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Introduction

The 25-50% of the total world annually fruit loss is caused by some mycotoxigenic foodborne fungi, mainly by *Penicillium expansum*. Apart from the fact that the contamination with *P. expansum* affects economic losses, it also causes the accumulation of patulin in apple fruit, which negatively affect food safety and human health. Regarding this problem and any possible solutions, attention is drawn to traditional apple cultivars, which contain higher amount of polyphenolic compounds. Such compounds are the bearers of apple resistance to plant diseases, as well as to abiotic stress from various source. Traditional apple cultivars showed great potential for *P. expansum* infection resistance due to higher levels of polyphenols, procyanidins, dihydrochalcones, flavan-3-ols, phenolic acids and flavonols. In this study, we investigate the resistance of Croatian traditional apple cultivars Kleker, Mašanka and Paradija to infection by *P. expansum* experiment was performed after harvesting and after three months storage period. Each traditional apple cultivar samples were analysed by HPLC in purpose of polyphenol profile determination.

Materials & Methods

The 1 cm thick apple slices were sterilised and inoculated by *P. expansum* (CBS 325.48) discs 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 apple slice. After incubation, samples were stored at -80°C. Patulin content was determined in stored samples by UPLC-MS/MS method. Traditional apple cultivars samples Kleker, Mašanka and Paradija were analysed by HPLC method described in Lončarić et al. 2020. Extracts were prepared by MycoSeop[®] 228 AflaPat Multifunctional Columns.

Results

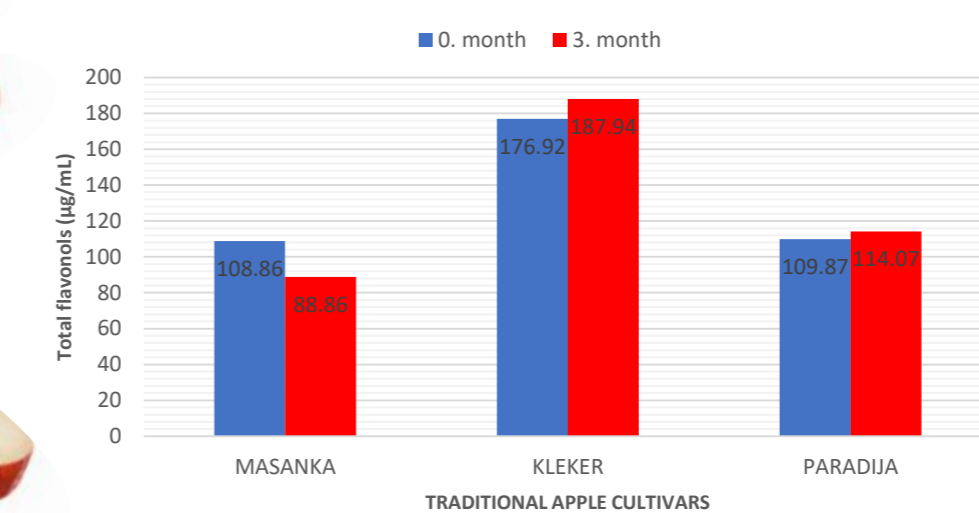


Figure 1: The content of total flavonols in traditional apple cultivars (Mašanka, Kleker, Paradija)

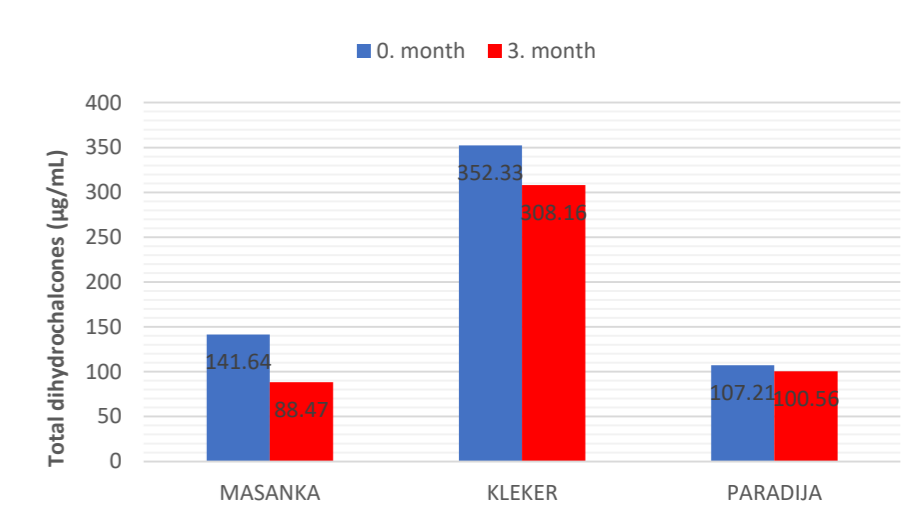


Figure 2: The content of total dihydrochalcones in traditional apple cultivars (Mašanka, Kleker, Paradija)

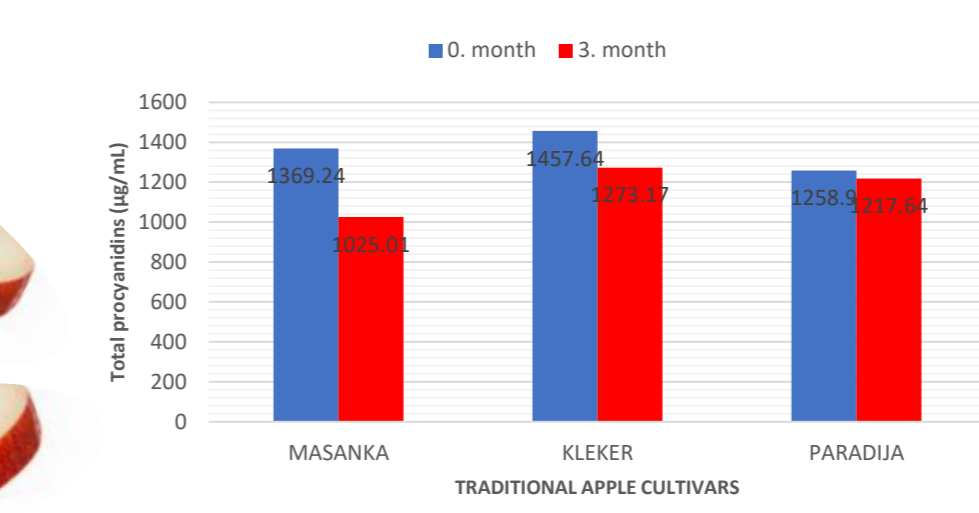


Figure 3: The content of total procyanidins in traditional apple cultivars (Mašanka, Kleker, Paradija)

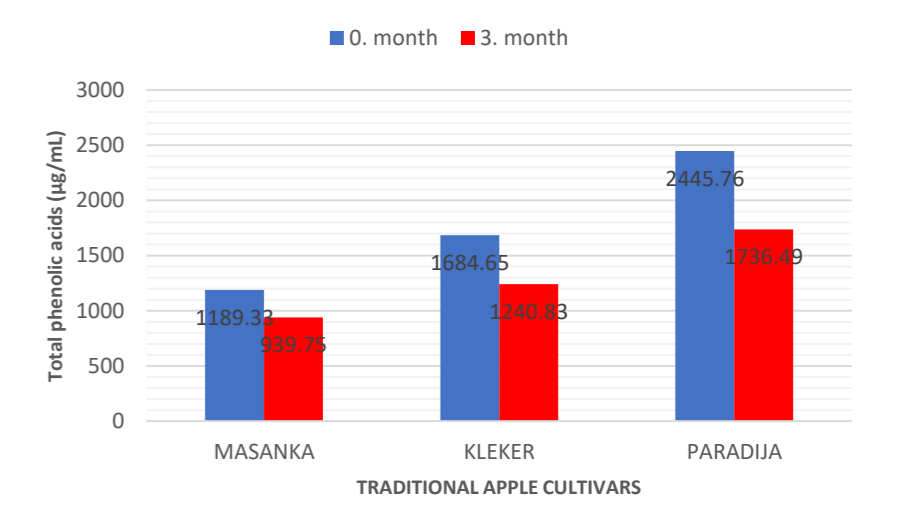


Figure 4: The content of total phenolic acids in traditional apple cultivars (Mašanka, Kleker, Paradija)

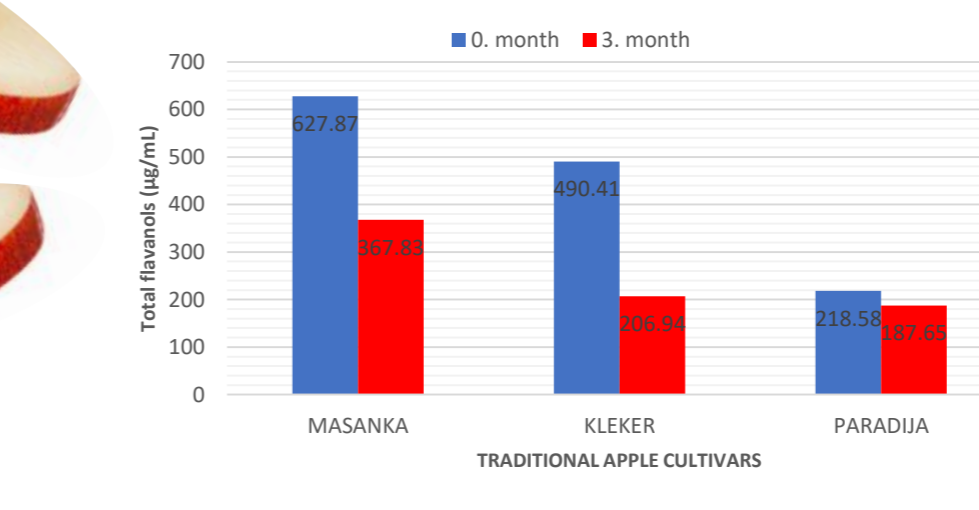


Figure 5: The content of total flavanols in traditional apple cultivars (Mašanka, Kleker, Paradija)

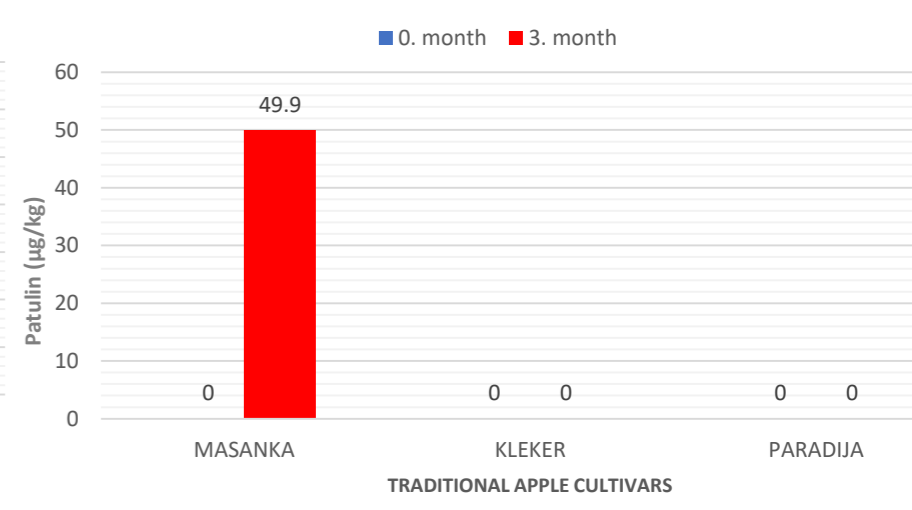
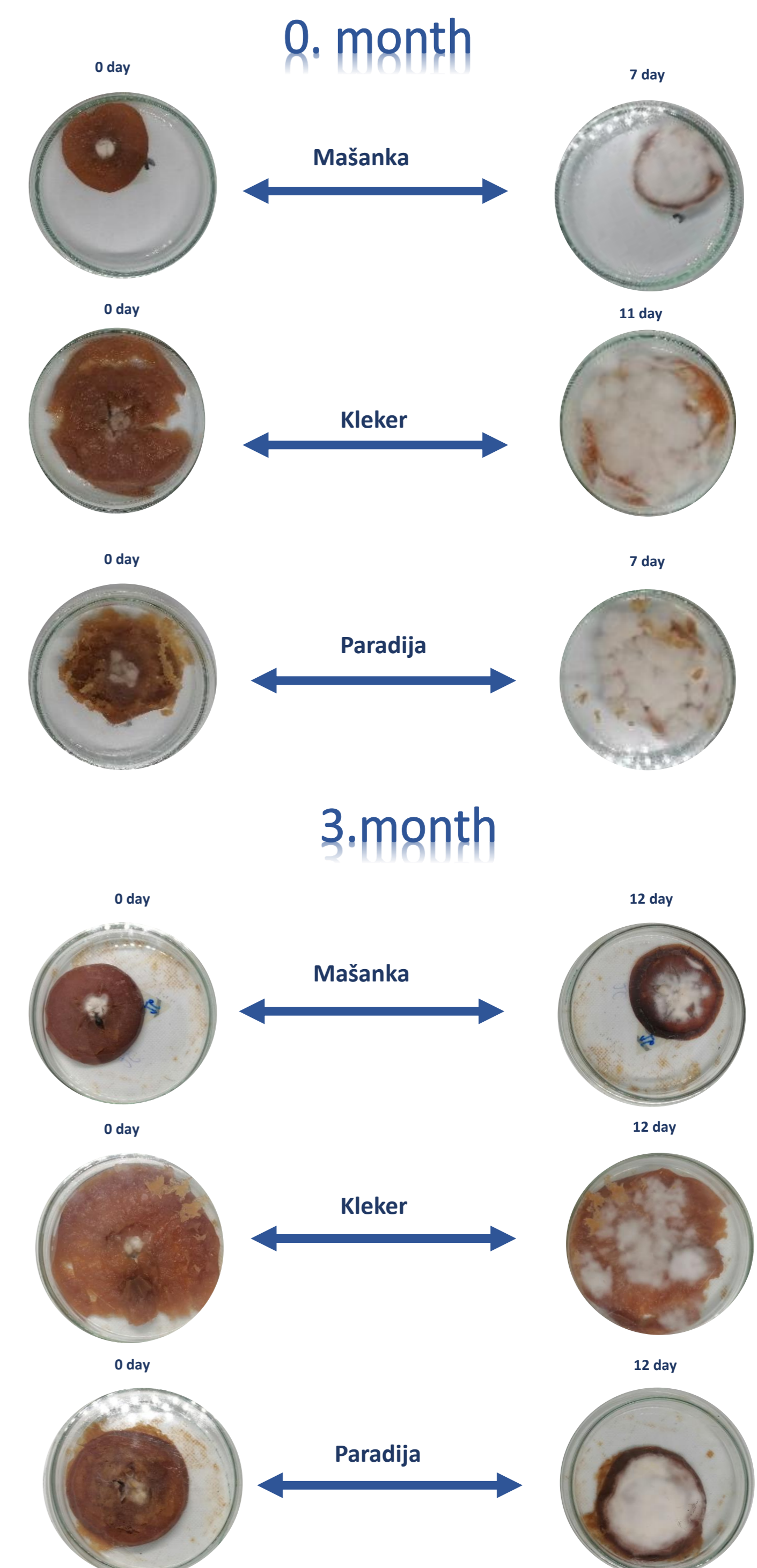
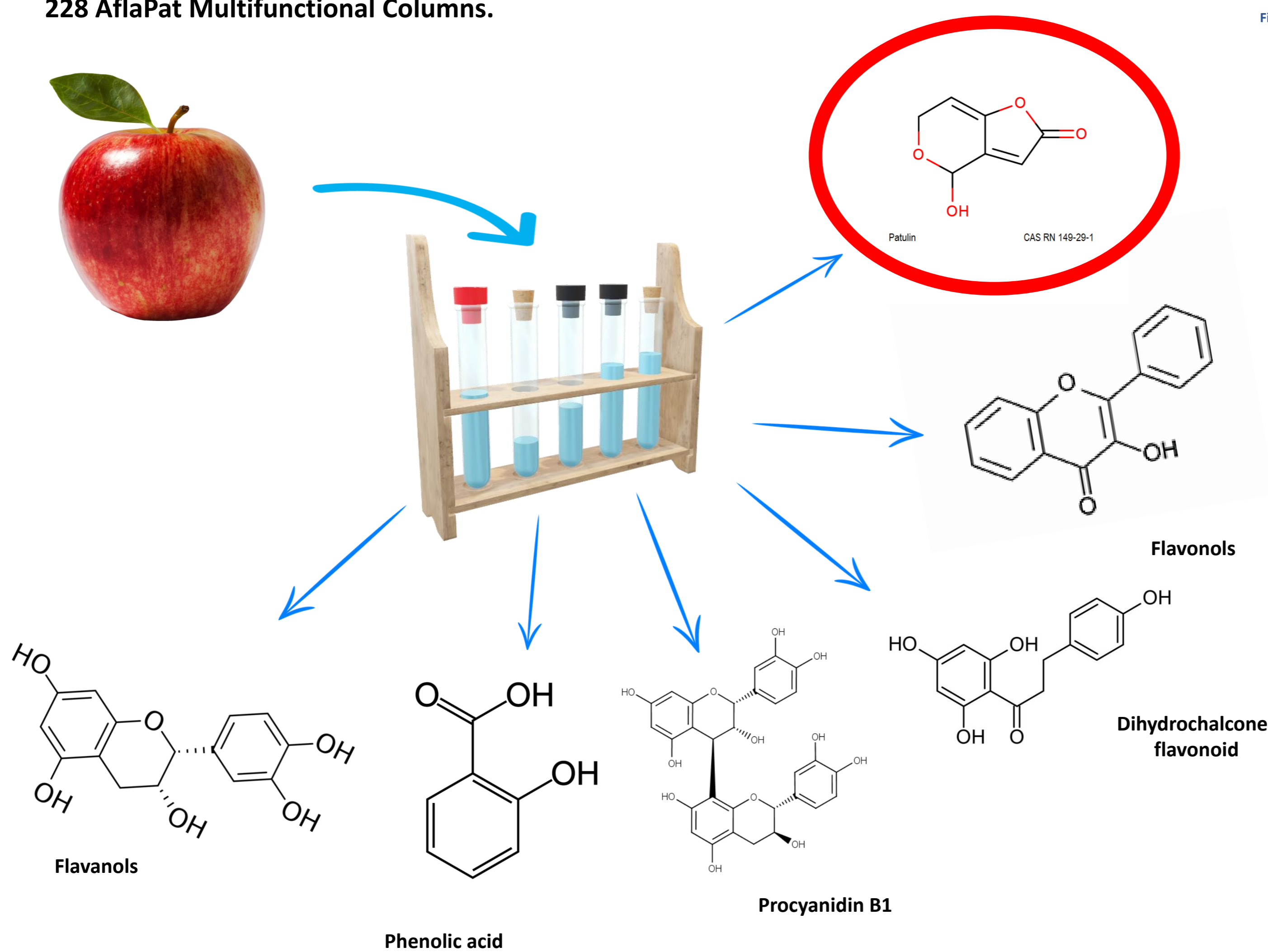


Figure 6: The content of patulin in traditional apple cultivars (Mašanka, Kleker, Paradija)



Conclusion

Results showed that patulin was detected only in Mašanka after three months of storage ($49.90 \pm 3.39 \mu\text{g/kg}$). Furthermore, Kleker had the highest content of procyanidins, dihydrochalcones and flavonols, Paradija had the highest content of phenolic acids and Mašanka had the highest content of flavanols.