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EFFECTS OF *TINOSPORA CRISPA* CALLUS EXTRACT ON LIVER CANCER (HEP G2) CELL LINE

SHAZANA BINTI DAUD

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ABSTRACT

Tinospora crispa is a climbing shrub that is usually grown in the Asian tropical region. *T. crispa* plant has claimed to have many benefits and has been used for many therapeutic purposes such as antidiabetic and antihypertensive. A previous study also showed that *T. crispa* natural plant has anticancer activity towards human cancer cell lines such as breast and liver cancers. So far, no research was done on investigating the anticancer properties of *T. crispain vitro* cultures. Therefore, this study was conducted to investigate the effect of *T. crispa* callus against liver cancer cell lines (Hep G2) since the plants grows faster using propagation technique. *T. crispa* callus growth was induced by using eight different concentrations medium that contain different concentrations of 6-benzylaminopurine and was supplemented with fixed concentration of 1-napthalene acetic acid. The results of this study showed that the *T. crispa* callus was able to grow, however the callus die after subculture process. This might be due to exposure to the contamination during subculture procedure. The callus used for treatment against liver cancer cell was selected only from certain concentration of media that are media B (MS+0.5mg/L BAP+ 0.25mg/L NAA), F (MS+4.0mg/L BAP+ 0.25mg/L NAA), G (MS+6.0mg/L BAP+ 0.25mg/L NAA) and H (MS+8.0mg/L BAP+ 0.25mg/L NAA). The liver cancer cells (Hep G2) was then treated with different extract concentration of *T. crispa* callus that is combined from selected medium concentration which then incubated for 96 hours. MTT assay was carried out and the plates were then read by plate reader. The results obtained showed that the higher concentration of treatment, the lower percentage of cell death. However, the reliability of data needs to be improved since only one replicate was done to test on Hep G2. Further study should be done to obtain more reliable result.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Tinospora crispa is a herb that usually grows in the Asian tropical region (Abu *et al.*,2013; Koay & Amir, 2013). It is known by many various local names such as Makabuhai in Philippines and Patawali in Malaysia. *T. crispa* is a climbing shrub with heart shape and thin leaves and the stem is a bit corky and has large lenticels (Yusuf *et al.*,1999). The plant contains bitter taste which is a combination of metabolite compounds of columbine, alkaloid and a glucoside (Nidhi *et al.*, 2013).

T. crispa is a well-known traditional herb with many therapeutic purposes in many countries such as Malaysia, Philippine and Thailand. It has been used as malaria treatment agent, to relieve aches and pain and as an anti-diabetic agent.A study showed that *T. crispa* extract on diabetic mice stimulated insulin production(Lokman *et al.*, 2013). It is also has significant effects on thiacetamide-induced hepatotoxicity in rats with liver cirrhosis(Kadir *et al.*,2011). *N* trans-feruloyltyramine and secoisolariciresinol in *T. crispa* are antioxidant properties which more potent than synthetic antioxidant butylhydroxytoluene(BHT)(Koay & Amir, 2013). The findings revealed high potential of the plant as an anticancer agent which is required for more investigation in this study.