Postharvest changes of rapeseed oil quality as affected by storage conditions

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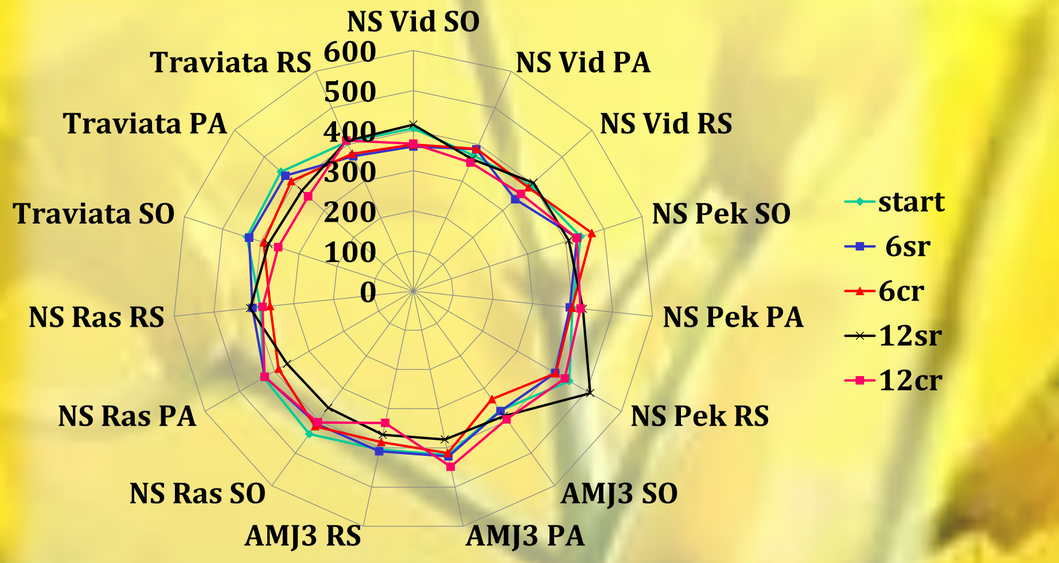
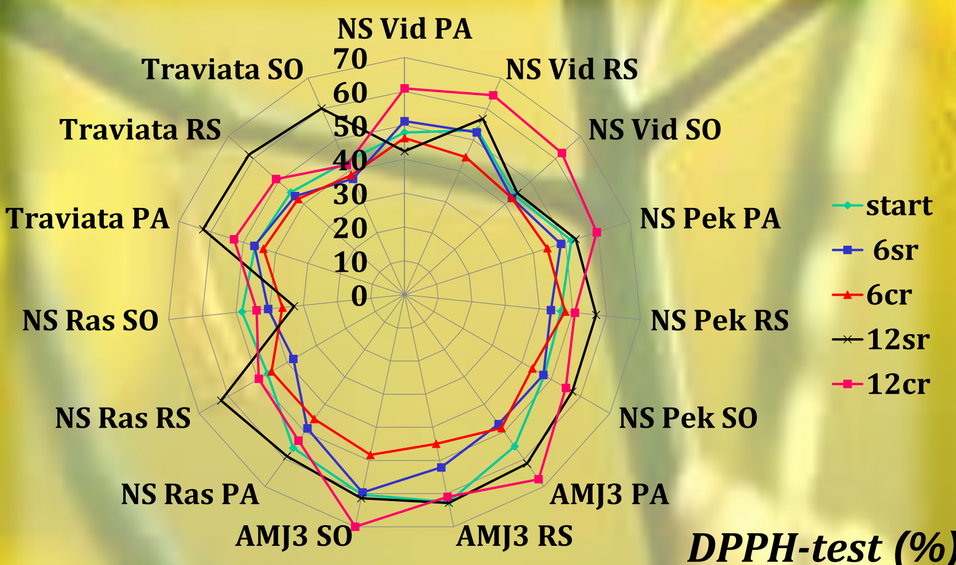
The aim of this study was to test whether variations in storage conditions throughout one year affect quality of oil of five different rapeseed genotypes (NS Vid, NS Pek, AMJ3, Traviata, NS Ras) harvested from three localities in Serbia (PA-Pancevo, RS-Rimski Sancevi, SO-Sombor). Harvested seeds were stored in a cold room (cr) with invariable conditions (4±1°C, 60% humidity) and store room (sr) with variable conditions (up to 5°C higher than environmental). Oil samples were obtained by cold pressing rapeseed 0, 6 and 12 months after the harvest and further analyses were performed to monitor content and composition of fatty acids, tocopherols and antioxidant capacity (2,2-diphenyl-1-picrylhydrazyl radical scavenging activity assay). The fatty acid composition was determined by gas chromatography coupled with a flame ionizing detector after derivatization to their volatile methyl esters. Quantification of tocopherols was carried out using high performance liquid chromatography with fluorescence detection.

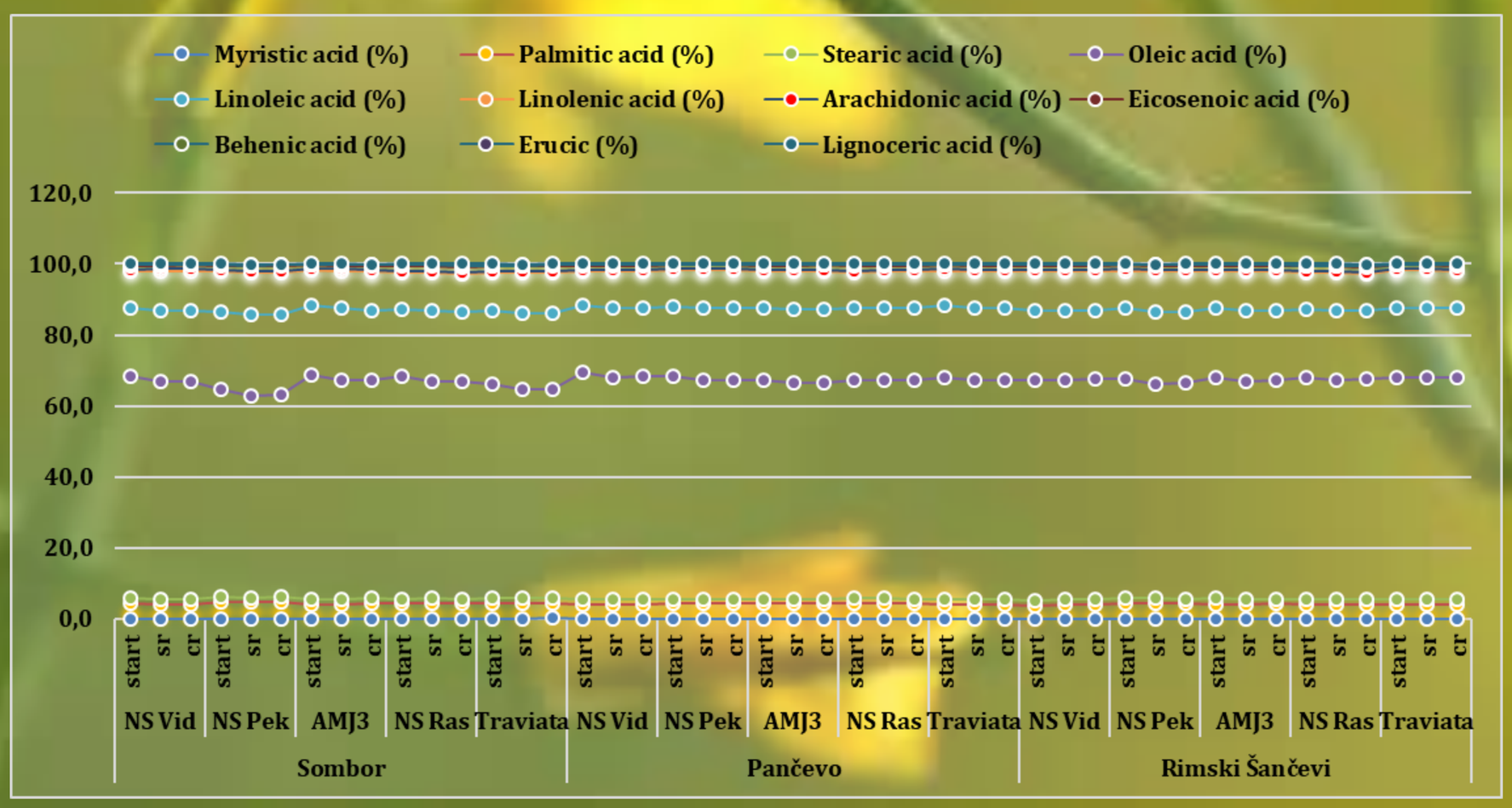


Total tocopherol content (mg/L)



DPPH-test (%)

Genotypes had stable major fatty acids content (linoleic-20%, linolenic-10.5%, oleic-61%, palmitic-4.2%) throughout the year. However, variations were observed in the contents of erucic (0.1%), eicosenoic (1.2%), stearic (1.6%), myristic (0.08%) and lignoceric acids (0.1%) which were higher in oils of Traviata and NS Ras genotypes from Sombor locality mostly stored in the cold room. Antioxidant capacity was in a correlation with total tocopherol content (approx. 391-413 mg/L, α-tocopherol:Ɣ-tocopherol=1:2) and was decreasing during the year. The highest antioxidant capacity had AMJ3 genotype which was constant throughout the year (up to 70% neutralized radicals, depending on the locality). These subtle changes in reserve compounds and oil antioxidant status show that change in rapeseed metabolism during storage is affected not only by storage conditions and genotype, but microclimate at the growing site as well.



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