

**DETERMINATION OF i) SUGAR BY LANE AND EYNON'S
TITRATION METHOD, ii) ESSENTIAL AND NON ESSENTIAL MINERALS
BY ATOMIC ABSORPTION SPECTROSCOPY (AAS) AND
INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION
SPECTROSCOPY (ICP-OES) IN DATES**

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OCTOBER 2009

ACKNOWLEDGEMENTS

Assalamualaikum w.b.t.

First and foremost, I wish to extend my deepest gratitude and profound appreciation to my main thesis supervisor, Prof. Madya Zuraidah bt Abdullah Munir and Prof. Madya Badariah Abu Bakar from the Chemistry Department, Faculty of Applied Sciences, Universiti Teknologi MARA, for her invaluable supervision. Also heartfelt thanks to my second examiner, Pn. Mashita Abdullah.

A note of thanks also goes to Pn. Norajulie Mat Jamin and Pn. Che Wan Juliana Wan Jaafar laboratory staff (Laboratory 602) for her assistance in the course of my work. A special note of gratitude also goes to En. Kamarudin b. Ismail and En. Zubir b. Othman for his invaluable advice and support.

To all my close friends, Farah Nadia binti Mahamad Ta'an, and Ainujariah Abd. Rahman, for their support. My sincere appreciation also extended to my UiTM colleagues who had supported me.

Finally, I am especially grateful for the support I received from my family. They have been very patient and considerate for in my entire life. Especially, my mother, who always offered me support in my study and my life.

Thank you.

Nurul Aida bt Mohamed

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ABSTRACT

DETERMINATION OF i) SUGAR BY LANE AND EYNON'S TITRATION METHOD ii) ESSENTIAL AND NON ESSENTIAL MINERALS BY ATOMIC ABSORPTION SPECTROSCOPY (AAS) AND INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION SPECTROSCOPY (ICP-OES) IN DATES

In this study, the concentration of essential and non-essential minerals such as calcium, and magnesium in dates from different origins was determined by using inductively coupled plasma-optical emission spectroscopy (ICP-OES) and atomic absorption spectroscopy (AAS). The sample was bought in market around Selangor. The sample was digested by using process of wet – ashing method. Mixed acids of HNO₃ (10 mL, 14.40 M) and H₂SO₄ (10 mL, 17.83 M) let stand over night. Dates from Saudi Arabia showed the higher concentration of calcium (434.1±88.52 mg/kg) and magnesium (409.6±5.48 mg/kg). It can be concluded that, the ICP-OES and AAS method showed significant different by using T test (comparing 2 experiment means) because the value of *t* test of Ca and Mg > 2.57, indicated at the 95% confidence level. Besides that, the sugar content was analyzed by Lane and Eynon's titration method. Fehling's solution was used in determination of percentages of reducing sugar and total sugar in dates from different origins. Dates from Madinah showed the highest percentages of reducing sugar, 2.94% and total sugar, 7.35% compared to Makah, Saudi Arabia, Iran and Egypt.

CHAPTER 1

INTRODUCTION

1.1 Background

Dates are fruits grown in sub-tropical and desert areas throughout North Africa, the Arab states, California, and Australia. The dates are traditionally used to prepare a wide range of different products such as date juice concentrates (spread, syrup and liquid sugar), fermented date products (wine, alcohol, vinegar, organic acids) and date pastes for different uses (bakery and confectionary). Within agricultural systems date press cake (by-product of date juice production) as well as date pits can be used as animal feed-stuff (also dates falling down from palms before maturity).

In Al-Qur'an, dates and date palms have been mentioned for 20 times. Allah S.W.T recommended the eating of dates, as indicated in a beautiful passage of the Al-Qur'an stated below,

"Then We brought forth for you there with gardens of date-palms and grapes, wherein is much fruit for you, and where of you eat."

(Surah Al-Mu'minun, Verse 19)