

Title Seasonal variations in fruit cell membrane properties and long-term quality preservation of semi-dry medjool date fruit

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Abstract

We have previously reported on the correlation between cell membrane composition and quality preservation during long-term storage of semi-dry Medjool date (*Phoenix dactylifera* L.) fruit. The present research examined semi-dry Medjool date fruit collected on several dates along the harvest season. High quality fruit were selected for cell membrane analysis and long-term storage studies. Microsomal and plasma membranes were isolated on the day of fruit collection and the levels of total protein, lipid and phospholipid as well as vanadate-sensitive H⁺-ATPase activity were measured. Fruit quality preservation was assessed after 9-month storage at -18°C or -25°C and 3-week shelf-life period at 25°C. The levels of cell membrane constituents and activity were higher in fruit collected on early dates and declined with the progression in the harvest season. The quality of fruit harvested early in the season was highly maintained during storage at either -18°C or -25°C, whereas, quality preservation in fruit collected late in the season was only achieved when stored at -25°C. The current study supports our earlier proposition that fruit cell membrane integrity plays a major role in quality preservation of semi-dry Medjool date fruit during storage. In light of the results, it may be worthwhile for date packing houses to consider different long-term storage conducts for semi-dry Medjool date fruit collected on different harvest dates to optimize fruit quality preservation.