

Patulin accumulation in Croatian traditional apple cultivars

Ante Lončarić^{1*}, Ana-Marija Gotal¹, Martina Skendrović Babojelić², Marija Kovač³, Ante Nevestić³, Bojan Šarkanj⁴, Tihomir Kovač¹, Maria Celeiro⁵ and Marta Lores⁵

¹Faculty of Food Technology Osijek, Josip Juraj Strossmayer University of Osijek, Franje Kuhača 18, HR 31000 Osijek, Croatia

²University of Zagreb, Faculty of Agriculture, Svetošimunska cesta 25, 10000 Zagreb, Croatia

³Inspecto Ltd., Industrijska Zona Nemetin, Vukovarska Cesta 239b, 31000 Osijek, Croatia

⁴Department of Food Technology, University North, Trg dr. Žarka Dolinara 1, 48000 Koprivnica, Croatia

⁵Laboratory of Research and Development of Analytical Solutions (LIDSA) Department of Analytical Chemistry, Nutrition and Food Science, Universidade de Santiago de Compostela, E-15782 Santiago de Compostela, Spain

Penicillium expansum is the most common mold which invades wounded apples, causing blue mold decay and ensuring the production of patulin, a mycotoxin that could lead to acute subacute, and chronic toxic problems. Therefore, European Commission set strict limitations on the residual concentration of patulin in solid apples to 25 µg/kg by Commission Regulation No. 1881/2006. For this reason, the resistance of Croatian traditional apple cultivars was investigated by assessing the accumulation of patulin in Penicillium expansum-infected apples stored at room temperature and its relationship with the polyphenol profile of seven different Croatian traditional apple cultivars. For the research, 1 cm thick apple slices were sterilized and inoculated by 168 hours old P. expansum (CBS 325.48) disc grown on potato dextrose agar in Petri's dish at 29°C. Inoculated apple samples were incubated at 29°C until the P. expansum colony reaches the edge of the apple slice. Polyphenol profile was determined by high-performance liquid chromatography with diode-array detector. After incubation, patulin was detected in four apple cultivars, 'Ivandija', 'Srčika', 'Šampanjka' and 'Božičnica' in amounts of 35.75; 19.35; 18.70 and 18.40 µg/kg, respectively. Patulin content was negatively correlated with procyanidin B1 ($r=-0.652$, $p\leq 0.005$), 4-hydroxycinnamic acid ($r=-0.643$, $p\leq 0.005$) and procyanidin A2 ($r=-0.614$, $p\leq 0.005$). These results suggesting the protective effect of named polyphenols on patulin accumulation in apples. In investigated Croatian traditional apple cultivars, except in 'Ivandija', detected levels of patulin were below limitations (25 µg/kg) set by European Commission for solid apples.

Biography

Ante Lončarić is affiliated from Faculty of Food Technology Osijek, Josip Juraj Strossmayer University of Osijek, Franje Kuhača 18, HR 31000 Osijek, Croatia.