

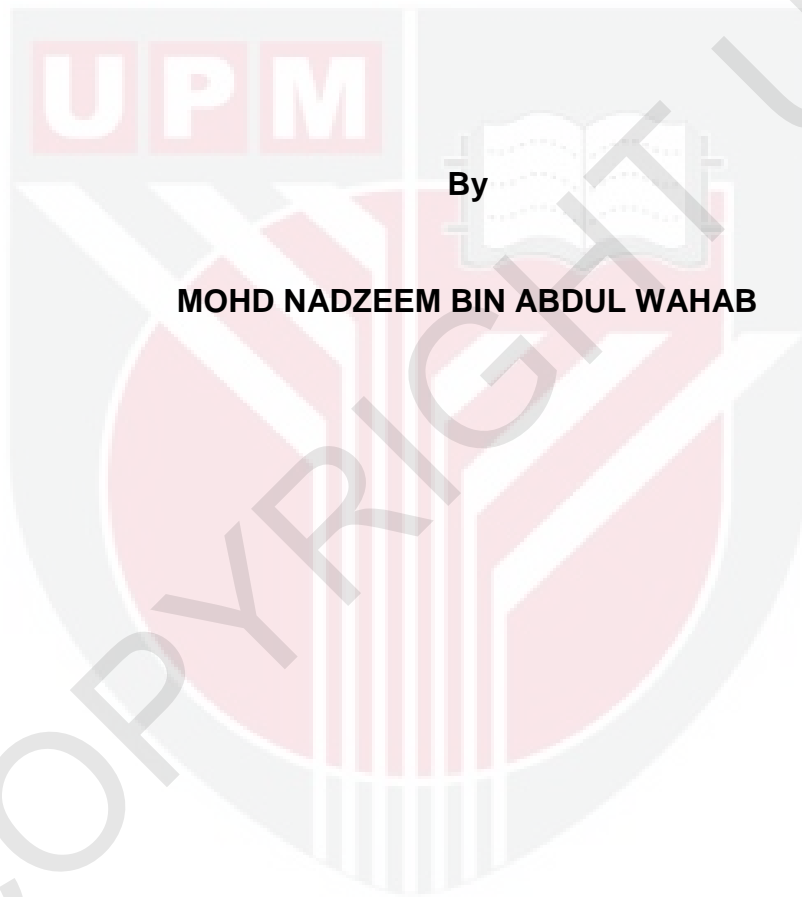


***EFFECT OF DIFFERENT SHADING LEVELS ON *Ficus carica*  
PHYSIOLOGY***

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**FH 2019 39**

**EFFECT OF DIFFERENT SHADING LEVELS ON *Ficus carica* PHYSIOLOGY**



By

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**A Project Report Submitted in Partial Fulfilment of the Requirements  
for the Degree of Bachelor of Forestry Science in the  
Faculty of Forestry  
Universiti Putra Malaysia**

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## DEDICATION

**For my beloved family:**

Abdul Wahab Bin Ahmad

Salinah Binti Kipli

To all my friends,

My supervisor Prof. Dr. Ahmad Ainuddin Bin Nuruddin,

Thank you for your encouragements supports

And the sacrifices that you have given.

Thank you for everything. May Allah Bless All of us.

## ABSTRACT

*Ficus carica* is a deciduous shrub or small tree in the Moraceae (mulberry family) that originated in the Mediterranean, was domesticated over 6,000 years ago as one of the most ancient fruit crops. However, the growth of *F. carica* in indoors is unknown either the physiological properties of the *F. carica* shows difference or not. Therefore, this study was carried out in Universiti Putra Malaysia to elucidate the growth of two *F. carica* variation which is Masui Dauphine and Improved Brown Turkey in two different shading levels which is shaded and not shaded area. Tree growth data is measured by diameter 2cm from tree ground and height in every weeks for about a month and finally the physiological changes of the *F. carica* in two variation and two shading levels is measured by LICOR 6400. The results shows a difference in between light intensity and the growth of each variations. Hence, *F. carica* has a potential to grow in indoors.

## ABSTRAK

*Ficus carica*, pokok ara biasa atau pokok ara, adalah pokok renek atau pokok kecil di Moraceae (keluarga mulberi) yang berasal dari Mediterranean, dipelihara lebih dari 6,000 tahun yang lalu sebagai salah satu tanaman buah yang paling purba. Walau bagaimanapun, pertumbuhan *F. carica* di dalam kawasan terlindung daripada cahaya tidak diketahui sama ada sifat fisiologi *F. carica* menunjukkan perbezaan atau tidak. Oleh itu, kajian ini dijalankan di Universiti Putra Malaysia untuk membincangkan pertumbuhan dua variasi *F. carica* iaitu Masui Dauphine dan Improved Brown Turkey dalam dua tahap teduhan yang berbeza iaitu teduh dan tidak teduh. Data pertumbuhan pokok diukur dengan diameter 2cm dari tanah dan ketinggian dalam setiap minggu selama sebulan dan akhirnya perubahan fisiologi *F. carica* dalam dua variasi dan dua tahap teduhan diukur oleh LICOR 6400. Hasilnya menunjukkan perbezaan antara keamatan cahaya dan pertumbuhan setiap variasi. Oleh itu, *F. carica* mempunyai potensi untuk hidup di dalam kawasan yang mempunyai kurang cahaya.

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## APPROVAL SHEET

I certify that this research project report entitled “The Effect of Different Shading Levels on *Ficus carica* Physiology” by Mohd Nadzeem has been examined and approved as a partial fulfillment of the requirements for the degree of Bachelor of Forestry Science in the Faculty of Forestry, Universiti Putra Malaysia.

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Prof. Ahmad Ainuddin Bin Nuruddin  
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Assoc. Prof. Dr. Azlizam Aziz  
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Date: June 2019

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## LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
IBT	Improved Brown Turkey
MD	Masui Dauphine
SD	Standard Deviation
MS	Mean Square
UPM	Universiti Putra Malaysia
INTROP	Institute Tropical Research and Forest Product
SAS	Statistical Analysis system
CO <sub>2</sub>	Carbon Dioxide

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

*Ficus carica* is known as common fig or just fig, is an Asian species of flowering plants in genus Moraceae. This genus is an important genetic resource due to its high economic and nutritional values and also an important part of the biodiversity in the Mediterranean ecosystem (Mawa *et al.*, 2013). It is grown since 4000 B.C. Turkey, Spain, Italy, Greece, Portugal, Algeria and Turkistan are the countries which are growing fig is on a commercial basis (Hiwale, 2015). In addition to this, it is cultivated in countries like Australia, California, New Zealand, and India. Turkey is the leading country producer with 26% of world production. The importance of this fruit as food can hardly be overemphasized. *Ficus carica* is a gynodioecious (dioecious), deciduous tree or large shrub, growing to a height of 7-10 meters with smooth white bark. Its aromatic leaf are 12-25 cm long and 10-18 cm wide (Crisosto & Kader, 2007).

Light has long been known to be the most important factor influencing plant growth, with changes in irradiance having impacts on plant growth, morphology, and anatomy, various aspects of physiology and cellular biochemistry, and ultimately, flowering time and plant productivity (Lambers *et al.*, 2008). Whole-plant energy capture depends not only on the photosynthetic response of individual leaves, but also on their integration into an effective canopy, and on the costs of producing and maintaining their photosynthetic capacity (Givnish, 1988).

The shading levels also give very significant different among the list of plant life rate of photosynthesis which some plant might endure at very low covering and several plants can make it through at high shading level (Sedigheh Rezai et al.,2017). The survivability of the plant to the different shading level is determined by the types of the plants itself which is some plant life are shade tolerant and some plant are light demanding which give the attribute to the plant for adapting different shading environments (Sedigheh Rezai et al.,2017). Furthermore, the figs plant is usually is one of the first plant that was grown by humans. Back in about 9400 B.C. were the first cultivated plant life before other cultivated vegetation is introduced, which is wheat, barley and dried beans. The figs can develop wild in dry and sunny areas, with profound and fresh soils also in rocky areas (Hiwale, 2015).

## **1.2 Justification / Problem Statement**

The Figs produces high valuable fruits and the trees are commonly produce fruit about two or three times yearly. Hence, the knowledge of how to grow and produce very high quality of *Ficus carica* are limited in this country. To makes it more clearly, the research has been conducted to investigate the following research question:

- Can figs be planted indoors where light level may be low?
- What is the most suitable shading level for the growth of the figs plant?

In Malaysia, the *Ficus* plant were least studied but the popularity of the plant is increasing variously among the people especially *Ficus carica* which produces delicious fruits and the value of the fruits is high values in the market. Thus, this study was conducted to get the most suitable environment for the *Ficus carica* to grow by analyzing the growth pattern which is the diameter, height and the rate of photosynthesis of the tree,

### **1.3 Objective**

The main objective of this study was to investigate the effect of different shading levels on *Ficus carica* physiology.

The specific objectives of this study was:

- I. To determine the physiological effect of two levels of shading on *Ficus carica*
- II. To compare the physiological changes in the figs at every shading level.

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