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CALLUS INDUCTION AND CYTOTOXIC ACTIVITIES OF *DENDROBIUM LEONIS* TOWARDS MCF 7 BREAST CANCER CELL

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ABSTRACT

Dendrobium leonis is a valuable plant that facing extinction. Preservation of this beautiful creature should be done to ensure their existence in this world. Therefore, this study was conducted in order to find suitable media for induction of callus from *D. leonis*. Besides that, this study was performed to study the cytotoxicity effect of *D. leonis*. The approach to propagate the plant in this study was by using Plant Tissue Culture technique. There were 4 different media used. The plant was cultured on Murashige and Skoog medium that supplemented with different concentration of plant growth regulators which were peptone and casein hydrolysate. For cytotoxicity test, breast cancer cell, MCF 7 was treated for about 72 hours with stem and leaves extract from *D. leonis*. The cell viability was determined by using MTT assay. Unfortunately, there was absent of callus on the media after 3 times of repeated experiment using plant tissue culture technique. Contamination by bacteria and fungi occurred on the plant culture. After saving the plant through a few of sterilization techniques, the contamination still happened. Furthermore, the result of antiproliferative properties of extract showed that increase in concentration of extracts inhibit the cancer cell line. The average of IC_{50} in 3 times of trials for stem and leaves extracts were 394.5 µg/ml and 778.78 µg/ml respectively. Further studies should be performed to prevent the contamination from happened and verify the preliminary data from cytotoxicity test for *D. leonis* extract.

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CHAPTER ONE

INTRODUCTION

1.1 Background of study

The largest sources flowering plant is come from orchidacease family (Rusea et al., 2009). There are many genus in orchid family. One of them is Dendrobium. Dendrobium that is concerned is *Dendrobium leonis* (Lindl). It also known as Aporum Leonis Lindl. (Chin & Tan, 1998).

Orchid has widely used as source of medicine since long time ago especially in Chinese medicine. It is distributed as herbal product. Herbal product is commonly suitable as consumption of food than medicine (Christopher J Bulpitt et al., 2007). Therapeutic properties of the plant is depends on its chemical constituents. As for Dendrobium, it consists of alkaloid, aromatic compounds, polysaccharides and sesquiterpenoids. Dendrobium species gives many medicinal activities such as neuroprotective, anti-cancer, anti-cataract, immunomodulatory, antioxidant and hepatoprotective (Xu et al., 2013). The species such as *Dendrobium candidum* also able to nourish *yin,* enhance the production of body fluid, comforting the stomach and withdrawing heat (Li, Zheng et al., 2004).