INFORMACIJE O PROJEKTU ZA SAJT FAKULTETA

Naziv projekta: Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry

Akronim: PhAgroWaste

Logo: u prilogu

Budžet: 32.502.256,30 RSD (275.442,85 EUR)

Dužina trajanja projekta: 3 godine 1.1.2022. – 31.12.2024.

Apstrakt: Cilj projekta PhAgroWaste je da se ispitaju kvalitet i mogućnosti primene potencijalno vrednih hemijskih sastojaka i materijala dobijenih jednostavnim i ekološki prihvatljivim postupcima iz žetvenih ostataka kukuruza, pšenice i suncokreta, kao i otpadnih materijala koji nastaju tokom industrijske proizvodnje jestivih ulja istih biljaka.

Poljoprivredni otpad je, u Srbiji, još uvek nedovoljno iskorišćen resurs, koji se uglavnom spaljuje ili baca - doprinoseći velikom zagađenju vazduha, ugrožavajući zdravlje stanovništva i narušavajući uslove životne sredine. Zbog toga je osmišljen ovaj projekat, u nastojanju da se podstakne kreiranje održive prakse u kojoj bi žetveni ostaci pšenice, kukuruza i suncokreta bili sirovina za proizvodnju različitih materijala za primenu u farmaceutskoj industriji, sa visokom komercijalnom vrednošću i važnim biološkim aktivnostima (mikro- i nanokristalna celuloza - MCC/NCC, voskovi, ekstrakti bogati polifenolima, izolovana hemijska jedinjenja itd.).

MCC je jedan od najčešće korišćenih ekscipijenasa u formulacijama različitih farmaceutskih proizvoda. S druge strane, NCC nalazi primenu u inženjeringu tkiva, 3D-bioprintingu, tretmanu otpadnih voda, razvoju kompozitnih materijala, isporuci lekova, itd. MCC i ekstrakti bogati polifenolima proizvedeni iz poljoprivrednog otpada će biti inkorporirani u inovativne formulacije mesnih proizvoda sa povećanom oksidativnom stabilnošću, dužim rokom trajanja, poboljšanim sastavom masnih kiselina i povećanim sadržajem vlakana. Voskovi i polifenolima bogati ekstrakti će biti upotrebljeni u formulaciji novih kozmetičkih proizvoda inspirisanih prirodom.

Na ovaj način, mogu se proizvesti materijali sa visokom dodatnom vrednošću, u cilju poboljšanja kvaliteta života njihovih korisnika, smanjenja generisanja otpada u proizvodnom lancu, ograničenja uticaja intenzivne poljoprivrede na životnu sredinu i unapređenja konkurentnosti i privrednog rasta srpske prehrambene i farmaceutske industrije.

Abstract: The aim of the project PhAgroWaste is to explore the quality and usefulness of potentially valuable chemical components and raw materials produced from maize, wheat and sunflower harvest residues, as well as sludge and waxes generated during the industrial production of edible vegetable oils from seeds/germs of the same plants.

In Serbia, agricultural waste is an underutilized resource. Recently, a trend of open burning of harvest residues in the fields has been observed, resulting in heavy air pollution and posing risk to human and ecological health. The main idea of this project is to investigate and propose a sustainable agricultural waste management practice in Serbia other than “harvest-and-burn”, as the potentials of the utilization of agricultural waste plant material are far from being exhausted.

To address this problem, a cost-effective and sustainable process for production of micro- and nanocrystalline cellulose (MCC/NCC) and the other products of high commercial value and biological

activity (waxes, polyphenol-containing extracts and/or isolated chemical compounds) has been designed.

MCC is one of the most frequently used excipients in formulations of different pharmaceutical products. On the other hand, NCC finds applications in tissue engineering, 3D-bioprinting, waste water treatment, development of composite materials, drug delivery, etc. MCC and polyphenol-rich extracts produced from agricultural waste will be incorporated in innovative formulations of meat products with increased oxidative stability, longer shelf life, improved fatty acid composition and increased fiber content. Waxes and polyphenol-rich extracts will be used in new formulations of nature-inspired cosmetics.

This way, high value-added products will be created, with intention to improve the quality of life of their consumers, to reduce waste in the production chain, to limit environmental impacts of intensive agriculture and to improve competitiveness and economic growth in Serbian food and pharmaceutical industry.

Učesnici/Participants

Rukovodilac projekta/Principal Investigator:

Prof. dr Zoran Maksimović, redovni profesor/Full Professor

Članovi tima/Team Members:

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