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EFFECT OF PLANT HORMONE CONCENTRATION ON KINSENOSIDE PRODUCTION IN *ANOECTOCHILUS FORMOSANUS* PLANTLETS

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ABSTRACT

Orchids are recognized as the rich sources of natural compound, particularly for medicinal uses. One of the orchid species well-known for medicinal uses is *Anoectochilus formosanus*. This orchid species is largely distributed in Taiwan and can be found in all regions around the world excluding Antarctica and hot deserts. A research finding justifies kinsenoside as the major compound responsible for its pharmacologic properties (Hsieh *et al.*, 2011). It is also being called "King of Medicine" because of its diverse pharmacologic effects such as cancer prevention, liver protection and diabetes and for prevention of cardiovascular disease (Hossain, 2011). However, this species is at the risk of extinction due to the high demand of their pharmacologic compound and low propagation rate (Ket *et al.*, 2004). Hence, this research aims to observe the differences of kinsenoside production by *in vitro A. formosanus* plants at different concentrations of a plant growth regulator (6-Benzylamino purine/BAP) to determine the accurate concentration to maximize the valuable compound production and sustain their population. BAP hormone regulator was used because of its ability as an abiotic elicitor to stimulate morphological changes in a psychological or developmental processes. Using tissue culture techniques, *Anoectochilus* plantlets were grown on media supplemented with various concentration of BAP (0, 1.0, 2.0 and 4.0 mg/mL) in replicates for each concentration and harvested on day 0, 14 and 28. Based on this research, it was found that media supplemented with 4.0 mg/mL BAP was the most favourable by the *in vitro Anoectochilus formosanus* plantlets to produce more kinsenoside over time. While none of the BAP concentrations leads to the changes of morphology and growth of the plantlets since there was no shoot production and plantlet length increment throughout the short duration of studies (28 days).

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Orchidaceae or orchid is an enormous group family of the flowering plants which has 25 000 – 35 000 species (Hsieh *et al.*, 2010). It becomes one of the two largest families of flowering plants which ranks second to Asteraceae family. In addition to that, new species are being reported in both of the latter families at a rate of roughly 500 per year (Chase *et al.*, 2015). The plants from this family can live more than two years up to 15 years and they are called perennial plants because of their long lifespan. Orchidaceae favoured living in the tropical and subtropical region where there are warm and moist seasons throughout the year so orchids are distributed globally in a non-uniform pattern. Collectively, the diversity of species rises towards the tropic; where almost 73 percent of the family constituted by the epiphytic species. A study states that the greatest number of species which is about 3000 species was found to be in Columbia followed by Ecuador and Brazil which both having 2500 species (Pant, 2013).

Orchids are recognized as the rich sources of the natural compound. Various metabolites and extracts obtained from the various species of orchids are found to treat many diseases such as anti-osteoporosis, anti-fatigue and hepatoprotection (Hsieh *et al.*, 2010). An