

In Vitro Biological Activity of Compounds from by-Products of the Oil Industry

Kristina Radosevic*, Marijan Logarusic, Ivana Radojic Redovnikovic, Igor Slivac and Visnja Gaurina Srcek
Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia

Increased exploitation of organic residues from various sectors of agriculture and food industries over the past two decades is a repercussion of global request for sustainable development. From that point, environmental and value-added aspects are the most important advantages of such crop residues utilization. Nowadays, different crop residues possess a large potential in the biotechnological field and are used as raw material in different bioprocesses. Among crop residues, much is expected from those of edible oils production, which are in the focus of our research interest. Oil cakes/oil meals are by-products after oil extraction from seeds. They are currently mainly used as feed source and fertilizers, although they possess high nutritional value, especially due to high protein content (from 15% to 50%). Flaxseed and hempseed meal, which are currently exploited less than 10%, contain significant portion of proteins and therefore could be used for preparation of various nutritional supplements. It is an ongoing trend turning agricultural waste proteins into hydrolysates and using them as peptide source in culture media for microbial or cell based bioprocesses. Furthermore, oil cake proteins as well as some other compounds from flaxseed and hempseed meal possess different biological activities (anti-hypertension, antioxidant, antimicrobial, immunomodulatory, etc.) and therefore have potential biomedical application.

The main goal of our work on “HYDRO PEP CELL” project (HRZZ Grant No. 38489) is the application of protein hydrolysates obtained from flaxseed and hempseed in cell culture media as a source of peptides for optimal cell growth and productivity. Furthermore, the screening for biological potential of hydrolyzed proteins would be also assessed, with emphasis on antioxidant and *in vitro* anticancer activity. Our preliminary results indicate possible usage of those hydrolysates as beneficial component of cell culture media and replacement for still often used animal serum. Also, it was shown that prepared hempseed protein hydrolysates and its fractions possess ant-oxidative activity and could protect cells against induced oxidative stress. Based on that, hempseed and flaxseed proteins and their hydrolysates have potential in production of peptide supplements used for nutritional and/or medicinal purposes.

Biography:

Kristina Radosevic, Ph.D., is assistant professor in the Laboratory for Cell Technology, Application and Biotransformation at the Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia. She received her PhD diploma in the field of biotechnology and bioprocess engineering and accomplished her postdoctoral study at Jožef Stefan Institute, Ljubljana, Slovenia. As a researcher on numerous national projects she gains knowledge and expertise in the field of animal cell culture technology, (cyto) toxicity, cell death, *in vitro* biological activity, alternative solvents and so on. Lately, her scientific work is focused on ecotoxicity of ionic liquids and deep eutectic solvents, biological activities of plant extracts obtained by alternative solvents as well as possible application of those extracts in biotechnology and other fields of life sciences. She has published 28 papers in peer reviewed journals and as a (co)author attended more than 30 international conferences.