World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:8, No:09, 2014

Biochemical and Pomological Variability among 14 Moroccan and Foreign Cultivars of Prunus dulcis

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Abstract : Biochemical and pomological variability among 14 cultivars of Prunus dulcis planted in a germoplasm collection site in Morocco were evaluated. Almond samples from six local and eight foreign cultivars (France, Italy, Spain, and USA) were characterized. Biochemical and pomological data revealed significant genetic variability among the 14 cultivars; local cultivars exhibited higher total polyphenol content. Oil content ranged from 35 to 57% among cultivars; both Texas and Toundout genotypes recorded the highest oil content. Total protein concentration from select cultivars ranged from 50 mg/g in Ferraduel to 105 mg/g in Rizlane1 cultivars. Antioxidant activity of almond samples was examined by a DPPH (1,1-diphenyl-2-picrylhydrazyl) radical-scavenging assay; the antioxidant activity varied significantly within the cultivars, with IC50 (the half-maximal inhibitory concentration) values ranging from 2.25 to 20 mg/ml. Autochthonous cultivars originated from the Oujda region exhibited higher tegument total polyphenol and amino acid content compared to others. The genotype Rizlane2 recorded the highest flavonoid content. Pomological traits revealed a large variability within the almond germplasms. The hierarchical clustering analysis of all the data regarding pomological traits distinguished two groups with some particular genotypes as distinct cultivars, and groups of cultivars as polyclone varieties. These results strongly exhibit a potential use of Moroccan-originated almonds as potential clones for future selection due to their nutritional values and pomological traits compared to well-established cultivars.

Keywords : antioxidant activity, DDPH, Moroccan almonds, Prunus dulcis
Conference Title : ICFBT 2014 : International Conference on Food and Bioprocess Technology
Conference Location : Istanbul, Türkiye
Conference Dates : September 29-30, 2014

Open Science Index, Nutrition and Food Engineering Vol:8, No:09, 2014 publications.waset.org/abstracts/13640/pdf