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ZVORNIK

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VII

**ENGINEERING, ENVIRONMENT AND MATERIALS
IN PROCESS INDUSTRY
EEM2021**

BOOK OF ABSTRACTS



**JAHORINA
MARCH 17-19, 2021**

**REPUBLIC OF SRPSKA
BOSNIA AND HERZEGOVINA**

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FACULTY OF TECHNOLOGY ZVORNIK**



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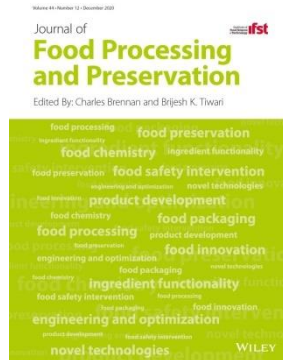


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GREEN EXTRACTION APPROACH FOR THE RECOVERY OF BIOACTIVE COMPOUNDS FROM TOBACCO WASTE

Marija Banožić¹, Krunoslav Aladić¹, Jelena Vladić², Senka Vidović², Silvija Šafranko¹, Ana-Marija Cikoš¹, Stela Jokić¹

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Abstract

Recent trends in the separation techniques have been largely focused on the green extraction techniques. The conventional extraction techniques require the high energy "input", including the consumption of harmful organic solvents, prolonged extraction time and utilization of high temperatures, and consequently degradation of thermolabile components occur. The novel extraction techniques such as supercritical CO₂ extraction, ultrasound assisted extraction, high voltage electric discharge assisted extraction and subcritical water extractions avoid or reduce these disadvantages and improve extraction efficiency. The aim of this paper is to give an overview of our results in the recovery of bioactive compounds from tobacco waste, with special attention to dominant bioactive compounds in tobacco waste, nicotine, chlorogenic acid and rutin, respectively. Three types of tobacco waste (scrap, dust and midrib) and Virginia leaf blend (composed by 73.3% Virginia and 26.7% oriental tobaccos) as starting material were obtained from tobacco factory "Fabrika duhana Sarajevo" and subjected to different extraction techniques and process conditions. Results showed that supercritical CO₂ extraction has advantages in extracting fatty acids and volatile organic compounds. Subcritical water extraction enabled high extraction yield, but some degradation products (furfurals) occurred on higher temperatures (above 250 °C). Ultrasound assisted extraction and high voltage electric discharge assisted extraction provided satisfying concentration of phenolic compounds (chlorogenic, acid and rutin). All tobacco waste types contained similar compounds as leaf blend but in lower concentrations.

Treatment of tobacco waste such as recycling and reusing are an imperative today due to rigorous environmental protection legislation. Studied green extraction techniques in this paper provided advantages over conventional extraction methods, such as being "greener", faster and more efficient.

Key words: tobacco waste, bioactive compounds, green extraction techniques

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