

HARVEST RESIDUES OF MAIZE, WHEAT AND SUNFLOWER - WASTE, OR THE SOURCE OF VALUABLE RAW MATERIALS? - PROJECT PHAGROWASTE

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In Serbia, agricultural waste is still an underutilized resource. Recently, a trend of harvest residues open burning in the fields has been observed, resulting in heavy air pollution and posing risk to human and ecological health. Therefore, a consistent set of interdisciplinary investigations under the title “Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry” (PhAgroWaste) has been designed, with the aim to investigate and propose a cost-effective and sustainable agricultural waste management practice, where 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) will be produced from harvest residues of corn, wheat and sunflower. 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 added to innovative formulations of meat products to gain higher oxidative stability, extend shelf life, improve fatty acid composition and increase fibres content. Waxes and polyphenol-rich extracts will be tested in new formulations of nature-inspired cosmetics. This way, high value-added products can 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.

Acknowledgements

This research is supported by the Science Fund of the Republic of Serbia, contract number: 7752847 - Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry” (PhAgroWaste).

ŽETVENI OSTACI KUKURUZA, PŠENICE I SUNCOKRETA - OTPAD ILI IZVOR VREDNIH SIROVINA? - PROJEKAT PHAGROWASTE

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Poljoprivredni otpad je, u Srbiji, još uvek nedovoljno iskorišćen resurs, koji se uglavnom spaljuje na poljima ili baca - doprinoseći velikom zagađenju vazduha, ugrožavajući zdravlje stanovništva i narušavajući uslove životne sredine. Zbog toga je osmišljen konzistentan set interdisciplinarnih istraživanja pod nazivom „Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry“ (PhAgroWaste), sa ciljem da ispita i predloži održivu praksu upravljanja poljoprivrednim otpadom 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 testirani 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.

Zahvalnica

Istraživanje se sprovodi uz podršku Fonda za nauku Republike Srbije, br. ugovora: 7752847 - Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry“ (PhAgroWaste).