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WIN SOME, LOSE SOME – STATUTORILY STRICTLY PROTECTED INDIGENOUS PLANT SPECIES IN THE BOTANICAL GARDEN OF THE FACULTY OF SCIENCE (UNIVERSITY OF ZAGREB, CROATIA)

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Early in 2013, we made a first report on *ex situ* conservation of threatened and statutorily protected indigenous plant species, grown in the rockeries dedicated to the plants of Croatian flora, in the Botanical Garden of the Faculty of Science (University of Zagreb, Croatia). We found 208 threatened, statutorily protected and strictly protected plant taxa, originating from native Croatian localities. In the meantime, we studied the Garden's collections and Database more thoroughly and also collected new plant material in our field research. Accordingly, our native-originating collections amount to 260 taxa that are statutorily protected and strictly protected. However, due to the accession of Croatia to the European Union, part of the vital legislation changed late in 2013. This time, we report on progress in collecting and the consequences of the implementation of the new regulations on our indigenous plants collections. According to the new legislation, growing in the Botanical Garden at this moment are 109 statutorily strictly protected vascular plant species of Croatian flora (13.6 % of all), 46 taxa from the *Red Book of Vascular Flora of Croatia* (19.5 % of categories RE, CR, EN and VU), and seven NATURA-2000-species of interest to European Union (38.9 % of all).

Key words: statutorily protected plant species, threatened plant species, *Natura 2000*, Zagreb Botanical Garden

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U Botaničkom vrtu Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu početkom 2013. po prvi puta izrađen je popis svojti iz kategorija visokog rizika od izumiranja te zakonom zaštićenih svojti hrvatske flore, prikupljenih na domaćim staništima. Tom smo prigodom prebrojili 208 zakonom zaštićenih i strogo zaštićenih vrsta podrijetlom s hrvatskih staništa. U međuvremenu smo pomno pretražili Bazu podataka Botaničkog vrta i terenskim istraživanjima prikupili nove vrste. Tako je krajem 2013. broj zakonom zaštićenih i strogo zaštićenih svojti u Vrtu narastao na 260. Međutim, pristupanjem Hrvatske Europskoj uniji promijenio se dio legislative te su stupili na snagu novi propisi. Slijedom izmjena, u Botaničkom vrtu sad uzgajamo 109 strogo zaštićenih vrsta (13,6 % od ukupnog broja), 46 iz kategorija *Crvene knjige* RE, CR, EN i VU (19,5 % od ukupnog broja) te sedam NATURA-2000 vrsta od značaja za Europsku uniju (38,9 % od ukupnog broja).

Ključne riječi: zakonom zaštićene biljke, svojte visokog rizika od izumiranja, *Natura 2000*, Botanički vrt Zagreb

INTRODUCTION

Recently, in order to establish the zero-state of the *Global Strategy for Plant Conservation 2011–2020*'s Target 8 (Anonymous, 2003, 2012a), in our paper Sandev *et al*. (2013) we analysed native plant collections of the Botanical Garden (Faculty of Science, University of Zagreb – below "the Botanical Garden" or "the Garden"). The study was focused on the inventory of species collected strictly in Croatian localities, which are listed as threatened in the *Red Book of Vascular Flora of Croatia* (Nikolić & Topić *eds*., 2005) and/or statutorily protected and strictly protected (Anonymous, 2009) in Croatia, as well as in some other nationally and internationally important species indices. These were included in the lists of, for example, the Croatian *National Ecological Network*, NEN (Anonymous, 2007), Croatian *Important Plant Areas*, IPA (Alegro *et al*., 2010), Draft of *Proposal for Ecological Network NATURA 2000* for Croatia (Anonymous, 2013b) and *Convention on International Trade in Endangered Species of Wild Fauna and Flora*, CITES (Anonymous, 1979). We thoroughly analysed the collections of Garden rockeries, which are planted with indigenous flora (mostly) collected in Croatian localities, to identify the plants listed in the named legislation. There, we found 668 indigenous plant taxa collected in Croatian native localities (Sandev *et al*., 2013), out of which 118 are *statutorily protected* and 90 are *statutorily strictly protected* (in total 208; acc. to Anonymous, 2009). In the regularly updated on-line *Red Book of Vascular Flora of Croatia* (Nikolić *ed*., 2014b; in Sandev *et al.* cited as accessed in 2013) we found 80 taxa of the Garden's rockeries, of which one (*Hippophaë rhamnoides* L.) was regionally extinct (RE). In the categories of critically endangered (CR), endangered (EN) and vulnerable (VU) species, we found 30 taxa: seven CR, six EN, and 17 VU. In the *European Red List of Vascular Plants* (Bilz *et al*., 2011) we found 24 taxa, and in the IUCN *Red List of Threatened Species in the World* (Anonymous, 2012b) 12, but all in the lower categories of nearly threatened (NT), least concerned (LC) and data deficient (DD). All details and references are available in Sandev *et al.* (2013).

Since the mid-2013, when these analyses were concluded, the data have changed considerably. The reasons for this are: *i)* we extended our analyses to all Botanical Garden collections and the Database, apart from the rockeries, planted strictly with indigenous species; *ii)* during our regular field-research in 2013, we collected new plant species in their native Croatian localities, and *iii)* after Croatia joined European Union on July 1st, 2013, some vital legislation changed. The new *Nature protection act* (Anonymous, 2013a) was passed in June, based on all crucial acts, ordinances and regulations of European Union. *EU Wild Life Trade Legislation* (Anonymous, 2013e) and Croatian *Act on Wildlife Trans-Boundary Transportation and Trade* (Anonymous, 2013f) were enacted in summer. The *Regulation of Ecological Network NATURA 2000* for Croatia (Anonymous, 2013c) replaced the *Regulation of National Ecological Network* (Anonymous, 2007) in September. Finally, the new *Ordinance of strictly protected species* (Anonymous, 2013d) was adopted by the Croatian Government in December of 2013.

The aim of this report is to present new results in *ex situ* conservation of important Croatian plant species in the Botanical Garden of the Faculty of Science (University of Zagreb), amending and correcting the recently published data (Sandev *et al*., 2013), according to the new legislation. These are achieved through the: *i)* revision of origin of the indigenous plants cultivated in parts of the Garden besides the rockeries (*e. g.*, systematic fields, nurseries, fern collection, arboretum, greenhouses), as well as taking into account the recently collected native plant species brought to Garden-cultivation from Croatian wild localities in 2013, *ii)* analysing the new data-set through the same national legislation as in our previous paper (Sandev *et al*., 2013), and *iii)* cross-checking the

whole data-set through the new legislation, adopted after Croatia's accession to European Union.

Our main goal is to establish the impact of legislation change on the inventory of our Botanical Garden, with particular reference to indigenous plants, collected in Croatian localities: how many plant species do we "win" or "lose" with the change of existing and the implementation of new Acts, Ordinances and Regulations considering nature conservation?

Method

1. For this Report, the plant-list of 208 statutorily protected and strictly protected plant species in cultivation of the Botanical Garden-rockeries, published in Sandev *et al*. (2013), was amended with new taxa (Tab. 1). First part of the recently added species were already growing in the Garden, out of the native collections of the Karstic, Mediterranean, Sub-Mediterranean and Alpine rockeries, analysed in Sandev *et al*. (2013). The second part consists of species collected in the wild during our 2013-field research, according to the annual *Permission to collect statutorily protected and threatened plants* assigned to the Botanical Garden of the Faculty of Science, University of Zagreb, in January of 2013, by the Croatian *Ministry of Environment and Nature Protection*.
2. The list of newly added plant species was then cross-checked through the same legislation as the list of 208 taxa in Sandev *et al*. (2013) paper – as follows:
   I. IUCN *Red List of Threatened Species in the World* (Anonymous, 2012b),
   II. *European Red List of Vascular Plants* (Bilz *et al*., 2011),
   III. *Red Book of Vascular Flora of Croatia* (Nikolić *ed*., 2014b),
   IV. List of protected and strictly protected wild plants from the *Ordinance on the proclamation of protected and strictly protected wild taxa* (Anonymous, 2009),
   V. *Important Plant Areas* (IPA) of Croatia (Alegro *et al*., 2010), based on two of its three criteria: A – Presence of threatened plant species; and B – Presence of botanical richness (assembled by B1: threatened species, and B2: endemic species);
   VI. *Regulation of the National Ecological Network* (Anonymous, 2007) and the Draft of *Proposal for Ecological Network NATURA 2000* for Croatia (Anonymous, 2013b),
   VII. Appendix II of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora,* CITES (Anonymous, 1979).
3. When analysed, the list of new taxa (Tab. 1) was combined with the list previously published in Sandev *et al*. (2013; Tab. 1 there), to gain the complete inventory of statutorily protected and strictly protected plant species grown in the Botanical Garden, until February 2013. The combined list (not shown here) was then re-checked again, through the following new legislation, which has recently changed;
4. *Ordinance on strictly protected species* (Anonymous, 2013d), which replaced the *Ordinance on the proclamation of protected and strictly protected wild taxa* (Anonymous, 2009), according to the new *Nature protection act* (Anonymous, 2013a);
5. *Regulation of Ecological Network NATURA 2000* for Croatia (Anonymous, 2013c), the final version of the Draft of *Proposal* (Anonymous, 2013b) accepted by Croatian Government,

Tab. 1. Status of the newly acquired indigenous plant species in *ex situ* collections of the Botanical Garden, Faculty of Science (University of Zagreb, Croatia): **Status** – PE: previously existing in the Garden; CW: collected in the wild during 2013. **IUCN-RL** – Red List of Threatened Species of the World. **EU-RL** – European Red List of Vascular Plants. **HR-RB** – Red Book of Vascular Flora of Croatia: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; DD – Data Deficient. **Stat. prot.** – statutorial protection in Croatia: SP-strictly protected species; P-protected species. **IPA** – Important Plant Area-taxa: A-globally threatened species; B1-threatened species from the Red Book of Vascular Flora of Croatia; B2-endemic species, s. l. **NEN**-National Ecological Network. **N2K-prop**. – Natura 2000-Draft of Proposal for Croatia: EU-plant species important for European Union; HR-plant species important for Croatia. **CITES App. II** – plant listed in the Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Details in text.

No.	Scientific name	Status	IUCN-RL	EU-RL	HR-RB	Stat. prot.	IPA	NEN	N2K-prop.	CITES App. II
1	*Agrimonia eupatoria* L.	PE				P				
2	*Agropyron cristatum* (L.) Gaertn. subsp. *pectinatum* (M. Bieb.) Tzvelev	CW		LC	CR	SP	B1		HR	
3	*Agrostemma githago* L.	PE				P				
4	*Althaea officinalis* L.	PE				P				
5	*Anthyllis barba-jovis* L.	PE			NT	P				
6	*Asparagus acutifolius* L.	PE		LC		P				
7	*Ballota nigra* L.	CW				P				
8	*Bryonia dioica* Jacq.	PE				P				
9	*Calla palustris* L.	PE		LC	CR	SP	B1	+	HR	
10	*Carex extensa* Gooden.	CW			EN	SP	B1			
11	*Carex praecox* Schreb.	CW			NT	P				
12	*Catabrosa aquatica* (L.) P. Beauv.	CW		LC	CR	SP	B1			
13	*Chaerophyllum coloratum* L.	CW			NT	SP	B2			
14	*Chouardia litardierei* (Breistr.) Speta (*Scilla litardierei* Breistr.)	CW	DD	CR	NT	SP	A, B2	+	EU	
15	*Cyclamen repandum* Sibth. et Sm.	PE			NT	P				II
16	*Dianthus giganteiformis* Borbás subsp. *pontederae* (A. Kerner) Soó	CW				P				
17	*Drosera rotundifolia* L.	PE			CR	SP	B1		HR	
18	*Eleocharis carniolica* Koch	PE	LC	LC	EN	SP	A, B1	+	EU	
19	*Elymus farctus* (Viv.) Runemark ex Melderis	PE			CR	SP	B1		HR	
20	*Gladiolus italicus* Mill.	CW	LC			SP				

21	*Hippuris vulgaris* L.	PE		LC	EN	SP	B1		HR	
22	*Iris pumila* L.	PE				SP				
23	*Lythrum hyssopifolia* L.	PE	LC	LC		SP				
24	*Matthiola incana* (L.) R. Br.	PE			NT	P				
25	*Melica transsilvanica* Schur	CW			DD	SP				
26	*Mentha aquatica* L.	PE		LC		P				
27	*Mentha longifolia* (L.) Huds.	PE				P				
28	*Mentha pulegium* L.	PE		LC		P				
29	*Narcissus tazetta* L.	PE			NT	P				
30	*Nonea pulla* DC.	CW			DD	SP				
31	*Ornithogalum pyramidale* L.	CW				P		+		
32	*Pancratium maritimum* L.	PE			CR	SP	B1		HR	
33	*Periploca graeca* L.	PE			EN	SP	B1		HR	
34	*Pimpinella saxifraga* L.	PE				P				
35	*Pinguicula vulgaris* L.	CW		LC	CR	SP	B1		HR	
36	*Portenschlagiella ramosissima* (Port.) Tutin	CW				SP	B1			
37	*Prunus avium* L.	PE		LC		P				
38	*Prunus tenella* Batsch	PE		DD	CR	SP	B1			
39	*Pulsatilla grandis* Wender. (*P. vulgaris* Mills. subsp. *grandis* (Wender.) Zamels)	CW	LC	LC	LC	SP	A, B1	+	EU	
40	*Salsola kali* L.	CW			VU	SP	B1		HR	
41	*Salsola soda* L.	CW			VU	SP	B1		HR	
42	*Sanguisorba minor* Scop.	PE				P				
43	*Scirpus holoschoenus* L.	CW	LC	LC	NT	P		+		
44	*Serratula lycopifolia* (Vill.) A.Kern (*Klasea lycopifolia* (Vill.) Á.Löve & D. Löve)	CW	DD	DD	DD	SP	A		EU	
45	*Sorbus domestica* L.	PE				P				
46	*Stipa capillata* L.	PE			DD	SP				
47	*Suaeda vera* J. F. Gmelin in L.	CW			VU	SP	B1			
48	*Tulipa praecox* Ten.	PE			NT	SP	A			
49	*Typha latifolia* L.	PE		LC		P				
50	*Urginea maritima* (L.) Baker	PE				P				
51	*Valeriana officinalis* L.	PE				P				
52	*Verbascum phoeniceum* L.	PE				P				

VIII. *EU Wildlife Trade Regulations* (Anonymous, 2013e), which specifically implement CITES-regulations in the European Union through four Annexes. The plant species growing in our native collections fit:

- *Annex B*, which includes all species from the CITES-Appendix II (except where EU Member States have entered a reservation), some CITES-Appendix III species and some non-CITES species, and
- *Annex D*, which includes some species of the CITES-Appendix III for which the EU holds a reservation, and some non-CITES species in order to be consistent with other EU regulations on the protection of native species, such as the Habitats Directive and the Birds Directive.

Although the *EU Wildlife Trade Regulations* (Anonymous, 2013e) are directly applicable in all EU Member States, the necessary enforcement provisions must be transferred into national legislation and supplemented with national laws, as these are matters that remain under the sovereignty of each Member State. Croatia does not yet have national regulation following those *Regulations*.

The rest of the legislation (I, II, III, V and VII) remains the same.

Nomenclature of plant taxa follows *Flora Croatica Database* (Nikolić *ed.*, 2014a)

RESULTS

1. Amending the list of Croatian statutorily protected and strictly protected species in the Botanical Garden cultivation

Since the *List* published in Tab. 1 of Sandev *et al*. (2013), another 52 statutorily protected and strictly protected plant species (acc. to Anonymous, 2009) were found growing in the Garden, or were collected during the season of 2013. (That list is shown as Tab. 1 here, which is an *Appendix* to Tab. 1 published in Sandev *et al*. (2013). Captures of the columns are in accordance with those published in Tab. 1 of Sandev *et al*. (2013) paper).

While analysing data of the origin of plants in Garden cultivation, apart from in the rockeries, we found another 32 statutorily protected or strictly protected wild taxa (acc. to Anonymous, 2009) collected in Croatian localities (Tab. 1). These plants are growing in the systematic fields, the greenhouses, wetland-flowerbed, the nurseries and in the arboretum. Furthermore, during our 2013 field research in Croatian national territory, we collected another 20 statutorily protected or strictly protected wild taxa (acc. to Anonymous, 2009) in the form of living plants, cuttings or seeds (Tab. 1). The data on collecting and origin of plants are reported to the Croatian *Ministry of Environment and Nature Protection*, in accordance with the yearly *Permission to collect statutorily protected and threatened plants* assigned to the Garden.

Adding the aforementioned 52 new taxa (Tab. 1) to the 668 previously published in Sandev *et al*. (2013), we reach the total number of 720 plant species in the Botanical Garden collections, originally collected in Croatia (not shown here).

2. Analysing the data according to the pre-EU-legislation

Analysing the recently added 52 taxa (Tab. 1) in the light of the same legislation as in Tab. 1 of Sandev *et al*. (2013), we found that 260 native species in Garden cultivation are statutorily protected or strictly protected, and those were cross-checked to establish as follows:

I. We gained seven new taxa from the lower categories of the IUCN *Red List* (Anonymous, 2012b), as seen in Tab. 1. Accordingly, out of the 260 native species in Garden cultivation, there are now 19 listed in the IUCN *Red List* (Anonymous, 2012b), seven more than counted in Sandev *et al*., 2013 (12 species out of 208): two as NT, 14 as LC and two as DD (Tab. 2).

II. From the *European Red List of Vascular Plants* (Bilz *et al*., 2011) now we have 17 more taxa (Tab. 2). Thus, out of the 260 analysed taxa, 43 are now identified in the *European Red List* (Bilz *et al*., 2011) (24 out of 208, in Sandev *et al*., 2013): four as NT, 35 as LC and two as DD.

III. In the *Red Book of Vascular flora of Croatia* (Nikolić *ed*., 2014b), we counted another eight critically endangered (CR) taxa from our native-plant collections (Tab. 2), four endangered (EN) and three vulnerable (VU). In the lower-risk categories, we found *Pulsatilla grandis* of low-concern (LC), ten more nearly threatened taxa (NT), and four more data deficient (DD), compared to Sandev *et al*. (2013). Consequently, out of the total of 260 statutorily protected taxa, we have 110 listed in the Croatian *Red Book* (Nikolić *ed*., 2014b) (comp. to 80 out of 208 in Sandev *et al*., 2013). In total, 46 taxa (31 in Sandev *et al*., 2013) growing in Botanical Garden are listed in the categories RE (1), CR (15), EN (10) and VU (20) – 19.5 % of the total of 236 from these categories in Croatia (comp. to 13.1 % in Sandev *et al*., 2013). Furthermore, 64 species (31 in Sandev *et al*., 2013), from our native collections are listed in "less concern" categories (50 NT, 9 LC and 5 DD) (Tab. 2).

IV. The *List of protected and strictly protected wild taxa* from Anonymous (2009) accounted for 1061 statutorily strictly protected and 572 protected wild plant species and subspecies in Croatia. Gaining new 27 strictly protected and 25 protected taxa (Tab. 1), the total list of 260 Croatian plant species grown in the Garden consists of 119 statutorily strictly protected and 141 protected (comp. to 90 vs. 118, respectively, in Sandev *et al*., 2013), as seen in Tab. 3, following that *Ordinance* (Anonymous, 2009).

V. *Important plant areas* of Croatia (Alegro *et al*., 2010) – list of taxa increased by several species: among 260 species, we have 17 taxa of criterion A, 51 of criterion B1 and 43 taxa of criterion B2 (comp. to 12, 31 and 38, respectively, in Sandev *et al*., 2013), scattered over 92 plant species, while some fulfil more than one criterion (Tab. 3).

VI. *National Ecological Network* (Anonymous, 2007) – list of taxa grown for six more species (Tab. 1), now counting 28 in total (22 in Sandev *et al*., 2013). As for the Draft of *Proposal for Ecological Network NATURA 2000* (Anonymous, 2013b), we acquired 10 new taxa from the proposed *List of wildlife species (except birds) of national interest* (HR) and four from the *List of wildlife species (except birds) of interest to European Union* (EU) (Tab. 3). Thus, collections of the Botanical Garden's native plants now include in total 43 taxa from this *Draft*: seven of European (EU) and 36 of national (HR) interest (Tab. 3).

VII. Newcomer *Cyclamen repandum* is listed in the Appendix II of the CITES-regulative (Tab. 1), now totalling 12 indigenous taxa collected in Croatia that are listed in Anonymous, 1979.

Tab. 2. Comparation of the numbers of red-listed-taxa in Botanical Garden collections, from the valid lists of statutorily strictly protected (SP) and protected (P) plant species, according to the *Ordinances* of 2009 and 2013, belonging to the IUCN-, EU- and Croatian (HR-) Red List-criteria. RE – Regionally Extinct; CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; DD – Data Deficient. **208** – number of red-listed taxa out of the 208 statutorily strictly protected and protected as listed in Sandev *et al*. (2013), according to the older *Ordinance* (Anonymous, 2009). **260** – number of red-listed taxa out of the 260 statutorily strictly protected and protected (208 listed in Sandev *et al*. (2013) plus 52 added in this paper), according to the older *Ordinance* (Anonymous, 2009). **109** – number of red-listed taxa out of the 109 statutorily strictly protected (listed in Sandev *et al*., 2013, plus added in this paper), according to the new *Ordinance* (Anonymous, 2013d).

Red Book Criterion	IUCN-Red List			EU-Red List			HR-Red List		
	208	260	109	208	260	109	208	260	109
RE							1	1	1
CR					1	1	7	15	15
EN							6	10	10
VU	1	1	1	1	1	1	17	20	20
Subtotal 1	**1**	**1**	**1**	**1**	**2**	**2**	**31**	**46**	**46**
NT	2	2	1	4	4	2	40	50	21
LC	9	14	6	19	35	16	8	9	5
DD		2	2		2	2	1	5	3
Subtotal 2	**11**	**18**	**9**	**23**	**41**	**20**	**49**	**64**	**29**
Total (1+2)	12	19	10	24	43	22	80	110	75

Tab. 3. Comparation of the numbers of statutorily strictly protected and protected plant species in the Botanical Garden collections, with numbers of *Important Plant Area*-species (acc. to Alegro *et al*., 2010) by categories, and numbers of plant species of national (HR) and European Union (EU) interest from the Draft of *Proposal* (Anonymous, 2013b) and final *Natura* 2000-document (Anonymous, 2013c). SP / P (2009) – Strictly Protected / Protected species, according to the older *Ordinance* (Anonymous, 2009). SP (2013) – Strictly Protected species, acc. to the new *Ordinance* (Anonymous, 2013d). HR – *Natura*-species of Croatian national interest (Anonymous, 2013b). EU – *Natura*-species of EU interest (Anonymous, 2013b,c). A – globally threatened IPA-species; B1 – threatened IPA-species from the *Red Book of Vascular Flora of Croatia*; B2 – endemic IPA-species *s.l.* (Alegro *et al*., 2010)

	Sandev *et al*., 2013			This paper					
No of SP/P	SP (2009)=90		P (2009)=118	SP (2009)=119		P (2009)=141	**SP (2013)=109**		**P (2013)=0**
SP+P total	208			260			**109**		
No of ***Natura***-taxa	EU=3		HR=26	EU=7		HR=36	**EU=7**		**HR=0**
No of IPA-taxa	A=12	B1=31	B2=38	A=17	B1=51	B2=43	**A=15**	**B1=51**	**B2=43**

3. Revising the data according to the new legislation, proclaimed after Croatia joined European Union

IV. In December of 2013, the new *Ordinance on strictly protected species* (Anonymous, 2013d) replaced the *Ordinance on protected and strictly protected wild taxa* (Anonymous, 2009). The new list contains 941 statutorily strictly protected plant taxa of Croatian flora: 871 species of vascular plants (859 of Spermatophyta and 12 of Pteridophyta) and 70 taxa of Bryophyta (calculations made by Dr. Igor Boršić, *State Institute for Nature Protection – pers. comm.*), while all former statutorily "just" *protected* species lost their status. Furthermore, some of the formerly strictly protected taxa also lost their status: *e. g.,* out of the total of 260 formerly strictly protected and protected taxa growing in the Garden (compiled Tab. 1 in Sandev *et al*., 2013, and this paper), 10 lost their statutorily strictly protected status. Those are: *Anemone trifolia* L., *Anthyllis vulneraria* L. subsp. *praepropera* (A. Kern.) Bornm., *Helichrysum italicum* (Roth) G. Don, *Lythrum hyssopifolia*, *Matteucia struthiopteris* (L.) Tod., *Melica transsilvanica*, *Stipa bromoides* (L.) Dörfl., *S. capillata*, *S. pennata* L. subsp. *eriocaulis* (Borbás) Martinovský et Skalický and *Veronica austriaca* L. subsp. *jacquinii* (Baumg.) Eb. Fisch. Consequently, out of the 52 plant species from our new list (Tab. 1), 26 are listed as statutorily strictly protected. Out of the total list of 260 statutorily protected and strictly protected native plants of our Botanical Garden as defined by the older *Ordinance* (Anonymous, 2009), in terms of the new *Ordinance* (Anonymous, 2013d) at the moment we cultivate only 109 statutorily strictly protected vascular plants of Croatian flora (Tab. 4), which is 12.5 % out of the total if 871 in Croatia.

VI. Another important piece of legislation declared after Croatia joined EU is the *Regulation of Ecological Network NATURA 2000* for Croatia (Anonymous, 2013c), replacing the *Regulation of National Ecological Network* (Anonymous, 2007). The final version differs from the Draft of *Proposal* of the same *Regulation* (Anonymous, 2013b) that we crosschecked in our previous paper (Sandev *et al*., 2013). The *List of wildlife species (except birds) of national interest* (HR), included in the *Proposal*, did not find its place in the final version. Therefore, collections of the Botanical Garden's native plants include only seven vascular plants from the *List of wildlife species (except birds) of interest to European Union* (EU), out of the 18 vascular species in total, as stated in Anonymous (2013c) and seen in Tab. 3. These are: *Chouardia litardierei*, *Degenia velebitica*, *Eleocharis carniolica*, *Eryngium alpinum* L., *Marsilea quadrifolia* L., *Pulsatilla grandis* and *Serratula lycopifolia*.

VIII. A new regulation crosschecked with the indigenous plants of the Garden collection is the *EU Wildlife Trade Legislation* (Anonymous, 2013e). That analysis reveals that the same 11 taxa from our collections which belong to the CITES-Appendix II (Anonymous, 1979) also belong to the Annex B of that *Legislation*, while two additional (*Gentiana lutea* L. and *Menyanthes trifoliata* L.) belong to the Annex D (Anonymous, 2013e).

DISCUSSION

It can readily be inferred that a botanical garden's collections became richer if living samples are gathered in the field (Donaldson, 2009; Feeley & Silman, 2011), or if new

Tab. 4. Final status of 109 statutorily strictly protected indigenous plant species cultivated in the Botanical Garden collections. **IUCN-RL** – *Red List of Threatened Species of the World*. **EU-RL** – *European Red List of Vascular Plants*. **HR-RB** – *Red Book of Vascular Flora of Croatia*: RE – Regionally Extinct; CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern; DD – Data Deficient. **IPA** – *Important Plant Area*-taxa: A-globally threatened species; B1-threatened species from the *Red Book of Vascular Flora of Croatia*; B2-endemic species, *s. l.* **EN-N2K** – Ecological Network *Natura*-2000: EU-plant species important for European Union. **CITES App. II** – plant listed in the Appendix II of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora*. **EU-WLT-Ann**. – plant listed in Annex B or D of the *EU Wildlife Trade Legislation*.

	Scientific name	IUCN- RL	EU-RL	HR-RB	EN-N2K	IPA	CITES-App. II	EU-WLT- Ann.
1	*Agropyron cristatum* (L.) Gaertn. subsp. *pectinatum* (M. Bieb.) Tzvelev		LC	CR		B1		
2	*Anemone sylvestris* L.			CR		B1		
3	*Aster sedifolius* L. subsp. *illyricus* (Murb.) Merxm.			DD		B2		
4	*Astragalus monspessulanus* L. subsp. *illyricus* (Bernhardt) Chater					B2		
5	*Astragalus muelleri* Steud. et Hochst.			(NT)[1]		B2		
6	*Calla palustris* L.		LC	CR		B1		
7	*Campanula fenestrellata* Feer			(NT)[1]		B2		
8	*Campanula istriaca* Feer			(NT)[1]		B2		
9	*Campanula justiniana* Witasek			(NT)[1]		B2		
10	*Campanula portenschlagiana* Roem. et Schult.			(NT)[1]		B2		
11	*Campanula poscharskyana* Degen			(NT)[1]		B2		
12	*Campanula tommasiniana* C. Koch			(NT)[1]		B2		
13	*Carex divisa* Huds.			EN		B1		
14	*Carex extensa* Gooden.			EN		B1		
15	*Carex panicea* L.			VU		B1		
16	*Catabrosa aquatica* (L.) P. Beauv.		LC	CR		B1		
17	*Centaurea crithmifolia* Vis.			(NT)[1]		B2		
18	*Centaurea friderici* Vis. subsp. *jabukensis* (Ginzb. et Teyber) Greuter			(NT)[1]		B2		
19	*Centaurea ragusina* L.			(NT)[1]		B2		
20	*Centaurea spinosociliata* Seenus			(NT)[1]		B2		
21	*Chaerophyllum coloratum* L.			(NT)[1]		B2		
22	*Chouardia litardierei* (Breistr.) Speta (*Scilla litardierei* Breistr.)	DD	CR	(NT)[1]	EU	A, B2		
23	*Clematis integrifolia* L.			VU		B1		
24	*Convolvulus lineatus* L.			CR		B1		
25	*Dactylorhiza majalis* (Rchb.) P.F.Hunt et Summerh.		LC	EN		B1	+	B

26	*Degenia velebitica* (Degen) Hayek	V[2]	V[3]	EN	EU	A, B1, B2		
27	*Dianthus carthusianorum* L.							
28	*Dianthus caryophyllus* L.							
29	*Dianthus giganteiformis* Borbás subsp. *pontederae* (A. Kerner) Soó							
30	*Dianthus integer* Vis.			VU		A, B1, B2		
31	*Dianthus petraeus* Waldst. et Kit.							
32	*Dianthus petraeus* Waldst. et Kit. subsp. *petraeus*			VU		B1		
33	*Dianthus sylvestris* Wulfen in Jacq. subsp. *nodosus* (Tausch) Hayek							
34	*Dianthus sylvestris* Wulfen in Jacq. subsp. *sylvestris*							
35	*Dianthus velebiticus* Borbás					B2		
36	*Digitalis ferruginea* L.			VU		B1		
37	*Drosera rotundifolia* L.			CR		B1		
38	*Eleocharis carniolica* Koch	LC	LC	EN	EU	A, B1		
39	*Elymus farctus* (Viv.) Runemark ex Melderis			CR		B1		
40	*Eryngium alpinum* L.	NT	NT	LC	EU	A, B1		
41	*Fritillaria meleagris* L.			VU		B1		
42	*Gentiana lutea* L. subsp. *symphyandra* (Murb.) Hayek		LC	EN		A, B1		D
43	*Geranium dalmaticum* (Beck) Rech.f.			CR		A, B1, B2		
44	*Gladiolus illyricus* W.D.J. Koch							
45	*Gladiolus italicus* Mill.	LC						
46	*Gymnadenia conopsea* (L.) R. Br.		LC				+	B
47	*Helleborus atrorubens* Waldst. et Kit.			(LC)[1]		B2		
48	*Helleborus multifidus* Vis.					B2		
49	*Helleborus multifidus* Vis. subsp. *istriacus* (Schiffn.) Merxm. et Podl.					B2		
50	*Helleborus niger* L. subsp. *macranthus* (Freyn) Schiffner			VU		A, B1, B2		
51	*Hippophaë rhamnoides* L.			RE				
52	*Hippuris vulgaris* L.		LC	EN		B1		
53	*Ilex aquifolium* L.			VU		B1		
54	*Iris adriatica* Trinajstić ex Mitić			NT		B2		
55	*Iris croatica* Horvat et M.D.Horvat			VU		A, B1, B2		
56	*Iris germanica* L.							
57	*Iris graminea* L.							
58	*Iris illyrica* Tomm.			LC		B2		
59	*Iris pallida* Lam.							
60	*Iris pseudacorus* L.		LC					

61	*Iris pseudopallida* Trinajstić					B2		
62	*Iris pumila* L.							
63	*Iris sibirica* L.					B1		
64	*Leucanthemum atratum* (Jacq.) DC. subsp. *platylepis* (Borbás) Heywood					B2		
65	*Lilium carniolicum* Bernh. ex Koch			VU		B1		
66	*Lilium martagon* L.			VU		B1		
67	*Lilium martagon* L. subsp. *cattaniae* (Vis.) Degen					B2		
68	*Limonium dictyophorum* (Tausch) Degen			NT		B2		
69	*Marsilea quadrifolia* L.	LC	NT	EN	EU	A, B1		
70	*Menyanthes trifoliata* L.		LC	EN		B1		D
71	*Moltkia petraea* (Tratt.) Griseb.					B2		
72	*Myricaria germanica* (L.) Desv.			CR		B1		
73	*Nonea pulla* DC.			DD				
74	*Onosma echioides* (L.) L. subsp. *dalmatica* (Scheele) Peruzziet N. G. Passal.					B2		
75	*Ophrys bertolonii* Moretti	LC	LC	VU		B1	+	B
76	*Ophrys sphegodes* Mill.		LC	VU		B1	+	B
77	*Orchis morio* L.			(NT)[1]		B1	+	B
78	*Osmunda regalis* L.			CR		B1		
79	*Paeonia mascula* (L.) Miller			(NT)[1]				
80	*Pancratium maritimum* L.			CR		B1		
81	*Parapholis incurva* (L.) C.E.Hubb.			VU		B1		
82	*Periploca graeca* L.			EN		B1		
83	*Petteria ramentacea* (Sieber) C. Presl					B2		
84	*Pinguicula vulgaris* L.		LC	CR		B1		
85	*Pinus nigra* Arnold subsp. *dalmatica* (Vis.) Franco			(NT)[1]		A, B2		
86	*Portenschlagiella ramosissima* (Port.) Tutin					B1		
87	*Prunus tenella* Batsch		DD	CR		B1		
88	*Pulsatilla grandis* Wender. (*P. vulgaris* Mills. subsp. *grandis* (Wender.) Zamels)	LC	LC	(LC)[1]	EU	A, B1		
89	*Pulsatilla pratensis* (L.) Miller subsp. *nigricans* (Störck) Zam.			CR		B1		
90	*Salsola kali* L.			VU		B1		
91	*Salsola soda* L.			VU		B1		
92	*Satureja visianii* Šilić					B2		
93	*Sempervivum tectorum* L.							
94	*Serapias istriaca* Perko					B2	(+)	(+)
95	*Serapias lingua* L.		LC				+	B
96	*Serratula lycopifolia* (Vill.) A.Kern (*Klasea lycopifolia* (Vill.) Á.Löve & D.Löve)	DD	DD	DD	EU	A		

97	*Seseli tomentosum* Vis.			(NT)[1]		B2		
98	*Sesleria tenuifolia* Schrad. subsp. *kalnikensis* (Jav.) Deyl					B2		
99	*Sibiraea altaiensis* (Laxm.) C. K. Schneid. subsp. *croatica* (Degen) Degen			(NT)[1]		B2		
100	*Stratiotes aloides* L.		LC	VU		B1		
101	*Suaeda maritima* (L.) Dumort.			VU		B1		
102	*Suaeda vera* J. F. Gmelin in L.			VU		B1		
103	*Tanacetum cinerariifolium* (Trevir.) Sch. Bip.					B2		
104	*Taxus baccata* L.	LC		VU		B1		
105	*Triglochin maritimum* L.			CR		B1		
106	*Tulipa praecox* Ten.			(NT)[1]		A, B1		
107	*Vicia ochroleuca* Ten. subsp. *dinara* (K. Malý) Rohlena					B2		
108	*Vincetoxicum hirundinaria* Medik. subsp. *adriaticum* (Beck) Markgr.			(LC)		A, B2		
109	*Viola suavis* M. Bieb. subsp. *adriatica* (Freyn) Haesler					B2		

[1]Croatian *Red Data Book*-category (Nikolić *ed.*, 2014b) not listed in the new *Ordinance of strictly protected species* (Anonymous, 2013d); [2]acc. to Walter & Gillett, 1998; [3]acc. to Anonymous, 1991
(+) endemic Croatian orchid species, *Serapias istriaca* Perko is mostly unrecognized by EU-legislation

plants are acquired and grown from other sources, such as the *Index Seminum*-exchange (active approach). Nevertheless, the conservational value of the collections rises and falls greatly with the change of legislation – implementing the new or amending the existing acts, ordinances and regulations (passive approach). As seen, the Garden's collections of indigenous plants collected in Croatian national territory increased in less than a year from 208 to 260 statutorily protected and strictly protected taxa (acc. to Anonymous, 2009). Part of this new acquisition derives from the act of re-checking the Database for the origin of the plant specimens growing outside the rockeries dedicated to indigenous flora (*e. g., Eleocharis carniolica, Pancratium maritimum, Tulipa praecox*, etc.), and part in carefully planned field trips in order to collect particularly valuable species in their native sites (*e. g., Chouardia litardierei, Serratula lycopifolia, Iris pumila, Pulsatilla grandis, Catabrosa aquatica*, species of *Salsola*, etc.). In this way the Garden collections progress: the number of taxa increases and the collections grow. Nevertheless, their value in a formal conservational sense is dependent on the recent legislation. The path goes both ways: the collections can be enriched when new taxa are added to the red lists, lists of statutorily protected or NATURA 2000-species lists – or they can be impoverished if the same lists are reduced.

By withdrawing the category of statutorily "just protected" plant species (Anonymous, 2009) and category of "nationally important" NATURA 2000-species (Anonymous, 2013b), our Garden "lost" a lot of plant species once considered to be of national importance, thus of importance to the Botanical Garden – in that sense, somewhat "lowering the value" of our collections of indigenous plants. Moreover, even 10 taxa from the

Garden collections that were statutorily *strictly* protected, according to the 2009 *Ordinance* (Anonymous, 2009), lost their status according to new *Ordinance* (Anonymous, 2013d), though some of them kept their (low) status in IUCN-, EU- or Croatian red lists.

Furthermore, all 141 of our formerly statutorily "just protected" species (Tab. 3) listed in our previous paper (Sandev *et al*., 2013) and added here (Tab. 1), have now lost their status, though some of them again kept their (low) status in other lists. These are, *e.g.*,**:** *Scirpus holoschoenus* and *S. maritimus* L. listed as NT in Croatian red list and LC in both IUCN- and EU-red lists; *Asparagus tenuifolius* Lam. and *Butomus umbellatus* L. listed NT in Croatian red list and LC in EU-red list, and many more, listed as NT in Croatian red list (*Anthyllis barba-jovis***,** *Adiantum capillus-veneris* L., *Carex praecox***,** *Digitalis grandiflora* Mill., *Eranthis hyemalis* (L.) Salisb., *Doronicum orientale* Hoffm., *Gentiana asclepiadea* L., *G. clusii* Perr. et Song., *Globularia alypum* L., *Matthiola incana***,** *Narcissus tazetta***,** *Primula auricula* L., *P. veris* L. subsp. *columnae* (Ten.) Lüdi, *Ruscus hypoglossum* L., *Trollius europaeus* L., *Tulipa sylvestris* L. and *Phlomis fruticosa* L.) and LC in EU-red list (*Allium victorialis* L., *Asparagus officinalis***,** *Caltha palustris* L., *Lythrum salicaria* L., *Mentha aquatica, M. pulegium, Prunus avium, Ranunculus repens* L., *Nuphar lutea* Sibth. et Sm., *Nymphaea alba* L. and *Typha latifolia*)**.**

CITES and EU WildLife Trade regulations (Anonymous, 1979; 2013e) include 12 and 14 species, respectively, of our native collections. These species are mostly popular as ornamentals (e. g., genus *Cyclamen*), out-door plants in so called "Wild gardens" (e. g., bulbs of Amaryllidaceae and Orchidaceae), or of other commercial use (e. g., *Gentiana lutea* L. subsp. *symphyandra* (Murb.) Hayek for medicinal purposes). Extremely popular in horticulture worldwide, bulbs are often listed in CITES-App. II (Anonymous, 1979) and EU-Ann. B (Anonymous, 2013e). The CITES-listed taxa that recently lost their status of statutorily protected species in Croatia (Anonymous, 2013d) are *Sternbergia lutea* (L.) Ker Gawl. ex Spreng. (also LC in EU-red list, NT in Croatian red list); *Galanthus nivalis* L. (also NT in IUCN- and EU-red lists; LC in Croatian red list); *Cyclamen purpurascens* Mill. and *C. repandum* (also NT in Croatian red list), as well as *C. hederifolium* Aiton. Species *Salvinia natans* (L.) All. (LC in IUCN- and EU-red lists, NT in Croatian red list) and *Trapa natans* L. (LC in IUCN-red list, NT in EU- and Croatian red lists) belong to the IPA-criterion A (Alegro *et al*., 2010), but left the new list of statutorily strictly protected (Anonymous, 2013d).

As seen, the Annex B of EU Wildlife Trade Legislation (Anonymous, 2013e) lists the same 12 taxa as the CITES-Appendix II (Anonymous, 1979), with two additional (*Gentiana lutea* and *Menyanthes trifoliata*) belonging to the Annex D. Neither of the lists contains *e. g., Serapias istriaca* Perko, or any other species of that orchid genus, probably because the taxon is unrecognized by European botanical authorities – like a number of other Croatian endemics.

The increased activity of gathering nationally red-listed plant taxa is evident in Tab. 2. There are 19 plant species from our collections listed through the categories in the IUCN *Red List of Threatened Species in the World* (Anonymous, 2012b), none of them directly threatened in the CR, EN or VU-categories (Tab. 2). However, we listed *Degenia velebitica* as "V" (vulnerable), the status that it had in the older documents (Walter & Gillett, 1998). It is an undeniable fact that the IUCN list is limited; it is deficient in even the rarest of Croatian plants, like the extinct (EX) *Dianthus multinervis* Vis. from the Island of Jabuka, or the most famous Croatian monotypic steno-endemic, *Degenia velebitica*. The same goes for the *European Red List of Vascular Plants* (Bilz *et al*., 2011): as seen in Tab. 2,

we grow only one species (*Chouardia litardierei*) categorized in that list as critically endangered (CR) for the European Union, assigned for the rest of the Europe as data deficient (DD). The European list (Bilz *et al*., 2011) also does not contain *Degenia velebitica* listed only in the older documents (Anonymous, 1991) as vulnerable (V).

After the revision of the statutorily protected species in the late 2013 (Anonymous, 2013d), the Croatian *Red list of vascular flora* (Nikolić *ed*., 2014b) also has to be revised and amended. According to recent estimations, our *Red Book* lists 814 species in all categories, out of the 5009 taxa of Croatian flora (Nikolić *ed*., 2014a). Approx. 236 Croatian plant species are directly threatened by extinction: 10 are extinct (EX) or regionally extinct (RE), 92 are critically endangered (CR), 62 endangered (EN) and 72 vulnerable (VU). Today in the Garden, we grow 19.5 % of them (46 taxa). There are a further 184 plant species in Croatian *Red list* (Nikolić *ed*., 2014b) which are expected to be threatened with extinction in the near future (NT), 46 are categorised as of least concern (LC), and 348 are listed as data deficient (DD). We now grow 64 taxa of those lower categories, 13.4 % of the total number of 478 in Croatia (Nikolić *ed*., 2014b). Most of those lower categories are not recognized in the new *Ordinance of statutorily strictly protected species* (Anonymous, 2013d), as seen in Tab. 4, meaning that the Croatian *Red List* (Nikolić *ed*., 2014b) needs re-evaluation.

After re-checking the *Important Plant Area*-categories A, B1 and B2 (Alegro *et al*., 2010) with our 260 species (Tab. 1; Sandev *et al*., 2013), we found that the collections of Botanical Garden hold 17 taxa of criterion A, 51 of criterion B1 and 43 taxa of criterion B2 (Tab. 3). It is worth mentioning that some taxa described in Alegro *et al.* (2010) main texts did not found their place in the final Tables at the end of that book: this is the case of some endemics (*e.g., Helleborus multifidus* Vis., *Moltkia petraea* (Tratt.) Griseb., or *Leucanthemum atratum* (Jacq.) DC. subsp. *platylepis* (Borbas) Heywood), which we, nevertheless, placed in the appropriate categories. Some species, *e.g.,* the very rare *Iris pumila*, which grows in only one locality in Croatia (Baranja Region in NW Croatia), is not listed in other classifications: not even in Croatian Red List (Nikolić *ed*., 2014b).

As the *National Ecological Network* (Anonymous, 2007) and the Draft of *Proposal for Ecological Network NATURA 2000* (Anonymous, 2013b) were replaced with the *Regulation of Ecological Network NATURA 2000* (Anonymous, 2013c), we "lost" many species considered to be nationally important. The vast *List of wildlife species (except birds) of national interest* is not integrated into the final *Regulation*, as originally proposed (Anonymous, 2013b), which means that only 20 plant taxa from the *List of wildlife species (except birds) of interest to the European Union* are included in the *Regulation*, out of which 18 are vascular. We have seven of them growing in the Garden (38.9 %).

So, what have we gained, and what have we lost? By collecting in the field and after a thorough evaluation of our collections, we gained 52 new plant taxa from the *List of statutorily protected and strictly protected Croatian wild taxa* (Anonymous, 2009), collected in national territory, bringing the number of indigenous plant species grown in the Garden to a total 720. However, by joining the EU, we found that the legislation changed, and we "lost" all of our 141 statutorily "just protected" plant taxa, and even 10 more, which were formerly (Anonymous, 2009) statutorily strictly protected, but lost their status according to the new *Ordinance* (Anonymous, 2013d). In the end, that means that though our native collections of statutorily protected and strictly protected plants increased from 208 in 2013 (Sandev *et al*., 2013) to 260 in 2014, with *one stroke of the pen* they have been reduced to 109 statutorily strictly protected taxa (Anonymous, 2013d), as seen

in Tab. 4. Something similar happened with the NATURA-2000-species: we gained 10 new taxa of proposed national interest (from 26 in Sandev *et al*., 2013, to 36) and four more of EU-interest (from three in Sandev *et al*., 2013, to seven) (Tab. 3). However, due to the change of legislation, we "lost" all species previously proposed in the *List of wildlife species (except birds) of national interest* (Anonymous, 2013b), and are now growing only seven species (Tab. 2) from the *List of wildlife species (except birds) of interest to European Union* (EU), according to the new Act (Anonymous, 2013c). We have recorded the "lost" species here, nevertheless, the legislation can – and certainly will – change again. Although Croatia has just accepted the NATURA-2000-regulations, voices calling for a change in these are becoming louder in the EU (Palo *et al*., 2011; Hochkirch *et al*., 2013).

However, by new acquisitions we also gained some important Croatian plant species. First, the number of threatened plants (Nikolić *ed*., 2014b) of the CR, EN and VU categories increased from 30 in Sandev *et al*. (2013) to 45 in this paper (Tab. 2). The same goes for the lower categories (NT, LC and DD), which increased from 49 in Sandev *et al*. (2013) to 64 in this paper. The number of the IUCN- (Anonymous, 2012b) and EU- (Biltz *et al*., 2011) red listed species increased from 12 and 24 (Sandev *et al*., 2013), respectively, to 19 and 43 here (Tab. 2). Except for *Chouardia litardierei*, all of our other taxa are listed in lower-risk categories, but the IUCN- and EU-lists themselves are incomplete, lacking any mention of many Croatian endemics.

In less than a year we significantly improved the number of threatened taxa in the Garden collections from the categories RE, CR, EN and VU: 19.5 % of the total number in those categories in Croatia (Nikolić *ed*., 2014b). Of course, that is still far from achieving the "Target 8" of GSPC 2011–2020 (Anonymous, 2003) asking for at least 75 % of nationally threatened species in *ex situ* collections – nevertheless, it is an improvement. As our collections will further grow with targeted collecting of the most valuable red-listed plants, it will be interesting to see how their status will change with the re-evaluation of the *Red Book of Vascular Flora of Croatia* to be undertaken in the very near future.

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SAŽETAK

Nešto dobiti, nešto izgubiti – zakonom strogo zaštićene vrste hrvatske flore u Botaničkom vrtu Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu

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Žive zbirke botaničkih vrtova rastu donošenjem i uzgojem novih biljaka: bilo prikupljanjem na prirodnim staništima, bilo razmjenom s drugim botaničkim vrtovima (aktivan pristup). Međutim, izmjenama, dopunama ili proglašenjem novih propisa u zašti-

ti prirode uvećava se ili umanjuje njihova konzervacijska vrijednost (pasivan pristup). Ovdje donosimo primjer povećanja brojnosti uz pad vrijednosti zbirki samoniklih vrsta hrvatske flore u Botaničkom vrtu Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu (u tekstu: "Botanički vrt"). Od našeg prošlog članka (Sandev *i sur*., 2013) broj vrsta izvorno skupljenih na hrvatskim staništima narastao je za 52: sa 668 na 720. Dio vrsta (32) pronađen je analizom vrtne Baze podataka i pretragom drugih zbirki (rasadnici, klijališta, sistematsko polje, perivoj, staklenici) osim biljnogeografskih vegetacijskih skupina (kamenjara), koje su izvorno namijenjene uzgoju samoniklih vrsta. Preostali dio vrsta (20) prikupljen je tijekom 2013. ciljanim terenskim istraživanjima kroz sve biogeografske regije Hrvatske (na pr. *Chouardia litardierei, Serratula lycopifolia, Iris pumila, Pulsatilla grandis, Catabrosa aquatica*, *Salsola soda*, *Salsola kali* i dr.). Dodatne 52 vrste podrijetlom s hrvatskih staništa proanalizirali smo kroz jednake propise kao i u našem prethodnom radu. Utvrdili smo kako je vrijednost vrtne zbirke samoniklih biljnih vrsta narasla, između ostaloga, sa 208 zakonom zaštićenih i strogo zaštićenih na 260; broj svojti iz visokorizičnih kategorija izumiranja (koje smo običavali nazivati "ugroženima" ne misleći pritom na konkretnu kategoriju "*endangered*", EN) RE, CR, EN i VU sa 31 na 46, broj Natura-vrsta od nacionalnog značaja sa 26 na 36, a Natura-vrsta od značaja za Europsku uniju s tri na sedam.

Međutim, nakon pristupanja Hrvatske Europskoj uniji dio se važne legislative promijenio. Novim *Pravilnikom o strogo zaštićenim vrstama* ukinuta je kategorija "zakonom zaštićenih" divljih svojta, čime smo iz vrtnih zbirki "izgubili" 141 vrstu, dok se i broj strogo zaštićenih vrsta smanjio za 10, koje su izgubile status u novom *Pravilniku*. Time se broj zakonom zaštićenih hrvatskih vrsta u zbirkama Botaničkog vrta PMF-a, *jednim potezom pera*, smanjio sa 260 na samo 109 (13,6% od ukupnog broja u Hrvatskoj). Također, u konačnu verziju *Uredbe o proglašenju ekološke mreže* Natura 2000 nije ušao Popis svojta od nacionalnog značaja, s više od 1000 biljnih vrsta, koji je bio uključen u Nacrt prijedloga te *Uredbe*, nego samo Popis svojta od značaja za Europsku uniju, s ukupno 20 biljnih vrsta (od čega dvije mahovine). Time su vrtne zbirke "izgubile" 36 vrsta s nacionalnog popisa pa sad uzgajamo sedam od ukupno 18 vaskularnih Natura-vrsta, važnih za Europsku uniju. Polovinom 2013. usvojena je i *Uredba Europske unije o trgovini divljim vrstama*, kojom se detaljnije reguliraju međunarodni CITES-propisi o trgovanju živim biljkama. Prema tim propisima, u Vrtu uzgajamo 12 vrsta s Dodatka II. CITES-regulative i 14 vrsta s Dopuna *B* i *D* europske *Uredbe*.

Nakon stupanja na snagu novog *Zakona o zaštiti prirode*, novog *Pravilnika o strogo zaštićenim vrstama* i *Uredbe o proglašenju ekološke mreže*, posljednji konzervacijski dokument važan za procjenu vrijednosti vrtnih zbirki, koji čeka reviziju, je *Crvena knjiga vaskularne flore Hrvatske*. Prema sadašnjem stanju, zbirke samoniklih vrsta hrvatske flore broje 46 vrsta iz važeće *Crvene knjige*, što je ukupno 19,5% u navedenim kategorijama. Kako "Cilj broj osam" *Globalne strategije za očuvanje biljaka* do 2020. godine traži najmanje 75% samoniklih vrsta iz kategorija visokog rizika od izumiranja matične zemlje u uzgoju domaćih botaničkih vrtova, pred nama je još dalek put. Međutim, prema najavama Državnog zavoda za zaštitu prirode, revizija *Crvene knjige vaskularne flore Hrvatske* trebala bi biti izvršena do kraja 2015., pa valja pričekati i vidjeti kako će se i te izmjene odraziti na vrijednost zbirki Botaničkog vrta. Kako bilo, naši će dalji napori biti usmjereni ka prikupljanju što većeg broja neposredno ugroženih, strogo zaštićenih i Natura-vrsta hrvatske flore, na prirodnim staništima u našoj zemlji, kako bi zbirke vrijedne samonikle flore u Botaničkom vrtu Biološkog odsjeka Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu nastavile rasti.