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Floristic and habitat diversity of Dospat Dere in the Dabrash mountain (West Rhodopes), Bulgaria

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***Abstract*:**

Dimitrov, D.S.: ***Floristic and habitat diversity of Dospat Dere in the Dabrash mountain (West Rhodopes), Bulgaria. Biologica Nyssana, 8 (1), September 2017: 39-45.***

A research has been done of the flora and natural habitats of the Dospat Dere area, which is located on the right bank of the Dospat river, between the Tuhovitsa and Zhizhevo villages, next to the border with Greece. The systematic specter of the flora contains 197 species of vascular plants (excluding the moss species). These vascular plants are referred to 143 genera and 57 families. As a result of this research, 5 habitats were established: 10 E1 Pseudo-steppe with grasses and annual of the *Thero-Brachypodietea*, 08H3 Calcareous rocky slopes with chasmophytic vegetation, 21G1 Supra Mediterranean hop-hornbeam woods, 02G1 Southern Helleno-Balkanic swamp alder woods and 07G1 Helleno-Balkanic riparian plane forests.

Key words: floral analysis, floristic elements, natural habitats

***Apstrakt*:**

Dimitrov, D.S.: ***Floristički i stanišni diverzitet Dospat Derea na planini Dabraš (Zapadni Rodopi), Bugarska. Biologica Nyssana, 8 (1), Septembar 2017: 39-45.***

Izvršeno je istraživanje flore i prirodnih staništa oblasti Dospat Dere, koja se nalazi na desnoj obali reke Dospat, između sela Tuhovica i Žiževo, pored granice sa Grčkom. Sistematski spektar flore sadrži 197 vrsta vaskularnih biljaka (sa izuzećem mahovina). Ove vaskularne biljke se svrstavaju u 143 roda i 57 familija. Kao rezultat ovog istraživanja, utvrđeno je 5 staništa: 10 E1 Psedostepe sa travama i jednogodišnjim biljkama Thero-Brachypodietea, 08H3 Krečnjačke stene sa hazmofitskom vegetacijom, 21G1 Supramediteranske šume crnog graba, 02G1 Južne grčko-balkanske močvarne šume jove i 07G1 grčko-balkanske riparijalne ravničarske šume.

Ključne reči: floristička analiza, florni elementi, prirodna staništa

Introduction

The Dabrash mountain is the westernmost part of the Rhodopes mountain range, which happens to be the oldest piece of land on the Balkan peninsula. Its highest peak is located in the northern part of this area: Beslet peak (1937 m height). Its geological makeup is rather variable. There are predominantly silicate rocks: granite and granite gneiss. However, there are also basic and ultrabasic rocks, especially in the southern part, where the investigated area is located. The rocks are marble dating back to the

Proterozoic eon (Stefanov, 1981). The highest peaks here are Pobit kamak 1086 m and Chukata 1010 m (**Fig. 1**). There are several caves in this area: Mecha dupka and Gargina dupka. The climate is transitional continental, since the valley of the Dospat river follows a meridional direction and thus allows for strong Mediterranean climate influence. The average annual temperature here is 10 °C. The average temperature in January is between 0 °C and 7 °C. There are predominantly autumn-winter and spring-summer rainfalls. The composition of the rocks is similar to the one in Northern and Southern Pirin, Stargach, Slavyanka and Trigradsko zhdrelo, which of course has an impact on the flora in this area. Until now, the flora of the Dabrash mountain has not been researched specifically in details. There are some brief notifications about some new and rare species for the Bulgarian flora (Kitanov, 1936) and also about some new localities of Macedonian pine (Jordanov, 1939, Kitanov, 1939b). There are new chorological data for 25 new species of the floristic area in the West Rhodopes (Dabrash) which are reported by Dimitrov & Vutov (2016).

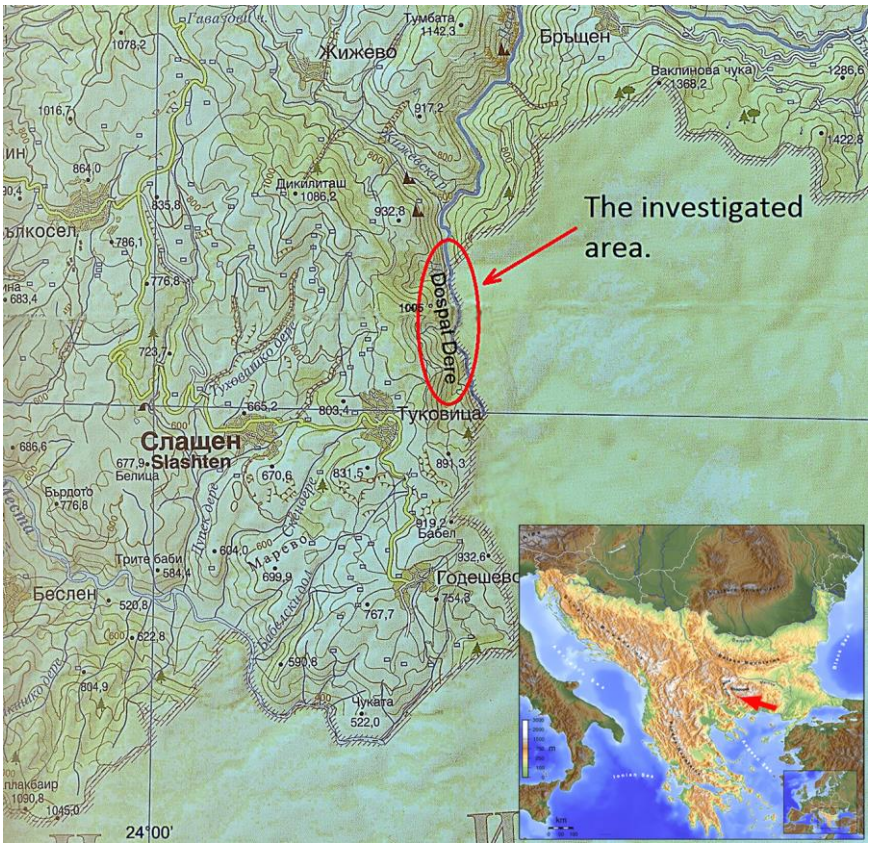

Fig. 1 – A geographical position of the investigated territory in Western Rhodopes (Tourist map, Domino, Stara Zagora, ISBN 978-954-651-205-5, M= 1:100 000) and on the Balkan Peninsula (down left)

Material and methods

The researched area is 1.35 км^2. The species determination was done according to: Jordanov (1963-1979), Velchev (1982-1989), Kozuharov (1992), Delipavlov & Cheshmedijev (2004), Peev (2012), Tutin et al. (1964-1980). The transect and trial sites methods were used for the determination of the vegetation in this case. The habitats were determined according to Bisserkov et al. (2015). The geo-elemental makeup was analyzed according to Assyov & Petrova (2012). The species` category with conservation status was determined according to Petrova & Vladimirov (2009). The protected species` status is based on the Law for biological diversity of the republic of Bulgaria. The herbarium specimens have been deposited in the herbarium of the Institute of Biodiversity and Eco Systematic research (SOM).

Results and discussion

The systematic specter of the flora of Dospat Dere is comprised mainly with specimens from Phylum Magnoliophyta – 52 families (91.2%), 137 genera (90.6%) and 188 species (95.4%). From class Dicotyledonae – 45 families (78.8%), 109 genera (76.2%), and 152 species (77.1%). From class Monocotyledonae – 7 families (12.2%), 28 genera (19.5%) and 36 species (18.2%). From Phylum Gymnospermae there are 2 families (3.5%), 2 genera (1.3%) and 4 species (2.03%). From Phylum Pteridophyta – 3 families (5.2%), 4 genera (2.7%) and 5 species (2.5%). Out of the examined families, the ones with the biggest number of species are: Fabaceae (23 species; 11.6% of the total number of species), Poaceae (17; 8.6%), Asteraceae (15; 7.6%), Caryophyllaceae (14; 7.1%) and Lamiaceae (11; 5.5%). Other families contain less than 10 species: Apiaceae, Rosaceae, Scrophulariaceae (7; 3.5%), Orchidaceae (6; 3.0%), Liliaceae, Brassicaceae, Cyperaceae (5; 2.5%), Campanulaceae, Dipsacaceae, Linaceae (4; 2.03%), Polygalaceae, Ranunculaceae, Aspleniaceae, Betulaceae (3; 1.5%), Juniperaceae, Pinaceae, Boraginaceae, Cornaceae, Cistaceae, Crassulaceae, Euphorbiaceae, Geraniaceae, Hyperica-

ceae, Loranthaceae, Oleaceae, Orobanchaceae, Rubiaceae (2; 1.02%), Polypodiaceae, Equisetaceae, Aceraceae, Amarillidaceae, Anacardiaceae, Asclepiadaceae, Cannabaceae, Convolvulaceae, Dioscoreaceae, Fagaceae, Globulariaceae, Iridaceae, Plantaginaceae, Platanaceae, Plumbaginaceae, Polygonaceae, Rutaceae, Salicaceae, Santalaceae, Thymeleaceae, Ulmaceae, Urticaceae, Valerianaceae, Violaceae (1; 0.5%).

According to biological type, there are predominately perennial herbaceous species (120 species; 60.8% of the total number of species), followed by annual species (29; 10.1%), arboreal species (10; 5.07%), bushes (10; 5.07%), annual to biennial species (9; 4.51%), semi-bushes (7; 3.5%), biennial (4; 2.02%), biennial to perennial (4; 2.07%) and annual to perennial species (4; 2.07%).

Based on the conducted research, the following floristic elements were determined: there are predominantly Mediterranean elements (34 species; 17.7% of the total number of species), followed by Euro-Asiatic (23; 11.6%), Euro-Mediterranean (19; 9.6%), Pontic-Mediterranean (16; 8.1%), Mediterranean (14; 7.1%), Balkan endemics (10; 5.07%), Euro-Siberian (9; 4.5%), Boreal, European (8; 4.5%), Subboreal (6; 3.4%), Euro-Submediterranean elements (5; 2.53%), Subpontic and Pontic elements (4; 2.03%), Mediterano-Central Asiatic, Apennino-Balcanic and Balcano-Anatolian (3; 1.5%), Submediterrano-Asiatic, Euro-Central Asiatic, Mediterrano-Asiatic, Euro-Orientalo Turanian, Subbalcanic, Kosmopolitian (2; 1.01%), Mediterano-Orientalo Turanian, Ponto-Submediterranean, Ponto-Balcanic, Alpo-Mediterranean, South Siberian, Bulgarian, Carpato-Balcanic and Ponto-Submediterranean elements (1; 0.5%).

The genera represented by the biggest number of species are: *Trifolium, Silene*: (5 species; 2.5% of the total number of species), *Carex, Scabiosa, Vicia*, *Linum* (4; 2.03%), *Scorzonera, Dianthus, Astragalus, Coronilla, Ajuga, Festuca, Polygala, Veronica* (3; 1.5%).

The floristic complex of the investigated flora includes 1 Bulgarian endemite - *Cerastium velenovskyi* and 13 Balkan endemites: *Anthemis macedonica, Chondrilla urumoffii, Onosma thracica, Trachelium rumelianum, Dianthus cruentus, Dianthus drenovskyanus, Scabiosa triniifolia, Hypericum umbellatum, Micromeria dalmatica, Linum thracicum, Orobanche esulae, Festuca penzesii* and *Silene frivaldszkyana*. There are also 20 Tertiary relics, some of them being: *Trachelium rumelianum, Chondrilla urumoffii, Onosma thracica, Festuca penzesii*.

The research has found 15 species with conservation status:

Galanthus elwesii Hook f. EN B1ab(ii,iii,iv,v)+2ab(ii); C2a(i) (Evstatieva, 2009), BDA, Annex 2, 3.
Chondrilla urumoffii Degen VU B2ab(ii,iii) (Dimitrova, 2009), BDA, Annex 3
Trachelium rumelianum Hampe VU B1ab(ii,iii,iv) (Goranova & Anchev, 2009), BDA, Annex 2, 3.
Romulea bulbocodium (L.) Sebast. & Mauri VU B2ab(ii,iv); C2a(i) (Meshinev, 2009), BDA, Annex 2, 3.
Limodorum abortivum (L.) Schwartz VU B2b(iv)c(iv) (Petrova, 2009), BDA, Annex 2, 3.
Ophrys cornuta Steven VU B2b(ii,iv)c(iv) (Petrova 2009), BDA, Annex 2, 3.
Lotus aegaeus (Griseb.) Boiss. LC (Sopotlieva, 2009)
Arabis collina Ten. BDA, Annex 2, 3.
Trinia glauca (L.) Dumort. ssp. *carniolica* (A. Kerner ex Janchen) H. Wolff. BDA, Annex 2.
Veronica multifida L. BDA, Annex 2, 3.
Dianthus drenowskyanus Rech. f. BDA, Annex 3.
Lilium martagon L. BDA, Annex 4
Asparagus tenuifolius Lam., BDA, Annex 4.
Stipa tirsa Steven, BDA, Annex 4.
Pulsatilla montana (Hoppe) Rchb. BDA, Annex 4.

Out of these species, 7 are protected by the Law for biological diversity of the republic of Bulgaria (Annex 2, 3): *Galanthus elwesii* Hook. f., *Trachelium rumelianum* Hampe, *Romulea bulbocodium* (l.) Sebast. & Mauri, *Limodorum abortivum* (L.) *Schwartz, Ophrys cornuta Steven, Arabis collina Ten. and Veronica multifida L.* One species - *Trinia glauca* (L.) Dumort. ssp. *carniolica* (A.Kerner ex Janchen) H.Wolff is reported in Annex 2. Two species - *Chondrilla urumoffii* Degen and *Dianthus drenowskyanus* Rech. f. are in Annex 3 and 4 species - *Lilium martagon* L., *Asparagus tenuifolius* Lam., *Stipa tirsa* Steven and *Pulsatilla montana* (Hoppe) Rchb. are in Annex 4.

Three species from the researched flora are reported in the Red Data Book of the republic of Bulgaria, v.1 Plants and fungi (Peev et al., 2015): *Dianthus drenovskyanus* Rech. f. CR B2b(II,v)c(ii,iv); D (Denchev & Assyov, 2015), *Chondrilla urumoffii* Degen VU B2ab(ii,iii) (Dimitrova, 2015) and *Trachelium rumelianum* Hampe VU B1ab (ii,iii,iv) (Goranova & Anchev, 2015).

Six species are also under the protection of the CITES convention: *Cephalanthera rubra* (L.) Rich., *Epipactis atrorubens* (Hoffm.) Besser, *Limodorum*

abortivum (L.) Schwarz, *Ophrys cornuta* Steven, *Orchis coriophora* L. and *Platanthera chlorantha* (Custer) Rchb.

Out of all the determined species in this research, there are 75 (38% of the total number) medicinal plants.

Regarding the natural habitats here, there are: 10 E1 Pseudo-steppe with grasses and annual of the *Thero-Brachypodietea*, 08H3 Calcareous rocky slopes with chasmophytic vegetation, 21G1 Supra Mediterranean hop-hornbeam woods, 02G1 Southern Helleno-Balkanic swamp alder woods and 07G1 Helleno-Balkanic riparian plane forests.

In general, the habitat 10 E1 Pseudo-steppe with grasses and annual of the *Thero-Brachypodietea* has a conservation status: vulnerable [VU- A1,2 B1 C1 D2 E2 F2 G2 H2 I L2] (Gussev, 2015). However, this habitat in the West Rhodopes has not been reported in the literature (Biserkov et al., 2015). At the moment, the habitat is being used as a grazing land for domestic sheep and goats.

The habitat 08H3 Calcareous rocky slopes with chasmophytic vegetation has a conservation status: vulnerable [VU – A1, 2 B2 D2 H2 I J] (Gussev & Russakova, 2015).

The habitat 21G1 Supra Mediterranean hop-hornbeam woods has a conservation status: vulnerable [VU- A1 B2 C1 D2 E2 F1 G1 H2I L2] (Russakova & Tashev, 2015). It is located on the steep and vertical slopes above the right bank of the Dospat river. This habitat has not been reported either according to Biserkov et al. (2015).

The habitat 02G1 Southern Helleno-Balcanic swamp alder woods has a conservation status: endangered [EN – A1, 2 C2 D2 E2 F2 G2 H2 I J L2] (Dimitrov & Tashev, 2015). This habitat also has not been reported according to Biserkov et al. (2015).

The habitat 07G1 Helleno-Balcanic riparian plane forest has a conservation status: endangered [EN – A1, 2 C1 D1 E2 F2 G2 H2 L3] (Gogoushev, 2015). This habitat has not been reported according to Biserkov et al. (2015) either.

Conclusion

The existence of this rich and interesting local flora brings up an important point – its preservation in the future. When the following facts are taken into consideration: the presence of 1 species with endangered conservation status, 5 vascular plant species with vulnerable conservation status, 1 species with a least concern status, the high percentage of endemites (7,1%) and tertiary relicts (10,6%), the presence of two habitats with endangered status, 3 habitats with vulnerable status, as well as 15 species protected according to the Law for biological diversity of the republic of Bulgaria – are more than enough for this area of the West Rhodopes to be officially classified as a natural protected one.

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Appendix

List of determined plants from the researched area

Pteridophyta

Aspleniaceae

1. *Asplenium ruta-muraria* L.
2. *A. trichomanes* L.
3. *Ceterach officinarum* DC.

Polypodiaceae

4. *Polypodium vulgare* L.

Equisetophyta

Equisetaceae

5. *Equisetum palustre* L.

Pinophyta

Juniperaceae

6. *Juniperus communis* L.
7. *J. oxycedrus*L.

Pinaceae

8. *Pinus nigra* Arnold
9. *P. sylvestris* L.

Magnoliophyta

Aceraceae

10. *Acer campestre* L. ssp. *campestre*

Amaryllidaceae

11. *Galanthus elwesii* Hook.f. EN

Apiaceae

12. *Eryngium campestre* L.
13. *Ferulago sylvatica* (Besser) Rchb.
14. *Orlaja daucoides* (L.) Greuter
15. *O. grandiflora* (L.) Hoffm.
16. *Peucedanum alsaticum* L.
17. *Torilis japonica* (Houtt.) DC.
18. *Trinia glauca* (L.) Dumort.

Anacardiaceae

19. *Pistacia terebinthus* L.

Asclepiadaceae

20. *Vincetoxicum hirundinaria* Medicus ssp. *nivale* (Boiss. et Heldr.) Markgr.

Asteraceae

21. *Achillea setacea* Waldst. & Kit.
22. *Anthemis macedonica* Boiss. ssp. *orbelica* (Balkan endemic)
23. *Carlina acanthifolia* All.
24. *Chondrilla urumoffii* Degen Balcan end. VU, BDA
25. *Crepis sancta* (L.) Babc.
26. *Inula aschersoniana* Janka (Balkan endemic)
27. *Leontodon crispus* Vill.
28. *I. ensifolia* L.
29. *Jurinea mollis* (L.) Rchb. ssp. *anatolica* (Boiss.) Stoj.et Stef.
30. *Scorzonera hispanica* L.
31. *S. laciniata* L.
32. *S. purpurea* L.
33. *Senecio vernalis* Waldst.& Kit.
34. *Tanacetum vulgare* L.
35. *Tragopogon dubius* Scop.

Betulaceae

36. *Alnus glutinosa* (L.) Gaertn.
37. *Carpinus orientalis* Mill.
38. *Ostrya carpinifolia* Scop.

Boraginaceae

39. *Buglossoides purpurocaerulea* (L.) I.M.Johnst.
40. *Onosma thracica* Velen. Balcan.end.

Brassicaceae

41. *Aethionema saxatile* (L.) R.Br.
42. *Alyssum alyssoides* (L.) L.
43. *Arabis collina* Ten.
44. *A. sagittata* (Bertol.) DC.
45. *Erysimum diffusum* Ehrh.

Campanulaceae

46. *Asyneuma canescens* (Waldst. & Kit.) Griseb. et Schenk
47. *Campanula lingulata* Waldst. & Kit.
48. *C. persicifolia* L.
49. *Trachelium rumelianum* Hampe (Balkan endemic) VU, BDA

Cannabaceae

50. *Humulus lupulus* L.

Caryophyllaceae

51. *Cerastium luridum* Guss.
52. *C. velenovskyi* Hayek Bul. end.
53. *Dianthus cruentus* Griseb. (Balkan endemic)
54. *D. drenowskyanus* Rech. f. (Balkan endemic)
55. *D. petraeus* Waldst. & Kit.
56. *Herniaria hirsuta* L.
57. *Lychnis coronaria* (L.) Desr.
58. *Minuartia mesogitana* (Boiss.) Hand.-Mazz.
59. *Petrorhagia prolifera* (L.) P.W.Ball & Heywood
60. *Silene conica* L.
61. *S. flavescens* Waldst. & Kit.
62. *S. frivaldszkyana* Hampe (Balkan endemic)
63. *S. italica* (L.) Pers.
64. *S. radicosa* Boiss. & Heldr.

Convolvulaceae

65. *Convolvulus cantabrica* L.

Cornaceae

66. *Cornus mas* L.
67. *Cornus sanguinea* L.

Cistaceae

68. *Fumana procumbens* (Dunal) Gren. & Godr.
69. *Rhodax alpestris* (Jacq.) Fuss.

Crassulaceae

70. *Sedum alpestre* Vill.
71. *S. anopetalum* DC.

Cyperaceae

72. *Blysmus compressus* (L.) Panz. ex Link
73. *Carex distans* L.
74. *C. divisa* Huds.
75. *C. hirta* L.
76. *C. liparocarpos* Gaudin

Dipsacaceae

77. *Scabiosa argentea* L.
78. *S. columbaria* L.
79. S. ochroleuca L. var. ochroleuca
80. *S. triniifolia* Friv. (Balkan endemic)

Dioscoreaceae

81. *Tamus communis* L.

Euphorbiaceae

82. *Euphorbia myrsinites* L.
83. *E. niciciana* Borbas f. *niciciana*

Fabaceae

84. *Anthyllis vulneraria* L. ssp. *pulchella* (Vis.) Bornm.
85. *Astragalus glycyphyllos* L.
86. *A. monspessulanus* L.
87. *A. onobrychis* L.
88. *Coronilla emerus* L.
89. *C. scorpioides* (L.) C. Koch
90. *C. varia* L
91. *Dorycnium herbaceum* Vill.
92. *Genista lydia* Boiss.
93. *Lotus aegaeus* (Griseb.) Boiss. LC
94. *Medicago minima* (L.) Bartal
95. *Onobrychis gracilis* Besser
96. *Ononis adenotricha* Boiss.
97. *O. pusilla* L.
98. *Trifolium alpestre* L.
99. *T. arvense* L.
100. *T. campestre* Schreb. var. *campestre*
101. *T. incarnatum* L.
102. *T. scabrum* L. ssp. *scabrum*
103. *Vicia cracca* L.
104. *V. grandiflora* Scop.
105. *V. varia* Host
106. *V. villosa* Roth

Fagaceae

107. *Quercus pubescens* Willd.

Geraniaceae

108. *Geranium robertianum* L.
109. G. sanguineum L.

Globulariaceae

110. *Globularia aphyllanthes* Crantz

Hypericaceae

111. *Hypericum rumeliacum* Boiss.
112. *H. umbellatum* A. Kern. (Balkan endemic)

Iridaceae

113. *Romulea bulbocodium* (L.) Sebast. & Mauri, VU, BDA

Juglandaceae

114. *Juglans regia* L.

Lamiaceae

115. *Ajuga chamaepitys* (L.) Schreb.
116. *A. genevensis* L.
117. *A. laxmannii* (L.) Benth.
118. *Calamintha sylvatica* Bromf.
119. *Micromeria dalmatica* Benth. (Balkan endemic)
120. *Salvia glutinosa* L
121. *Sideritis montana* L.
122. *Stachys recta* L.
123. *Teucrium polium* L.
124. *Thymus callieri* Borb.ex Velen.
125. *Th. striatus* Vahl.

Liliaceae

126. *Allium moschatum* L.
127. *Anthericum liliago* L.

128. *Asparagus tenuifolius* Lam.
129. *Lilium martagon* L.
130. *Muscari comosum* (L.) Mill.

Linaceae

131. *Linum austriacum* L.
132. *L. tenuifolium* L.
133. *L. nervosum* Waldst. & Kit.
134. *L. thracicum* (Griseb.) Degen (Balkan endemic)

Loranthaceae

135. *Arceutobium oxycedri* (DC.) M.Bieb.
136. *Viscum laxum* Boiss. & Reuter ssp. *laxum*

Oleaceae

137. *Fraxinus ornus* L.
138. *Ligustrum vulgare* L.

Orchidaceae

139. *Cephalanthera rubra* (L.) Rich.
140. *Epipactis atrorubens* (Hoffm.) Besser
141. *Limodorum abortivum* (L.) Schwarz, VU, BDA
142. *Ophrys cornuta* Steven VU, BDA
143. *Orchis coriophora* L.
144. *Platanthera chlorantha* (Custer) Rchb.

Orobanchaceae

145. *Orobanche elatior* Sutton
146. *O. esulae* Pancic

Plantaginaceae

147. *Plantago lanceolata* L.

Platanaceae

148. *Platanus orientalis* L.

Plumbaginaceae

149. *Armeria rumelica* Boiss. (Balkan endemic)

Poaceae

150. *Aegilops neglecta* Req. ex Bertol.
151. *Bromus intermedius* Guss.
152. *B. sterilis* L.
153. *Chrysopogon gryllus* (L.) Trin.
154. *Festuca nigrescens* Lam.
155. *F. penzesii*(Acht.)Markgr.-Dann. (Balkan endemic)
156. *F. spectabilis* Jan. ssp. *affinis* (Boiss. & Heldr. ex Hack.) Hack.
157. *Koeleria nitidula* Velen.
158. *Melica ciliata* L.
159. *Molinia coerulea* (L.) Moench
160. *Phleum pratense* L.
161. *Sclerochloa dura* (L.) P.beauv.
162. *Sesleria alba* Sm.
163. *Stipa tirsa* Steven
164. *Trachynia distachya* (L.) Link
165. *Vulpia ciliata* Dumort.
166. *V. myurus* (L.) C.C.Gmel.

Polygalaceae

167. *Polygala comosa* Schkuhr
168. *P. major* Jacq.
169. *P. rhodopea* (Velen.) Janch. (Balkan endemic)

Polygonaceae

170. *Rumex acetosella* L.

Ranunculaceae

171. *Pulsatilla montana* (Hoppe) Rchb.
172. *Ranunculus sardous* Crantz
173. *Thalictrum aquilegifolium* L.

Rosaceae

174. *Agrimonia eupatoria* L.
175. *Crataegus monogyna* Jacq.
176. *Filipendula vulgaris* Moench
177. *Potentilla argentea* L.
178. *Prunus spinosa* L.
179. *Rosa micrantha* Borrer ex Sm.
180. *Sanguisorba minor* Scop. ssp. *muricatum* Briq.

Rubiaceae

181. *Asperula tenella* Heuff. Ex Deg. in Kerner
182. *Cruciata laevipes* Opiz

Rutaceae

183. *Dictamnus albus* L.

Salicaceae

184. *Salix alba* L.

Santalaceae

185. *Thesium arvense* Horv.

Scrophulariaceae

186. *Euphrasia rostkoviana* Hayne
187. *Melampyrum sylvaticum* L.
188. *Parentucellia latifolia* (L.) Caruel
189. *Rhinanthus wagneri* Degen ssp. *wagneri*
190. *Veronica annagalis-aquatica* L.
191. *V. chamaedrys* L.
192. *V. multifida* L.

Thymeleaceae

193. *Thymelaea passerina* (L.) Coss. & Germ.

Ulmaceae

194. *Ulmus minor* Mill.

Urticaceae

195. *Urtica dioica* L.

Valerianaceae

196. *Valerianella rimosa* Bast.

Violaceae

197. *Viola alba* Besser ssp. *scotophylla* (Jordan) Nyman