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BIOENERGÍA Y BIOPRODUCTOS

Título:
An integrated and intensified approach for enhanced bioethanol production and validation with different lignocellulosic materials

Autores:
Costa Carlos, Romaní Aloia, Johansson Bjorn, Teixeira José A, Domingues Lucília
Centro de Trabajo:
Centre of Biological Engineering
Email:
pg26392@alunos.uminho.pt
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With the increase of fossil fuels prices and environmental concerns derived of its use, the search of new energy sources has become a central subject. Lignocellulosic biomass is a renewable and abundant source of organic material in amount enough to satisfy the growing energetic needs and suitable for the bioconversion into biofuels. The appropriate use of lignocellulosic biomass to produce biofuels must integrate several requirements: selection of the appropriate raw materials, effective biomass pre-treatment to improve the enzymatic saccharification of cellulose into glucose and efficient conversion of hexoses and pentoses from the pre-treatment into biofuels. In this context, great progress has been accomplished in terms of lignocellulosic bioethanol production, but an integrated approach of all stages involved in the process is still a goal to be achieved. The main highlighted challenges are: reduction of processing costs, recovery and valorisation of all biomass fractions, and development of robust microorganisms able to successfully convert all the available sugars into the desired biofuels under harsh and intensified conditions. (Menon and Rao, 2012) Recent works showed the importance of suitable strain selection from industrial environments (Pereira et al., 2014) for efficient lignocellulose fermentation and for its engineered modification in order to metabolize xylose (Romaní et al., 2015). In this context, the aim of this work was the development of efficient ethanol process from several lignocellulosic materials, derived from agricultural products (corn cob and wheat straw) and hardwood materials (eucalyptus and paulownia wood), alongside different nutritional sources using a new robust constructed yeast strain for xylose and glucose co-consumption isolated from industrial environment able to withstand harsh environments.