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Dipartimento di scienze biotecnologiche di base, cliniche intensivologiche e perioperatorie



Proteomics and Metabolomics for Personalized Medicine

XV ITALIAN PROTEOMICS ASSOCIATION ANNUAL
MEETING



Italian Proteomics Association

IN PARTNERSHIP WITH
HELLENIC PROTEOMICS SOCIETY

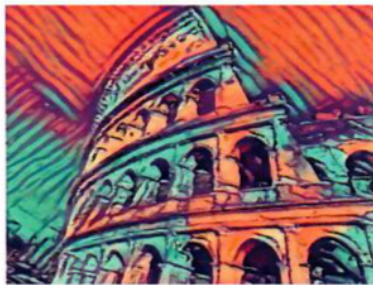


Hellenic Proteomics Society

SERBIAN PROTEOMICS ASSOCIATION
AND



СРПСКО УДРУЖЕЊЕ ЗА ПРОТЕОМИКУ-SePA



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Effects of extraction conditions on proteins' profiles of *Tenebrio molitor***Vesna Jovanović^{a*}, Katarina Smiljanić^a, Tamara Lujčić^a, Teodora Djukić^a,
and Tanja Ćirković Veličković^{a-d}**^aUniversity of Belgrade – Faculty of Chemistry, Center of Excellence for Molecular Food Sciences & Department of Biochemistry, Serbia;^bGhent University Global Campus, Incheon, South Korea;^cGhent University, Faculty of Bioscience Engineering, Belgium;^dAcademy of Sciences and Arts, Belgrade, Serbia

Edible insects are recommended as a future food because of many reasons. The nutritional value of edible insects is one of criteria for the selection of seven most promising species among which is *Tenebrio molitor* [1]. The objective of this study was to examine the effects of different extraction conditions on the yield, solubility and protein profiling after extraction from defatted flour *Tenebrio molitor*. Twelve different extraction conditions were set up in which three parameters were combined: pH of extraction solutions (6, 8 and 12.5), temperature (30°C and 60°C), and ultrasound (US). Shotgun proteomics of trypsin digests profiled protein isolates. The highest proteins yield was in extractions at pH 12.5. The temperature elevation and US application significantly increased the yield of isolated proteins at pH 12.5 but their solubility at the pH 7.4 was lower compared to isolates at pH6 and 8. 1D-SDS-PAGE showed marked differences in protein profiles on various extraction conditions, with the highest number of the distinctive bands at pH 8 at 30°C. Shotgun proteomics showed that extraction condition at pH 12.5, on 30°C has the highest numbers of different proteins however, among the top 20 abundant proteins are chitin-associated proteins, allergens and proteinases, while at pH 8 these proteins are not enriched. Highly basic extraction significantly contributes to protein hydrolysis while application of US contributes to the protein cross-linking and this effect is more prominent at higher temperature.

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References:

[1] van der Spiegel M., Noordam M. and van der Fels-Klerx H.J. Safety of novel protein source (insects, microalgae, seaweed, duckweed, and rapeseed) and legislative aspects for their application in food and feed production. *Comprehensive Reviews in Food Science and Food Safety*, 12(6), 662-678 (2013).