BOOK OF ABSTRACTS

GREEN WEEK

3rd International Workshop

TOWARDS ZERO POLLUTION

2023 Viseu
05 june

june, 2023

Title: 3rd International Workshop: Zero Pollution – Territory Valorization

Editor
Escola Superior de Tecnologia e Gestão de Viseu

Editorial Coordination
Luísa Paula Cruz-Lopes
Isabel Brás
Maria Elisabete Silva
Nuno Rodrigues
Sérgio Lopes

ISBN: 978-989-33-4725-6

Chemical composition of *Crataegus monogyna* – Preliminary Studies

Yuliya Dulyanska, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, ydulyanska@esav.ipv.pt
Luísa Cruz-Lopes, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, lvalente@estgv.ipv.pt
Bruno Esteves, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, bruno@estgv.ipv.pt
Maria João Barroca, Molecular Physical-Chemistry R&D Unit, Department of Chemistry, University of Coimbra, Portugal, mjbarroca@esac.pt
Luís Batista de Carvalho, Molecular Physical-Chemistry R&D Unit, Department of Chemistry, University of Coimbra, Portugal, labc@ci.uc.pt
Fernando J. Gonçalves, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, fgoncalves@esav.ipv.pt
Idalina Domingos, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, ijd@estgv.ipv.pt
José Ferreira, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, jvf@estgv.ipv.pt
Raquel P. F. Guiné, CERNAS Research Centre, Polytechnic Institute of Viseu, Portugal, raquelguine@esav.ipv.pt

Abstract

With a growing environmental awareness, the re-evaluation of agroforestry waste is one of the challenging issues for sustainable agriculture to reduce its environmental impacts and give them a high added value.
The *Crataegus monogyna* plant belongs to the *Rosaceae* family; *C. monogyna* is an indigenous plant and in Portugal it is very common in deciduous and evergreen forests.
The present study aims to contribute to the development of scientific knowledge regarding the chemical composition of *C. monogyna* for a better understanding of the possible value-added products that can be obtained from this material.
The *C. monogyna* samples were characterized for their ash content, extractives (in dichloromethane, ethanol, and hot water), α-cellulose, lignin, and hemicelluloses. The extractives were determined by extraction with different solvents in sequential order of ascending polarity. The lignin content in *C. monogyna* free of extractives was determined by the Klason method with 72% H_2SO_4 (according to Tappi T 204 om-88). Holocellulose was determined by the acid chloride method. The hemicellulose content was determined by the difference between holocellulose and α-cellulose.
Preliminary studies on chemical composition revealed that the material is lignocellulosic, presenting approximately 39,5% α-cellulose, followed by hemicellulose 23,2% and lignin 22,9%.
The chemical characterization performed on *Crataegus monogyna* showed that this material has several components that can be recovered. This lignocellulosic material can also be converted in a liquefied material that can be further processed to replace the polyol in polyurethane foams with or can be used for the production of adhesives.

Keywords

Crataegus monoguna; Chemical Composition; Ecovalorisation; Residues.