## DETERMINATION OF ANTIOXIDANT AND ANTIMICROBIAL PROPERTIES OF APPLE PEEL EXTRACT AS POSSIBLE ADITIVE FOR CHITOSANE BASED EDIBLE COATING

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Nowadays an alternative to plastic packaging is searched in the so called edible coatings for foods, which are biodegradable. Chitosan, a derivative of chitin, is one of the polysaccharides that can be used as edible coating. Various additives are added to the chitosan coating to improve its antioxidant and antimicrobial efficacy.



For the antioxidant activity of apple extracts and chitosan solution the Folin– Ciocalteu method was applied, whereas the antimicrobial activity of apple extracts and chitosan solution was checked by determining the susceptibility of ten Contact e-mail: mojca.kralj@zf.uni-lj.si

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Microbiological analyses

Chitosan edible

Apple extracts from

non commercial

apples

coating

strains of microorganisms to them (CLSI, 2015, inhibition zone, disc method, Table below).

Apple production

Apple extract had inhibitory properties on 40% of the microorg. tested. Chitosan, on the other hand, has shown inhibitory potential against four microorganism *S. sciuri, E. coli* and *M. luteus* and against the yeast *H. Gilliermondii.* Besides, it has shown significantly lower activity of *Penicillium* (t test; p<0,05; 0,038), when the peel of the fruit

Searching alternative to plastic packaging
Preventing rotten

The solution of chitosan and higher concentrations of apple extracts had the best antimicrobial properties against the investigated microorganisms, while the standard

apples

	and meroplation properties against the investigated meroorganisms, while the standard
(apple) was treated with	solution of chlorogenic acid did not have an inhibitory effect on any of the analyzed
chitosan (1% w/w, 2%	microorganisms. On the other hand, the antioxidant efficacy of our apple extracts
acetic acid).	were comparable to the results of studies by other authors. Whereas, chitosan
	solution itself had any antioxidant capacity.

Diameter [mm]	Control	Apple extract (12 mg/g)	Apple extract (6 mg/g)	<b>Chitosan solution</b>
Hanseniaspora Guilliermondii	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	8,0 ± 0,1
Candida intermedia var. intermedia	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1
Saccharomyces cerevisiae	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1
Penicillium expansum	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1
Pseudomonas aeruginosa	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1
Escherichia coli	6,0 ± 0,1	6,0 ± 0,1	6,0 ± 0,1	6,5 ± 0,5
Micrococcus luteus	6,0 ± 0,1	8,5 ± 0,5	6,0 ± 0,1	7,5 ± 0,5
Bacillus cereus	6,0 ± 0,1	6,7 ± 0,5	6,5 ± 0,5	6,0 ± 0,1

