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The differences between halophyte species grown in different soils using imaging software tools

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Introduction

Today, the entire world is facing with the response of the nature to anthropic factors, also called climate change. Thereby, the impact of climate change is manifested globally, in all areas and sectors, including agriculture. This, as the main food supplier, is strictly dependent on the quality of the soil resources, which is in a continuous depreciation.

Aims: The aim of this paper is to present some biometric data of leaves and roots of *Amaranthus* sp., *Limonium* sp., *Portulaca* sp., *Festuca* sp. grown in greenhouse conditions, on different types of soil, with pH and conductivity known in order to establish plant adaptability for soil remediation.

Methods

► The seeds were sowed in January in pots, and after five moths leaves and roots of the plant species were analysed. *Amaranthus* sp., *Limonium* sp., *Portulaca* sp., *Festuca* sp. were sowed in following soils: soil from Dâmbovița county (S1), soil from Ialomița county (S3), and soil from Lacul Sarat (S2), Brăila county.

►For morphological analysis of leaves and roots two equipments were used, WinFolia and WinRhizo, wich are image analysis specifically designed for leaves and roots measurement in different forms.

Results

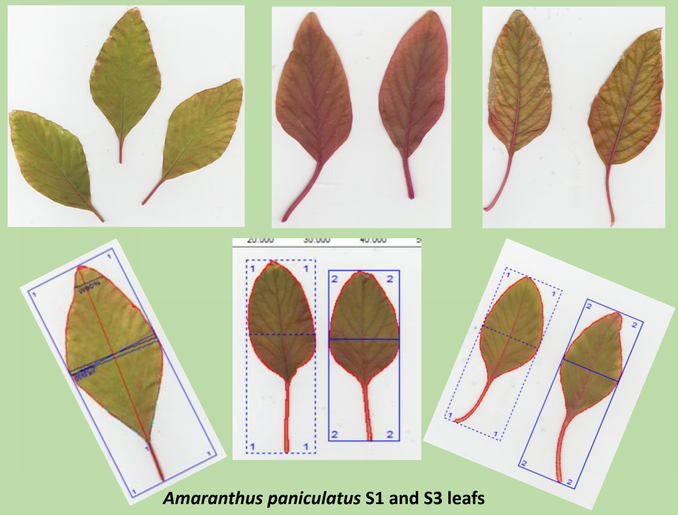
►It was found that on the soil S1 *Portulaca* species developed better than on the soil S3. As for the *Festuca* species, both the roots and the leaves were larger on soil S3 than on soil S1. In the same way as *Festuca*, the *Amaranthus* species was highlighted, on S3 both the roots and the aerial part were more developed. There were no significant differences in the case of *Limonium* sp.

The results were related to those obtained from scanning the leaves and roots of plants grown on peat and pearl substrate.

►The results are presented in the images below.

***Limonium sinuatum* S1 and S3 leafs**

***Limonium sinuatum* S1 and S3 roots**

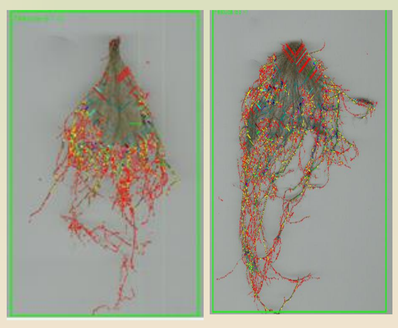


***Amaranthus paniculatus* S1 and S3 leafs**

***Amaranthus paniculatus* S1 and S3 roots**

Plant	Leaf Area	Perimeter	Vert Length	Horiz Width	Avg Horiz Width	Aspect Ratio (W/L)	Form Coefficient
Festuca peat	16.41	75.06	33.31	13.38	4.33	0.40	0.04
Festuca S1	8.07	36.81	10.65	4.78	0.76	0.45	0.07
Festuca S3	24.32	86.07	35.32	1.00	0.69	0.03	0.04
Portulaca peat	3.85	7.95	3.23	1.85	1.20	0.57	0.77
Portulaca S1	1.76	5.82	2.37	1.07	0.74	0.45	0.65
Portulaca S3	1.99	6.63	2.59	1.22	0.77	0.47	0.57
Amaranthus peat	29.65	26.75	9.50	5.13	3.13	0.54	0.52
A. cruentus S1	11.10	19.21	8.11	2.84	1.37	0.35	0.38
A. cruentus S3	16.66	22.33	9.19	3.74	1.81	0.41	0.42
Limonim peat	20.83	34.33	13.68	3.57	1.52	0.26	0.22
Limonim S1	10.30	25.90	8.81	2.57	1.17	0.29	0.19
Limonim S3	11.23	29.74	10.87	2.79	1.04	0.26	0.16

***Festuca arundincea* S1 and S3 leafs**



***Festuca arundincea* S1 and S3 roots**

***Portulaca sativa* S1 and S3 leafs**

***Portulaca sativa* S1 and S3 roots**

Conclusions

► The substrate influenced the growth and development of the halophytes plants.

► Between species, *Limonium* sp. and *Portulaca* sp. showed good adaptability on salinity. None of the plant species developed on soil S2.

►*Portulaca sativa* adapted better to the soil S1 than *Festuca arundinacea.*

►S3 is suitable both for *Portulaca* and *Festuca* sp.

Acknowledgements

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