

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقراص المدمجة قد أعدت دون أية تغييرات



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IDENTIFICATION OF SOME VARIETIES OF PALM TREES USING BARCODE GENE

By

Hagar Hani Abdel-Hamed Hemeda

B. Sc. Agri. Sci. (Biotechnology), Fac. Agric., Cairo Univ., 2013

THESIS

**Submitted in Partial Fulfillment of the
Requirements for the Degree of**

MASTER SCIENCE

In

**Agricultural Sciences
(Genetics)**

**Department of Genetics
Faculty of Agriculture
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Format Reviewer

Vice Dean Graduate Studies

APPROVAL SHEET

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APPROVAL COMMITTEE

Dr. NEVEEN ABD EL-FATAH HASSAN.....
Head Research, National Gene Bank, Agriculture Research Centre

Dr. SALAH EL- DIN SAYED EL- ASAAL.....
Professor of Genetics, Fac. Agric., Cairo University

Dr. SHEREEN ABU EL-MAATY MOHAMED.....
Associate professor of Genetics, Fac. Agric., Cairo University

Dr. MONA HASHEM AHMED HUSSEIN.....
Professor of Genetics, Fac. Agric., Cairo University

Date: / / 2021

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SUPERVISION COMMITTEE

Dr. MONA HASHEM AHMED HUSSEIN
Professor of Genetics Department, Fac. Agric., Cairo University

Dr. SHEREEN ABU EL-MAATY MOHAMED
Associate Professor of Genetics, Fac. Agric., Cairo University

Dr. EZZ EL-DIN GAD-ALLAH HUSSEIN
Head Researcher, Central laboratory of Date Palm Research and
Development, Agricultural Research Center

Name of Candidate: Hagar Hani Abdel-Hamed **Degree:** M.Sc.
Title of Thesis: Identification of Some Varieties of Palm Trees Using
Barcode Gene
Supervisors: Dr.Mona Hashem Hussein
Dr.Shereen Abu EL-Maaty
Dr.Ezz El-Din Gad-Allah Hussein
Department: Genetics **Date:** / /

ABSTRACT

In last decade, date palm has been considerable undergo to intensive molecular and cytogenetic studies. In recent years a new technique 'DNA barcoding' was suggested to identify animal and plant species. The consortium for the Barcode of Life's Plant Working Group selected some markers from chloroplast genes as Ribulose-1,5-Biophosphate Carboxylase/Oxygenase Large Subunit (*rbcL*), maturase K (*matK*), RNA Polymerase β subunit (*rpoB*), Acetyl-coenzyme A carboxylase carboxyl transferase β subunit (*accD*) and Internal Transcribed spacer (*ITS*) from nuclear genome. In the present study, six different varieties of dates, viz. Hayani, Sakkoty, Gondila, Bartamoda, Malkaby and Amhaat were sequenced for *rbcL*, *matK*, hypothetical chloroplast reading frame 5 (*ycf5*), an intergenic spacer a region of non-coding DNA between two genes (*psbA-trnH*) and *ITS* genes for being used as barcode in date palm. Bioinformatics tools were used to establish its potential as a DNA barcoding of Egyptian date palm varieties. One variety (Bartamoda) has been used for studying the somaclonal variation during tissue culture technique and chromosomal aberrations in micropropagated plant and seeds of mother plant, and analyzing its karyotype. The results showed that the nuclear *ITS* marker was failed to amplify well, and suggested that it is not existed in the palm genome. While tested chloroplast *matK*, *rbcL*, and *ycf5* markers have successfully amplified products and were more informative than the *psbA-trnH* chloroplast DNA marker, which was failed to amplify and resulted in distinct double bands in all cultivars, except Gondila. Sequencing and phylogenetic trees were constructed on the basis of the *matK*, *rbcL*, and *ycf5* markers, and the results suggested that the *matK*, *rbcL*, and *ycf5* can be used for determining the levels of genetic divergence and for identification of Egyptian date palm. The cytological studies showed that there were high similarity among the micropropagated plantlets and seeds of mother plant.

Key words: Date palm, *Phoenix dactylifera*, DNA Barcoding, *rbcL*, *matK*, *ycf5*, *psbA-trnH*, Chromosomal aberrations

DEDICATION

*I dedicate this work to my mother **Mona Sayed** for all the support she lovely offered during my post- graduate studies and my father **Hani Abdel-Hameed** who passed away, I may didn't get How much I loved you, I have got to stop the tears, keep my faith and be strong, I will try to take it all, even though it's so hard, but I want you to be sure that the only thing that kept me going is you, I want you to be proud of me even if you can't be here. May Allah have mercy on your soul. Special deep appreciation is given to my sisters and my brothers for their continuous patience, support, and love throughout this process I never have done it without you, thank you.*

