GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Short Communication

Proline accumulation is a general response to abiotic stress in the date palm tree (*Phoenix dactylifera* L.)

M.W. Yaish

Department of Biology, College of Science, Sultan Qaboos University, Muscat, Oman

Corresponding author: M.W. Yaish
E-mail: myaish@squ.edu.om

Genet. Mol. Res. 14 (3): 9943-9950 (2015)
Received May 13, 2015
Accepted July 22, 2015
Published August 19, 2015
DOI http://dx.doi.org/10.4238/2015.August.19.30

ABSTRACT. Plants exposed to certain abiotic stress conditions tend to produce the amino acid proline, which acts as an active osmolyte, a metal chelator, an antioxidant, and a signaling molecule. There is increasing evidence that proline accumulates in plants due to a wide range of abiotic stress, in particular high soil salinity and drought. Therefore, proline content is often used as a marker-assisted breeding tool aimed at improving drought and salinity tolerance. In this study, it was investigated whether proline accumulation in date palm (*Phoenix dactylifera* L.) seedlings occurs solely due to high salinity and drought stresses or due to other unspecified abiotic stresses, including salinity and salinity shock, drought, extreme temperatures, and abscisic acid. The free proline assays revealed that this amino acid over-accumulated in the roots and leaves of each stress-treated plant, and was remarkably high when leaves were exposed to suboptimum temperatures and salinity stress. These results indicate that the production of proline is a common response to various abiotic stresses and its differential accumulation cannot be used as a molecular marker in date palm breeding programs aimed at improving drought or salinity

tolerance traits in date palms. This conclusion is consistent with the theory that the molecular outcomes of abiotic stresses are often non-specific.

Key words: Proline; Salinity; Abiotic stress; *Phoenix dactylifera* L.

