

UNIVERSITI TEKNOLOGI MARA

**LIGHT INTENSITY AND MARKET
WASTE COMPOST EFFECTS ON
THE GROWTH PERFORMANCE OF
Andrographis paniculata (Burm.f.) Wall.
ex Nees PLANTED IN POLYBAG AND
FIELD**

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ABSTRACT

In the modern world today, the demand for traditional herbs which are free from agrochemicals as medicines is high. This study focused on evaluating the growth, yield and active compound of *Andrographis paniculata* (hempedu bumi), which is well known as a traditional herb and commonly used by the village folk to treat various diseases. A total of two experiments were carried out, each was based on a split plot design. The first experiment was on the crop production using polybags in the greenhouse while the second one was repeated as a field experiment. Seedlings of six to seven weeks from seed sowing were transplanted to the polybags or field beds for experimentations. In each experiment, 100% relative light intensity (RLI) and 50% RLI achieved with commercial 50% shade netting were assigned as the main plots and fertilization treatments were the sub plots within each RLI plot. Compost prepared from market wastes of fresh fish refuse of gills and internal organs, dumped or rotting brassica vegetables and expired or dumped bread was tested on the plants at 0, 25, 50, 75 and 100 g per plant, and compared with 5 g of NPK green per plant. Each treatment was replicated five and four times for polybag and field experiments, respectively. Planting distance between plants was 30 cm. Plants were harvested at eight and twelve weeks after transplanting (8 WAT and 12 WAT), respectively. Results showed that the plants grown at 100% RLI had better branching, leaf development, stem diameter, biomass and leaf andrographolide content while plant height, leaf area, chlorophyll and carotenoid content were significantly higher in the plants raised under 50% RLI in both polybag and field experiments at 8 WAT and 12 WAT. In combination with 100% RLI, application of 100 g market waste compost was generally the best for enhancing the growth, biomass and active compound in this medicinal herb, even compared with nitrophoska green (15:15:15). Plants were recommended to be harvested at 12 WAT when flowering had just started. Field cultivation of this medicinal plant was better in terms of yield and andrographolide content in comparison with polybag plants. This study also showed that it was viable in terms of biomass and active compound content to cultivate *A. paniculata* without inorganic fertilization. It is hoped that this research work can also contribute to greater height in organic farming, especially in medicinal plant production.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF PLANT

Malaysia is a country with tropical climate. Its average temperature is 27 °C and average rainfall is 2,500 mm annually. Malaysia also receives adequate sunshine throughout the year for plant growth. Such climatic conditions allow many plant species to thrive in the forests or even in the bushes. According to Ministry of Natural Resources and Environment (2014), there are approximately 15,000 flowering plants throughout Peninsular Malaysia. About 2,000 of these plants have medicinal and therapeutic substances that can promote human health. Research has been done on some of these medicinal plants, followed by promotion of their herbal products. Some products have even fetched high market values as there is high demand for the products.

Medicinal and aromatic plants are reported to be currently used by high percentage of world population for their medicinal and therapeutic effects (WHO, 2002; Ekor, 2014; Martins and Brijesh, 2018). Before modern civilization, medicinal plants or herbs were main sources for medicines to treat the diseases and illness. In modern days now, people living in villages are still depending on wild herbs as their medicinal sources to treat or cure the sick folk as these rural or undeveloped areas have difficult access to modern medical centres. Villagers are dependent on the wild herbs that can be obtained from the jungles or bushes around their villages. In some cases, local people collect the wild herbs to sell in the market as their source of income (Jamal, 2006; Ong et al., 2011). Due to economic values, some medicinal herbs such *Eurycoma longifolia* or commonly known as Tongkat Ali, *Orthosiphon stamineus* or Misai Kucing by its local name, *Andrographis paniculata* with local name of Hempedu Bumi, *Labisia pumila* with common name of Kacip Fatimah, and many more, have been planted by the farmers recently as they have high values and demands in local markets.

Andrographis paniculata (Burm.f.) Wall. ex Nees is one of the widely recognised valuable traditional herbs that has received a big interest in local farming context. It is one of the nineteen species of the *Andrographis* genus which is indigenous to India (Bhattacharya et al., 2012). This medicinal plant is an active constituent in many