

## Effect of Fluraton and male cultivar on embryonic development of flowers of date palm (*Phoenix dactylifera* L.) C.V. 'Barhee'

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This study explores the influence of Fluoraton treatment and male cultivar selection on the embryonic development of offshoot flowers in tissue-cultured date palms (*Phoenix dactylifera* L.), specifically focusing on the 'Barhee' cultivar. Female offshoots, derived from tissue culture, were subjected to inoculation with two male cultivars, namely Al-Ghanamy Al-Akhdar and a male-seed strain. Concurrently, Fluoraton treatment, administered at concentrations of 0, 0.3, and 0.6 g L<sup>-1</sup>, was applied to the female inflorescences. Microscopic examinations unveiled significant impacts on pollen tube development, fertilization, and embryonic sac growth. These findings offer valuable insights into optimizing the pollination process, ultimately leading to enhanced fruit production. The study underscores the significance of employing Fluoraton treatment and selectively choosing certain male cultivars over others for the pollination of female cultivars, given their pivotal role in expediting the early ripening of fruits. Notably, the male was utilized in the pollination process independently of the female variety, as no discernible differences were observed between the flowers of the two female cultivars.

**Keywords:** Fluraton, male cultivar, embryonic development, flowers, date palm, Barhi.

### INTRODUCTION

The date palm is one of the most important plant species in the Areaceae family, which includes more than 200 genera and 2,500 species. It is also the most beneficial plant family for humans after the Gramineae family. The order Arecales, to which the date palm belongs, is one of the most important known plant orders, as many types of palms belong to it. The date palm belongs to the genus *Phoenix* and the species *dactylifera* (EL-Hadrami and EL-Hadrami, 2009; Jain *et al.*, 2011). Since the date palm is dioecious and unisexual, the male flowers are borne on one tree and the female flowers on another; therefore, pollination must be done artificially to ensure good fruit production.

Pollen grains represent an important and fundamental role in setting and forming fruits, as the date palm is characterized by its high ability to respond to the source of pollen, not only for its stallion but also for other stallions that do not belong to its kind (*dactylifera*), but perhaps its response was greater (Derhab, 2004). This is what Al-Najjar, (2014) found in terms of significant differences in the degree of response of female cultivars to different male cultivars, represented by the time of fertilization, fruiting characteristics, and the studied productivity. The chemical and physiological changes that

fruits go through during the stages of growth and development are considered among the scientific bases upon which it has relied to explain many of the physiological and chemical phenomena that accompany the development and growth of the fruit, as well as relied upon to determine the date of maturity and attainment of the fruits (Ibrahim, 2001).

When used in low concentrations, growth regulators are non-nutrient organic compounds that promote, inhibit, or modify physiological processes. They may occur naturally in plants or be synthesized in a laboratory. They also play an important role in the plant's response to external environmental factors. Auxins are the first and most important group of plant growth regulators, which increase growth irreversibly along the longitudinal axis when added in low concentrations (Trivellini *et al.*, 2015). Auxins regulate a large number of growth and maturation processes, stimulate cell division and elongation, as well as stimulate rooting, enhance pollen germination, and pollen tube growth, improve fruit settling and growth, and the formation of maiden fruits in plants through the effect of auxins in increasing the transport of nutrients and vitality (Sotomayor *et al.*, 2012).

Fluraton (fanphthyl acetamide, acetic acid) is a plant growth regulator that improves the effect of other plant hormones, stabilises flowers, and increases their knot and fruit

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