

## A hormonal study of the phenomenon of parthenocarpic fruits in the date palm *Phoenix dactylifera* L. of the Barhi cultivar derived from tissue culture

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### Abstract

Phytohormones play a pivotal role in the growth and development of plants, including date palms. This study investigates the dynamics of four key hormones—indole-3-acetic acid (IAA), gibberellic acid (GA3), abscisic acid (ABA), and kinetin (Kin) across various developmental stages (pre-flowering, flowering, and fruiting) in three date palm phenotypes: phenotype derived from tissue culture and producing abnormal fruits (shees), phenotype derived from tissue culture and producing normal fruits (normal), and phenotype propagated by offshoots and producing normal fruits (vegetal). The results showed that IAA and GA3 levels in leaves exhibited a significant decline in the shees phenotype, while the normal and vegetal phenotypes displayed decreases from the pre-flowering to flowering stages, followed by increases in the fruiting stage. Interestingly, the vegetal phenotype showed a unique rise in IAA and GA3 levels during the fruiting stage. In flowers and fruits, the normal phenotype consistently exhibited the highest IAA and GA3 levels, while the shees phenotype displayed the lowest. Conversely, ABA levels showed distinct patterns among the phenotypes. The shees phenotype exhibited a sharp increase from pre-flowering to flowering, followed by a slight decrease in the fruiting stage. The normal phenotype displayed a significant decrease from pre-flowering to flowering, with a slight increase in the fruiting stage. The vegetal phenotype maintained relatively constant ABA levels. Kinetin levels displayed variations, with the normal phenotype consistently showing the highest