

Study of Plant Species Composition of Grasslands in Mugla Village Region (Western Rhodopes, South Bulgaria)

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Abstract. The study presents data on the diversity of grass species in the region of the village of Mugla (the Western Rhodopes). One hundred forty-one species of higher plants belonging to 40 families were registered. (Apiaceae, Aspleniaceae, Asteraceae, Boraginaceae, Brassicaceae, Campanulaceae, Caryophyllaceae, Cistaceae, Cyperaceae, Dipsacaceae, Equisetaceae, Ericaceae, Euphorbiaceae, Fabaceae, Gentianaceae, Geraniaceae, Gesneriaceae, Hypericaceae, Juncaceae, Lamiaceae, Lemnaceae, Liliaceae, Linaceae, Menyanthaceae, Oleaceae, Onagraceae, Orchidaceae, Parnassiaceae, Plantaginaceae, Plumbaginaceae, Poaceae, Polygalaceae, Primulaceae, Ranunculaceae, Rosaceae, Rubiaceae, Saxifragaceae, Scrophulariaceae, Valerianaceae and Violaceae). Their conservation status was presented, as well as medicinal plants.

Key words: Mugla, Western Rhodopes, higher plants, conservation status.

Introduction

The Rhodope Mountains are located in the central part of the Balkan Peninsula and they have a total area of 18000 km², over 14000 km² of them being in the territory of the Republic of Bulgaria. Morphographically they are divided into two major parts – the Western and the Eastern Rhodopes Mts. The border between them runs along the river Kayaliyka, Kitka saddle, the Valley of Borovitza River, the eastern slopes of Zhalty Dyal Hill and reaches the saddle Tri Kamaka, southwest of Zlatograd Town (BRAMBAROV, 2001).

The Western Rhodope Mountains are the higher part of the mountain massif. They are of a medium mountain type, with a highly indented, thick and deeply incised river network. The average altitude of this part of the mountains is 1150 meters. The

Western Rhodopes Mts. are divided into two parts along the Valley of Vacha River: Batak-Dabrava and Perelik-Prespa. The major peaks in the Perelik-Prespa part are Perelik, Prespa and Chernatitsa Peaks. The highest peak of the Rhodopes is in the Perelik Peak, named "Golyam Perelik" Peak (2 191 m). A large number of tributaries of the rivers Vacha, Chepelarska and Arda rise in that part of the Rhodopes. Smolyan and Hvoyna Valleys are also located in that part of the Western Rhodopes Mts. They fall in the Southern Bulgarian mountain-and-valley region, sub-region of the Western Rhodopes Mts. (PETROV, 1997).

Materials and Methods

According to the administrative division of the Republic of Bulgaria, the studied area includes the territories of the

villages of Mugla and Chamla, a small part of the villages of Gela, Gyovren and Trigrad and Nastan quarter of the town of Devin (the border areas with the village of Mugla). Administratively they all belong to the municipalities of Smolyan and Devin Towns, Smolyan District. Smolyan District belongs to South Central region of Bulgaria according to the National Plan for Regional Development (Fig. 1). Inventory of the grass

plants was carried out from June to October 2015. A routing method with transect transitions was used. Transects were selected according to the specificities of different floristic groups, peculiarities of the terrain and altitude, aiming to cover maximum area and all typical and representative of the floristic diversity areas from the studied territory (Table 1). A GPS receiver GARMIN530 was used for inspection of the localities.



Fig. 1. Indicative map of the studied area in Bulgaria.

Table 1. Geographical coordinates of the studied areas.

No	Locality	Altitude	GPS coordinates
01.	Novak	1790 m	N 41°34.913'; E 024°32.419'
02.	Kanarata roud	1590 m	N 41°35.487'; E 024°31.363'
03.	Kasaka (swamp)	1573 m	N 41°36.856'; E 024°31.223'
04.	Ravna gora	1647 m	N 41°37.286'; E 024°30.715'
05.	Syulmenitsa	1714 m	N 41°38.106'; E 024°30.066'
06.	Roud toward Chaeva chuka	1829 m	N 41°38.563'; E 024°30.376'
07.	Chaeva chuka	1925 m	N 41°38.881'; E 024°30.031'
08.	Chaeva chuka (peak)	1841 m	N 41°39.086'; E 024°29.758'
09.	Mursalitsa (cattle-shed)	1774 m	N 41°39.840'; E 024°27.693'
10.	Village of Mugla	1452 m	N 41°37.156'; E 024°29.133'
11.	Kazandzhi dere	1368 m	N 41°37.526'; E 024°29.459'
12.	Kazandzhi dere (falls)	1398 m	N 41°37.606'; E 024°29.677'
13.	Golyamata dzhinupa	1559 m	N 41°35.853'; E 024°29.543'
14.	Yozere	1616 m	N 41°35.880'; E 024°28.483'
15.	Chamla (Usaykata)	1680 m	N 41°37.497'; E 024°26.915'
16.	Chairski ezera (hut)	1413 m	N 41°35.682'; E 024°26.711'
17.	Mechata polyana	1693 m	N 41°34.442'; E 024°30.788'
18.	Chetraka	1771 m	N 41°34.249'; E 024°30.352'

The nomenclature follows DELIPAVLOV & CHESHMEDJIEV (2003). Localization and characterization of taxa populations with conservation status was carried out parallel to the route research.

Results and Discussion

One hundred forty-one plant species belonging to 40 families were found during the field inventory of the area (Apiaceae, Aspleniaceae, Asteraceae, Boraginaceae, Brassicaceae, Campanulaceae, Caryophyllaceae, Cistaceae, Cupressaceae, Cyperaceae, Dipsacaceae, Equisetaceae, Ericaceae, Euphorbiaceae, Fabaceae, Gentianaceae, Geraniaceae, Gesneriaceae, Hypericaceae, Juncaceae, Lamiaceae, Lemnaceae, Liliaceae, Menyanthaceae, Oleaceae, Onagraceae, Orchidaceae, Parnassiaceae, Plantaginaceae, Plumbaginaceae, Poaceae, Polygalaceae, Primulaceae, Ranunculaceae, Rosaceae, Rubiaceae, Saxifragaceae, Scrophulariaceae, Valerianaceae and Violaceae). The full list of the plants is presented in Table 2.

Figure 2 shows that out of the 141 identified species, *Asteraceae* family is represented by the richest species diversity (18 species), followed by *Lamiaceae* family (13 species). *Caryophyllaceae* and *Fabaceae* families are represented by 9 species each and *Rosaceae* and *Poaceae* – by 8 species each. The rest of the families are under-represented.

Medicinal plants and species with conservation status

Seventy-five (50,34%) of all the 141 described plants are under a special regime (Table 3). 64 species are included in the *Medicinal Plants Act* (2000), which provides various activities for their conservation and sustainable use, including the collection and buy-out of herbs obtained thereof.

Eight species are included in the *Biological Diversity Act* (2002). Two of them (*Carex limosa* and *Menyanthes trifoliata*) belong to Annex 2a of the Act and it is stated that the conservation of their habitats is intended by designating protected areas. Five species (*Cortusa matthioli*, *Gentiana lutea* ssp. *symphyandra*, *Geum rhodopaeum*, *Haberlea rhodopensis* and *Potentilla palustris*) are

included in Annex 3 of the same Act and they are announced protected on the territory of the whole country. *Primula veris* species is included in Annex 4 of the Biological Diversity Act under a regime of protection and of regulated use from nature.

There are 4 protected species included in the Red Book of the Republic of Bulgaria, Volume 1. Plants and fungi (PEEV *et al.*, 2015) – *Carex limosa*, *Gentiana lutea* ssp. *symphyandra*, *Menyanthes trifoliata* and *Sideritis scardica*. They all fall in the category Endangered (EN).

The Red List of Bulgarian vascular plants (PETROVA & VLADIMIROV, 2009) includes 12 species. *Gentianella praecox* species is included under the category Data Deficient (DD). *Haberlea rhodopensis* is under the category Least Concern (LC), the species *Geum rhodopaeum*, *Jasione bulgarica* and *Saxifraga stribrnyi* are under Near Threatened (NT) category. Three species: *Angelica pančičii*, *Cortusa matthioli* and *Potentilla palustris* and under Vulnerable (VU) and *Carex limosa*, *Gentiana lutea* ssp. *symphyandra*, *Menyanthes trifoliata* and *Sideritis scardica* are Endangered (EN).

Haberlea rhodopensis is included in Appendix 1 “Strictly protected flora species” of the Convention on the Conservation of European Wildlife and Natural Habitats (CEST, 1979).

Seventeen of the species described in the studied area are included in the Red List of Threatened Plants of the International Union for Conservation of Nature (IUCN, 2015). 16 of them – *Caltha palustris*, *Carex limosa*, *Dactylorhiza cordigera*, *Dactylorhiza sambucina*, *Equisetum palustre*, *Filipendula ulmaria*, *Haberlea rhodopensis*, *Juniperus communis*, *Lemna minor*, *Mentha longifolia*, *Menyanthes trifoliata*, *Nasturtium officinale*, *Parnassia palustris*, *Potentilla palustris*, *Scirpus sylvaticus* and *Trifolium pratense* – are under the category of Least Concern (LC), and the species *Sideritis scardica* – under Near Threatened (NT).

The endemic plants listed in the “Atlas of Bulgarian Endemic Plants” (PETROVA, 2006) are 7. Those are the species *Geum rhodopaeum*, *Jasione bulgarica*, *Sideritis scardica*, *Saxifraga stribrnyi*, *Haberlea*

rhodopensis, *Armeria rumelica* and *Chamaecytisus absinthioides*.

Balkan endemics in the Bulgarian flora (PETROVA & VLADIMIROV, 2010) are: *Achillea ageratifolia*, *Chamaecytisus calcareus*, *Pastinaca*

hirsute, *Cirsium appendiculatum* and *Knautia midzorensis*. The species *Haberlea rhodopensis* is also a Tertiary relict and the species *Cortusa matthioli*, *Gymnadenia conopsea* and *Parnassia palustris* are glacial relicts.

Table 2. List of the registered plants species in the studied area of Mugla (Western Rhodopes, South Bulgaria).

No	Familia	Species
1.	Apiaceae	<i>Angelica pančičii</i> Vandas
2.	Apiaceae	<i>Chaerophyllum aureum</i> L.
3.	Apiaceae	<i>Pastinaca hirsute</i> Pančiči
4.	Aspleniaceae	<i>Asplenium trichomanes</i> L.
5.	Asteraceae	<i>Achillea ageratifolia</i> (Sibth. & Sm.) Boiss.
6.	Asteraceae	<i>Achillea millefolium</i> L.
7.	Asteraceae	<i>Antennaria dioica</i> (L.) Gaertner
8.	Asteraceae	<i>Anthemis arvensis</i> L.
9.	Asteraceae	<i>Carlina acanthifolia</i> All.
10.	Asteraceae	<i>Centaurea nervosa</i> Willd.
11.	Asteraceae	<i>Centaurea stenolepis</i> A. Kerner
12.	Asteraceae	<i>Cirsium appendiculatum</i> Griseb.
13.	Asteraceae	<i>Doronicum austriacum</i> Jacq.
14.	Asteraceae	<i>Hieracium hoppeanum</i> Schultes
15.	Asteraceae	<i>Hieracium pilosella</i> L.
16.	Asteraceae	<i>Leontodon crispus</i> Vill.
17.	Asteraceae	<i>Leucanthemum vulgare</i> Lam.
18.	Asteraceae	<i>Petasites albus</i> (L.) Gaertner
19.	Asteraceae	<i>Scorzonera laciniata</i> L.
20.	Asteraceae	<i>Solidago virgaurea</i> L.
21.	Asteraceae	<i>Taraxacum officinale</i> Weber
22.	Asteraceae	<i>Tussilago farfara</i> L.
23.	Boraginaceae	<i>Echium vulgare</i> L.
24.	Boraginaceae	<i>Myosotis sicula</i> Guss.
25.	Boraginaceae	<i>Myosotis sylvatica</i> Ehrh. ex Hoffm.
26.	Boraginaceae	<i>Nonea pulla</i> (L.) DC.
27.	Boraginaceae	<i>Symphytum officinale</i> L.
28.	Brassicaceae	<i>Arabis alpine</i> L.
29.	Brassicaceae	<i>Cardamine rivularis</i> Schur
30.	Brassicaceae	<i>Nasturtium officinale</i> R. Br.
31.	Brassicaceae	<i>Roripa sylvestris</i> (L.) Besser
32.	Brassicaceae	<i>Thlaspi</i> sp.
33.	Campanulaceae	<i>Campanula rapunculoides</i> L.
34.	Campanulaceae	<i>Campanula rapunculus</i> L.
35.	Campanulaceae	<i>Campanula sparsa</i> Friv.
36.	Campanulaceae	<i>Jasione bulgarica</i> Stoj. & Stefanov
37.	Caryophyllaceae	<i>Dianthus deltoides</i> L.
38.	Caryophyllaceae	<i>Dianthus pinifolius</i> Sm.
39.	Caryophyllaceae	<i>Lychnis flos-cuculi</i> L.
40.	Caryophyllaceae	<i>Moenchia mantica</i> (L.) Bartl.
41.	Caryophyllaceae	<i>Paronychia kapela</i> (Hacq.) A. Kerner
42.	Caryophyllaceae	<i>Scleranthus polycarpus</i> L.
43.	Caryophyllaceae	<i>Silene roemeri</i> Friv.
44.	Caryophyllaceae	<i>Silene vulgaris</i> (Moench) Garcke
45.	Caryophyllaceae	<i>Stellaria graminea</i> L.
46.	Cistaceae	<i>Helianthemum nummularium</i> (L.) Miller
47.	Cyperaceae	<i>Carex limosa</i> L.
48.	Cyperaceae	<i>Eriophorum vaginatum</i> L.
49.	Cyperaceae	<i>Scirpus sylvaticus</i> L.
50.	Dipsacaceae	<i>Knautia arvensis</i> (L.) Coulter
51.	Dipsacaceae	<i>Knautia midzorensis</i> Form.

52.	Equisetaceae	<i>Equisetum arvense</i> L.
53.	Equisetaceae	<i>Equisetum palustre</i> L.
54.	Ericaceae	<i>Bruckenthalia spiculifolia</i> (Salisb.) Reichenb.
55.	Euphorbiaceae	<i>Euphorbia myrsinites</i> L.
56.	Fabaceae	<i>Anthyllis montana</i> L.
57.	Fabaceae	<i>Anthyllis vulneraria</i> L.
58.	Fabaceae	<i>Astragalus monspessulanus</i> L.
59.	Fabaceae	<i>Chamaecytisus absinthioides</i> (Janka) Kuzmanov
60.	Fabaceae	<i>Chamaecytisus calcareus</i> (Velen.) Kuzmanov
61.	Fabaceae	<i>Genista lydia</i> Boiss.
62.	Fabaceae	<i>Trifolium pratense</i> L.
63.	Fabaceae	<i>Trifolium repens</i> L.
64.	Fabaceae	<i>Vicia incana</i> Gouan
65.	Gentianaceae	<i>Gentiana lutea</i> ssp. <i>symphyandra</i> (Murb.) Hayek
66.	Gentianaceae	<i>Gentiana utriculosa</i> L.
67.	Gentianaceae	<i>Gentianella praecox</i> (A. & J. Kerner) Dostal
68.	Geraniaceae	<i>Geranium macrorrhizum</i> L.
69.	Geraniaceae	<i>Geranium sanguineum</i> L.
70.	Gesneriaceae	<i>Haberlea rhodopensis</i> Friv.
71.	Hypericaceae	<i>Hypericum maculatum</i> Crantz
72.	Hypericaceae	<i>Hypericum perforatum</i> L.
73.	Juncaceae	<i>Juncus effuses</i> L.
74.	Juncaceae	<i>Luzula</i> sp.
75.	Lamiaceae	<i>Ajuga genevensis</i> L.
76.	Lamiaceae	<i>Ajuga laxmanii</i> (L.) Bentham
77.	Lamiaceae	<i>Betonica officinalis</i> L.
78.	Lamiaceae	<i>Clinopodium vulgare</i> L.
79.	Lamiaceae	<i>Coronilla varia</i> L.
80.	Lamiaceae	<i>Galeopsis speciosa</i> Miller
81.	Lamiaceae	<i>Mentha longifolia</i> (L.) Hudson
82.	Lamiaceae	<i>Nepeta nuda</i> L.
83.	Lamiaceae	<i>Onobrychis montana</i> DC
84.	Lamiaceae	<i>Origanum vulgare</i> L.
85.	Lamiaceae	<i>Prunella vulgaris</i> L.
86.	Lamiaceae	<i>Sideritis scardica</i> Griseb.
87.	Lamiaceae	<i>Thymus</i> sp.
88.	Lemnaceae	<i>Lemna minor</i> L.
89.	Liliaceae	<i>Muscari botryoides</i> (L.) Miller
90.	Liliaceae	<i>Ornithogalum umbellatum</i> L.
91.	Liliaceae	<i>Veratrum album</i> L. ssp. <i>lobelianum</i> (Bernh.) Reichenb.
92.	Linaceae	<i>Linum capitatum</i> Kit. ex Schultes
93.	Menyanthaceae	<i>Menyanthes trifoliata</i> L.
94.	Oleaceae	<i>Thesium alpinum</i> L.
95.	Onagraceae	<i>Chamaenerion angustifolium</i> (L.) Scop.
96.	Orchidaceae	<i>Dactylorhiza cordigera</i> (Fries.) Soó
97.	Orchidaceae	<i>Dactylorhiza sambucina</i> (L.) Soó
98.	Orchidaceae	<i>Gymnadenia conopsea</i> (L.) R. Br.
99.	Parnassiaceae	<i>Parnassia palustris</i> L.
100.	Plantaginaceae	<i>Plantago lanceolata</i> L.
101.	Plantaginaceae	<i>Plantago media</i> L.
102.	Plumbaginaceae	<i>Armeria rumelica</i> Boiss.
103.	Poaceae	<i>Agrostis cappilaris</i> L.
104.	Poaceae	<i>Alopecurus myosuroides</i> Hudson
105.	Poaceae	<i>Apera spica-venti</i> (L.) Beauv.
106.	Poaceae	<i>Arrhenatherum elatius</i> (L.) Beauv. ex J. & C. Presl
107.	Poaceae	<i>Briza humilis</i> Bieb.
108.	Poaceae	<i>Calamagrostis epigeios</i> (L.) Roth
109.	Poaceae	<i>Festuca nigrescens</i> Lam.
110.	Poaceae	<i>Festuca pratensis</i> Hudson
111.	Polygalaceae	<i>Polygala anatholica</i> Boiss. & Heldr.
112.	Polygonaceae	<i>Rumex acetosa</i> L.
113.	Polygonaceae	<i>Rumex acetosella</i> L.
114.	Primulaceae	<i>Cortusa matthioli</i> L.

115.	Primulaceae	<i>Primula veris</i> L.
116.	Ranunculaceae	<i>Caltha palustris</i> L.
117.	Ranunculaceae	<i>Ranunculus acris</i> L.
118.	Ranunculaceae	<i>Ranunculus polyanthemos</i> L.
119.	Ranunculaceae	<i>Thalictrum aquilegifolium</i> L.
120.	Rosaceae	<i>Filipendula ulmaria</i> (L.) Maxim.
121.	Rosaceae	<i>Fragaria vesca</i> L.
122.	Rosaceae	<i>Geum revale</i> L.
123.	Rosaceae	<i>Geum rhodopaeum</i> Stoj. & Stefanov
124.	Rosaceae	<i>Potentilla argentea</i> L.
125.	Rosaceae	<i>Potentilla erecta</i> (L.) Rauschel
126.	Rosaceae	<i>Potentilla palustris</i> (L.) Scop.
127.	Rosaceae	<i>Sanguisorba minor</i> Scop.
128.	Rubiaceae	<i>Cruciata laevipes</i> Opiz
129.	Rubiaceae	<i>Galium rivale</i> (Sibth. & Sm.) Griseb.
130.	Rubiaceae	<i>Galium verum</i> L.
131.	Saxifragaceae	<i>Saxifraga adscendens</i> L.
132.	Saxifragaceae	<i>Saxifraga sibirnyi</i> (Velen.) Podp.
133.	Scrophulariaceae	<i>Euphrasia minima</i> Jasq. Ex DC.
134.	Scrophulariaceae	<i>Melampyrum sylvaticum</i> L.
135.	Scrophulariaceae	<i>Rhinanthus rumelicus</i> Velen.
136.	Scrophulariaceae	<i>Verbascum</i> sp.
137.	Scrophulariaceae	<i>Veronica</i> sp.
138.	Valerianaceae	<i>Valeriana officinalis</i> L.
139.	Valerianaceae	<i>Valerianella</i> sp.
140.	Violaceae	<i>Viola kitaibeliana</i> Schultes
141.	Violaceae	<i>Viola tricolor</i> L.

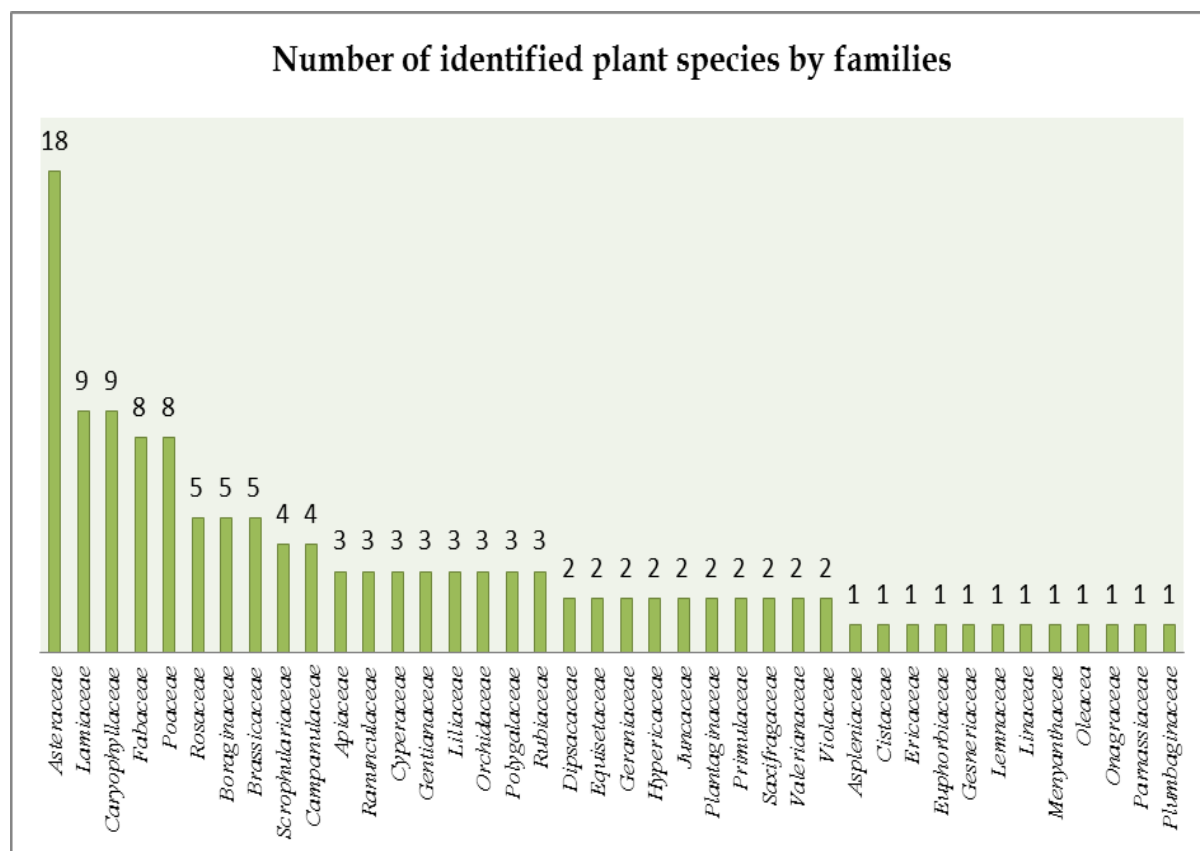


Fig. 2. Number of identified plant species by families.

Table 3. Plants of conservation importance and medicinal plants, registered in the studied area of Mugla (Western Rhodopes, South Bulgaria). *Legend:* IUCN - IUCN Red List of Threatened species; BC - Bern Convention; RLBVP - Red List of Bulgarian vascular plants; RB - Red Book of the Republic of Bulgaria; BDA - Biological Diversity Act; MPA - Medicinal Plants Act (explanations and citations are in the text).

No	Species	IUCN	BC	RLBVP	RB	BDA	MPA
1.	<i>Achillea millefolium</i>	-		-	-	-	+
2.	<i>Angelica pančičii</i>	-		VU	-	-	-
3.	<i>Antennaria dioica</i>	-		-	-	-	+
4.	<i>Anthyllis vulneraria</i>	-		-	-	-	+
5.	<i>Asplenium trichomanes</i>	-		-	-	-	+
6.	<i>Betonica officinalis</i>	-		-	-	-	+
7.	<i>Caltha palustris</i>	LC		-	-	-	+
8.	<i>Carex limosa</i>	LC		EN	EN	+	-
9.	<i>Clinopodium vulgare</i>	-		-	-	-	+
10.	<i>Coronilla varia</i>	-		-	-	-	+
11.	<i>Cortusa matthioli</i>	-		VU	-	+	-
12.	<i>Cruciata laevipes</i>	-		-	-	-	+
13.	<i>Dactylorhiza cordigera</i>	LC		-	-	-	-
14.	<i>Dactylorhiza sambucina</i>	LC		-	-	-	-
15.	<i>Echium vulgare</i>	-		-	-	-	+
16.	<i>Equisetum arvense</i>	-		-	-	-	+
17.	<i>Equisetum palustre</i>	LC		-	-	-	+
18.	<i>Eriophorum vaginatum</i>	-		-	-	-	+
19.	<i>Euphorbia myrsinites</i>	-		-	-	-	+
20.	<i>Filipendula ulmaria</i>	LC		-	-	-	+
21.	<i>Fragaria vesca</i>	-		-	-	-	+
22.	<i>Galeopsis speciosa</i>	-		-	-	-	+
23.	<i>Galium verum</i>	-		-	-	-	+
24.	<i>Gentiana lutea</i> ssp. <i>symphyandra</i>	-		EN	EN	+	+
25.	<i>Gentianella praecox</i>	-		DD	-	-	-
26.	<i>Geranium macrorrhizum</i>	-		-	-	-	+
27.	<i>Geranium sanguineum</i>	-		-	-	-	+
28.	<i>Geum rhodopaeum</i>	-		NT	-	+	-
29.	<i>Gymnadenia conopsea</i>	-		-	-	-	+
30.	<i>Haberlea rhodopensis</i>	LC	+	LC	-	+	+
31.	<i>Hieracium pilosella</i>	-		-	-	-	+
32.	<i>Hypericum maculatum</i>	-		-	-	-	+
33.	<i>Hypericum perforatum</i>	-		-	-	-	+
34.	<i>Jasione bulgarica</i>	-		NT	-	-	-
35.	<i>Juniperus communis</i>	LC		-	-	-	-
36.	<i>Knautia arvensis</i>	-		-	-	-	+
37.	<i>Lemna minor</i>	LC		-	-	-	+
38.	<i>Leucanthemum vulgare</i>	-		-	-	-	+
39.	<i>Lychnis flos-cuculi</i>	-		-	-	-	+
40.	<i>Mentha longifolia</i>	LC		-	-	-	+
41.	<i>Menyanthes trifoliata</i>	LC		EN	EN	+	+
42.	<i>Nasturtium officinale</i>	LC		-	-	-	+
43.	<i>Origanum vulgare</i>	-		-	-	-	+
44.	<i>Parnassia palustris</i>	LC		-	-	-	+
45.	<i>Petasites albus</i>	-		-	-	-	+
46.	<i>Plantago lanceolata</i>	-		-	-	-	+
47.	<i>Plantago media</i>	-		-	-	-	+
48.	<i>Potentilla argentea</i>	-		-	-	-	+
49.	<i>Potentilla erecta</i>	-		-	-	-	+
50.	<i>Potentilla palustris</i>	LC		VU	-	+	+
51.	<i>Primula veris</i>	-		-	-	+	+
52.	<i>Prunella vulgaris</i>	-		-	-	-	+
53.	<i>Ranunculus polyanthemos</i>	-		-	-	-	+
54.	<i>Rumex acetosa</i>	-		-	-	-	+

55.	<i>Rumex acetosella</i>	-	-	-	-	+
56.	<i>Salix caprea</i>	-	-	-	-	+
57.	<i>Salix purpurea</i>	-	-	-	-	+
58.	<i>Sambucus racemosa</i>	-	-	-	-	+
59.	<i>Sanguisorba minor</i>	-	-	-	-	+
60.	<i>Saxifraga strobilifera</i>	-	NT	-	-	-
61.	<i>Scirpus sylvaticus</i>	LC	-	-	-	-
62.	<i>Sorbus aucuparia</i>	-	-	-	-	+
63.	<i>Sideritis scardica</i>	NT	EN	EN	-	+
64.	<i>Solidago virgaurea</i>	-	-	-	-	+
65.	<i>Stellaria graminea</i>	-	-	-	-	+
66.	<i>Symphytum officinale</i>	-	-	-	-	+
67.	<i>Taraxacum officinale</i>	-	-	-	-	+
68.	<i>Thalictrum aquilegifolium</i>	-	-	-	-	+
69.	<i>Trifolium pratense</i>	LC	-	-	-	+
70.	<i>Trifolium repens</i>	-	-	-	-	+
71.	<i>Tussilago farfara</i>	-	-	-	-	+
72.	<i>Vaccinium myrtillus</i>	-	-	-	-	+
73.	<i>Valeriana officinalis</i>	-	-	-	-	+
74.	<i>Veratrum album</i> L. ssp. <i>lobelianum</i>	-	-	-	-	+
75.	<i>Viola tricolor</i>	-	-	-	-	+

Conclusions

In the present study was found a high abundance of plants in all investigated territories. This could be a hallmark for their importance of environmental issues. The list of plants includes 141 species, 24 of them being of conservation importance. Phytocenological studies including species variety and quantity should be carried out in order to determine more detailed characteristics of the areas. This would be of great importance to be done for species with conservation significance.

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