1. Zorica Knežević-Jugović, Alina Culetu, Denisa Duta, Gabriela Mohan, Jelena Jovanović, Andrea Stefanović, Nataša Šekuljica, Verica Đorđević, "***Enzymatic hydrolysis as a tool for enhancing antioxidant capacity and sensory qualities of soy proteins***". 9th Central European Congress on Food (CEFood), 24 - 26 May 2018, Sibiu, Romania, Abstract Book, pag. 110, ISBN 978-606-12-1546-1. http://ceefood.conferences.ulbsibiu.ro/2018/wp-content/uploads/2019/01/Abstract-Book.pdf

ENZYMATIC HYDROLYSIS AS A TOOL FOR ENHANCING ANTIOXIDANT CAPACITY AND SENSORY QUALITIES OF SOY PROTEINS

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Introduction: Soy proteins are widely used in several food products in the forms of soy flour, soy protein concentrate (SPC) and soy protein isolate (SPI) to improve water and fat binding ability and improve nutritional content. Recent research efforts in this field continue to look at novel functional properties of soy proteins through physical, chemical or enzymatic modifications [1]. Although it has been demonstrated that the enzymatic hydrolysis of SPI is a suitable route to improve its antioxidant properties, there is a general lack of knowledge about the potential for beneficial effects of protease hydrolysis on soy products other than SPI, such as soy flour or SPC. The aim of this study was to investigate the antioxidant activities, and color of spray-dried hydrolysates of SPC obtained with several proteases.

Materials and methods: A commercial SPC (protein content 71.24%) was a gift from the SOJAPROTEIN, Bečej. The proteases used were: alcalase® 2.4L, neutrase® 0.8L, papain, everlase 16.0 L (Sigma) and umamizyme (Amano Enzyme Inc). The antioxidant activity was tested by using several methods: DPPH, ABTS, and linoleic acid emulsion system [2].

Results: Process parameters like substrate concentration, *E/S* ratio, temperature, and *DH* have been optimized for each selected enzyme or their combination. The five proteolytic enzymes used for hydrolysis of SPC led to different reaction kinetics resulting also in different peptide profiles determined by gel filtration chromatography using Sephadex G-50.

Conclusions: The alcalase hydrolysate seemed to be the most effective antioxidant determined by DPPH, ABTS, and linoleic acid emulsion system assays. The enzymatic hydrolysis in all cases resulted in an increase in the antioxidant activity of hydrolysate and all hydrolysates showed significantly changed color compared to SPC.

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INFLUENCE OF SOY PROTEIN HYDROLYSATES ON THE RHEOLOGICAL CHARACTERISTICS OF WHEAT DOUGH

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The use of protein hydrolysates in bakery products is gaining importance due to the presence of bioactive peptides in their composition. Soy protein hydrolysates (SPHs) have gained interest due to the lack of antinutritional factors and presence of various bioactivities (antioxidant activity, cholesterol-lowering activity or immunoregulatory properties).
The aim of the study was to evaluate the dough rheology parameters of wheat flour replaced by 5% with different SPHs. SPHs were obtained by enzymatic hydrolysis of soy protein concentrate with different proteases: Alcalase® 2.4L, Everlase 16.0L, Neutrase® 0.8L, Papain and Umamizyme. The rheological behaviour of flour mixtures was evaluated using a Mixolab analyzer (Chopin Technologies) with the "Chopin+" protocol.
The SPH addition in the wheat flour resulted in decreases in water absorption with almost 3.9% as compared with control dough. Dough development time increased with SPH addition, with the highest value registered for umamizyme hydrolysate (5.9 min towards 1.4 min for control). Thus, SPHs prevented gluten network development. Stability and C2 value (which represents the beginning of the protein destabilization and unfolding) decreased with the SPH addition in the dough formulation, which proves the weakening of the gluten network. In the same trend, starch gelatinization (C3), stability of the starch gel (C4) as well as starch retrogradation (C5) were reduced by the addition of SPHs. These values were decreased in the order: control > alcalase ≈ everlase ≈ umamizyme > neutrase > papain.
In conclusion, dough characteristics provided by Mixolab are the results of the interaction of SPHs components with the flour constituents. Papain hydrolysate could contribute to the increase of the shelf-life of bakery products.
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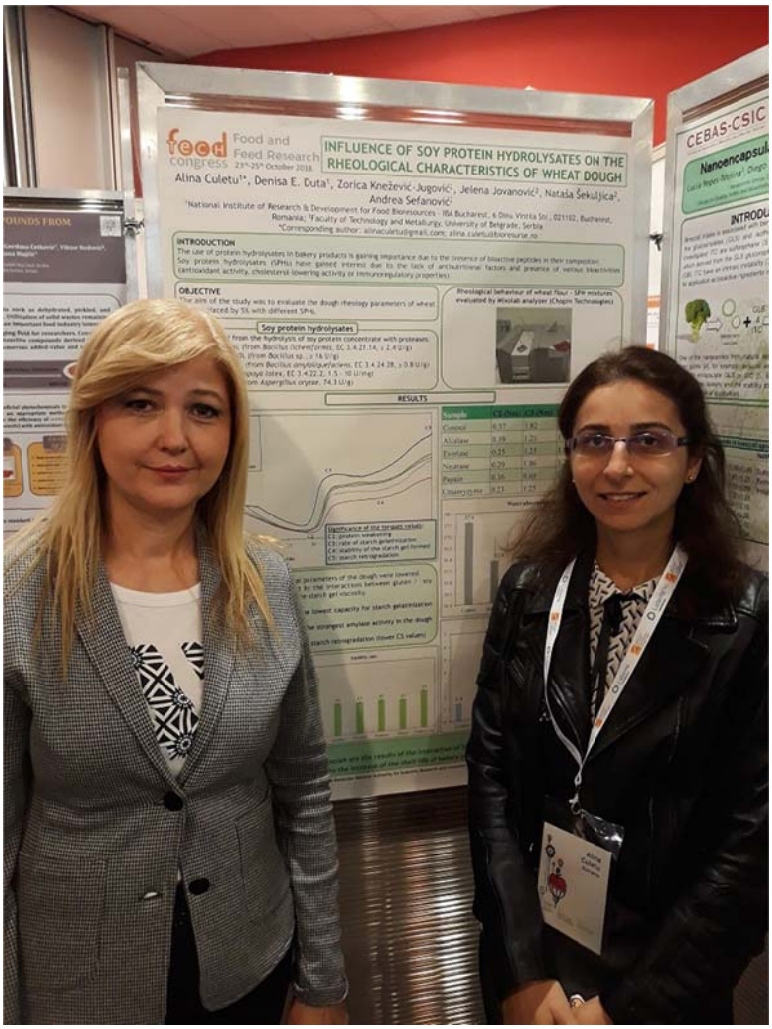
Keywords: *soy protein hydrolysates, protease, wheat dough, rheological characteristics, Mixolab*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