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MULTI HYDROLYTIC ENZYME COCKTAIL FROM THE FUNGAL ISOLATE OF *Schizophyllum commune* ON PRETREATED *Tamarix jSordanis* BIOMASS

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Abstract

Tamarix are salt tolerant woody perennial trees or shrubs, living in desert areas; recently this species has been proposed as vegetation filter for cleaning soils from contamination with heavy metals by phytoextraction and as saline crops to obtain fermentable sugar in second generation ethanol production.
In this paper the possible use of pre-treated *Tamarix* biomass has been investigated as a natural substrate for production of high value-added products such as cocktails of glycoside hydrolase enzymes.
Since the cost of cellulolytic enzymes is a major contributor to production costs in second generation bioethanol production, the use of cheap substrate could improve the economy of whole process.
In this study, several wood-degrading fungi have been isolated from *Tamarix* biomass and identified as belonging to genera: *Paecilomyces*, *Aspergillus*, *Fusarium*, *Giberella*, *Scopularopsis* and *Schizophyllum.*
Among these, an interesting cellulase producing strain, taxonomically assigned as *Schizophyllum commune*, was selected. This specie has been reported to be a pathogen of trees, but it mainly adopts a saprobic lifestyle by causing white rot on plants.
Different pre-treated *Tamarix* biomass based media were evaluated as substrate for *S. commune* in submerged culture in bioreactor, obtaining a specific hydrolytic cocktail well balanced in glycosidase composition. Polysaccharides derived from hydrolysed *Tamarix* biomass seems to have a certain inducers effects on cellulase production, especially on β-glucosidase levels (1389 U/gds), that generally are limiting in commercial enzymatic mixture. Moreover, considering the presence of starch into the wood fibers of *Tamarix*, consistent amount of amylase and α-glucosidase were detected as components of multi-enzymatic cocktail produced by *S. commune.*
Based on the obtained results, this work can represent preliminary study in view of cellulase production using *Tamarix* biomass as low cost inducer/substrate to reduce enzyme production cost and to obtain a cellulase cocktail suitable for highly-efficient enzymatic hydrolysis of biomass for ethanol production.