



**STUDY OF *DIOSCOREA HISPIDA* INDUCED  
HEPATOTOXICITY IN MATERNAL RATS**

**By,**

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## ABSTRACT

### Study of *Dioscorea Hispida* Induced Hepatotoxicity in Maternal Rats

*Dioscorea hispida* Dennst (*D. hispida*) commonly known as Asiatic Bitter Yam or 'Ubi Gadong' is known as a poisonous plant. It contained a water-soluble alkaloid of dioscorine, which may induce health complications if ingested in large amounts without proper processing. The present study aimed to determine the effects of *D. hispida* on the liver tissues of maternal rats through oxidative damage and lipid peroxidation. The hepatotoxicity effects of *D. hispida* was determined by using 20 Sprague Dawley rats consists of control group and three supplemented groups of *D. hispida* at different concentrations of 500, 1000 and 2000 mg/kg (n=5) with Superoxide Dismutase (SOD) inhibition activity and the direct quantitative measurement of Malondialdehyde (MDA) level. The results revealed that there were no significant difference in SOD inhibition activity (%) and MDA level in all groups (P>0.05). Nevertheless, this present study has proved that the decreased of the antioxidant defence and increase to lipid peroxidation do relate to the involvement in *D. hispida* induce oxidative stress production. In conclusion, the supplementation of *D. hispida* may induce liver oxidative stress injury to maternal rats, however the toxicity may not give a major role in damaging the liver tissues.

Keywords: *D. hispida*, hepatotoxicity, Malondialdehyde, Superoxide dismutase

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

*Dioscorea hispida* (*D. hispida*) is one of the economically edible starchy sources of food for many people in the tropical and subtropical regions. It provide daily nutrient energy source as it is rich in proteins and many dietary minerals. Study done by Theerasin & Baker, (2009) have found that the *D. hispida* tuber contains of various components, such as carbohydrate, lipids and protein. Despite of being use a sources of food, the resistant starch contained in *D. hispida* has been found to reduce the liberation and absorption of glucose in the lower parts of the human gastrointestinal tract thus making the *D. hispida* tuber's as one of the digestive property in reducing the risk of obesity, diabetes and other related diseases (Kumoro, Retnowati, & Budiayati, 2011). Nevertheless, *D. hispida* is well known as a poisonous plant as it contain a water-soluble alkaloid of dioscorine (Ashri, Yusof, Jamil, Abdullah, Yusoff, Arip & Lazim, 2014). The behavioral studies have found that dioscorine may lead to dizziness, nausea, vomiting, and later sleepiness in humans while pharmacological studies have revealed that dioscorine express the mydriatic activity, hyperthermia and central nervous system stimulation (Sasiwatpaisit, Thitikornpong, Palanuvej, & Ruangrungsi, 2014). As a consequences, the dioscorine contain in *D. hispida* may induce health complications if ingested in large amounts without proper processing.

Oxidative damage is related with the yielding of reactive oxygen species (ROS) where it seems to have the ability to induce alterations of genetic material either by oxidizing specific DNA-bases or indirectly oxidize proteins or lipids which is crucial in maintaining the function of individual cells (Theerasin & Baker, 2009). There might be the possibility of *D. hispida* can increase the ROS production and induce oxidative stress in liver. As a result, overproduction of ROS then may either trigger lipid peroxidation or DNA damage, or in worst can lead to conditions such as aging, mutagenesis or even carcinogenesis thus causing harm to liver. However,