

Endemic and endangered plant taxa in the collection of Otto Blau

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Abstract: The analysis of material from the herbarium collection of Otto Blau (SARA) collected in Bosnia and Herzegovina confirmed the presence of 41 endemic species, 33 of which have a defined conservation status in the Federation of Bosnia and Herzegovina and 6 taxa are listed in the European Red List of endangered species.

According to the guidelines and criteria of the International Union for Conservation of Nature, a total of 99 species and subspecies of different conservation statuses have been identified at the local and 274 taxa at the European level.

Keywords: Herbarium, Bosnia and Herzegovina, SARA, distribution, IUCN

INTRODUCTION

During his diplomatic stay (1861-1872), Dr. Otto Blau traveled through the mountains and canyons of Bosnia and Herzegovina and collected extremely valuable plant material from which he made a botanical collection. He entrusted the taxonomic and systematic processing of the material to one of the eminent botanists of the time, Paul Friedrich Ascherson, who raised the amateur collection to the level of scientific, and this data was partly used for creating floristic works (Ascherson & Kanitz, 1877; Blau, 1887; Beck, 1903-1927; Beck & Maly, 1950; Beck et al., 1967, 1974, 1983), monographs (Šilić, 1979), Red Lists of Flora of Bosnia and Herzegovina (Šilić, 1992-1996; Đug et al., 2013), etc.

Small and unique herbarium collections owned by the National Museum of BiH are a valuable source of information for interdisciplinary research aimed at extending knowledge about taxonomy, phytogeography, ecology, evolution, and biodiversity of the flora of Bosnia and Herzegovina.

The data from old herbarium collections is often considered dubious or inaccurate, but it is often taken as relevant to the species distribution, especially when determining one of the endangered categories, which in that case has only relative significance.

Given that complete data on the contents of Blau's herbarium has not been cited previously, this paper should point to the findings on endemic and endangered plant species and their distribution in Bosnia and Herzegovina and provide an opportunity to verify or confirm the long-established sites for future floristic research.

MATERIALS AND METHODS

The data used in this paper is taken from the original collection of Otto Blau and the accompanying catalog which is deposited in the Herbarium of the National Museum of Bosnia and Herzegovina (SARA).

The collection contains 2503 inventory units (B&H, Montenegro) which were collected in the 1868-1872 period. The analysis included 1404 species and lower systematic categories of *Pteridophyta* and *Spermatophyta* from the territory of Bosnia and Herzegovina (Lagumdžija, 2020).

The classification sequence of taxa in the paper is consistent with the *Flora Europaea* (Tutin et al., I-V, 1964-1980). The systematic status and scientific names of the species have been revised according to Euro+Med (2006) and The Plant List.

The endemic character and general distribution range were determined according to the available literature sources (Bjelčić and Šilić, 1971; Šilić et al., 1986; Bjelčić, 1987; Šilić, 1990, 2002; Šilić and Abadžić, 1991; Stevanović et al., 2003, Redžić et al., 2008; Šoljan et al., 2009, 2014b; Stupar et al., 2011; Mišić & Šoljan, 2014; Šoljan et al., 2014a; Lubarda et al., 2014; Bjelčić & Šoljan, 2015; Šilić and Šoljan, 2018).

An overview of rare and endangered species with IUCN categorization is given according to the current Red List of wild species and subspecies of plants, animals and fungi of the Federation of Bosnia and Herzegovina (the Official Gazette of the Federation of BiH, 7/14) with abbreviations: **EX** (Extinct), **EW** (Extinct in The Wild), **CR** (Critically Endangered), **VU** (Vulnerable), **NT** (Near Threatened), **LC** (Least Concern), **DD** (Data Deficient) and **NE** (Not Evaluated). This information is accompanied by the current status for Europe according to the IUCN Red List (IUCN 2021) with categories: **EX** (Extinct), **EW** (Extinct in The Wild), **RE** (Regionally Extinct), **CR** (Critically Endangered), **EN** (Endangered), **VU** (Vulnerable), **NT** (Near Threatened), **LC** (Least Concern), **DD** (Data Deficient), **NA** (Not Applicable) and **NE** (Not Evaluated).

RESULTS AND DISCUSSION

The taxonomic and chorological analysis of Otto Blau's collection showed that it contains 348 species and subspecies from the territory of Bosnia and Herzegovina. Some of them, in addition to endemic status, also belong to one of the threatened categories (Tab. 1).

Out of 450 officially recognized endemic plant species of the vascular flora of Bosnia and Herzegovina (Redžić et al., 2008), Blau's collection contains stenoendemic taxa (*Alyssum moellendorffianum* Asch. ex Beck; *Melampyrum trichocalycinum* Vandas; *Campanula hofmannii* (Pant.) Greuter & Burdet; *Edraianthus niveus* Beck) and 37 endemic species of different ranges of distribution:

- Trans-regional endemics (**TRE**) - 16 (Stevanović et al., 2003);
- Regional endemics (**RE**) - 17 (Stevanović et al., 2003);
- Balkan-Apennine endemics - 2;
- Alpine-Dinaric endemics - 1;
- Dinaric-Apennine endemics - 1.

Of the total number of listed endemic taxa of the Blau's collection (41), 33 were assessed as threatened in Bosnia and Herzegovina (the Official Gazette of the Federation of BiH, 7/14): **CR** (Critically Endangered) - 1, **EN** (Endangered) - 8, **VU** (Vulnerable) - 11, **NT** (Near Threatened) - 4, **LC** (Least Concern) - 7, **DD** (Data Deficient) - 2 (Fig. 1).

Six endemic species of Bosnia and Herzegovina are listed in the international Red List of threatened species: Near Threatened (**NT**) - 1 and Least Concern (**LC**) - 5 taxa.

Endemic species, such as *Cerastium malyi* (Georgiev) Niketić, *Drypis spinosa* L., *Clinopodium thymifolium* (Scop.) Kuntze, *Thymus praecox* subsp. *janka* (Čelak.) Jalas *Helictotrichon blavii* (Asch. & Janka) C. E. Hubb., *Digitalis laevigata* Walds. & Kit. and *Saxifraga blavii* (Engl.) Beck were not listed as threatened taxa in the Red lists.

The analysis of the total number of species and lower systematic categories in the collection of Otto Blau originating

Table 1. Data on sites, endemic and Red List status for the species on the Blau's collection

No.	Family according to the original collection data	Taxon name according to the original collection data	Family according to Euro+Med PlantBase and the Plant List	Taxon name according to Euro+Med PlantBase and the Plant List	Locality	Endemic status and general range	Red List status in FB&H	European Red List
1	Lycopodiaceae	<i>Lycopodium annotinum</i> L.	Lycopodiaceae	<i>Lycopodium annotinum</i> L.	Hranisava			LC
2	Lycopodiaceae	<i>Lycopodium clavatum</i> L.	Lycopodiaceae	<i>Lycopodium clavatum</i> L.	Trebević			LC
3	Equisetaceae	<i>Equisetum hyemale</i> L.	Equisetaceae	<i>Equisetum hyemale</i> L.	the Krupa river valley, near Pazarić			LC
4	Equisetaceae	<i>Equisetum palustre</i> L.	Equisetaceae	<i>Equisetum palustre</i> L.	Hreša, the valley of Mošćanica, Lukavica, lake (Herzegovina)			LC
5	Equisetaceae	<i>Equisetum arvense</i> L.	Equisetaceae	<i>Equisetum arvense</i> L.	Sarajevo field			LC
6	Polypodiaceae	<i>Notholaena marantae</i> R. Br.	Pteridaceae	<i>Paragymnopteris marantae</i> (L.) K. H. Shing	Maglaj		EN	NT
7	Polypodiaceae	<i>Aspidium thelypteris</i> (L.) Sw.	Thelypteridaceae	<i>Thelypteris palustris</i> Schott	lake (Herzegovina), Pliva		VU	LC
8	Polypodiaceae	<i>Asplenium trichomanes</i> L.	Aspleniaceae	<i>Asplenium trichomanes</i> L.	Igman, Fojnica, Paljev do			LC
9	Polypodiaceae	<i>Asplenium viride</i> Huds.	Aspleniaceae	<i>Asplenium viride</i> Huds.	Trebević, Treskavica, Zec			LC
10	Polypodiaceae	<i>Asplenium adianthum-nigrum</i> L.	Aspleniaceae	<i>Asplenium adianthum-nigrum</i> L.	Igman, Trebević			LC
11	Polypodiaceae	<i>Asplenium septentrionale</i> Hoffm.	Aspleniaceae	<i>Asplenium septentrionale</i> (L.) Hoffm.	Fojnica		VU	LC
12	Polypodiaceae	<i>Scolopendrium vulgare</i> Sm.	Aspleniaceae	<i>Phyllitis scolopendrium</i> (L.) Newm.	Stari grad, Lapišnica, Trebević			LC
13	Polypodiaceae	<i>Cystopteris filix-fragilis</i> (L.) Bernh.	Athyriaceae	<i>Cystopteris fragilis</i> (L.) Bernh.	Trebević, Igman			LC
14	Polypodiaceae	<i>Blechnum spicant</i> Roth	Blechnaceae	<i>Blechnum spicant</i> (L.) Roth	Valley of the Bistrica river, Zec, Kiseljak			LC
15	Coniferae	<i>Abies alba</i> Mill.	Pinaceae	<i>Abies alba</i> Mill.	Ozren, Zec			LC
16	Coniferae	<i>Pinus laricio</i> Poir. var. <i>austriaca</i>	Pinaceae	<i>Pinus nigra</i> J. F. Arnold	Surroundings of Sarajevo, Borci			LC
17	Coniferae	<i>Pinus sylvestris</i> L.	Pinaceae	<i>Pinus sylvestris</i> L.	Stari grad			LC
18	Coniferae	<i>Pinus mugo</i> Turra	Pinaceae	<i>Pinus mugo</i> Turra	Trebević, Vranica			LC
19	Coniferae	<i>Juniperus communis</i> L.	Cupressaceae	<i>Juniperus communis</i> L.	Sarajevo, Ravno			LC
20	Salicaceae	<i>Salix fragilis</i> L.	Salicaceae	<i>Salix fragilis</i> Sm.	Sarajevo field, Ilidža, Koševo, Dobrinjka			LC
21	Salicaceae	<i>Salix alba</i> L.	Salicaceae	<i>Salix alba</i> L.	Sarajevo, Trebević, Lepenica, Kiseljak			LC
22	Salicaceae	<i>Salix triandra</i> L.	Salicaceae	<i>Salix triandra</i> L.	Valley of Miljacka			LC
23	Salicaceae	<i>Salix cinerea</i> L.	Salicaceae	<i>Salix cinerea</i> L.	Trebević, Hreša, Ilidža			LC
24	Salicaceae	<i>Salix caprea</i> L.	Salicaceae	<i>Salix caprea</i> L.	Mošćanica, Igman			LC
25	Salicaceae	<i>Salix incana</i> Schrk.	Salicaceae	<i>Salix eleagnos</i> Scop.	Valley of the Neretva, Trešanica, Borci, Konjic			LC
26	Salicaceae	<i>Salix purpurea</i> L.	Salicaceae	<i>Salix purpurea</i> L.	Trebević, he valley of the Košava, canyon of the Miljacka, surroundings of Sarajevo, Ilidža, the valley of the Željeznica			LC
27	Salicaceae	<i>Populus alba</i> L.	Salicaceae	<i>Populus alba</i> L.	Canyon of Miljacka, the valley of the Bosna, Kobilja glava			LC

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28	Salicaceae	<i>Populus tremula</i> L.	Salicaceae	<i>Populus tremula</i> L.	Surroundings of Sarajevo, Hum			LC
29	Salicaceae	<i>Populus nigra</i> L.	Salicaceae	<i>Populus nigra</i> L.	Canyon of Miljacka			DD
30	Amentaceae	<i>Betula pendula</i> Roth	Betulaceae	<i>Betula verrucosa</i> Ehrh.	Trebević, Hrid, Romanija			LC
31	Amentaceae	<i>Alnus glutinosa</i> Gartn.	Betulaceae	<i>Alnus glutinosa</i> (L.) Gaertn.	Surroundings of Sarajevo, Dobrinjka, Zujjevina			LC
32	Amentaceae	<i>Alnus incana</i> (L.) DC.	Betulaceae	<i>Alnus incana</i> (L.) Moench	Lapišnica, the valley of the Željiznica			LC
33	Amentaceae	<i>Carpinus betulus</i> L.	Corylaceae	<i>Carpinus betulus</i> L.	Stari grad, Bijele vode, Ivan			LC
34	Amentaceae	<i>Ostrya carpinifolia</i> Scop.	Corylaceae	<i>Ostrya carpinifolia</i> Scop.	Stari grad			LC
35	Amentaceae	<i>Corylus avellana</i> L.	Corylaceae	<i>Corylus avellana</i> L.	Surroundings of Sarajevo, Klanac, Kalinovik			LC
36	Amentaceae	<i>Corylus colurna</i> L.	Corylaceae	<i>Corylus colurna</i> L.	Lipite, Konjic, around Jablaničko lake, Mostar		EN	LC
37	Amentaceae	<i>Castanea sativa</i> Mill.	Fagaceae	<i>Castanea sativa</i> Mill.	Grdonj, Bradina			LC
38	Amentaceae	<i>Quercus cerris</i> L.	Fagaceae	<i>Quercus cerris</i> L.	Dobro polje, Dumboš, canyon of the Neretva, Bijele vode			LC
39	Amentaceae	<i>Quercus sessiliflora</i> Salisb.	Fagaceae	<i>Quercus petraea</i> (Matt.) Liebl.	Trebević			LC
40	Amentaceae	<i>Quercus pubescens</i> Willd.	Fagaceae	<i>Quercus pubescens</i> Willd.	Igman			LC
41	Urticaceae	<i>Celtis australis</i> L.	Ulmaceae	<i>Celtis australis</i> L.	Mostar, Bjela			LC
42	Urticaceae	<i>Humulus lupulus</i> L.	Cannabaceae	<i>Humulus lupulus</i> L.	Sarajevo			LC
43	Urticaceae	<i>Urtica dioica</i> L.	Urticaceae	<i>Urtica dioica</i> L.	Sarajevo			LC
44	Santalaceae	<i>Thesium ebracteatum</i> Hayne	Santalaceae	<i>Thesium ebracteatum</i> Hayne	Trebević			LC
45	Loranthaceae	<i>Viscum album</i> L.	Loranthaceae	<i>Viscum album</i> L. subsp. <i>album</i>	Hrid			LC
46	Polygonaceae	<i>Polygonum aviculare</i> L.	Polygonaceae	<i>Polygonum aviculare</i> L.	Sarajevo			LC
47	Polygonaceae	<i>Polygonum persicaria</i> L.	Polygonaceae	<i>Persicaria maculosa</i> Gray	Sarajevo field			LC
48	Polygonaceae	<i>Polygonum nodosum</i> Pers.	Polygonaceae	<i>Polygonum lapathifolium</i> L.	Fojnica, Kiseljak, Pliva			LC
49	Polygonaceae	<i>Polygonum bistorta</i> L.	Polygonaceae	<i>Polygonum bistorta</i> L.	Lopata mt.			LC
50	Polygonaceae	<i>Polygonum amphibium</i> L.	Polygonaceae	<i>Polygonum amphibium</i> L.	Sarajevo			LC
51	Polygonaceae	<i>Rumex alpinus</i> L.	Polygonaceae	<i>Rumex alpinus</i> L.	Hranisava			LC
52	Chenopodeae	<i>Beta vulgaris</i> L.	Chenopodiaceae	<i>Beta vulgaris</i> L. subsp. <i>vulgaris</i>	Sarajevo			LC
53	Caryophylleae	<i>Cerastium moesiacum</i> Friv.	Caryophyllaceae	<i>Cerastium malyi</i> (Georgiev) Niketić	Trebević, Treskavica	trans-regional Balkan endemic		
54	Caryophylleae	<i>Herniaria glabra</i> L.	Caryophyllaceae	<i>Herniaria glabra</i> L.	Bratač (Nevesinje)			LC
55	Caryophylleae	<i>Silene sendtneri</i> Boiss.	Caryophyllaceae	<i>Silene sendtneri</i> Boiss.	Vučija luka-Ozren, Trebević, valley of the Mošćanica, Zec mt. Treskavica, Inač mt.	trans-regional Balkan endemic	LC	LC

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56	Caryophyllaceae	<i>Heliosperma tommasinii</i> (Vis.) Gris.	Caryophyllaceae	<i>Silene tommasinii</i> Vis.	Fojnica	regional endemic	VU	
57	Caryophyllaceae	<i>Drypis spinosa</i> L.	Caryophyllaceae	<i>Drypis spinosa</i> L.	Treskavica	Balkan-Apenine endemic		
58	Caryophyllaceae	<i>Saponaria officinalis</i> L.	Caryophyllaceae	<i>Saponaria officinalis</i> L.	Sarajevo, Fojnica, Višnjevo			LC
59	Caryophyllaceae	<i>Dianthus plumarius</i> L. var. <i>petraeus</i> W. K.	Caryophyllaceae	<i>Dianthus petraeus</i> Walds. & Kit.	Mt. Trebević, canyon of the Miljacka		LC	LC
60	Ranunculaceae	<i>Eranthis hiemalis</i> L.	Ranunculaceae	<i>Eranthis hiemalis</i> (L.) Salisb.	Usora		CR	
61	Ranunculaceae	<i>Trollius europaeus</i> L.	Ranunculaceae	<i>Trollius europaeus</i> L.	Treskavica, Vitovlje (Travnik)		LC	LC
62	Ranunculaceae	<i>Actaea spicata</i> L.	Ranunculaceae	<i>Actaea spicata</i> L.	Trebević, Bjelašnica, Igman, Busovača, valley of the Lašva			LC
63	Ranunculaceae	<i>Caltha palustris</i> L.	Ranunculaceae	<i>Caltha palustris</i> L.	Valley of the Bosna		CR	LC
64	Ranunculaceae	<i>Anemone narcissiflora</i> L.	Ranunculaceae	<i>Anemonastrum narcissiflorum</i> (L.) Holub	Treskavica		VU	
65	Ranunculaceae	<i>Hepatica triloba</i> Chaix	Ranunculaceae	<i>Hepatica nobilis</i> Mill.	Surroundings of Sarajevo, Trebević		VU	LC
66	Ranunculaceae	<i>Pulsatilla alpina</i> (L.) Del.	Ranunculaceae	<i>Pulsatilla alpina</i> (L.) Delarbre	Zec mt.		VU	
67	Ranunculaceae	<i>Pulsatilla vulgaris</i> All.	Ranunculaceae	<i>Pulsatilla vulgaris</i> Mill.	Surroundings of Rogatica			NT
68	Ranunculaceae	<i>Ranunculus repens</i> L.	Ranunculaceae	<i>Ranunculus repens</i> L.	Kobilja glava			LC
69	Ranunculaceae	<i>Ranunculus lingua</i> L.	Ranunculaceae	<i>Ranunculus lingua</i> L.	Jezero near Jajce			LC
70	Ranunculaceae	<i>Ranunculus aquatilis</i> L.	Ranunculaceae	<i>Ranunculus aquatilis</i> L.	Dobrinja near Sarajevo, along the Miljacka river			LC
71	Ranunculaceae	<i>Thalictrum flavum</i> L.	Ranunculaceae	<i>Thalictrum flavum</i> L.	Papraske, Fojnica, Maglaj		EN	LC
72	Berberideae	<i>Berberis vulgaris</i> L.	Berberidaceae	<i>Berberis vulgaris</i> L.	Sarajevo			LC
73	Nymphaeaceae	<i>Nuphar luteum</i> (L.) Sm.	Nymphaeaceae	<i>Nuphar lutea</i> (L.) Sm.	Dobož		VU	LC
74	Papaveraceae	<i>Papaver rhoeas</i> L.	Papaveraceae	<i>Papaver rhoeas</i> L.	Sarajevo			LC
75	Papaveraceae	<i>Chelidonium majus</i> L.	Papaveraceae	<i>Chelidonium majus</i> L.	Sarajevo			LC
76	Papaveraceae	<i>Corydalis leiosperma</i> Contr. = <i>Corydalis ochroleuca</i> Koch subsp. <i>leiosperma</i> (Contr.) Hayek	Papaveraceae	<i>Pseudofumaria alba</i> subsp. <i>leiosperma</i> (P. Contrath) Lidén	Stari grad, Lapišnica	trans-regional Balkan endemic	EN	
77	Cruciferae	<i>Nasturtium austriacum</i> Crtz.	Brassicaceae	<i>Rorippa austriaca</i> (Crantz) Besser	Canyon of the Miljacka			LC
78	Cruciferae	<i>Nasturtium silvestre</i> (L.) R. Br.	Brassicaceae	<i>Rorippa sylvestris</i> (L.) Besser	Sarajevo, Vranduk			LC
79	Cruciferae	<i>Nasturtium lippizense</i> (Wulf.) DC.	Brassicaceae	<i>Rorippa lippizensis</i> (Wulfen) Rchb.	Sarajevo, Igman, Konjic, Borci			LC
80	Cruciferae	<i>Cardamine amara</i> L.	Brassicaceae	<i>Cardamine amara</i> L.	Along the Bosna river			LC
81	Cruciferae	<i>Cardamine pratensis</i> L.	Brassicaceae	<i>Cardamine pratensis</i> L.	Along the Bosna river			LC
82	Cruciferae	<i>Dentaria trifolia</i> W. K.	Brassicaceae	<i>Cardamine trifolia</i> L.	Trebević, Pazarić		EN	

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83	Cruciferae	<i>Alyssum moellendorffianum</i> Asch.	Brassicaceae	<i>Alyssum moellendorffianum</i> Asch. ex Beck	Valley of Trešanica, Borci	stenoendemic	EN	
84	Cruciferae	<i>Lepidium campestre</i> (L.) R. Br.	Brassicaceae	<i>Lepidium campestre</i> (L.) W. T. Aiton	Sarajevo, Reljevo			LC
85	Cruciferae	<i>Draba aizoides</i> (L.) R. Br.	Brassicaceae	<i>Draba aizoides</i> L.	Stari grad, Hranisava, Trebević		EN	
86	Cruciferae	<i>Brassica oleracea</i> L.	Brassicaceae	<i>Brassica oleracea</i> L.	Sarajevo			DD
87	Cruciferae	<i>Brassica rapa</i> L.	Brassicaceae	<i>Brassica rapa</i> L.	Sarajevo			DD
88	Cruciferae	<i>Brassica nigra</i> L.	Brassicaceae	<i>Brassica nigra</i> (L.) W. D. J. Koch	Ivan mt.			LC
89	Crassulaceae	<i>Sempervivum heuffelii</i> Schott	Crassulaceae	<i>Jovibarba heuffelii</i> (Schott) Á. Löve & D. Löve	Stari grad, Zec mt., Vučja bara, Višnjevo		NT	
90	Crassulaceae	<i>Sedum acre</i> L.	Crassulaceae	<i>Sedum acre</i> L.	Trebević			LC
91	Crassulaceae	<i>Saxifraga adscendens</i> var. <i>blavii</i> Engler	Saxifragaceae	<i>Saxifraga blavii</i> (Engl.) Beck	Trebević, Dobra voda, Romanija	regional endemic		
92	Rubiaceae	<i>Chrysosplenium alternifolium</i> L.	Saxifragaceae	<i>Chrysosplenium alternifolium</i> L.	Valley of the Bosna, Trebević, valley of the Krupa			LC
93	Hypericaceae	<i>Parnassia palustris</i> L.	Parnassiaceae	<i>Parnassia palustris</i> L.	Trebević, Bijele vode			LC
94	Rosaceae	<i>Spiraea cana</i> W. K.	Rosaceae	<i>Spiraea cana</i> Walld. & Kit.	Dobra voda-Stari grad, canyon of the Miljacka, Ilovača along the valley of the Željeznica			DD
95	Rosaceae	<i>Ulmaria filipendula</i> L.	Rosaceae	<i>Filipendula ulmaria</i> (L.) Maxim.	Sarajevo field			LC
96	Rosaceae	<i>Dryas octopetala</i> L.	Rosaceae	<i>Dryas octopetala</i> L.	Treskavica		VU	
97	Rosaceae	<i>Geum urbanum</i> L.	Rosaceae	<i>Geum urbanum</i> L.	Sarajevo, the valley of the Mošćanica, Igman, Porim, Borci			LC
98	Rosaceae	<i>Geum molle</i> Vis.	Rosaceae	<i>Geum molle</i> Vis. & Pančić	Trebević, Glasinac, Romanija		DD	
99	Rosaceae	<i>Fragaria vesca</i> L.	Rosaceae	<i>Fragaria vesca</i> L.	Central Bosnia			LC
100	Rosaceae	<i>Fragaria moschata</i> Duchesne	Rosaceae	<i>Fragaria moschata</i> Duchesne	Sarajevo, Hrid			LC
101	Rosaceae	<i>Pyrus communis</i> L.	Rosaceae	<i>Pyrus communis</i> L.	Sarajevo			LC
102	Rosaceae	<i>Pyrus torminalis</i> (L.) Ehrh.	Rosaceae	<i>Sorbus torminalis</i> (L.) Crantz	Igman			LC
103	Rosaceae	<i>Pyrus aria</i> (L.) Ehrh.	Rosaceae	<i>Sorbus aria</i> (L.) Crantz	Stari grad, Paljev do, Poljine, Igman, Pazarić			LC
104	Rosaceae	<i>Prunus spinosa</i> L.	Rosaceae	<i>Prunus spinosa</i> L.	Sarajevo			LC
105	Rosaceae	<i>Prunus avium</i> L.	Rosaceae	<i>Prunus avium</i> L.	Valley of the Miljacka, Igman, Treskavica			LC
106	Rosaceae	<i>Prunus mahaleb</i> L.	Rosaceae	<i>Prunus mahaleb</i> L.	Canyon of the Neretva near Bijela			LC
107	Papilionaceae	<i>Cytisus tommasinii</i> Vis.	Fabaceae	<i>Cytisus tommasinii</i> Vis.	Ilovitza, Zelenitza	trans-regional Balkan endemic	VU	
108	Papilionaceae	<i>Cytisus ramentaceus</i> Sieb.	Fabaceae	<i>Petteria ramentacea</i> (Sieber) C. Presl	Jablanica, Pakračić, Prenj, Bijela, Blagaj	regional endemic	NT	LC
109	Papilionaceae	<i>Genista sylvestris</i> Scop. var. <i>dalmatica</i> Beck	Fabaceae	<i>Genista sylvestris</i> Scop. subsp. <i>dalmatica</i> (Bartl.) H. Lindb.	Borci	regional endemic	LC	

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110	Papilionaceae	<i>Vicia orobus</i> DC.	Fabaceae	<i>Vicia orobus</i> DC.	Treskavica			LC
111	Papilionaceae	<i>Vicia oroboides</i> Wulfen	Fabaceae	<i>Vicia oroboides</i> Wulfen	Bjelašnica, Dobra voda-Trebević		LC	LC
112	Papilionaceae	<i>Vicia sepium</i> L.	Fabaceae	<i>Vicia sepium</i> L.	Trebević, Bjela near Konjic, surroundings of Konjic			LC
113	Papilionaceae	<i>Vicia grandiflora</i> Scop.	Fabaceae	<i>Vicia grandiflora</i> Scop.	Bradina, valley of Trešanica, Konjic			LC
114	Papilionaceae	<i>Vicia pannonica</i> Jacqu.	Fabaceae	<i>Vicia pannonica</i> Crantz	Sarajevo			LC
115	Papilionaceae	<i>Vicia sativa</i> L.	Fabaceae	<i>Vicia sativa</i> L.	Surroundings of Sarajevo, Konjic			LC
116	Papilionaceae	<i>Lathyrus tuberosus</i> L.	Fabaceae	<i>Lathyrus tuberosus</i> L.	Surroundings of Sarajevo, valley of the Miljacka			LC
117	Papilionaceae	<i>Lathyrus sylvestris</i> sensu auct.	Fabaceae	<i>Lathyrus sylvestris</i> L.	Trebević			LC
118	Papilionaceae	<i>Lathyrus latifolius</i> L.	Fabaceae	<i>Lathyrus latifolius</i> L.	Trebević, Igman, Višnjevo			LC
119	Papilionaceae	<i>Pisum sativum</i> L.	Fabaceae	<i>Pisum sativum</i> L.	Sarajevo			LC
120	Papilionaceae	<i>Melilotus albus</i> L.	Fabaceae	<i>Melilotus albus</i> Medik	Valley of Bosna, Blažuj, near Jablanica			LC
121	Papilionaceae	<i>Melilotus officinalis</i> Desv.	Fabaceae	<i>Melilotus officinalis</i> (L.) Lam.	Surroundings of Sarajevo, Dupovci, Ravno, Fojnica			LC
122	Papilionaceae	<i>Medicago lupulina</i> L.	Fabaceae	<i>Medicago lupulina</i> L.	Trebević			LC
123	Papilionaceae	<i>Medicago arabica</i> L.	Fabaceae	<i>Medicago arabica</i> (L.) Huds.	Sarajevo field, Mošćanica			LC
124	Papilionaceae	<i>Medicago minima</i> L.	Fabaceae	<i>Medicago minima</i> (L.) L.	Sarajevo, Bendbaša			LC
125	Papilionaceae	<i>Trifolium repens</i> L.	Fabaceae	<i>Trifolium repens</i> L.	Sarajevo, Blažuj			LC
126	Papilionaceae	<i>Trifolium hybridum</i> L.	Fabaceae	<i>Trifolium hybridum</i> L.	Valley of Bosna			LC
127	Papilionaceae	<i>Trifolium arvense</i> L.	Fabaceae	<i>Trifolium arvense</i> L.	Valley of Košava			LC
128	Papilionaceae	<i>Trifolium incarnatum</i> L.	Fabaceae	<i>Trifolium incarnatum</i> L.	Grdonj			LC
129	Papilionaceae	<i>Trifolium pratense</i> L.	Fabaceae	<i>Trifolium pratense</i> L. var. <i>pratense</i>	Sarajevo, valley of the Mošćanica, Treskavica			LC
130	Papilionaceae	<i>Trifolium noricum</i> Wulf.	Fabaceae	<i>Trifolium noricum</i> Wulfen	Treskavica		NT	
131	Papilionaceae	<i>Trifolium alpestre</i> L.	Fabaceae	<i>Trifolium alpestre</i> L.	Vučija luka, Ozren, Blažuj			LC
132	Papilionaceae	<i>Lotus corniculatus</i> L.	Fabaceae	<i>Lotus corniculatus</i> L.	Valley of the Miljacka, Reljevo, surroundings of Sarajevo, Zec mt., Mostarsko blato, Porim			LC
133	Geraniaceae	<i>Geranium sanguineum</i> L.	Geraniaceae	<i>Geranium sanguineum</i> L.	Trebević, Borije			LC
134	Zygophyllaceae	<i>Tribulus terrestris</i> L.	Zygophyllaceae	<i>Tribulus terrestris</i> L. subsp. <i>terrestris</i>	Blagaj			LC
135	Rutaceae	<i>Dictamnus albus</i> L.	Rutaceae	<i>Dictamnus albus</i> L.	Reljevo, Crno vrelo-Grabovica			LC
136	Polygalaceae	<i>Polygala alpestris</i> Rchb.	Polygalaceae	<i>Polygala alpestris</i> Rchb.	Zec mt.		EN	
137	Terebinthaceae	<i>Rhus cotinus</i> L.	Anacardiaceae	<i>Cotinus coggygia</i> Scop.	Stari grad, canyon of the Miljacka, Lapišnica, Borci			LC
138	Aceraceae	<i>Acer platanoides</i> L.	Sapindaceae	<i>Acer platanoides</i> L.	Igman, Bijele vode			LC
139	Aceraceae	<i>Acer campestre</i> L.	Sapindaceae	<i>Acer campestre</i> L.	Trebević, Igman, Višnjevo			LC

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140	Aceraceae	<i>Acer tataricum</i> L.	Sapindaceae	<i>Acer tataricum</i> L.	Sarajevo, Pazarić			LC
141	Aceraceae	<i>Acer pseudoplatanus</i> L.	Sapindaceae	<i>Acer pseudoplatanus</i> L.	Ozren, Igman, Poljine, Paljev do			LC
142	Aceraceae	<i>Acer obtusatum</i> W.K.	Sapindaceae	<i>Acer obtusatum</i> Willd.	Igman			LC
143	Aceraceae	<i>Acer hircanum</i> f. <i>intermedium</i> non Pax	Sapindaceae	<i>Acer hircanum</i> subsp. <i>intermedium</i> (Pantić) Borm.	Stari grad (Sarajevo)	regional endemic	EN	
144	Aceraceae	<i>Acer monspessulanum</i> L.	Sapindaceae	<i>Acer monspessulanum</i> L.	Ivan mt., Gacko			LC
145	Hippocastanaceae	<i>Aesculus hippocastanum</i> L.	Sapindaceae	<i>Aesculus hippocastanum</i> L.	Sarajevo			VU
146	Aquifoliaceae	<i>Ilex aquifolium</i> L.	Aquifoliaceae	<i>Ilex aquifolium</i> L.	Trebević		VU	LC
147	Celastraceae	<i>Euonymus europaeus</i> L.	Celastraceae	<i>Euonymus europaeus</i> L.	Sarajevo, Lapišnica, Kiseljak, Bijela			LC
148	Staphyleaceae	<i>Staphylea pinnata</i> L.	Staphyleaceae	<i>Staphylea pinnata</i> L.	Sarajevo			LC
149	Rhamnaceae	<i>Frangula alnus</i> Mill.	Rhamnaceae	<i>Frangula alnus</i> Mill.	Hranisava, Dobra voda, Vučja bara, Ravno			LC
150	Vitaceae	<i>Vitis vinifera</i> L.	Vitaceae	<i>Vitis vinifera</i> L.	Zujevina, Svrakov potok - Novoselje near Banjaluka			LC
151	Tiliaceae	<i>Tilia argentea</i> Desf.	Malvaceae	<i>Tilia tomentosa</i> Moench	Ivan mt., Bijela near Grabovica, valley of Neretva, Banjaluka			LC
152	Tiliaceae	<i>Tilia platyphylloides</i> Scop.	Malvaceae	<i>Tilia platyphylloides</i> Scop.	Igman, Ivan mt.			LC
153	Malvaceae	<i>Althaea officinalis</i> L.	Malvaceae	<i>Althaea officinalis</i> L.	Maglaj			LC
154	Thymelaeaceae	<i>Daphne mezereum</i> L.	Thymelaeaceae	<i>Daphne mezereum</i> L.	Trebević, Igman			LC
155	Hypericaceae	<i>Hypericum quadrangulum</i> L.	Clusiaceae	<i>Hypericum tetrapterum</i> Fr.	Zec mt.			LC
156	Violaceae	<i>Viola odorata</i> L.	Violaceae	<i>Viola odorata</i> L.	Sarajevo, Trebević, Vrelo Bosne			LC
157	Violaceae	<i>Viola tricolor</i> L.	Violaceae	<i>Viola tricolor</i> L.	Trebević, Fojnica			LC
158	Violaceae	<i>Viola arvensis</i> Murr.	Violaceae	<i>Viola arvensis</i> Murray	Sarajevo			LC
159	Violaceae	<i>Viola calcarata</i> var. <i>zoysii</i> Wulfen	Violaceae	<i>Viola calcarata</i> subsp. <i>zoysii</i> (Wulfen) Murb.	Treskavica	Alpine-Dinaric endemic	VU	
160	Lythraceae	<i>Lythrum salicaria</i> L.	Lythraceae	<i>Lythrum salicaria</i> L.	Sarajevo, Dobra voda - Trebević			LC
161	Lythraceae	<i>Lythrum hyssopifolia</i> L.	Lythraceae	<i>Lythrum hyssopifolia</i> L.	Busovača			LC
162	Haloragaceae	<i>Myriophyllum spicatum</i> L.	Haloragaceae	<i>Myriophyllum spicatum</i> L.	Lake in Herzegovina, Plivsko lake near Jajce, Sana near Prijedor, along the Bosna river			LC
163	Haloragaceae	<i>Hippuris vulgaris</i> L.	Plantaginaceae	<i>Hippuris vulgaris</i> L.	Lake near Jajce		VU	LC
164	Cornaceae	<i>Cornus mas</i> L.	Cornaceae	<i>Cornus mas</i> L.	Trebević, Bijele vode, Igman			LC
165	Araliaceae	<i>Hedera helix</i> L.	Araliaceae	<i>Hedera helix</i> L.	Igman			LC
166	Umbelliferae	<i>Sanicula europaea</i> L.	Apiaceae	<i>Sanicula europaea</i> L.	Trebević, Dobra voda, Bijele vode, Pazarić			LC
167	Umbelliferae	<i>Eryngium palmatum</i> Pantić & Vis.	Apiaceae	<i>Eryngium palmatum</i> Pantić & Vis.	Igman	trans-regional Balkan endemic	DD	

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168	Umbelliferae	<i>Berula angustifolia</i> (R.) Koch	Apiaceae	<i>Berula erecta</i> (Huds.) Coville	Dobrinjka, the valley of the Pliva, lake in Herzegovina			LC
169	Umbelliferae	<i>Pancicja serbica</i> Vis.	Apiaceae	<i>Pancicja serbica</i> Vis.	Glog near Drijevac, Vučija bara, Trebević, Treskavica	trans-regional Balkan endemic	EN	
170	Umbelliferae	<i>Bupleurum ranunculoides</i> L.	Apiaceae	<i>Bupleurum ranunculoides</i> L.	Treskavica		DD	
171	Umbelliferae	<i>Peucedanum longifolium</i> Walld. & Kit.	Apiaceae	<i>Peucedanum longifolium</i> Walld. & Kit.	Gacko		EN	
172	Ericaceae	<i>Pyrola rotundifolia</i> L.	Ericaceae	<i>Pyrola rotundifolia</i> L.	Trebević		DD	
173	Ericaceae	<i>Calluna vulgaris</i> (L.) Salisb.	Ericaceae	<i>Calluna vulgaris</i> (L.) Hull	Trebević, Mokro, Vjetrenica			LC
174	Ericaceae	<i>Arctostaphylos uva-ursi</i> (L.) Spreng.	Ericaceae	<i>Arctostaphylos uva-ursi</i> (L.) Spreng.	Trebević			LC
175	Ericaceae	<i>Vaccinium myrtillus</i> L.	Ericaceae	<i>Vaccinium myrtillus</i> L.	Trebević, Ozren			LC
176	Primulaceae	<i>Primula elatior</i> (L.) Jacq.	Primulaceae	<i>Primula elatior</i> (L.) Hill	Trebević, Igman, Hranisava, Bjelašnica, Treskavica			LC
177	Primulaceae	<i>Primula longiflora</i> L.	Primulaceae	<i>Primula halleri</i> J. F. Gmel.	Treskavica		CR	
178	Primulaceae	<i>Soldanella alpina</i> L.	Primulaceae	<i>Soldanella alpina</i> L.	Zec mt.		LC	
179	Primulaceae	<i>Cyclamen neapolitanum</i> Ten.	Primulaceae	<i>Cyclamen hederifolium</i> Aiton	Grabovica, Jablanica, Porim		CR	
180	Primulaceae	<i>Cyclamen europaeum</i> L.	Primulaceae	<i>Cyclamen purpurascens</i> Mill.	Trebević, Ivan mt., Bijela, Grabovica, Maglaj		LC	LC
181	Primulaceae	<i>Lysimachia vulgaris</i> L.	Primulaceae	<i>Lysimachia vulgaris</i> L.	Valley of the Bosna river			LC
182	Primulaceae	<i>Lysimachia nummularia</i> L.	Primulaceae	<i>Lysimachia nummularia</i> L.	Kobilja glava			LC
183	Jasminaceae	<i>Fraxinus ornus</i> L.	Oleaceae	<i>Fraxinus ornus</i> L.	Sarajevo, Poljine, Paljev do, Hranisava, Kalinovik, Grabovica			LC
184	Jasminaceae	<i>Fraxinus excelsior</i> Scop.	Oleaceae	<i>Fraxinus excelsior</i> L.	Trebević, Ravno			NT
185	Gentianaceae	<i>Erythraea centaurium</i> (L.) Pers.	Gentianaceae	<i>Centaurium erythraea</i> Rafn	Valley of Košava, Igman			LC
186	Gentianaceae	<i>Gentiana symphyandra</i> Murb.	Gentianaceae	<i>Gentiana lutea</i> L. subsp. <i>symphyandra</i> (Murb.) Hayek	Treskavica	trans-regional Balkan endemic	EN	
187	Gentianaceae	<i>Gentiana pneumonanthe</i> L.	Gentianaceae	<i>Gentiana pneumonanthe</i> L.	Kobilja glava, Dobra voda			LC
188	Gentianaceae	<i>Gentianella ciliata</i> L.	Gentianaceae	<i>Gentianella ciliata</i> (L.) Borkh.	Ozren, Trebević		DD	
189	Gentianaceae	<i>Gentianella crispata</i> Vis.	Gentianaceae	<i>Gentianella crispata</i> (Vis.) Holub	Trebević, Bijele vode, Ravno	Balkan-Apenine endemic	VU	
190	Boraginaceae	<i>Onosma stellulata</i> Walld. & Kit.	Boraginaceae	<i>Onosma stellulata</i> Walld. & Kit.	Stari grad, Hrid, Lapišnica, Borci, Bjelašnica, Pazarić	regional endemic	LC	
191	Boraginaceae	<i>Moltkia petraea</i> (Tratt.) Gris.	Boraginaceae	<i>Moltkia petraea</i> (Tratt.) Griseb.	Crno vrelo-Grabovica	trans-regional Balkan endemic	NT	

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192	Boraginaceae	<i>Pulmonaria officinalis</i> L.	Boraginaceae	<i>Pulmonaria officinalis</i> L.	Sarajevo and surroundings			LC
193	Boraginaceae	<i>Symphytum officinale</i> L.	Boraginaceae	<i>Symphytum officinale</i> L.	Sarajevo and surroundings			LC
194	Boraginaceae	<i>Myosotis palustris</i> (L.) W. K.	Boraginaceae	<i>Myosotis scorpioides</i> L.	Canyon of the Miljacka			LC
195	Verbenaceae	<i>Verbena officinalis</i> L.	Verbenaceae	<i>Verbena officinalis</i> L.	Sarajevo field, Crno vrelo-Grabovica, Mostar field			LC
196	Labiatae	<i>Ajuga pyramidalis</i> L.	Lamiaceae	<i>Ajuga pyramidalis</i> L.	Treskavica		LC	
197	Labiatae	<i>Teucrium arduinii</i> L.	Lamiaceae	<i>Teucrium arduinii</i> L.	Grabovica	regional endemic	LC	
198	Labiatae	<i>Teucrium chamaedrys</i> L.	Lamiaceae	<i>Teucrium chamaedrys</i> L.	Trebević, Igman, Mostar			LC
199	Labiatae	<i>Marrubium vulgare</i> L.	Lamiaceae	<i>Marrubium vulgare</i> L.	Valley of Bistrica			NT
200	Labiatae	<i>Leonurus cardiaca</i> L.	Lamiaceae	<i>Leonurus cardiaca</i> L.	Lepenica, Kokorina			LC
201	Labiatae	<i>Ballota nigra</i> Link	Lamiaceae	<i>Ballota nigra</i> L.	Sarajevo and surroundings			LC
202	Labiatae	<i>Stachys anisochila</i> Vis. & Panč.	Lamiaceae	<i>Stachys anisochila</i> Vis. & Panč.	Konjic	trans-regional Balkan endemic	LC	LC
203	Labiatae	<i>Stachys palustris</i> L.	Lamiaceae	<i>Stachys palustris</i> L.	Gorica			LC
204	Labiatae	<i>Nepeta cataria</i> L.	Lamiaceae	<i>Nepeta cataria</i> L.	Kobilja glava, Vogošća-Koševo, Vranduk			LC
205	Labiatae	<i>Glechoma hederacea</i> L.	Lamiaceae	<i>Glechoma hederacea</i> L.	Grdonj			LC
206	Labiatae	<i>Glechoma hirsuta</i> W.K.	Lamiaceae	<i>Glechoma hirsuta</i> Waldst. & Kit.	Canyon of the Miljacka, Vogošća, Zujevin, valley of the Lašva			DD
207	Labiatae	<i>Prunella vulgaris</i> L.	Lamiaceae	<i>Prunella vulgaris</i> L.	Sarajevo			LC
208	Labiatae	<i>Melissa officinalis</i> L.	Lamiaceae	<i>Melissa officinalis</i> L.	Tisovac			LC
209	Labiatae	<i>Satureja hortensis</i> L.	Lamiaceae	<i>Satureja hortensis</i> L.	Sarajevo			DD
210	Labiatae	<i>Satureja cuneifolia</i> Ten.	Lamiaceae	<i>Satureja cuneifolia</i> Ten.	Blagaj, surroundings of Nevesinje			LC
212	Labiatae	<i>Calamintha thymifolia</i> Rchb.	Lamiaceae	<i>Clinopodium thymifolium</i> (Scop.) Kuntze	Trebević, Grdonj, Lapišnica, valley of the Željeznica, Vranduk, Crna rijeka, Grabovica, Jablanica	regional endemic		
213	Labiatae	<i>Hyssopus officinalis</i> L.	Lamiaceae	<i>Hyssopus officinalis</i> L.	Pojline, Paljev do			DD
214	Labiatae	<i>Origanum vulgare</i> L.	Lamiaceae	<i>Origanum vulgare</i> L.	Trebević			LC
215	Labiatae	<i>Thymus janikae</i> Čelak	Lamiaceae	<i>Thymus praecox</i> subsp. <i>janikae</i> (Čelak.) Jales	Canyon of the Miljacka	trans-regional Balkan endemic		
216	Labiatae	<i>Thymus serpyllum</i> L.	Lamiaceae	<i>Thymus serpyllum</i> L.	Trebević			LC
217	Labiatae	<i>Lycopus europaeus</i> L.	Lamiaceae	<i>Lycopus europaeus</i> L.	Blažuj, Lukavica, Busovača			LC
218	Labiatae	<i>Lycopus exaltatus</i> L.	Lamiaceae	<i>Lycopus exaltatus</i> L. f.	Reljevo			LC
219	Labiatae	<i>Mentha pulegium</i> L.	Lamiaceae	<i>Mentha pulegium</i> L.	Reljevo, Kokorina			LC

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220	Labiatae	<i>Mentha aquatica</i> L.	Lamiaceae	<i>Mentha aquatica</i> L.	Sarajevo field, lake (Herzegovina)			LC
221	Labiatae	<i>Salvia officinalis</i> L.	Lamiaceae	<i>Salvia officinalis</i> L.	Valley of the Neretva, Crno vrelo-Grabovica, Bijela			LC
223	Scrophulariaceae	<i>Gratiola officinalis</i> L.	Plantaginaceae	<i>Gratiola officinalis</i> L.	Mostarsko blato			LC
224	Scrophulariaceae	<i>Scrophularia scopoli</i> Hoppe	Scrophulariaceae	<i>Scrophularia scopoli</i> Hoppe	Banjaluka, valley of Sana, near Prijedor, Bjelašnica, Stari grad, Fojnica		DD	
225	Scrophulariaceae	<i>Scrophularia nodosa</i> L.	Scrophulariaceae	<i>Scrophularia nodosa</i> L.	Valley of Bosna, Ivan mt.			LC
226	Scrophulariaceae	<i>Digitalis ambigua</i> Murray	Plantaginaceae	<i>Digitalis grandiflora</i> Mill.	Stari grad, Blažuj, Bijele vode, Kalinovik			LC
227	Scrophulariaceae	<i>Digitalis laevigata</i> Walds. & Kit.	Plantaginaceae	<i>Digitalis laevigata</i> Walds. & Kit.	Crno vrelo - Grabovica	trans-regional Balkan endemic		
228	Scrophulariaceae	<i>Veronica satyroides</i> Vis.	Plantaginaceae	<i>Veronica satyroides</i> Vis.	Hranisava	regional endemic	EN	
229	Scrophulariaceae	<i>Veronica aphylla</i> L.	Plantaginaceae	<i>Veronica aphylla</i> L.	Treskavica		VU	
230	Scrophulariaceae	<i>Veronica beccabunga</i> L.	Plantaginaceae	<i>Veronica beccabunga</i> L.	Lapišnica			LC
231	Scrophulariaceae	<i>Melampyrum trichocalycinum</i> Vandas	Orobanchaceae	<i>Melampyrum trichocalycinum</i> Vandas	Grabovica	stenoendemic	VU	
232	Scrophulariaceae	<i>Pedicularis foliosa</i> L.	Orobanchaceae	<i>Pedicularis hoermanniana</i> K.Maly	Trebević, Treskavica	trans-regional Balkan endemic	VU	
233	Scrophulariaceae	<i>Pedicularis leucodon</i> Griseb.	Orobanchaceae	<i>Pedicularis leucodon</i> Griseb.	Treskavica		VU	
234	Globulariaceae	<i>Globularia cordifolia</i> L.	Plantaginaceae	<i>Globularia cordifolia</i> L.	Stari grad, valley of the Miliacka, Trebević, Zec			LC
235	Rubiaceae	<i>Asperula odorata</i> L.	Rubiaceae	<i>Galium odoratum</i> (L.) Scop.	Ozren, Hranisava, Bijele vode, Gradina, Romanija, Zec			LC
236	Rubiaceae	<i>Galium verum</i> L.	Rubiaceae	<i>Galium verum</i> L.	Sarajevo field, Trebević, Kokorina, Ravno			LC
237	Plantaginaceae	<i>Plantago major</i> L.	Plantaginaceae	<i>Plantago major</i> L.	Sarajevo field, Kokorina			LC
238	Plantaginaceae	<i>Plantago gentianoides</i> Sibth. & Sm.	Plantaginaceae	<i>Plantago gentianoides</i> Sibth. & Sm.	Treskavica		EN	
239	Caprifoliaceae	<i>Sambucus nigra</i> L.	Viburnaceae	<i>Sambucus nigra</i> L.	Sarajevo			LC
240	Caprifoliaceae	<i>Lonicera alpigena</i> L.	Caprifoliaceae	<i>Lonicera alpigena</i> L.	Dobra voda, Poljane, Paljev do, Krupa, Pazarić, Višnjevo			LC
241	Caprifoliaceae	<i>Lonicera nigra</i> L.	Caprifoliaceae	<i>Lonicera nigra</i> L.	Dobra voda, Poljane, Paljev do			LC
242	Dipsacaceae	<i>Cephalaria pastricensis</i> Hayek	Dipsacaceae	<i>Cephalaria pastricensis</i> Dorfl. & Hayek	Kokorina kod Gacka	trans-regional Balkan endemic	VU	
243	Dipsacaceae	<i>Scabiosa graminifolia</i> L.	Dipsacaceae	<i>Scabiosa graminifolia</i> L.	Borci, valley of the Trešnica, Prenj, Grabovica		NT	
244	Dipsacaceae	<i>Scabiosa silenifolia</i> Walds. & Kit.	Dipsacaceae	<i>Scabiosa silenifolia</i> Walds. & Kit.	Treskavica	Dinaric-Apennine endemic		

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245	Campanulaceae	<i>Symphandra hofmannii</i> Pant.	Campanulaceae	<i>Campanula hofmannii</i> (Pant.) Greuter & Burdet	Busovača, Vranduk, valley of the Lašva, Fojnica, Srebrenik, Maglaj, valley of the Ugar river	stenoendemic	NT	
246	Campanulaceae	<i>Campanula trichocalycina</i> Ten.	Campanulaceae	<i>Asyneuma trichocalycinum</i> (Ten.) K. Malý	Treskavica	trans-regional Balkan endemic	NT	
247	Campanulaceae	<i>Phyteuma orbiculare</i> L.	Campanulaceae	<i>Phyteuma orbiculare</i> L.	Treskavica, Zec mt., Bila, Borci		LC	
248	Campanulaceae	<i>Phyteuma sieberi</i> Spreng.	Campanulaceae	<i>Phyteuma sieberi</i> Spreng.	Zec mt.		VU	
249	Campanulaceae	<i>Hedraeanthus dalmaticus</i> Bartl.	Campanulaceae	<i>Edraianthus dalmaticus</i> (A.DC.) A.DC.	Stari grad, Trebević, Lapišnica, Glog	regional endemic	VU	
250	Campanulaceae	<i>Hedraeanthus serpyllifolius</i> (Vis.) DC.	Campanulaceae	<i>Edraianthus serpyllifolius</i> (Vis.) A.DC.	Treskavica	regional endemic	LC	
251	Campanulaceae	<i>Hedraeanthus niveus</i> Beck	Campanulaceae	<i>Edraianthus niveus</i> Beck	Zec mt.	stenoendemic	EN	
252	Synantheraceae	<i>Solidago virgaurea</i> L.	Compositae	<i>Solidago virgaurea</i> L.	Stari grad, Trebević, Romanija, Poljane, Paljev do, Kalinovik, Busovača			LC
253	Synantheraceae	<i>Bellidistrum michelii</i> Cass.	Compositae	<i>Bellidistrum michelii</i> Cass.	Treskavica		EN	
254	Synantheraceae	<i>Inula helenium</i> L.	Compositae	<i>Inula helenium</i> L.	Valley of the Bosna			LC
255	Synantheraceae	<i>Telekia speciosa</i> (Schreb.) Baumg.	Compositae	<i>Telekia speciosa</i> (Schreb.) Baumg.	Valley of the Dusina, Romanija		VU	
256	Synantheraceae	<i>Bidens tripartita</i> L.	Compositae	<i>Bidens tripartita</i> L.	Stari grad, surroundings of Sarajevo, Kiseljak			LC
257	Synantheraceae	<i>Achillea clavennae</i> L.	Compositae	<i>Achillea clavennae</i> L.	Treskavica		VU	
258	Synantheraceae	<i>Achillea linguata</i> W. K.	Compositae	<i>Achillea linguata</i> Walds. & Kit.	Zec mt.		VU	
259	Synantheraceae	<i>Achillea millefolium</i> L.	Compositae	<i>Achillea millefolium</i> L.	Vučja luka, Kotorina			LC
260	Synantheraceae	<i>Matricaria chamomilla</i> L.	Compositae	<i>Matricaria chamomilla</i> L.	Sarajevo field			LC
261	Synantheraceae	<i>Chrysanthemum cinerariifolium</i> (Trev.) Vis.	Compositae	<i>Tanacetum cinerariifolium</i> (Trev.) Sch. Bip.	Crno vrelo-Grabovica, Mostar field, Porim	trans-regional Balkan endemic	VU	LC
262	Synantheraceae	<i>Artemisia vulgaris</i> L.	Compositae	<i>Artemisia vulgaris</i> L.	Sarajevo			LC
263	Synantheraceae	<i>Petasites albus</i> (L.) Gaertn.	Compositae	<i>Petasites albus</i> (L.) Gaertn.	Stari grad, canyon of the Miljacka			LC
264	Synantheraceae	<i>Petasites kablíkianus</i> Tsch.	Compositae	<i>Petasites kablíkianus</i> Bercht.	Stari grad		EN	
265	Synantheraceae	<i>Arnica montana</i> L.	Compositae	<i>Arnica montana</i> L.	Vučja luka (Ozren), Zec mt.		VU	LC
266	Synantheraceae	<i>Centaurea kotschyana</i> Heuff.	Compositae	<i>Centaurea kotschyana</i> W. D. J. Koch	Treskavica		VU	
267	Synantheraceae	<i>Centaurea punctata</i> Vis.	Compositae	<i>Centaurea glaberrima</i> Tausch	Near Blagaj, Prenj	regional endemic	EN	
268	Synantheraceae	<i>Centaurea cyanus</i> L.	Compositae	<i>Centaurea cyanus</i> L.	Sarajevo field			LC
269	Synantheraceae	<i>Cichorium intybus</i> L.	Compositae	<i>Cichorium intybus</i> L.	Surroundings of Sarajevo			LC
270	Synantheraceae	<i>Lactuca saligna</i> L.	Compositae	<i>Lactuca saligna</i> L.	Foča, Mostarsko polje			LC

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271	Synanthraceae	<i>Mulgedium pancici</i> Vis.	Compositae	<i>Lactuca pancicii</i> (Vis.) N. Kilian & Greuter	Treskavica	trans-regional Balkan endemic	VU	LC
272	Synanthraceae	<i>Crepis blavii</i> Ascher.	Compositae	<i>Crepis pannonica</i> subsp. <i>blavii</i> (Asch.) M. A. Fisch. & D. Dimitrova	Paljev do-Bakračuša	regional endemic	DD	
273	Synanthraceae	<i>Hieracium waldsteinii</i> Tausch	Compositae	<i>Hieracium waldsteinii</i> Tausch	Valley of the Mošćanica, Višnjevo, Gacko, Lipnik near Gacko		EN	
274	Alismataceae	<i>Alisma plantago-aquatica</i> L.	Alismataceae	<i>Alisma plantago-aquatica</i> L.	Surroundings of Sarajevo			LC
275	Najadaceae	<i>Potamogeton lucens</i> L.	Potamogetonaceae	<i>Potamogeton lucens</i> L.	Lake near Jajce			LC
276	Najadaceae	<i>Potamogeton perfoliatus</i> L.	Potamogetonaceae	<i>Potamogeton perfoliatus</i> L.	Sana near Prijedor			LC
277	Najadaceae	<i>Potamogeton pusillus</i> L.	Potamogetonaceae	<i>Potamogeton pusillus</i> L.	Along the Bosna and Miljacka rivers			LC
278	Najadaceae	<i>Potamogeton crispus</i> L.	Potamogetonaceae	<i>Potamogeton crispus</i> L.	Ilidža			LC
279	Liliaceae	<i>Tofieldia calyculata</i> (L.) Wh.	Tofieldiaceae	<i>Tofieldia calyculata</i> (L.) Wahlenb.	Treskavica		VU	
280	Liliaceae	<i>Veratrum album</i> L.	Melanthiaceae	<i>Veratrum album</i> L.	Igman			LC
281	Liliaceae	<i>Colchicum visianii</i> Parl.	Colchicaceae	<i>Colchicum haynaldii</i> Heuff.	Stari grad (Sarajevo)		CR	
282	Liliaceae	<i>Erythronium dens-canis</i> L.	Liliaceae	<i>Erythronium dens-canis</i> L.	Trebević, Prača, Igman, Blažuj		LC	LC
283	Liliaceae	<i>Lilium martagon</i> L.	Liliaceae	<i>Lilium martagon</i> L.	Trebević		LC	LC
284	Liliaceae	<i>Scilla bifolia</i> L.	Asparagaceae	<i>Scilla bifolia</i> L.	Sarajevo, Igman, Reljevo			LC
285	Liliaceae	<i>Scilla pratensis</i> W. K.	Asparagaceae	<i>Chouardia litardierei</i> (Breistr.) Speta	Sarajevo, Borci	regional endemic	VU	NT
286	Liliaceae	<i>Allium ursinum</i> L.	Amaryllidaceae	<i>Allium ursinum</i> L.	Pazaric			LC
287	Liliaceae	<i>Allium carinatum</i> (L.) Koch	Amaryllidaceae	<i>Allium carinatum</i> L.	Trebević, Lukavica, valley of the Željeznica, Vranduk, Ivan mt., Konjic			LC
288	Liliaceae	<i>Allium scorodoprasum</i> L.	Amaryllidaceae	<i>Allium scorodoprasum</i> L.	Valley of Košava, Trebević			LC
289	Smilacaceae	<i>Convallaria majalis</i> L.	Asparagaceae	<i>Convallaria majalis</i> L.	Trebević		NT	LC
290	Smilacaceae	<i>Asparagus acutifolius</i> L.	Asparagaceae	<i>Asparagus acutifolius</i> L.	Mostar field, Pakračić-Blagaj			LC
291	Smilacaceae	<i>Asparagus officinalis</i> L.	Asparagaceae	<i>Asparagus officinalis</i> L.	Mokro			LC
292	Smilacaceae	<i>Paris quadrifolia</i> L.	Melanthiaceae	<i>Paris quadrifolia</i> L.	Surroundings of Sarajevo			LC
293	Smilacaceae	<i>Ruscus aculeatus</i> L.	Asparagaceae	<i>Ruscus aculeatus</i> L.	Mostar, Crna rijeka-Grabovica		VU	LC
294	Smilacaceae	<i>Ruscus hypoglossum</i> L.	Asparagaceae	<i>Ruscus hypoglossum</i> L.	Bjelašnica, towards Kreševo		VU	LC
295	Amaryllidaceae	<i>Galanthus nivalis</i> L.	Amaryllidaceae	<i>Galanthus nivalis</i> L.	Trebević, Igman		NT	NT
296	Amaryllidaceae	<i>Narcissus poeticus</i> L.	Amaryllidaceae	<i>Narcissus poeticus</i> L.	Sarajevo			LC
297	Iridaceae	<i>Iris bosniaca</i> Beck	Iridaceae	<i>Iris reichenbachii</i> Heuff.	Trebević	regional endemic	LC	

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298	Iridaceae	<i>Iris pseudacorus</i> L.	Iridaceae	<i>Iris pseudacorus</i> L.	Reljevo			LC
299	Iridaceae	<i>Crocus biflorus</i> Mill.	Iridaceae	<i>Crocus biflorus</i> Mill.	Konjic, Mostar		CR	
300	Iridaceae	<i>Gladiolus imbricatus</i> L.	Iridaceae	<i>Gladiolus imbricatus</i> L.	Karaula (Travnik)		EN	
301	Juncaceae	<i>Juncus effusus</i> L.	Juncaceae	<i>Juncus effusus</i> L.	Blažuj, valley of the Željeznica			LC
302	Juncaceae	<i>Juncus trifidus</i> L.	Juncaceae	<i>Juncus trifidus</i> L.	Zec mt.		EN	
303	Juncaceae	<i>Juncus bufonius</i> L.	Juncaceae	<i>Juncus bufonius</i> L.	Valley of the Bosna			LC
304	Juncaceae	<i>Juncus lamprocarpus</i> Ehrh.	Juncaceae	<i>Juncus articulatus</i> L.	Ilidža, Dobrinjka, Željeznica, Pliva			LC
305	Gramineae	<i>Festuca rubra</i> L.	Poaceae	<i>Festuca rubra</i> L.	Sarajevo field			LC
306	Gramineae	<i>Festuca ovina</i> L.	Poaceae	<i>Festuca ovina</i> L.	Glog, Sarajevo field, Berkua, Trebević			LC
307	Gramineae	<i>Lolium perenne</i> L.	Poaceae	<i>Lolium perenne</i> L.	Sarajevo			LC
308	Gramineae	<i>Poa pratensis</i> L.	Poaceae	<i>Poa pratensis</i> L.	Sarajevo, Trebević, Reljevo, Kobilja glava			LC
309	Gramineae	<i>Poa alpina</i> L. var. <i>badensis</i> Haenke	Poaceae	<i>Poa alpina</i> L.	Berkua, Trebević			LC
310	Gramineae	<i>Catabrosa aquatica</i> (L.) P. B.	Poaceae	<i>Catabrosa aquatica</i> (L.) P. Beauv.	Vrelo Bosne (the spring of the Bosna river)			LC
311	Gramineae	<i>Bromus moellendorffianus</i> Aschers. & Graebner	Poaceae	<i>Bromus moellendorffianus</i> (Asch. & Graebn.) Hayek	Ablakovina (Trebević)	regional endemic	CR	
312	Gramineae	<i>Hordeum murinum</i> L.	Poaceae	<i>Hordeum murinum</i> L.	Sarajevo			LC
313	Gramineae	<i>Avena blavii</i> Janka	Poaceae	<i>Helictotrichon blavii</i> (Asch. & Janka) C.E.Hubb.	Trebević	regional endemic		
314	Gramineae	<i>Phleum pratense</i> L.	Poaceae	<i>Phleum pratense</i> L.	Lopata mt., Zec mt.			LC
315	Gramineae	<i>Alopecurus pratensis</i> L.	Poaceae	<i>Alopecurus pratensis</i> L.	Reljevo			LC
316	Gramineae	<i>Alopecurus geniculatus</i> L.	Poaceae	<i>Alopecurus geniculatus</i> L.	Sarajevo			LC
317	Gramineae	<i>Arundo phragmites</i> L.	Poaceae	<i>Phragmites australis</i> (Cav.) Steud.	Ilidža, Reljevo			LC
318	Araceae	<i>Lemna minor</i> L.	Lemnaceae	<i>Lemna minor</i> L.	Dobrinja (Sarajevo)			LC
319	Araceae	<i>Typha angustifolia</i> L.	Typhaceae	<i>Typha angustifolia</i> L.	Surroundings of Sarajevo, Blažuj			LC
320	Araceae	<i>Typha latifolia</i> L.	Typhaceae	<i>Typha latifolia</i> L.	Sarajevo field, valley of the Bosna			LC
321	Cyperaceae	<i>Scirpus palustris</i> L.	Cyperaceae	<i>Eleocharis palustris</i> (L.) Roem. & Schult.	Mošćanica, Reljevo			LC
322	Cyperaceae	<i>Scirpus sylvaticus</i> L.	Cyperaceae	<i>Scirpus sylvaticus</i> L.	Valley of the Miljacka			LC
323	Cyperaceae	<i>Cyperus fuscus</i> L.	Cyperaceae	<i>Cyperus fuscus</i> L.	Buna			LC
324	Cyperaceae	<i>Cyperus flavescens</i> L.	Cyperaceae	<i>Cyperus flavescens</i> L.	Busovača			LC
325	Cyperaceae	<i>Carex rostrata</i> W.	Cyperaceae	<i>Carex rostrata</i> Hoppe ex Schkuhr	Romanija			LC
326	Cyperaceae	<i>Carex vesicaria</i> L.	Cyperaceae	<i>Carex vesicaria</i> L.	Reljevo			LC
327	Orchidaceae	<i>Epipactis palustris</i> Cr.	Orchidaceae	<i>Epipactis palustris</i> (L.) Crantz	Plivsko lake near Jajce			LC

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328	Orchidaceae	<i>Cephalanthera rubra</i> (L.) Rchb.	Orchidaceae	<i>Cephalanthera rubra</i> (L.) Rich.	Stari grad, canyon of Miljacka, Treskavica		VU	LC
329	Orchidaceae	<i>Neottia nidus-avis</i> (L.) Rich.	Orchidaceae	<i>Neottia nidus-avis</i> (L.) Rich.	Ozren			LC
330	Orchidaceae	<i>Neottia ovata</i> (L.) Bl. & Fing.	Orchidaceae	<i>Neottia ovata</i> (L.) Bluff & Fingerh.	Stari grad, Trebević, Bjelašnica			LC
331	Orchidaceae	<i>Platanthera bifolia</i> (L.) Rchb. fil.	Orchidaceae	<i>Platanthera bifolia</i> (L.) Rich.	Stari grad, Trebević, Igman, near Blažuj		NT	LC
332	Orchidaceae	<i>Gymnadenia conopsea</i> (L.) R.Br.	Orchidaceae	<i>Gymnadenia conopsea</i> (L.) R.Br.	Stari grad, Trebević, Bradina			LC
333	Orchidaceae	<i>Nigritella nigra</i> Scop.	Orchidaceae	<i>Gymnadenia rhellicani</i> (Teppner & E.Klein) Teppner & E.Klein	Dobra voda on Trebević		NT	LC
334	Orchidaceae	<i>Orchis sambucina</i> L.	Orchidaceae	<i>Dactylorhiza sambucina</i> (L.) Soo	Ozren, Trebević, Lapišnica, Hranisava, Reljevo			LC
335	Orchidaceae	<i>Orchis incarnata</i> L.	Orchidaceae	<i>Dactylorhiza incarnata</i> (L.) Soo	Trebević, valley of the Željeznica - Hrasnica, Hreša - Han, Tarčin			LC
336	Orchidaceae	<i>Orchis maculata</i> L.	Orchidaceae	<i>Dactylorhiza maculata</i> (L.) Soó subsp. <i>maculata</i>	Stari grad, Dupovci, valley of the Mošćanica, Trebević		VU	LC
337	Orchidaceae	<i>Orchis globosa</i> L.	Orchidaceae	<i>Trausteinera globosa</i> (L.) Rchb.	Han near Nahorevo		NT	LC
338	Orchidaceae	<i>Orchis morio</i> L.	Orchidaceae	<i>Orchis morio</i> L.	Surroundings of Sarajevo			NT
339	Orchidaceae	<i>Orchis ustulata</i> L.	Orchidaceae	<i>Neottia ustulata</i> (L.) R. M. Bateman, Pridgeon & M. W. Chase	Surroundings of Sarajevo			LC
340	Orchidaceae	<i>Orchis tridentata</i> Scop.	Orchidaceae	<i>Neottia tridentata</i> (Scop.) R. M. Bateman, Pridgeon & M. W. Chase	Valley of the Miljacka, Lapišnica			LC
341	Orchidaceae	<i>Orchis simia</i> Link	Orchidaceae	<i>Orchis simia</i> Lam.	Trebević, Pazarić		VU	LC
342	Orchidaceae	<i>Orchis purpurea</i> Huds.	Orchidaceae	<i>Orchis purpurea</i> Huds.	Reljevo		VU	LC
343	Orchidaceae	<i>Orchis mascula</i> L.	Orchidaceae	<i>Orchis mascula</i> (L.) L.	Trebević			LC
344	Orchidaceae	<i>Orchis pallens</i> L.	Orchidaceae	<i>Orchis pallens</i> L.	Igman			LC
345	Orchidaceae	<i>Aceras pyramidalis</i> (L.) Rchb. fil.	Orchidaceae	<i>Anacamptis pyramidalis</i> (L.) L.C.M. Richard	Stari grad (Sarajevo)		NT	LC
346	Orchidaceae	<i>Ophrys aranifera</i> Huds.	Orchidaceae	<i>Ophrys sphegodes</i> Mill. subsp.	Stari grad, Hum			LC
347	Orchidaceae	<i>Ophrys fuciflora</i> Scop.	Orchidaceae	<i>Ophrys fuciflora</i> (F.W.Schmidt) Moench	Canyon of the Miljacka			LC
348	Orchidaceae	<i>Ophrys apifera</i> Huds.	Orchidaceae	<i>Ophrys apifera</i> Huds.	Grdonj			LC

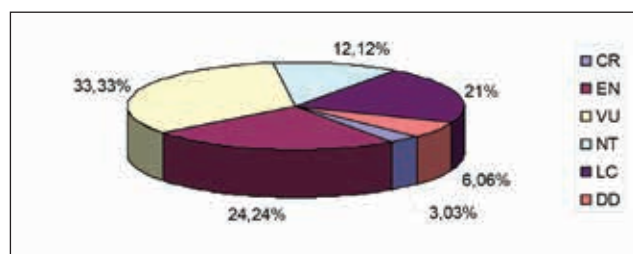


Figure 1. IUCN Threatened status of endemic species in Blau's herbarium according to the Red List of FB&H

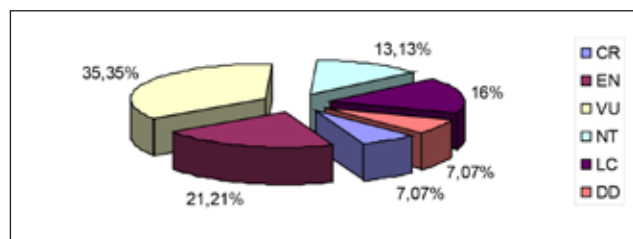


Figure 2. IUCN Threatened status of species from Blau's collection according to the Red List of FB&H

from Bosnia and Herzegovina (1404) confirmed that a total of 341 taxa have conservation status:

- 99 (30%) taxa are included in the Red List of FBiH (**CR** – 7 species, **EN** – 21 species, **VU** – 35 species, **NT** – 13 species, **LC** – 16 species, **DD** – 7 species) (Fig. 2);
- 274 (80%) taxa are included in the European Red List (**VU** – 1 species, **NT** – 7 species, **LC** – 259 species, **DD** – 7 species);
- 35 (10%) taxa were included in both lists (Fig. 2).

CONCLUSION

The review of literature sources and their comparison with the original collection material confirmed the floristic value of Blau's herbarium on the basis of the following:

- of the total number of species and subspecies (1404) of the *Herbarium Blavianum* collection originating from Bosnia and Herzegovina, 2.9% are endemics mostly of trans-regional (**TRE**), regional (**RE**), and local (**LE**) distributions;
- of the 41 registered endemic species, 33 have a defined conservation status in the Federation of Bosnia and Herzegovina, while 6 taxa are included in the European Red List: *Chouardia litardierei* (Breistr.) Speta - Near Threatened (**NT**), *Silene sendtneri* Boiss., *Petteria ramentacea* (Sieber) C. Presl, *Stachys anisochila* Vis. & Panč., *Tanacetum cinerariifolium* (Trevir.) Sch. Bip., *Lactuca pancicii* (Vis.) N. Kilian & Greuter – Last Concern (**LC**);
- of the total number of endemic species if the Blau's collection, 20 are at risk of extinction (**CR**, **EN**, **VU**);
- the endangered part of the collection is represented by 341 species, of which 30% are included in the Red List of the Federation of BiH, 80% in the European Red List and 10% in both lists;
- taxonomic revision indicated numerous changes in the status of species at the family and genus level.

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SAŽETAK

Najstariji primjerci SARA herbarija datiraju iz druge polovine 19. stoljeća i pripadaju kolekciji dr. Otto Blau-a pohranjenoj u Zemaljskom muzeju Bosne i Hercegovine. Cilj rada bio je da se omogući transparentnost podataka kolekcije koji pružaju mogućnost sagledavanja areala endemičnih i ugroženih vrsta do unazad 153 godine, odnosno da se ukaže na brojnost, brzinu i stepen smanjivanja i uništavanja prirodnih staništa i vrsta koje u ovom momentu imaju sve više kategorije ugroženosti (CR, EN, VU). Utvrđena je njihova brojnost prema originalnoj kolekciji i pratećem katalogu sa pregledom od nivoa porodice čiji su nazivi revidirani prema važećoj nomenklaturi. Također je dat pregled lokaliteta, opća rasprostranjenost endemskih vrsta kao i kategorije ugroženosti. Od ukupno 1404 kolekcijskih vrsta prikupljenih sa područja Bosne i Hercegovine, konstantirane su vrste koje se nalaze na bosanskohercegovačkoj (99) i evropskoj Crvenoj listi ugroženosti (274). Posebno obilježje istraživanoj kolekciji *Herbarium Blavianum* daju registrirane endemične vrste (41) različitih kategorija ugroženosti u FBiH (33) i Evropi (6). Rezultati ovoga rada ukazuju na izuzetnu vrijednost Blauovog herbarija koji sa muzeološkog aspekta ima status kolekcije od posebnog znanstvenog i historijskog značaja u sklopu herbarske zbirke Zemaljskog muzeja BiH (SARA).

Ključne riječi: herbarij, Bosna i Hercegovina, SARA, distribucija, IUCN