proceedings

Extended Abstract

Coupling Phytoremediation with Bioenergy †

Carmen Gabriela Constantin [1], Elena Berteanu [2], Adina Zuav [2], Vlad Serafim [2] and Maria Paraschiv [2,3,*]

[1] HORTINVEST Center, University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăști Boulevard, 011464 Bucharest, Romania; manolecarmen2000@gmail.com
[2] National Institute of R&D for Biological Sciences, Department of Biomaterials and Bioproducts, 296 Splaiul Independentei, 060042 Bucharest, Romania; elena.berteanu@incdsb.ro (E.B.); adina.zuav@incdsb.ro (A.Z.); vlad.serafim@incdsb.ro (V.S.)
[3] Research Center for Advanced Materials, Products and Processes (CAMPUS), University Politehnica of Bucharest, 313 Spaiul Independentei, 060042 Bucharest, Romania
* Correspondence: maria.paraschiv@incdsb.ro
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1. Introduction

The increased salinity of soils may be induced by natural causes and anthropic activities. Salted soils have no suitability for agriculture crops, thus inducing the decline of regional economies. To restore the quality of these soils, different remediation practices can be applied, among which the use plant species for salt extraction seems to be suitable for developing synergistic green technologies coupling phytoremediation with biofuel production [1,2].

HaloSYS Project—funded within the frame of FACCE SURPLUS Programme—aims to develop the cultivation of selected halophytes species in salt-affected soils and explore how to use the obtained biomass in new value chains.

2. Materials and Methods

To test the ability of halophyte species to extract salts from soils, laboratory trials have been organized. The plants were monitored from germination to the end of life cycle and soil analysis using ICP-MS was performed to determine the decline of salinity. On the biomass side, enzymatic hydrolysis was applied on dried samples and free glucose was determined using a UV-VIS spectrometer.

3. Results

It was found that *Limonium* sp., *Festuca* sp. and *Portulaca* sp. have good adaptability on soils with moderate salinity. To produce second-generation biofuels, the ability of cellulosic biomass to be hydrolyzed is the main step in ensuring sustainable path for fermentation. In our work, it appears that the produced halophytic biomass can be hydrolyzed with cellulase and xylanase up to 48% (wt) in 4 h, as it can be seen in Figure 1.

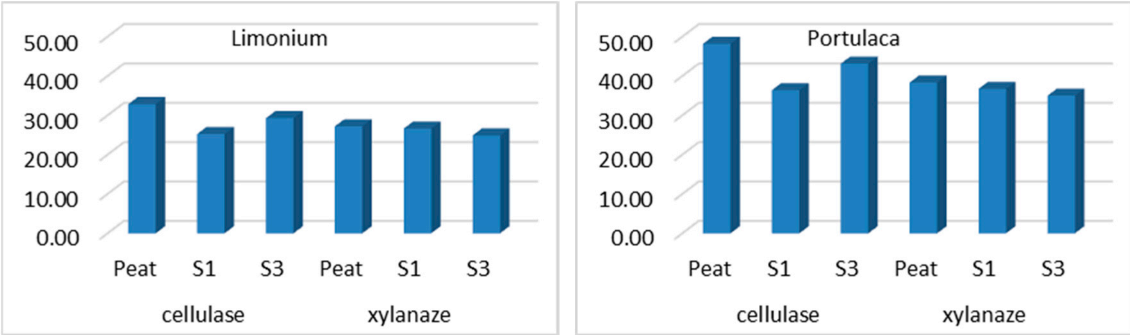

Figure 1. Enzymatic hydrolysis of biomass.

4. Conclusions

Halophyte species can be successfully used for salts extraction in phytoremediation practices and obtain biomass suitable for biofuel production.

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References

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