

EFFECTS OF FREEZING STRESS ON ELECTROLYTE LEAKAGE OF SAFFRON (*CROSVUS SATIVUS* L.) UNDER CONTROLLED CONDITION

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Saffron (*Crosvus Sativus* L.) is a perennial plant that belongs to Iridaceae family and reproduces by corms. A great part of the saffron's growing season is expose to winter cold and frost, although, there is a little information about the response of saffron to freezing stress. In order to evaluate the effect of freezing stress on leaf and corm electrolyte leakage of three saffron ecotype (Ghaen, Kashmar and Torbat heydarieh) a factorial experiment based on completely randomized design with three replication was carried out under the controlled conditions in the Faculty of Agricultural, Ferdowsi University of Mashhad in autumn, 2009. Plants were grown in natural conditions to acclimate with the growth condition and then, they transferred to the thermogradient freezer with the six freezing temperature (0, -4, -8, -12, -16, -18, -20 °C). Cell membrane integrity of leaf and corm was measured by electrolyte leakage (EL) index and the lethal temperature 50% (LT50) was determined according to the electrolyte leakage. The results showed that electrolyte leakage and LT50_e were significantly affected by experimental treatments. The highest and lowest electrolyte leakage was observed in the Kashmar ecotype at -20 °C and in the Torbat heydarieh ecotype at 0 °C. Leaves and corms of saffron showed significant differences in electrolyte leakage. The highest and lowest electrolyte leakage percentage was observed in the leaf and corm at -20°C and 0°C, respectively. There were significant differences among saffron ecotype's LT50_e. The lowest and highest LT50_e was observed in Torbat heydarieh, and Kashmar, respectively. There were significant correlation ($r=0.82^{**}$) between electrolyte leakage percentage and corm's LT50_e where by decrease in electrolyte leakage, ecotypes' LT50 also decreased. Among all ecotypes, Torbat heydarieh ecotype showed the lowest electrolyte leakage percentage, lowest LT50_e and it is the most tolerant ecotype to freezing stress.