

OPTIMIZATION OF MICROWAVE-ASSISTED EXTRACTION OF PECTIN FROM TOMATO POMACE

Nikolina Golub¹, Dubravka Vitali Čepo¹, Emerik Galić¹, Kristina Radić¹, Ilija Djekic², Nada Smigic²

¹University of Zagreb Faculty of Pharmacy and biochemistry, Ante Kovačića 1, 10 000 Zagreb, Croatia ²University of Belgrade Faculty of Agriculture, Nemanjina 6, 11080 Beograd, Serbia

INTRODUCTION



Tomato is one of the most produced vegetables in the world. Its processing into sauce, paste, juice and other food products, creates a substantial amount of waste in the form of tomato pomace, primarily composed of tomato peel, seeds and small amounts of pulp. Despite being rich in bioactive compounds with significant potential for creating value-added products, tomato pomace is typically discarded in landfills or used as livestock feed and fertilizer. One of the valuable functional ingredients that can be extracted from tomato pomace is

pectin, a cell wall polysaccharide with galacturonic acid backbone which can be methylesterfied and acetylated. Its functionality depends on molecular size and degree of methoxylation, which may vary depending on the source and extraction conditions. In this research we optimized microwave-assisted extraction (MAE) of pectin from tomato pomace using citric acid as solvent.



Figure 1. 3D response surface plot for the effect of time and power on pectin extraction yield at pH 1

	EM (g/mol)	MC (%)	AUA (%)	DE (%)	Yield (%)
MAE (optimal)	779 ± 18	4.8 ± 0.2	50.0 ± 0.9	54.8 ± 1.4	8.8 ± 0.4
CE	940 ± 25	2.4 ± 0.1	32.6 ± 0.4	42.5 ± 1.3	4.8 ± 0.1

CONCLUSIONS

Optimal microwave conditions (12 min/600 W/pH 1) yielded two times more pectin than CE (2 h/85 °C/pH 1.5). The ecological footprint of MAE is lower, as confirmed by LCA (Life Cycle Assessment). Results suggest that MAE can be used as an efficient method for pectin extraction from tomato pomace.

This study was financially supported by the project "Application of sustainable extraction and formulation principles





