

# **Optimizing a Sustainable and Cost-effective DNA Extraction Method from Dry Date Palm Leaves**

**Ahmed Yousef Lafta Hzaa <sup>a\*</sup>**  
**and Aqeel Hadi Abdulwahid Al-Amiry <sup>b</sup>**

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## **ABSTRACT**

Palm date *Phoenix dactylifera* L. is considered a vital economic fruit tree in Iraq, where its cultivation is of great importance. The extraction of DNA from palm tissues poses significant challenges due to the plant's tough tissue structure and high levels of phenolic and polysaccharide compounds, which hinder DNA isolation efficiently. This study presents an effective method for DNA extraction using Cetyl Trimethyl Ammonium Bromide (CTAB) without the need for liquid nitrogen. A simple and reliable protocol has been developed for isolating DNA from the leaves of six different varieties of palm dates. The resulting DNA showed high concentration and purity, ranging from 567.6 to 1047.1 ng/µL, and 1.82-2.00 nm, respectively. The quality of the extracted DNA was verified using four SSR-PCR markers, which produced 61 clear bands. Our results indicate that this modified CTAB-based method is highly suitable for extracting DNA from palm date tissues without the need for liquid nitrogen, providing a simplified and effective approach for molecular biology applications in date palm research, and this advancement facilitates more accessible and efficient genetic studies of date palms and potentially other plant species with similar extraction challenges.

**Keywords:** Date palm; CTAB; liquid nitrogen; SSR.

## **1. INTRODUCTION**

Date palm (*Phoenix dactylifera* L.) is the most extensively cultivated fruit tree plant in extremely arid and semi-arid regions due to its socio-economic and

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<sup>a</sup> Department of Marine Biology, Marine Science Centre, University of Basrah, Iraq.

<sup>b</sup> Department of Horticulture, College of Agricultural, University of Basrah, Iraq.

\*Corresponding author: E-mail: ahmed.lafta@uobasrah.edu.iq