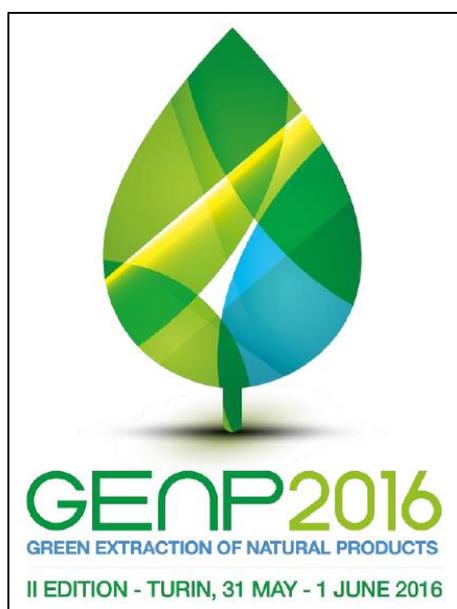


GENP2016 – Green Extraction of Natural Products – Turin, Italy

Sequential biomass valorisation of Halophytes: High pressure extraction prior to biogas production



The SALICHEM project was presented during the Green Extraction of Natural Products (GENP2016) held in Turin, Italy.

The International congress focuses mainly on the advancement of Green Extraction and Sustainable Processes in the agro, food, cosmetic, chemical, fuel and energy sectors. The whole value chain of every application was considered; cultivation, extraction, purification, processing and recycling steps.

This congress follows the European commission action plan of circular economy. The idea is that resources are used in a more sustainable way. Our SALICHEM project enters in that concept which cover the full lifecycle of products: from production and consumption to waste management and the market for secondary raw materials.

The abstract of the presented poster can be found below.

Abstract

Sequential biomass valorisation of Halophytes: High pressure extraction prior to biogas production

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Salinization of soil is caused by global warming and over-cultivation of crops. Saline crops or halophytes are naturally adapted to salinity and can grow under these conditions in contrast to the majority of our crops. The need of biomass for the production of food, chemicals and energy is apparent, considering the increase in costs and unknown reserves of fossil petroleum and the increase in world population. However, due to the food vs. fuel debate, only biomass which cannot be used for food can be considered for chemical and energy production. In order to satisfy all requirements, within this Cornet project (called SALICHEM), we envision an extraction of high-value natural products before the residual plant material is used for energy production. In terms of biological activity, we focus on antimicrobial, anti-oxidant and anti-aging potency to cover the cosmetics, nutraceuticals and food industry.

Screenings of six halophytes were conducted based on secondary metabolites profiling, bioactivity, lignocellulosic composition for fermentation, and anaerobic digestion for methane production. *Spartina maritima* Fernald, giving the best results in terms of biogas production, was selected to maximize the valorization potential. *S. maritima* (Poaceae) is a herbaceous perennial cordgrass that grows along Europe's western and southern coasts. Its moderately and non-polar extracts showed promising anti-collagenase and anti-elastase activity. According to literature, anti-aging compounds are found in polyphenols and terpenoids family. The next step of the project is to optimize the extraction of the chosen extracts. Knowing that the SALICHEM project gives priority to green extraction, supercritical CO₂ and subcritical water were selected for the optimization of extraction. The anti-aging activity will be assessed during the optimization process.

The lignocellulosic pretreatment of the biomass is currently under investigation. In terms of biogas production, *S. maritima* showed similar results compared to grass silage, a typical feedstock for agricultural biogas plants.

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