

DISTRIBUTION AND COMMUNITIES OF *SUAEDA PANNONICA* IN SERBIA

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In this article are presented data referring to the distribution and phytocoenology of *Suaeda pannonica* in Serbia. Between the years 2009 and 2013 we confirmed this species on four localities from the total of about 10 its known sites. It was found on the banks and bottoms of salt lakes Medura, Slano Kopovo, Rusanda and Okanj in Bačka and Banat. We also recorded 25 phytosociological relevés with *S. pannonica*. Besides community *Suaedetum pannonicae* the species occurs in other associations within the class *Thero-Suaedetea*, alliance *Salicornion prostratae*: *Salicornietum prostratae*, *Crypsido-Suaedetum maritimae* and in a separate cluster, i. e. combination of species *Suaeda pannonica* – *Chenopodium chenopodioides* which syntaxonomical character is unresolved. In comparison with previously published data, recent situation indicates gradual vegetation changes and habitat loss at all remaining localities of *S. pannonica* in Serbia.

Key words: endangered species, halophytes, *Suaeda*, saline lakes.

INTRODUCTION

Denuded banks and bottoms of inland salt lakes are extremely peculiar habitats with sub-continental, semi-desert character. Their vegetation is represented with open to moderately closed succulent therophyte stands exhibiting low species diversity. Communities of the *Thero-Suaedetea* class occupy places which show distinctly large fluctuations of moisture with pronounced semidry season during the year. The vegetation is composed only of obligate halophytes (cf. Borhidi 2003). These halophytes include also the representatives of the genus *Suaeda*.

The genus *Suaeda* Forssk. ex J.F. Gmel. (Chenopodiaceae s.str.; Amaranthaceae sensu APG) has a large geographical range and belongs to the critical taxa of the European flora. In spite of the high number of published studies (e.g. Bassett & Crompton 1978, Akhani *et al.* 1997, Lomonosova *et al.* 2005, Kapralov *et al.* 2006) the determination of the subgeneric taxa is not unified so far and their exact number is not even known. In Europe 30 (31) taxa are reported majority of which are occurring on strictly coastal saline habitats (Uotila 2011). Much less number of species are characteristic for the inland saline habitats. With the exception of Ukraine and European part of Russia the largest distribution range of inland saline vegetation in Europe is inside the Pannonian Basin, with three documented representatives of the genus *Suaeda*: *S. pannonica* Beck), *S. prostrata* Pallas and *S. salinaria* (Schur) Simk. (Mile & Walter 2003). Their taxonomy, nomenclature, distribution, as well as their connection with coastal *S. maritima* (L.) Dumort., were intricate and controversial so far (Freitag *et al.* 1996, Mile & Walter 2003, Fischer & Kästner 2011).

From the Serbian part of the Pannonian Basin (Vojvodina) are known two species, *S. prostrata* (*S. maritima* auct. serb., p.p., non (L.) Dumort.) and *S. pannonica* (cf. Slavnić 1939, 1972, Sturc 1973, Knežević & Boža 1987). The records of *S. prostrata* in Vojvodina, instead of coastal *S. maritima*, were sporadically published on rare occasions (e.g. Guelmino 1968, Gajić 1986, Boža & Vasić 1986, Budak 1998;) and confirmed by Freitag *et al.* (1996).

Suaeda prostrata Pallas [syn.: *S. maritima* subsp. *prostrata* (Pall.) Soó; *S. maritima* sensu auct. serb., p.p.] is a species with Eurasian but somewhat uncertain distribution range. In the Pannonian Basin, it occurs in E. Austria (around lake Neusiedl), in Hungary and Serbia. There are several opinions about its rather large areal across Ukraine, Russia, Transcaucasia and Siberia (Freitag & Lomonosova 1996, Zhu Gelin *et al.* 2003, Fischer & Kästner 2011). On the NW border of its distribution range (Czech Republic, South Morava region) it has disappeared (Šumberová 2007), as well as from the northern part of Hungary (Schmidt 2007).

Suaeda pannonica Beck [syn. *Schoberia pannonica* Beck; *Suaeda maritima* subsp. *pannonica* (Beck) Soó ex P.W. Ball] is considered as a Pannonian endemic (Tatár 1939). It is reported around lake Neusiedl in E. Austria (Mucina 1993, Fischer & Kästner 2011), from Hungary (Boros 1959, Borhidi 2003, Király 2009) and N. Serbia. The distribution range extends also to the Transylvania in W. Romania (Ciobanu *et al.* 2004). In the northern part of the Pannonian Basin, it was not recorded in Slovakia (Marhold & Hindák 1998), while in the Czech Republic was erroneously reported (Šumberová 2007). Data from Ukraine and SE Russia need to be revised (Mile & Walter 2003). In case of their confirmation *S. pannonica* would rather be a Pannonian sub-endemic or Pontic-Pannonian endemic (Fischer & Kästner 2011).

Both *S. prostrata* and *S. pannonica* grow in periodical wet habitats with high soil salinity, in most cases on dried banks and bottoms of shallow salt pans. *S. pannonica* creates mono-dominant stands of the association *Suaedetum pannonicae* representing vegetation of the class *Thero-Suaedetea*, alliance *Salicornion prostratae*, but it also occurs in other communities within the alliance and it sporadically occurs within the class *Crypsidetea aculeatae* as well (Wendelberger 1943, 1950, Slavnić 1948, Borhidi 2003). *S. prostrata* has a little different coenological affinities, it does not create mono-dominant stands as *S. pannonica*, it occurs rather in the alliance *Puccinellion limosae* within the class *Festuco-Puccinellietea*.

The objective of this contribution is to complete the historical and recent distribution of *S. pannonica* in Serbia and to characterize the recent status of its plant communities and habitats.

MATERIAL AND METHODS

Analysis of phytosociological and ecological affinities of *S. pannonica* were based on traditional phytosociological approach. During the vegetation seasons from 2009 to 2013, phytosociological relevés (25) were sampled following the Zürich-Montpellier approach with adapted nine-grade Braun-Blanquet scale (Barkmann *et al.* 1964). All relevés were stored in the TURBOVEG database (Hennekens & Schaminée 2001) and exported to the JUICE program (Tichý 2002).

The nomenclature of vascular plants is given according to Tutin *et al.* (1968–1980, 1993), nomenclature of genus *Suaeda* mostly follows Freitag *et al.* (1996), but it was corrected after reviewing the original descriptions. Author citations has complied with the Code (McNeil *et al.* 2012: Rec. 46A, Note 1). Nomenclature of the syntaxa is based on work of Molnár & Borhidi (2003). The names of communities which are not mentioned in that work are presented with the name(s) of author(s) of the description.

Herbarium abbreviations are given according to Thiers (2014) with the exception of the herbarium of the Institute for Nature Conservation of Vojvodina province in Novi Sad (PZZP).

Distribution of the species in Serbia is given on a map with 10 × 10 km MGRS grid system (Lampinen 2001).

RESULTS

Historical and recent distribution of *Suaeda pannonica* in Serbia

In total, *S. pannonica* is present (historically as well) only in the northern part of the country. It was clearly reported from nine localities distributed within eight MGRS squares: five squares in the Bačka region (localities: Subotica, Krvavo lake, Slano lake, Ridica, Gornji Breg near Senta and Novi Sad) and three squares in the Banat region (localities: Slano Kopovo near Novi Bečej, Rusanda near Melenci and Okanj between Melenci and Elemir), while the data from the vicinity of Sombor (two squares, localities: Gakovo and Stanišić remain questionable due to the insufficiency of data given by its author) (Fig. 1, Appendix).

Based on our field investigations of saline habitats in Vojvodina, we have documented this species on four localities on dried bottoms of saline lakes i. e. from lakes Medura (near Ridica), Rusanda, Okanj and Slano Kopovo.

RIĐICA, LAKE MEDURA

S. pannonica was observed mostly on the eastern and southern banks of the periodically dried saline lake Medura. The species occurred with low cover values and it was accompanied by *Chenopodium chenopodioides*, *Crypsis aculeata*, *Cyperus pannonicus* and *Puccinellia distans* agg.

NOVI BEČEJ, SLANO KOPOVO

This is the largest known stand of *S. pannonica* in Serbia (cca. 1.32 km²) occupying the large, shallow periodically dried saline lakebed. In years of low precipitation and hot dry summers (e.g. 2009) the monocoenoses of *S. pannonica* were distributed across the whole desiccated lakebed with average cover values of 15–20%. In 2012 we did not record any individual at all, with some other halophytes such *Crypsis aculeata* and *Salicornia europaea* s.l. recorded only on the northern lake ends.

MELENCI, RUSANDA

The lake is located near the western side of the village Melenci and consisting of two interconnected portions: bigger called Velika Rusanda and smaller known as Mala Rusanda. Velika Rusanda is with area of 1.5 km²

and has irregular drying periods. Populations of *S. pannonica* were concentrated only on the banks and along the shallow littoral zone in the western part of the lake. The lakebed itself remained vegetation free even after the water retreat. The monocoenoses of *S. pannonica* were accompanied with *Puccinellia distans* agg., *Phragmites australis* and sporadically with *Crypsis aculeata*.

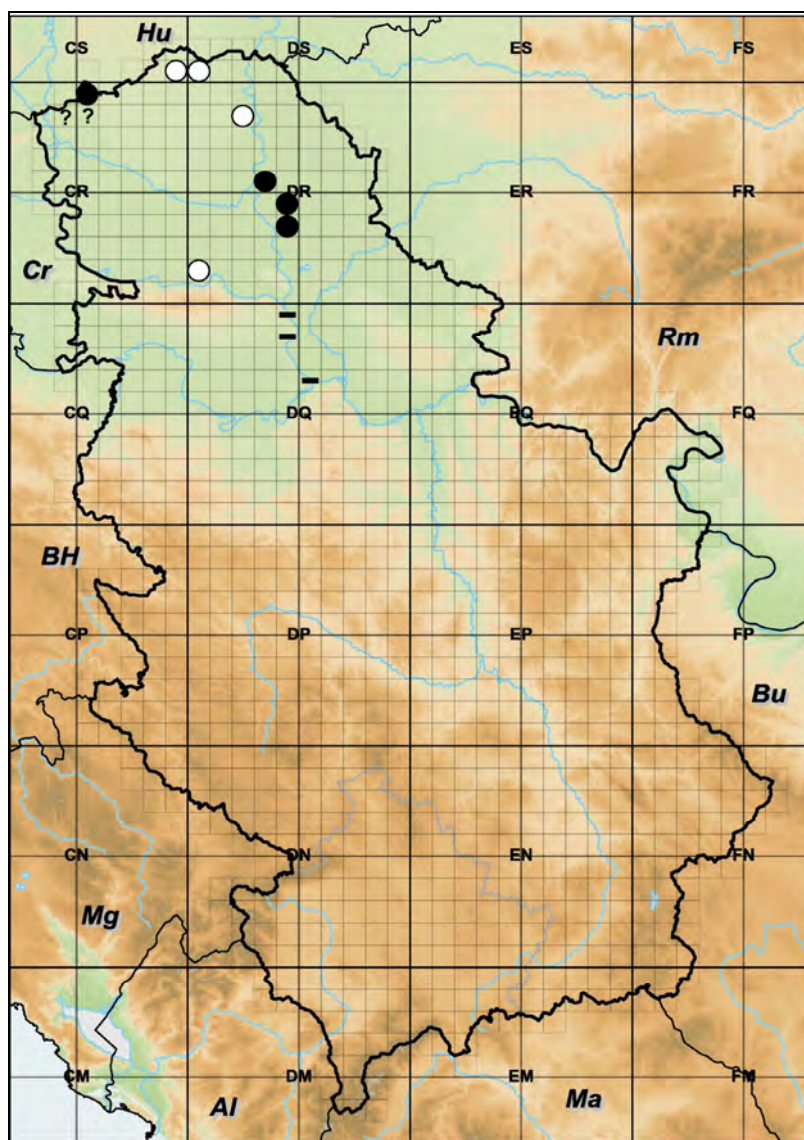


Fig. 1. – Distribution of *Suaeda pannonica* in Serbia: ● – recently documented localities (after the year 2000), ○ – historical records (from 1914 to 1998), “?” – questionable data, “-” – erroneous data.

Mala Rusanda has the area of only 0.25 km² and where the stands of *S. pannonica* are also restricted to the banks and to the shallow littoral zone. *S. pannonica* was accompanied with *S. prostrata* and other species (e.g. *Atriplex littoralis*, *Chenopodium chenopodioides*, *Ch. glaucum*).

ELEMIR, OKANJ

The southernmost occurrence of *S. pannonica* in studied area is on periodically dried saline lake Okanj. Compared to the previous localities, the population is poor, not creating continuous stands. *S. pannonica* were represented with solitary individuals or small clumps among the vegetation dominated by *Chenopodium glaucum* and *Ch. chenopodioides*, sporadically accompanied with *Crypsis schoenoides* and *Crypsis aculeata*.

Syntaxonomic preferences of *S. pannonica* in Serbia

The analyzed dataset of 25 own relevés with *Suaeda pannonica* was divided into four clusters. Cluster 1 comprises vegetation from the northern edge of the dried lake Slano Kopovo (Tab. 1, rel. no. 1–7). These stands are moderately closed, cover values varying between 20 to 40(–65)%. Species richness is low, however, this cluster contains most species among the whole dataset (in average four species per relevé). *Salicornia europaea* s.l. occurs constantly with average cover of 15% and *S. pannonica* only 5%, maximally 15%. These species are accompanied by *Puccinellia distans* agg. (average cover 5–15%, in two cases more than 50%) and with low cover values of *Spergularia marina*, *S. media* and *Aster tripolium* subsp. *pannonicus*. We classified this vegetation into the class *Thero-Suaedetetea*, alliance *Salicornion prostratae*, association *Salicornietum prostratae*.

Cluster 2 (Tab. 1., rel. no. 9–11) contains relevés also from Slano Kopovo with two species – *Crypsis aculeata* and *S. pannonica*, each with identical abundance, while total cover is around 35%. The vegetation represents a transition between associations *Crypsietum aculeatae* and *Suaedetum pannonicae*. This type is defined as a separate association called *Crypsido-Suaedetum maritimae*.

In Cluster 3 (Tab. 1., rel. no. 12–16) there are relevés from Ridica and Melenci (Mala Rusanda). Together with *S. pannonica*, which had high cover value (around 50%) *Chenopodium chenopodioides* is also dominant with 5–(15–25) % cover. Concerning the high cover of *S. pannonica* we can consider these stands as association *Suaedetum pannonicae*.

Relevés in Cluster 4 (Tab. 1, rel. no. 17–25) were collected from Slano Kopovo and Rusanda lakes and represent ass. *Suaedetum pannonicae* as well with other accompanying species. Dense monocoenoses of *S. pannonica* with cover from 25 to 90% were sporadically recorded with

Puccinellia distans agg., *Phragmites australis* and in a single case *Camphorosma annua* (Tab. 1., rel. no. 20).

Table 1. – Analytic table with *Suaeda pannonica* relevés recorded in northern Serbia.

Cluster	1							2			3				4										
Number of relevé	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
cover E ₁ %	20	25	35	65	60	40	20	30	25	35	40	50	60	65	60	40	90	70	80	35	35	20	30	25	30
cover E ₀ %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salicornia europaea</i> s.l.	a	a	a	1	+	a	a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Spergularia salina</i>	.	.	1	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Aster tripolium</i> subsp. <i>pannonicus</i>	.	.	1	+	1	1	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
<i>Spergularia media</i>	.	.	.	+	.	1	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Puccinellia distans</i> agg.	1	1	a	4	4	a	1	.	.	.	.	.	.	.	.	+	+	1	1	1	.	.	.	.	.
<i>Suaeda pannonica</i>	1	a	1	1	1	1	1	a	a	1	1	3	3	4	4	3	5	5	5	3	3	b	3	b	3
<i>Crypsis aculeata</i>	r	.	.	.	.	+	.	a	a	3	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Chenopodium chenopodioides</i>	.	.	.	.	.	.	.	.	.	.	.	3	b	a	a	1	.	.	.	.	.	.	.	.	.
<i>Phragmites australis</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	+	1	.	.	.	.	.	.

Species recorded in single relevé only: *Atriplex littoralis* + (16); *Camphorosma annua* + (20); *Polygonum arenastrum* + (4); *Suaeda prostrata* 2a (16).

Locations of relevés

- 1–7. Slano Kopovo, bare bottom of lake, 72 m a. s. l., 16 m², 13-Aug-2009.
 8–11. Slano Kopovo, bare bottom of lake, northern part, 72 m a. s. l., 16 m², 13-Aug-2009.
 12–15. Ridica, bare bottom of lake, 93 m a. s. l., 16 m², 30-Aug-2012.
 16. Melenci, Mala Rusanda lake, southern part, 72 m a. s. l., 16 m², 31-Aug-2012.
 17–20. Melenci, Rusanda lake, northern part, 72 m a. s. l., 16 m², 12-Aug-2009.
 21–23. Slano Kopovo, bare bottom of lake, 72 m a. s. l., 16 m², 13-Aug-2009.
 24–25. Melenci, Rusanda lake, northern part, 72 m a. s. l., 16 m², 12-Aug-2009.

DISCUSSION

During our study we visited four known localities of *S. pannonica* in Serbia and confirmed its presence in one locality in Bačka (Ridica) and three in Banat (Okanj, Rusanda, Slano Kopovo), while the historical records from the other known localities were not checked (see Appendix). Concerning the population trends on these historical stands evaluated by Boža (1999) they were pre-considered as most likely destroyed. Accor-

dingly, despite the fact that *S. pannonica* has disappeared from other localities in vicinity of Sombor (Stanišić and Gakovo) (Đakić *et al.* 2012, Boža 1999), we confirmed *S. pannonica* in this region after a long time near Ridica. Relatively large populations of *S. pannonica* were observed there together with extremely rare *Cyperus pannonicus* (Dítě *et al.* 2013).

Beside Bačka and Banat, data relating to the presence of *S. pannonica* in Srem region (Obradović 1966: 134, 1987: 107) are erroneous. They are based on the misinterpretation of the Kitaibel records of *Salsola prostrata* (= *Bassia prostrata* (L.) A.J. Scott) (Gombocz 1945: 514-515, 517) which are later cited or transcribed by various authors under the names *Salsola fruticosa* (Kanitz 1863: 71), *Schoberia fruticosa* (Schlosser & Vukotinović 1869: 965), *Suaeda pannonica* (Obradović l.c.) and eventually indicated under the name *Suaeda vera* Forssk. ex J.F. Gmel. by Jalas & Suominen (1980: 72) and Nikolić (2005: 525-526) as “questionable” for Danube lowland.

Slavnić (1948) published plant communities with *Suaeda* species first for Serbia under the name *Suaedetum maritimae hungaricum* Soó 1927. Together with *S. prostrata* (“*S. maritima*”), which has cover from 25 to 40% in his relevés, he recorded with a low cover *Crypsis aculeata* and *Puccinellia distans* agg. as well. He described this association in the northern part of the Bačka region (Senta, Subotica, Martonoš) and fragmentary from the rest of the Bačka and Banat, but without any data about *S. pannonica*. In his previous paper however, he published data about presence of *S. pannonica* in the vicinity of Senta (Slavnić 1939).

Firstly, the community *Suaedetum pannonicae* has been mentioned for Serbia by Parabućski *et al.* (1986) as a synonym of *Suaedetum maritimae hungaricum* Soó with two subassociations: *bolboschoenetosum maritimae* Čapaković 84 and *asteretosum pannonicae* Čapaković 84. The author of these subassociations, Jelica Čapaković, never published them and they were only subsequently cited from her manuscript by Parabućski *et al.* (1986) without any relevé or further explanation. Therefore, these two subassociations are described invalidly (see Weber *et al.* 2000: Art. 2).

Exact data about community with *S. pannonica* in Serbia under the correct name *Suaedetum pannonicae* (Soó 1927) Wendelbg. 1943 were published for the first time by Knežević & Boža (1987) from the Rusanda lake. The community was documented by five relevés. *S. pannonica* reached constancy level of V., cover of 25–75% and it was accompanied with low cover of *Aster tripolium* subsp. *pannonicus*, *Atriplex littoralis* and *Puccinellia distans* agg. Accessorial species were *Camphorosma annua* and *Polygonum aviculare*. In contrast to our recent findings (Tab. 1, rel. no. 24, 25), dense populations and monocoenoses of *S. pannonica* were not recorded.

Except the association *Suaedetum pannonicae* Knežević and Boža (1990) mentioned also vegetation with *S. prostrata* (as *S. maritima*) from Rusanda lake under the name *Suaedetum maritimae hungaricum* Soó 33 (ex Wendelbg. 43, 50). From the floristical point of view, with the exception of dominants the stands are almost identical with the association *Suaedetum pannonicae*, with sporadic occurrence of *Salsola soda*, *Phragmites australis*, *Bolboschoenus maritimus* s.l. and *Crypsis aculeata*. According to several authors (Knežević & Boža 1987, Mile & Walter 2003) the ecological differences between these communities are clearly pronounced: *Suaedetum pannonicae* occupies habitats with longer inundation time and slower drying process, while *Suaedetum maritimae* is more typical where inundation is shorter and the habitats dries out quickly. There is no relevé where both species grow together. We recorded *S. prostrata* on the southern part of Mala Rusanda lake very rarely in 2012 where it occurred together with *S. pannonica* (Tab. 1, rel. no. 16). Therefore, we can agree with Vučković (1986) that proper name of *Suaedetum maritimae hungaricum* should be *Suaedetum maritimae pannonicum* because there are no real ecological, floristic and phytocoenological differences between *Suaedetum* communities in Hungary and Serbia (cf. Vučković 1986: 472). Furthermore, the names *S. pannonica* and *S. prostrata* in Hungary have been wrongly used with one replacing the other (ap. Fischer and Kästner 2011) which certainly had an impact on the treatment of communities.

The same records of *Suaedetum pannonicae* (Knežević & Boža 1987) were cited later by other authors (Knežević & Boža 1990, Knežević *et al.* 2002). *Suaedetum pannonicae* from Okanj without relevés were published by Knežević *et al.* (2009). In the species list they presented only *S. pannonica*. Later Panjković *et al.* (2011) reported both *Suaeda* species from Okanj.

Vegetation characteristics of the alliance *Salicornion prostratae* from Slano Kopovo and Rusanda were published by Knežević *et al.* (2002). The authors give detailed analysis of ecological preferences and floristical composition of four associations: “*Salicornieto-Suaedetum maritimae continentale* Knežević et Boža 88 and *Suaedetum maritimae* Soó 27 developing along the banks of Slano Kopovo, and stands of the associations *Suaedetum maritimae* Soó 27, *Suaedetum pannonicae* (Soó 27) Wendel. 43 and *Salsoletum sodae* Slavnić (39) 48 along the banks of Rusanda lake”.

Our investigation of these localities shows a somewhat different vegetation pattern. Stands of *Salicornia europaea* s.l. were recorded only 2009 on a small area of the northern bank of Slano Kopovo. In 2012, this area was even reduced. We did not confirmed *Salsola soda* from any of these localities with the exception of a small patch with a few individuals in Melenci, 30 m from the bank of Mala Rusanda around the fences of the

village cemetery in 2013. On the other hand, *Suaeda prostrata* was found on a small area on the southern bank of Mala Rusanda. Contrarily, we recorded large populations of *Chenopodiaceae* species with high nitrogen demand in the soil and higher tolerance to the human disturbance. This indicates higher amount of nutrients and soil eutrophication. This process is the most distinct in the area of Okanj, where these *Chenopodiaceae* are dominant. Also, only here we were able to confirm larger patches of *Crypsis schoenoides*, which indicates lower salinization (Eliáš *et al.* 2008). Plant communities on the majority of this localities belong to the class *Crypsidetea aculeatae*. *S. pannonica* can be found scattered in this class, (except *Heleochoetum schoenoidis*) in the stands relative to the association *Atriplici prostratae-Chenopodietum crassifolii*. Species combination *Suaeda pannonica – Chenopodium chenopodioides*, which was confirmed in Medura and Mala Rusanda on dried lake bottom (Cluster 3), is not known from the literature of the studied area. This type of vegetation was studied in the Hungarian Bácska region (Lake Sós-tó, Bácsalmás town), on the banks of Büdös-szék in the Kiskunság National Park (Dítě, Eliáš jun., Melečková, ined.). Further studies may show whether this is an individual association based on two dominants from two different classes like the association *Crypsido-Suaedetum maritimae*. In addition, *S. pannonica* often creates transition (in case of the northern bank of Rusanda lake) into the association of *Puccinellietum limosae* (class *Festuco-Puccinellietea*) likewise for instance in the Kiskunság region, lakes of Kelemén-szék and Büdös-szék (Dítě, Eliáš jun. & Melečková, ined.).

It is also necessary to clarify the distribution and vegetation preferences of *Suaeda prostrata*. This even more intricate representative of the *Suaeda* genus in Serbia was during this study recorded only in a single case, therefore it is considered less frequent than *S. pannonica*.

CONCLUSIONS

Suaeda pannonica, a critically endangered species in Serbia known from about 10 localities in total were confirmed on four salt lakes in Banat and Bačka region (Medura, Slano Kopovo, Rusanda and Okanj). This situation indicates gradual vegetation changes and habitat loss at all remaining localities of *S. pannonica* in Serbia. According to our analysis of phytosociological relevés, besides *Suaedetum pannonicae* the species occurs also in associations within the class *Thero-Suaedetea*, alliance *Salicornion prostratae*: *Salicornietum prostratae*, *Crypsido-Suaedetum maritimae* and in a separate cluster, combination of species *Suaeda pannonica – Chenopodium chenopodioides*. The last vegetation type as

well as the distribution and vegetation of *Suaeda prostrata* need further study.

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APPENDIX

Historical and recent distribution of *S. pannonica* in Serbia

Bačka: **CS90 Subotica** (Godicl 1980a: 79); **DS00 Palić Lake?** [“Palicsi-tó”, subnom. *S. maritima* L. and (L.) Dum.] (Prodán 1914: 115?; “in some cases is very similar to *S. pannonica* G. Beck”; Prodán 1915: 216?); **Krvavo Lake** (“very similar to *S. pannonica* Beck, but not typical” Slavnić 1972: 49?; Godicl 1980b: 63); **Slano Lake** [“Sóstó”] (Sturc 1973: 126; Gajić, 1986: 100; Zrnić 1993: 261); **CR48 Sombor: Gakovo?** [“Gádor”, subnom. *S. maritima* L. and (L.) Dum.] (Prodán 1914: 115?; “in some cases is very similar to *S. pannonica* G. Beck” 1915: 216?; “near Sombor” Đakić 2012: 47-48); **CR59 Ridića, Medura Lake** (Dítě *et al.* 2013: 47); **CR58 Stanišić?** [“Őrszállás”, subnom. *S. maritima* L. and (L.) Dum.] (Prodán 1914: 115?; “in some cases is very similar to *S. pannonica* G. Beck” 1915: 216?; “near Sombor” Đakić 2012: 47-48); **DR28 Senta** (Godicl 1980b: 63); Gornji Breg (Slavnić 1939: 79); **DR01 Novi Sad** (Obradović & Budak 1974: 19; Godicl 1980a: 79; Obradović 1987: 107).

Banat: DR35 Novi Bečej (subnom. *S. maritima* (L.) Dum., Kovačev, G., [s.d.], BUNS; Lindtner, V. 18-Jun-1955, BEO; Boža 1999: 313); at the bottom of a dried puddle (subnom. *S. maritima* (L.) Dum., Andrejević, N. [s.d.], BUNS); **Slano Kopovo** (Kovačev, G. 03-Aug-1976, BUNS; Boža, P. Sep-1987, BUNS; Stojšić, V. 19-Jul-1990, PZZP; Butorac, B., Knežević, A. 03-Aug-1990, PZZP; Butorac, B. 22-Aug-1997, PZZP; Stojšić, V. 03-Aug-1990, PZZP; Boža, P., Stevanović, V. 10-Aug-1998, BEOU; Perić, R. 13-Aug-2009, PZZP; Butorac 1993a: 24; Boža 1999: 313; Knežević, A., Butorac, B., Stojšić, V. 1990 Butorac 1999: 15, 17), succulent halophytes vegetation, ass. *Suaedetum pannonicae* (Butorac, B. 03-Aug-1990, PZZP); saltmarsh (Kovačev, G. 03-Aug-1976, BUNS); **DR44 Zrenjanin: Melenci** (Boža, P. 13-Sep-1984, BUNS); **Rusanda Lake**, ass. *Suaedetum pannonicae* (Soó 1927) Wendelberger 1943, ass. *Salsoletum sodae* Slavnić 1939 (Knežević & Boža 1987: 158; Boža & Knežević 1988: 17-18; Knežević & Boža 1988: 130, 132; 1990: 73-76; Butorac 1993a: 24; Tucakov, J. 1966, BEO; Boža, P., Stevanović, V. 10-Aug-1998, BEOU; Boža 1999: 313; Knežević *et al.* 2002: 38; Knežević *et al.* 2003: 293), Rusanda spa, saltmarsh (Boža, P. 04-Sep-1971, BUNS); **DR43 Elemir:** Okanj, dried lake and lakeshore (Stankov, M. 20-Jul-2002; 17-Aug-2002; 14-Sep-2002; 14-Aug-2003; 05-Sep-2003; BUNS); Okanj bara, on north end of the lake, ≈ N 45° 29' 09.42", E 20° 18' 10.68", 71 m (Perić, R. 13-Aug-2009, PZZP; Knežević *et al.* 2009: 191; Panjković *et al.* 2011: 769-770).

General data: Vojvodina (Trinajstić 1980: 831); Bačka (Slavnić 1953: 52; Obradović 1987: 107; Budak 1998: 142); Banat (*Anonymous* 1989, BUNS; Slavnić 1953: 52; Obradović 1987: 107); Subotica Sand (Obradović & Boža 1986: 136).

Incorrectly cited data:

(referring to *S. prostrata*): Subotica, Horgoš, Senta (Slavnić 1943, ap. Sturc 1973: 126); Kelebija (Boža, P. 15-Aug-1968, BUNS; M. Obradović *pers. comm.* Budak 1998: 142); Selevenjske pustare: Kilapoš (Butorac 1993b: 13; 1993c: 18, ap. Boža 1999: 313); Zrenjanin: Melenci (Rusanda Lake) (Butorac, B., Knežević, A. 03-Aug-1990, PZZP; Boža 1999: 313).

(referring to *Bassia prostrata*): Obradović 1966: 134, 1987: 107.

РАСПРОСТРАЊЕЊЕ И ЗАЈЕДНИЦЕ *SUAEDA PANNONICA* У СРБИЈИ

ДАНИЕЛ ДИТЕ, РАНКО ПЕРИЋ, ПАВОЛ ЕЛИАШ МЛ., ЗУЗАНА МЕЛЕЧКОВА

РЕЗИМЕ

У раду су дати подаци о распрострањењу и фитоценозама врсте *Suaeda pannonica* у Србији. Између 2009. и 2013. године потврђено је присуство *S. pannonica* на четири посећена локалитета од укупно око десет њених познатих налазишта. Пронађена је на обалама и дну сланих језера Медура, Слано Копово, Русанда и Окањ у Бачкој и Банату. Такође је дато и 25 фитоценолошких снимака у којима је едификатор *S. pannonica*. Поред заједнице *Suaedetum pannonicae*, ова врста се такође јавља у заједницама из класе *Thero-Suaedetea*, свезе *Salicornietum prostratae*: *Salicornietum prostratae*, *Crypsido-Suaedetum maritimae* и у посебној групи, односно комбинацији врста *Suaeda pannonica* – *Chenopodium chenopodioides*, која као синтаксономска јединица захтева даље проучавање. Поређење са подацима објављеним у прошлости указује на постепене промене вегетације и губитак станишта на свим преосталим налазиштима *S. pannonica* у Србији.