



***DIOSCOREA HISPIDA* SUPPLEMENTATION-INDUCED HISTOLOGICAL  
CHANGES IN MATERNAL RAT'S LIVER AND PLACENTA**

**By**

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## ABSTRACT

### ***Dioscorea hispida* Supplementation-Induced Histological Changes in Maternal Rat's Liver and Placenta**

*Dioscorea hispida* (*D. hispida*) is a well-known poisonous wild tuber plants used as food in Malaysia. The study regarding *D. hispida* intoxicating effect on liver and placental tissues including its safety for consumption require investigation. Therefore, this study was aimed to investigate the effect of *D. hispida* supplementation on maternal rat *via* histological examination of the maternal rat's liver and placenta. A total of 30 pregnant Sprague-Dawley rats were divided randomly into five groups (n=6) consists of a negative control group and four *D. hispida* supplementation groups. The negative control group rat's was administered with distilled water while the rats in other four groups were supplemented with increasing dosage of *D. hispida* aqueous extract; 250 mg/kg, 500 mg/kg, 1000 mg/kg, and 2000 mg/kg *via* oral gavage. The supplementation was given during organogenesis period and euthanization was done on day 21. Both tissues were harvested and routinely processed for histological examination. The liver weight of rats in all supplemented groups were increased with only rats of 2000 mg/kg *D. hispida* extract group showed significant liver weight increment compared to control group ( $p < 0.05$ ). The placental weight of rats in 250 mg/kg, 500 mg/kg and 1000 mg/kg extract supplemented groups increased with reduction of placental number compared to control but not significantly difference. Placental weight of rat in group 2000 mg/kg extract decreased compared to control with presence of unformed placenta. Photomicrograph of maternal rats' liver and placental tissues in all supplemented groups showed significant morphology changes especially at dose 2000 mg/kg extract indicating possible toxic effect of the extract on the liver and placenta. Histological examination of maternal rats' liver in all supplemented groups undergo degeneration which characterized by hepatocyte swelling, cytoplasmic vacuolation, cytolysis, margination and clumping of nucleus chromatin. The placental histological examination of the maternal rats in all supplemented groups presented changes of the basal and labyrinth zone. The glycogen cells were reduced with fibrin deposition in the basal zone while in the labyrinth zone, there were irregular vessel formation in the extract supplemented groups. In conclusion, *D. hispida* plant aqueous extract exerted histological changes in maternal rat's liver and placenta tissues which indicate that this extract potentially gives deleterious effect to both tissues.

**Keywords:** *Dioscorea hispida*, placenta, liver, maternal rats, histological changes

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Plants are related to people daily life for many usage such as food, clothing, accommodation, healthcare, decoration, ceremonies and cultures. This relationship has developed since the living of those primitive and aboriginal people (Nashriyah *et al.*, 2012; Schultes, 1992). When human civilization grows, the knowledges about plant were discovered and people can categorized the plant according to their usage by identifying their contents and benefits (Dutta, 2015). Some of plants has been categorized as medicinal plant due to their potential in healthcare while some of them are used as food. For example, roots and tubers has been used as food source since ancient time during war, drought and food deficiency. They has been used for these purposes because of their carbohydrate, nutritious contents including their easy cultivating and harvesting processes (Cahyo Kumoro, Susetyo Retnowati, & Sri Budiayati, 2011). One example of wild tubers that has been used majorly as food is plant come from *Dioscoreaceae* family with approximately over 600 species are edible to be consumed (Ashri *et al.*, 2014).

*Dioscorea hispida* (*D. hispida*) is a starchy, poisonous wild tuber and food plants grows wildly in a few tropical regions of the world such as Indonesia, Thailand and Malaysia including Southeast Asia. In Malaysia, it is abundantly found Terengganu. It is originated from family of discoreaceae of *Dioscorea* species (Hudzari, Ssomad, M. Rizuwan, Asimi, & Abdullah, 2011; Nashriyah *et al.*, 2012) and commonly known as tropical yam, wild tuber, *Ubi Gadong*, or intoxicating yam. This yam is usually used by people as staple food because of its starch content (Tajuddin, Mat, Yunus, & Shamsul Bahri, 2013) and its easy cultivation process. Research also has reported that some people consumed this yam as traditional medicines to treat diabetes and eyes (Nashriyah *et al.*, 2011) because of good properties such as analgesic, anti-inflammatory, pro-oxidant and anti-tumor