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Effects of Fruit Chilling and Extract Storage on Antioxidant Activity, Total Phenolic and Anthocyanin Content of Four Date Palm (*Phoenix dactylifera*) Cultivars

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Abstract—*Phoenix dactylifera*, or date palm fruits have been reported to contain natural compounds with high antioxidant and antibacterial properties. In this study, the effect of fruit chilling at 4 °C for 8 weeks, extract storage at -20°C for 5 weeks, and extraction solvents (methanol or acetone) on total phenolic content (TPC) and antioxidant activity of Saudi Arabian *P. dactylifera* cv Mabroom, Safawi and Ajwa, as well as Iranian *P. dactylifera* cv Mariami. The storage stability of total anthocyanin content (TAC) was also evaluated, before and after storing the extracts at -20 °C and 4 °C respectively, for 5 weeks. The results showed that Mariami had the highest TAC (3.18 ± 1.40 mg cyd 3-glu/100 g DW) while Mabroom had the lowest TAC (0.54 ± 0.15 mg cyd 3-glu/100 g DW). The TAC of all extracts increased after storage. The chilling of date palm fruits for 8 weeks prior to solvent extraction elevated the TPC of all date fruit extracts, except for methanolic extracts of Mabroom and Mariami. All IC₅₀ values of all cultivars decreased after the fruit chilling treatment. Methanol was a better solvent compared to acetone for the extraction of phenolic compounds in dates. The TPC of all cultivars extracts decreased after 5 weeks of extract storage. IC₅₀ values of all cultivars extracts increased after extract storage except for the methanolic extracts of Safawi and Ajwa. These results could be useful to the nutraceutical and pharmaceutical industries in the development of natural compound-based products.

Keywords— antioxidant activity; total phenolic content; total anthocyanin content; storage; antibacterial activity; *Phoenix dactylifera*.