

A comparative anatomical study of date palm vitroplants

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ABSTRACT

Because the rate of survival of tissue culture-derived date palm plantlets (vitroplants) in acclimatization stage is significantly low, this study was suggested in order to focus on the anatomical structures of roots and leaves of date palm vitroplants. The obtained data showed the complete absence of vascular elements in roots of some sorts (clones) of vitroplants; meanwhile in other clones, the vascular elements were found to be in early stages of development. Anatomical variations were also recorded in leaf topography and anatomy among different clones of vitroplants originated from the same explant and subjected to the same media regime. The recorded anatomical variations and the poor development of vascular elements and consequently poor connection and transportations of water, solute, mineral and gases within the vascular elements, may be involved in severe wilting of date palm vitroplants in acclimatization stage. Accordingly, it could be suggested that successful acclimatization of date palm vitroplants starts in rooting stage in vitro.

Key words: Date palm, vitroplants, acclimatization.

INTRODUCTION

As a result of its multipurpose uses, tolerance to extremely adverse environmental conditions and low cultivation and harvesting costs, compared with other fruit crops, date palm is the most important fruit crop in Middle East, North of Africa and is the major plantation crop in some Arabic countries, such as Saudi Arabia (FAO, 1984). Unfortunately, insufficient number of offshoots resulting from the mother tree through the traditional vegetative propagation hinders the expansion of date palm-cultivated area. Moreover, the long life cycle of palm tree makes its improvement through traditional breeding programmes a tedious endeavour (Moursy and Saker, 1998). Accordingly,

employment of recent advances in plant biotechnology, including plant tissue culture, marker assisted selection (MAS) and transformation, seem to be the appropriate solution for quick propagation, selection of new date palm breeds and production of pest auto-resistance varieties (Saker and Moursy, 2003).

Although, date palm is considered a recalcitrant monocot plant to respond to *in vitro* conditions, extremely high number of successful attempts were made on its *in vitro* propagation (for instance, Tisserat, 1982; Dass et al., 1989; Bhansali et al., 1988; Zaid and Hughes et al., 1995; Bekheet and Saker, 1998 and El-Bahr et al., 2003a&b). However, the applicability of the published results is rare due to low percentage of survival and development in the acclimatization stage.