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PLANT COVER OF THE SALINE GRASSLAND IN THE RIPARIAN ZONE OF THE OKANJ OXBOW LAKE (THE VOJVODINA PROVINCE, SERBIA)

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Abstract

The Okanj oxbow lake is located in the alluvial flood plain of the Tisza River, north of the village of Elemir in central Banat (the Vojvodina Province, Serbia). Saline pastures predominate in the riparian zone of Okanj. The plant cover of the zone is characterized by the following floristic (182 identified taxa, i.e., 166 species, 7 subspecies, 2 varieties, 6 forms and 1 lusus naturae) and phytocoenological (3 classes, 5 orders, 6 alliances and 14 associations) elements. It is important to mention that out of the 174 characteristic taxa (166 species, 7 subspecies and, because of its plant-geographic and ecological significance, the Pontic-Pannonian plant species *Aster tripolium* var. *pannonicus*), 44 or 25.29% of them have the ecological index **S**$_+$, which defines the Okanj oxbow lake as a part of a halobiome occupying the Tisza's meander scars.

Associations *Scirpo-Phragmitetum*, *Bolboschoenetum maritimi continentale*, *Suaedetum pannonicae*, *Salsoletum sodae*, *Puccinellietum limosae*, *Pholiuro-Plantaginetum tenuiflorae*, *Hordeetum histricis*, *Camphorosmetum annuae*, *Halo-Agrostetum albae*, *Agrostio-Alopecuretum pratensis*, *Agrostio-Beckmannietum*, *Plantagineto-Festucetum pseudovinae*, *Artemisio-Festucetum pseudovinae* and *Achilleo-Festucetum pseudovinae* are the specific phytocoenological elements of the observed halobiome.

Droughts and increasing anthropogenic influences keep degrading the ecosystem and if protective measures are not applied shortly, the rare stenovalent euhalophytes *Suaeda pannonica* and *Salsola soda* as well as the associations they predominate, *Suaedetum pannonicae* and *Salsoletum sodae*, respectively, will soon disappear.

Key words:
the Okanj oxbow lake, flora, vegetation, halobiome, protection

1. INTRODUCTION

In the region of central Banat (the Vojvodina Province, Serbia), several oxbow lakes had been formed in cut off meanders of the Tisza River by the action of ground and surface waters and precipitation. Significant among those, going from north to south, are Slano Kopovo, northeast of the town of Novi Bečej, Ostrovo, north of the village of Melenci, Rusanda, west of Melenci, and Okanj, north of the village of Elemir.

Plant covers of the riparian zones of Slano Kopovo, Ostrovo and Rusanda have been studied in considerable detail (Knežević et al. 2003, Knežević et al. 2005a, Knežević et al. 2005b). On the other hand, data on the plant cover in the riparian zone of Okanj are much scantier (Knežević 1994).

The objectives of this paper are to bring to attention the specific features of the flora and vegetation of saline pastures located in the riparian zone of Okanj, to support the initiative for protection of the Okanj ecosystem, submitted by "Okanj", Society for Environmental Protection from Elemir, to the Directorate for Environmental Protection of Serbia, and to urge the Directorate to legislate the initiative on a short notice because the Okanj ecosystem is seriously threatened in consequence to persistent droughts and intensive negative anthropogenic influences.

2. INVESTIGATED AREA

According to Walter climodiagram made at the meteorological station in Zrenjanin, the region of central Banat which includes the village of Elemir has an average annual rainfall of 574 mm and an average annual temperature of 11.1^{o}C. The beginning of vegetation period (April) in that region is characterized by an abrupt increase in the amount of rainfall and a considerable but gradual increase of temperature. After reaching peak discharge in June, the amount of rainfall drops abruptly. Conversely to the rainfall, the gradually increased temperatures persist through the medium part of the vegetation period and they start to go down at an increased rate only after most severe droughts in

October. Because of such relationship of rainfall to temperature, the period from July to October is semidry, which is unfavorable for the vegetation of the investigated region (Knežević et al. 2003).

As a result of such climate pattern, the Okanj ecosystem has highest water level in the course of spring. During that period, the length of Okanj is up to 4.5 kilometers, the width is about 500 meters, and the depth in the middle zone is over 1 meter. Each year during the semidry period, the water level in Okanj drops down significantly. In some years, because of intensive evaporation, the entire lake runs dry.

The soil of the riparian zone of Okanj is solonchakic solonetz, but in the extensive pastures around Okanj the solonchakic solonetz soil surrounds areas under uncultivated calcareous chernozem (micellar) on the loess terrace (Nejgebauer et al. 1971).

3. MATERIAL AND METHODS

The presented date on the plant cover of the saline sites in the riparian zone around the Okanj oxbow lake include results from previous studies of saline flora of Banat (Knežević 1994) and the results of the present study.

Plants have been determined and their names used in accordance with the nomenclatures published in "Flora of SR Serbia" (Josifović, M. ed. I-X, 1970-1976), "Flora Europaea" (Tutin et al. 1960-1980, "A magyar flóra és vegetació rendszertani-növényföldrajzi kézikönyve" (Soó I-VII, 1964-1985) and "Iconography of the Flora from the South-Eastern part of Central Europe" (Jávorka & Csapody, 1975).

Salinity values have been assessed on the basis of the ecological index of Landolt (Landolt 1977; Knežević 1994).

Syntaxonomic position of the halophytic communities occupying the sites surrounding the Okanj oxbow lake has been defined in accordance with the publications "A magyar flóra és vegetació rendszertani-növényföldrajzi kézikönyve" (Soó V. 1973) and "Halophytic Vegetation of the Yugoslav Portion of the Banat Region" (Knežević et al. 1989).

4. RESULTS AND DISCUSSION

Following taxa have been found at sites in the riparian zone of the Okanj oxbow lake:

1. *Achillea millefolium* L. /**S**-/,
2. *Achillea millefolium* L. subsp. *pannonica* (Scheele) Hayek /**S**-/,
3. *Achillea setacea* W. et K. /**S**-/,
4. *Agrimonia eupatoria* L. /**S**-/,
5. *Agropyrum repens* (L.) Beauv. /**S**+/,
6. *Agrostis alba* L. /**S**-/,
Agrostis alba L. f. *coarctata* Rchb.,
7. *Allium atropurpureum* W. et K. /**S**-/,
8. *Allium vineale* L. /**S**-/,
9. *Alopecurus pratensis* L. /**S**-/,
10. *Althea officinalis* L. /**S**-/,
11. *Anthemis austriaca* Jacq. /**S**-/,
12. *Arabidopsis thaliana* (L.) Heynh. /**S**-/,
13. *Artemisia maritima* L. subsp. *salina* (Willd.) Gams. /**S**+/,
14. *Artemisia pontica* L. /**S**-/,
15. *Artemisia vulgaris* L. /**S**-/,
16. *Aster tripolium* var. *pannonicus* (Jacq.) Beck /**S**+/,
17. *Atriplex litoralis* L. /**S**+/,
18. *Ballota nigra* L. /**S**-/,
19. *Beckmannia eruciformis* (L.) Host /**S**+/,
20. *Bidens tripartitus* L. /**S**-/,
21. *Bolboschoenus maritimus* (L.) Palla /**S**+/,
Bolboschoenus maritimus (L.) Palla var. *compactus* (Hoffm.) Jáv.,
22. *Bromus commutatus* Schrad. /**S**-/,
23. *Bromus mollis* L. /**S**-/,
Bromus mollis L. f. *nanus* Weig. ,
24. *Bromus sterilis* L. /**S**-/,
25. *Bupleurum tenuissimum* **L.** /**S**+/,
26. *Calystegia sepium* (L.) R. Br. /**S**-/,
27. *Camphorosma annua* Pall. /**S**+/,
28. *Capsella bursa-pastoris* (L.) Medik. /**S**-/,
29. *Carduus acanthoides* L. /**S**-/,
30. *Carduus nutans* L. /**S**-/,
31. *Carex gracilis* Curt. /**S**-/,
32. *Carex humilis* Leysser /**S**-/,
33. *Carex pseudocyperus* L. /**S**-/,
34. *Carex vulpina* L. /**S**-/,
35. *Centaurea banatica* Roch. ex Rchb. /**S**-/,
36. *Centaurea pannonica* (Heuff.) Simk. /**S**-/,
37. *Cephalaria transilvanica* (L.) Schrad. /**S**-/,
38. *Cerastium dubium* (Bast.) Schwarz. /**S**-/,
39. *Cerastium pumilum* Curt. /**S**-/,
40. *Chartamus lanatus* **L.** /**S**-/,
41. *Chenopodium apulifolium* Schrader /**S**-/,
42. *Chenopodium glaucum* L. /**S**+/,
43. *Chondrilla juncea* /**S**-/,
44. *Cichorium intybus* L. /**S**-/,
45. *Cirsium arvense* **(**L.) Scop. /**S**+/,
46. *Cirsium palustre* **(**L.) Scop. (**S** -),
47. *Consolida orientalis* (Gay.) Schröd. /**S** -/,
48. *Convolvulus arvensis* L. /**S**-/,
49. *Crepis foetida* L. subsp. *rhoaedifolia* (M. B.) Fiori et Paol. /**S**-/,
50. *Crepis setosa* Hall. /**S**-/,
51. *Crepis tectorum* L. /**S**-/,
52. *Crypsis aculeata* (L.) Aitt. /**S**+/,
53. *Cynoglosum montanum* Höjer /**S**-/,
54. *Cynodon dactylon* (L.) Pers. /**S**-/,
55. *Dactylis glomerata* L. /**S**-/,
56. *Daucus carota* L. /**S**-/,
57. *Descurainia sophia* (L.) Webb**.** /**S**-/,
58. *Dipsacus laciniatus* L. /**S**-/,
59. *Epilobium adnatum* Griseb. /**S**-/,
60. *Erigeron canadensis* L. /**S**-/,
61. *Erophila verna* (L.) Schevall. /**S**-/,

62. *Erysimum repandum* L. /**S**-/,
63. *Euclidium syriacum* /L./ R. Br. /**S**-/,
64. *Euphorbia esula* L. /**S**-/,
65. *Festuca ovina* L. /**S**-/,
66. *Festuca vallesiaca* Sch. subsp. *Pseudovina* (Hack.) A. et G. /**S**+/,
67. *Fragaria viridis* Duchesne /**S**-/,
68. *Gagea arvensis* (Pers.) Dumort. /**S**-/,
69. *Gagea pratensis* (Pers.) Dumort. /**S**-/,
70. *Galium aparine* L. /**S**-/,
71. *Galium molugo* L. /**S**-/,
72. *Galium pedemontanum* All. /**S**-/,
73. *Galium verum* L. /**S**-/,
74. *Geranium columbinum* L. /**S**-/,
75. *Geranium dissectum* Jusl. /**S**-/,
76. *Geranium molle* L. /**S**-/,
77. *Geranium pusillum* Burm. /**S**-/,
78. *Glyceria maxima* (Hortm.) Holombg. /**S**-/,
79. *Gratiola officinalis* L. /**S**-/,
80. *Gypsophila muralis* L. /**S**-/,
81. *Heleocharis palustris* (L.) R. Br. /**S**-/,
82. *Helminthia echioides* (L.) Gärtn. /**S**-/,
83. *Holosteum umbelatum* L. /**S**-/,
84. *Hordeum maritimum* With. subsp. *gussoneanum* (Parl.) A. et G. /**S**+/,
85. *Hordeum murinum* L. /**S**-/,
86. *Inula britannica* L. /**S**+/,
Inula britannica L. f. *angustifolia* Marson.,
87. *Lactuca saligna* L. /**S**+/,
88. *Juncus compressus* Jacq. /**S**+/,
89. *Juncus gerardi* Lois. /**S**+/,
90. *Lamium amplexicaule* L. /**S**-/,
91. *Lamium purpureum* L. /**S**-/,
92. *Lepidium draba* L. /**S**-/,
93. *Lepidium perfoliatum* L. /**S**-/,
94. *Lepidium ruderale* L. /**S**-/,
95. *Lolium perenne* L. /**S**-/,
96. *Lotus tenuis* Kit. /**S**-/,
97. *Lycopus europeus* L. /**S**-/,
98. *Lythrum salicaria* L. /**S**-/,
99. *Lythrum virgatum* L. /**S**-/,
100. *Malva silvestris* L. /**S**-/,
101. *Matricaria chamomilla* L. /**S**+/,
Matricaria chamomilla L. f. *salina* (Schur) Jáv.
102. *Matricaria inodora* L. /**S**+/,
103. *Medicago lupulina* L. /**S**-/,
104. *Melilotus officinalis* (L.) Pallas /**S**-/,
105. *Mentha pulegium* L. /**S**+/,
Mentha pulegium L. l. *roseiflora* Priszter
106. *Muscari racemosum* (L.) Mill. /**S**-/,
107. *Myosotis collina* Hoffm. /**S**-/,
108. *Myosurus minimus* L. /**S**-/,
109. *Oenanthe silaifolia* M.B. /**S**+/,
110. *Ononis spinosa* L. /**S**-/,
111. *Ornithogalum umbellatum* L. /**S**-/,
112. *Papaver rhoeas* L. /**S**-/,
113. *Pastinaca sativa* L. /**S**-/,
114. *Pholiurus pannonicus* (Host) Trin. /**S**+/,
115. *Phragmites communis* Trin. /**S**+/,
Phragmites communis Trin. f. *stolonifera* (G. F. W. Meyer) Hegi,
116. *Picris hieracioides* L. /**S**-/,
117. *Plantago maior* L. /**S**+/,
118. *Plantago schwarzenbergiana* Schur /**S**+/,
119. *Plantago tenuiflora* W. et K. /**S**+/,
120. *Poa pratensis* L. /**S**-/,
121. *Podospermum canum* C.A. Mey. /**S**+/,
122. *Polygonum arenarium* W. et K. /**S**-/,
123. *Polygonum aviculare* L. /**S**-/,
124. *Potentilla argentea* L. /**S**-/,
125. *Prunus spinosa* L. **(S -)**,
126. *Puccinellia limosa* (Schur) Holmb. /**S**+/,
127. *Pulicaria dysenterica* (L.) Gaertn. /**S**+/,
128. *Ranunculus pedatus* W. et K. /**S**-/,
129. *Ranunculus sardous* Cr. /**S**+/,
130. *Roripa kerneri* Menyh. /**S**+/,
131. *Rubus fruticosus* L. /**S**-/,
132. *Rumex crispus* L. /**S**+/,
133. *Salsola soda* L. /**S**+/,
134. *Salvia austriaca* Jacq. /**S**-/,
135. *Salvia nemorosa* L. /**S**-/,
136. *Sambucus ebulus* L. /**S**-/,
137. *Sambucus nigra* L. (**S -**),
138. *Schoenoplectus lacuster* (L.) Palla /**S**-/,
139. *Scilla autumnalis* L. /**S**-/,
140. *Senecio vernalis* W. et K. /**S**+/,
141. *Silene alba* (Mill.) Krause /**S**-/,
142. *Silene viscosa* (L.) Pers. /**S**+/,
143. *Sinapis arvensis* L. /**S**-/,
144. *Sonchus arvensis* L. /**S**+/,
145. *Statice gmelini* Willd. subsp. *Hungaricum* (Klokov) Soó /**S**+/,
146. *Suaeda pannonica* Beck /**S**+/,
147. *Symphytum officinale* L. /**S**-/,
148. *Taraxacum laevigatum* (Willd.) DC. /**S**-/,
149. *Taraxacum officinale* Weber /**S**+/,
150. *Taraxacum serotinum* (W. et K.) Poir. subsp. *bessarabicum* (Horn.) Hand. –Mazz. /**S**+/,
151. *Thlaspi arvense* L. /**S**-/,
152. *Thymus marschallianus* Willd. /**S**-/,
153. *Trifolium angulatum* W. et K. /**S**+/,
154. *Trifolium campestre* Schreb. (**S -**),
155. *Trifolium fragiferum* L. /**S**+/,
Trifolium fragiferum L. f. *rigidifolium* Hendrych.
156. *Trifolium pratense* L. /**S**-/,
157. *Trifolium repens* L. /**S**-/,
158. *Trifolium strictum* (L.) Jusl. /**S**+/,
159. *Tussilago farfara* L. /**S**-/,
160. *Urtica dioica* L. /**S**-/,
161. *Urtica urens* L. (**S -**),
162. *Valerianella dentata* Pall. /**S**-/,
163. *Valerianella locusta* (L.) Betcke /**S**-/,
164. *Valerianella rimosa* Bast. /**S**-/,
165. *Verbascum blattaria* L. /**S**+/,
166. *Verbena officinalis* L. /**S**-/,
167. *Veronica anagalloides* Guss. /**S**-/,
168. *Veronica arvensis* L. /**S**-/,
169. *Veronica hederifolia* L. /**S**-/,
170. *Veronica polita* Fr. /**S**-/,
171. *Vicia angustifolia* L. /**S**-/,
172. *Vicia hirsuta* (L.) S. F. Gray. /**S**-/,
173. *Vicia striata* M. Bieberst. /**S**-/, i
174. *Xanthium spinosum* L. /**S**-/.

Out of the 182 recorded taxa, 174 have been numbered as characteristic. Those were 166 species, 7 subspecies and, because of its plant-geographic and ecological significance, 1 variety (the Pontic-Pannonian species *Aster tripolium* var. *pannonicus*). Eight taxa (1 variety, 6 forms and 1 lusus naturae) were left unnumbered.

Of the 174 numbered characteristic taxa, 44 or 25.29% of those were labeled with the ecological index **S**$_+$, and 130 or 74.71% with the ecological index **S**$_-$.

Comparing the florae of the riparian zones of Okanj on one side and Slano Kopovo (Knežević et al. 2005a), Ostrovo (Knežević et al. 2005 b) and Rusanda (Knežević et al. 2003) on the other, we found the following. The flora of the Okanj riparian zone (174 numbered taxa) was richer than the florae of the riparian zones of Slano Kopovo, Ostrovo and Rusanda (91, 77 and 134 numbered taxa, respectively).

The percentage of taxa labeled with the ecological index **S**$_+$ was lower for the flora of the Okanj riparian zone (25.29% or 44 taxa) than those for the florae of the riparian zones of Slano Kopovo, Ostrovo and Rusanda (50.54% or 46 taxa, 31.17% or 24 taxa and 31.34% or 43 taxa, respectively).

Obviously, the highest floristic richness and the lowest percentage of taxa bearing the ecological index **S**$_+$ in the sites around Okanj are due to a higher diversity of these sites and a higher degree of preservation of that ecosystem compared with the other analyzed ecosystems.

Rationale

The ecosystem of the riparian zone of the Okanj oxbow lake is larger (areawise) than the other ecosystems under comparison. It includes spacious pastures with the solonchakic solonetz soil. In several spots, solonchakic solonetz surrounds areas under uncultivated calcareous chernozem (micellar) on the loess terrace (Nejgebauer et al. 1971).

The ecosystem of the riparian zone of the Slano Kopovo oxbow lake covers a smaller area. It consists of a narrow riparian and inundated zone with the solonchak soil of an unusually high salinity rate (Janjatović, Kastori 1979) and adjoining pastures with the solonchakic solonetz soil (Nejgebauer et al. 1971). The calcareous chernozem soil (micellar) on the loess terrace surrounding these pastures has mostly been turned to field crop production.

The ecosystem of the riparian zone of the Ostrovo oxbow lake is made up of a system of fishponds whose construction had destroyed a considerable area under the solonchakic solonetz soil while the remaining area has been floristically impoverished by intensive anthropogenic activities. Most of the surrounding calcareous chernozem soil (micellar) on the loess terrace has been turned to field crop production (Nejgebauer et al. 1971). The ecosystem of the riparian zone of the Rusanda oxbow lake is smallest of the analyzed ecosystems. Its narrow riparian zone under the solonchakic solonetz soil and the surrounding calcareous chernozem soil (micellar) on the loess terrace suffer intensive anthropologic influences coming from the village of Melenci, the Rusanda spa and field crop production (Nejgebauer et al. 1971).

The actual number of taxa labeled with the ecological index **S**$_+$ in the riparian zone of Okanj is fairly high (44 taxa). This number is below than that for the riparian zone of Slano Kopovo (46 taxa) but it is higher than those for the riparian zones of Rusanda (43 taxa) and especially Ostrovo (24 taxa).

Therefore, judging by the percentage of the recorded halophytes (25.29%) and especially by their actual numbers (44 taxa), the ecosystem of the Okanj riparian zone is obviously a part of the halobiome occupying the meander scars of the Tisza River in central Banat. Together with the other observed taxa, the recorded halophytes form numerous plant communities in the Okanj riparian zone. The syntaxonomic position of the plant communities registered at the saline sites surrounding the Okanj oxbow lake is as follows.

Phragmitetea Tx. et Prsg. 1942
Phragmitetalia W. Koch1926 emend. Pign 1953
Phragmition communis W. Koch 1926 emend. Soó 1947
Ass. *Scirpo-Phragmitetum* W. Koch 1926 *medioeuropaeum* Tx. 1941
p.p. emend. Soó 1971
Bolboschoenetalia maritimi Hejný 1967
p.p. (*Bolboschenetea maritimi* Tx. 1969, *Scirpetalia maritimi* Borhidi 1970 p.p.)
Bolboschoenion maritimi continentale Soó (1945) 1947 emend. Borhidi 1970
Ass. *Bolboschoenetum maritimi continentale* Soó (1927) 1957 (*Scirpetum maritimi* Tx. 1937)
Thero-Salicornietea Tx. 1955, Tx.et Oberd. 1958
Thero-Salicornietalia (Br.–Bl.1931) Tx. 1954 ex Tx. et Oberd. 1958
Thero-Salicornion Br.–Bl. 1933 em Tx. 1950
Ass. *Suaedetum pannonicae* Soó 1927 Wendel. 1943
Ass. *Salsoletum sodae* Slavnić (1939) 1948
Festuco-Puccinellietea Soó 1968
Festuco-Puccinellietalia Soó 1968
Puccinellion limosae (Klika 1937) Wendel. 1943
Ass. *Puccinellietum limosae* (Rapcs. 1927) Soó 1930
Ass. *Pholiuro-Plantaginetum tenuiflorae* (Rapcs. 1927) Wendel. 1943
Ass. *Hordeetum histricis* (Soó 1933) Wendel. 1943
Ass. *Camphorosmetum annuae* (Rapcs. 1916) Soó 1933 corr. Soó 1938
Halo-Agrostion albae pannonicum Knežević 1990
Ass. *Halo-Agrostetum albae* Vučković 1985
Ass. *Agrostio-Alopecuretum pratensis* Soó (1933) 1947
Ass. *Agrostio-Beckmannietum* (Rapcs. 1916) Soó 1933
Artemisio-Festucetalia pseudovinae Soó 1968
Festucion pseudovinae Soó 1933.
Halo-Festucenion pseudovinae Vučković 1985
Ass. *Plantagineto-Festucetum pseudovinae* Parabućski 1980
Ass. *Artemisio-Festucetum pseudovinae* (Magyar 1928) Soó 1945
Xero-Festucenion pseudovinae Vučković 1985
Ass. *Achilleo-Festucetum pseudovinae* (Magyar 1928) Soó 1945.

The plant cover of the Okanj riparian zone comprises stands belonging to 3 classes, 5 orders, 6 alliances and 14 plant associations, bearing witness of a considerable diversity of the existing ecological niches.

Some of the registered plant communities cover a limited area or even are not completely formed in some parts of the vegetation period. On the shoreline of the oxbow lake that is not covered with stands of the communities *Scirpo-Phragmitetum* and *Bolboschoenetum maritimi continentale*, there are stands of the communities *Suaedetum pannonicae* and *Salsoletum sodae*. Since the oxbow lake serves as watering hole for cattle, the latter stands are frequently crushed down before *Suaeda pannonica* and *Salsola soda*, their respective characteristic species, reach the stage of full seed maturity. This practice, in combination with increasingly severe droughts, has led to a situation that only scant populations of the species *Suaeda pannonica* and *Salsola soda* could be observed in recent years. Stands of plant communities *Pholiuro-Plantaginetum tenuiflorae*, *Hordeetum histricis*, *Camphorosmetum annuae*, *Agrostio-Beckmannietum* and *Plantagineto-Festucetum pseudovinae* develop on limited areas. Largest areas in the riparian zone of the Okanj oxbow lake are occupied by stands of the plant communities *Puccinellietum limosae*, *Halo-Agrostetum albae*, *Agrostio-Alopecuretum pratensis*, *Artemisio-Festucetum pseudovinae* and *Achilleo-Festucetum pseudovinae*. These stands cover the saline pastures which are subject to intensive cattle grazing and sheep folding and which are daily traversed by horse-drawn wagons and agricultural machines in the course of the vegetation period.

5. CONCLUSION

Distinguishing features of the plant cover of the saline pastures in the riparian zone of the Okanj oxbow lake (the Vojvodina Province, Serbia) make its floristic (182 recorded taxa, i.e., 166 species, 7 subspecies and 2 varieties, 6 forms and 1 lusus naturae) and phytocoenological constituents (3 classes, 5 orders, 6 alliances and 14 associations).

It is important that out of the 174 characteristic taxa (166 species, 7 subspecies and, because of its plant-geographic and ecological significance, the Pontic-Pannonian plant species *Aster tripolium* var. *pannonicus*) 44 or 25.29% of them were assigned the ecological index $\mathbf{S}_{+}$ which defines the Okanj oxbow lake as a part of the halobiome that occupies the meander scars of the Tisza River in central Banat.

The following associations make this halobiome phytocoenologically specific: *Scirpo-Phragmitetum*, *Bolboschoenetum maritimi continentale*, *Suaedetum pannonicae*, *Salsoletum sodae*, *Puccinellietum limosae*, *Pholiuro-Plantaginetum tenuiflorae*, *Hordeetum histricis*, *Camphorosmetum annuae*, *Halo-Agrostetum albae*, *Agrostio-Alopecuretum pratensis*, *Agrostio-Beckmannietum*, *Plantagineto-Festucetum pseudovinae*, *Artemisio-Festucetum pseudovinae* and *Achilleo-Festucetum pseudovinae*.

Droughts and increasing anthropogenic influences keep degrading the ecosystem and if protective measures are not applied soon, the rare stenovalent euhalophytes *Suaeda pannonica* and *Salsola soda* as well as the associations they predominate, *Suaedetum pannonicae* and *Salsoletum sodae*, respectively, will disappear in near future.

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