Insight Medical Publishing

Journal of Environmental Research

2020

Vol.4 No.3

Fungal Pretreatment of lignocellulosic biomass for the production of ethanol

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Abstract

In the region of Meknes, Morocco, there is a large amount of lignocellulosic mass rich in cellulose and hemicelluloses but released in the trash. The direct use of this mass to produce bioethanol has a low yield because the cellulose and hemicellulose are protected by lignin hence the need for pretreatment to degrade or modify the lignin to release cellulose and hemicellulose. Biological treatment, especially with fungi, is a very simple method, respects the environment and specifically degrades lignin. The main objective of this project is the evaluation of the impact of the treatment with fungi on the digestibility, lignin content and cellulose crystallinity index of wheat straw, reddish wood sawdust and olive pomace.

In this study, three fungi, Fusarium oxysporum , Fusarium solani and Fusarium sp were used to treat the lignocellulosic biomass. Samples obtained after 8 weeks of incubation were assayed for digestibility, lignin, and cellulose contents according to the Van Soest method and cellulose cristallinity cellulose. The digestibility, lignin content and cellulose crystallinity index were significantly affected by substrate and treatment. But cellulose did not change among substrates and treatments. The digestibility was higher ($p<0.05$) in the control than in the three fungi types, and higher ($p<0.01$) in wheat straw than in the two other substrates.

Biography:

Mohamed benaddou is a third year doctoral student. He is working on fungal and enzymatic pretreatment of lignocellulosic biomass as a doctoral project. Besides research, he is a qualifying high school teacher since 2009. He obtained his mater in 2012 under the title "master of environmental sciences". He participates in several congresses and scientific conferences in Morocco.

Speaker Publications:

1. “Numerical Modelling of AISI 316L Cardiovascular Stent Behaviour under Blood Pressure and Restenosis Loadings”; Journal of Biomimetics, Biomaterials and Biomedical Engineering (Volume 27), May 2016.
2. “Study of cleavage in a rectangular plate by the XFEM method and the integral contour J method”; Materials Today: Proceedings Volume 27, Part 4, 2020.
3. “Translation and the Quest for Meaning: Adūnīs and Yūsuf al-Khāl's Translation of T. S. Eliot's The Waste Land”; Dragoman Journal of Translation Studies, Volume-7-no-8-2018.

14th International Conference on Biofuels and Bioenergy; Webinar – June 22-23, 2020.

Abstract Citation:

Dr. Mohamed BENADDOU, Fungal Pretreatment of lignocellulosic biomass for the production of ethanol, Bio Fuels 2020, 14th International Conference on Biofuels and Bioenergy; Webinar – June 22-23, 2020.

(https://biofuels.conferenceseries.com/abstract/2020/fungal-pretreatment-of-lignocellulosic-biomass-for-the-production-of-ethanol)