liliaceae	*Fritillaria meleagris*	Chess flower	Floare de șah; lalea pestriță
34	Melanthiaceae	*Veratrum album*	European white hellebore	Stirigoaie
35	Colchicaceae	*Colchicum autumnale*	Autumn crocus	Brândușă de toamnă
36	Orchidaceae	*Anacamptis morio*	Green-winged orchid	Bujor
37	Salicaceae	*Populus tremula*	Common aspen	Plop de munte; plop sălbatic
38		*Salix cinerea*	Common sallow	Răchită înflorită; salcie broștească
39	Polygonaceae	*Persicaria hydropiper*	Water pepper	Ardeiul broaștii; piperul bălții
40	Betulaceae	*Alnus glutinosa*	European black alder	Arin negru
41		*Carpinus betulus*	Common hornbeam	Carpen
42		*Corylus avellana*	Common hazel	Alun
43	Fagaceae	*Quercus petraea*	Sessile oak	Gorun
44		*Quercus robur*	Pedunculate oak	Stejar
45	Caryophyllaceae	*Stellaria aquatica*	Water chickweed	Pleșcaiță; răcoină
46	Ranunculaceae	*Caltha palustris*	Marsh-marigold	Calce de baltă
47		*Ficaria verna*	Pilewort	Sălățică; untișor mărunt
48		*Ranunculus repens*	Creeping buttercup	Piciorul cocoșului târâtor; țelina broaștei
49	Rosaceae	*Crataegus monogyna*	Common hawthorn	Păducel
50		*Prunus spinosa*	Blackthorn	Porumbar
51		*Pyrus pyraster*	European wild pear	Păr pădureț
52		*Rosa canina*	Dog rose	Măceș; trandafir de mărăcine
53		*Rubus caesius*	European dewberry	Mură de câmp
54		*Sanguisorba officinalis*	Great burnet	Ceapă rea; sângerie
55	Fabaceae	*Ononis arvensis*	Field restharrow	Iarbă de lingoare; trifoi puturos
56		*Trifolium repens*	White clover	Trifoi alb târâtor; trifoi de luncă
57		*Vicia hirsuta*	Hairy tare	Linte sălbatică
58	Apiaceae	*Astrantia major*	Great masterwort	Ștevie de pădure
59		*Daucus carota*	European wild carrot	Morcov sălbatic; urda vacii
60	Cornaceae	*Cornus sanguinea*	Common dogwood	Lemn câinesc; sânger
61	Primulaceae	*Lysimachia nummularia*	Moneywort	Drețe; gălbioară
62	Boraginaceae	*Myosotis laxa*	Tufted forget-me-not	”Nu mă uita”
63		*Symphytum officinale*	Common comfrey	Iarba lui Tatin; tătăneasă
64	Lamiaceae	*Ajuga reptans*	Blue bugle	Iarba șopârlei; vineriță
65		*Lycopus europaeus*	Gypsywort	Cervana; urzică de baltă
66		*Prunella vulgaris*	Common self-heal	Busuioc de câmp
67		*Thymus pulegioides*	Broad-leaved thyme	Cimbru de munte; lămâioară
68	Orobanchaceae	*Euphrasia stricta*	Drug eyebright	Flori de ochi; ochișori
69	Plantaginaceae	*Plantago lanceolata*	Narrowleaf plantain	Limba câinelui; pătlagină îngustă

70		*Plantago major*	Broadleaf plantain	Limba oii; pătlagină mare
71		*Veronica chamaedrys*	Bird's-eye speedwell	Stejărel
72	Rubiaceae	*Galium schultesii*	Schultes' bedstraw	Iuj; samcă
73	Viburnaceae	*Viburnum opulus*	European cranberrybush	Călin
74	Campanulaceae	*Campanula patula*	Spreading bellflower	Căldărușă; clopoței de câmp
75	Asteraceae	*Achillea millefolium*	Common yarrow	Coada șoricelului
76		*Centaurea jacea*	Brownray knapweed	Pălămidă
77		*Omalotheca sylvatica*	Heath cudweed	Rozmarin de munte
78		*Pilosella officinarum*	Mouse-ear hawkweed	Limba mielului; vulturică
79		*Scorzoneroides autumnalis*	Autumn hawkbit	Păpădiță
80		*Senecio jacobaea*	Common ragwort	Cruciuliță
81		*Taraxacum officinale*	Common dandelion	Păpădie

For such a small area as this forest is, the plant diversity is quite high. This might be due to the variety of habitats within the area which provide a suitable environment for numerous plant species, even the forest suffers a significant anthropic impact (Chintăuan 2000; Chintăuan et al 2004; Rusu et al 2012; Gavriloaie et al 2016a).

Concerning the species *Alisma plantago-aquatica* and *Alnus glutinosa*, they could be found within the rivulet on the north-west side of the forest.

According to Chintăuan et al (2004), L. Gubesch and I. Morariu observed a single specimen of yellow chess flower (*Fritillaria meleagris* f. *lutescens*) back in the days at an unspecificed period. But we were not able to find this variety anywhere within the entire area.

Chintăuan (2000) and Chintăuan et al (2004) mentioned about the presence of daffodil *Narcissus angustifolius* f. *stellaris* (Amaryllidaceae) on the east side of the forest, which used to appear in the beginning of the spring. However, due to the heavy grazing in the area, the number of daffodils decreased year after year. Actually we were not able to find any specimen of this species during the two years of observations.

The great wealth of species sheltered by this forest must be properly preserved by following for real the regulations settled for it as a protected area. An increased involvement of the local authorities in taking real protection measures of the area is highly needed.

Conclusions. The biodiversity of the botanical reservation is remarkable, though the protected surface is quite small. We discovered a number of 36 families and 81 species. The most important species is *Fritillaria meleagris*, which is the reason for the protected area status of "Pădurea din Şes". There is a quite increased anthropic impact in the area, but the forest is still a stable zone. The local authorities should enforce real and diverse protection measures of the area in order to preserve its wealth of species.

Conflict of interest. The authors declare that there is no conflict of interest.

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