

## ACUTE TOXICITY TEST OF SKIN MANGOSTEEN (*GARCINIA MANGOSTANA* L.) AND HISTOPATHOLOGIC STUDY OF LIVER

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### ABSTRACT

The purpose of writing was to examine the toxicity acute mangosteen skin (*Garcinia mangostana* L.) and histopathologic study of liver. Animals in this study was 2 weeks old chickens with an average weight of 500 grams were divided into the test group; distilled water (blank), doses of 250, 500.1000, 2000.4000 mg/kg body weight. Chicken were housed in individual cages and given food and drink ad libitum. Acute toxicity tests performed on experimental animals. Giving the toxic dose in the treatment group performed one (single dosage) by intragastric using a stomach tube. The control group was force-fed with physiological saline. Acute toxicity tests performed on experimental animals. Giving the toxic dose in the treatment group performed one (single dosage) by intragastric using a stomach tube. On histopathological examination of liver in the test toksikasi mangosteen rind extract the microscopic changes that occur are cell degeneration and necrosis of hepatocytes. In the treatment group occurred degeneration that occurs in hepatocyte cell degeneration grained and hidrops. Extract of mangosteen rind has a broad safety index and does not cause high mortality in administration. Mangosteen rind extract that does not cause cellular toxicity reaction in the delivery of 100 doses

**Key word:** Mangosteen Skin, Acute Toxicity and Histopathology

### INTRODUCTION

Natural plant materials used in the treatment both as a medicine and medicinal materials showed an increasing trend in their use. Increased use of these showed increased public confidence in the efficacy and safety that is no longer based solely on traditional empirical experience, but has the support of scientific data based on the research. The use of natural ingredients of herbal medicine is now divided into three sections, namely as herbs, standardized herbal preparations. In the era of advanced as today, a variety of foods consumed by humans. Chemotherapeutics (drugs) is marketed and consumed freely by the public. Consumption of drugs that are not followed by an understanding of the risk of negative effects like an iceberg. One is the consumption of paracetamol. Paracetamol or acetaminophen is the drug that is most in demand and most widely consumed by people other than Amoxicillin. Whenever suffering from fever, paracetamol is definitely going to be the drug most wanted to lose body heat. Indiscrimination use is a risk of liver damage.

Traditional medicine is commonly called the herbal medicine is a medicine which is basically a crude drug material and the weave is very simple, with boiled or brewed with hot water, as well as its use was based on hereditary experience, and have no guarantee of the quality control aspect. Another use is as an herbal preparations standardized, namely the preparation of herbal medicines base ingredients is no longer simple, but extracts of which the quality and levels can be controlled, efficacy and safety have been through testing preclinical form of testing in experimental animals, as well as the chemical content of the active has been able to set (Moeljanto and Mulyono, 2003).

The use of herbal preparations that have undergone and passed the clinical testing and with which guarantee quality is equivalent to synthetic drugs, so dosage of plant origin that is no longer an alternative in the treatment, but it becomes an equal partner of synthetic drugs in the formal health care system (Moeljanto and Mulyono, 2003).

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Mangosteen (*Garcinia mangostana* L.) is known as "The Queen of Tropical Fruit" because of the special and various properties owned. Aside from being antiluka, fruit mangosteen peel extract is also known to have various activities such as antioxidant, antitumor, hypo-allergenic, anti-inflammatory, antibacterial, and antiviral. Mangosteen rind has also been widely used in the treatment of diarrhea, dysentery and chronic ulcers (Cheville, 2008).

In this study will test the ability of mangosteen rind in alleviating liver damage / inflammation resulting from the use of paracetamol by using experimental animals (hepatoprotective effect). Hepatoprotective drug is a compound which can provide protection to the liver from damage caused by toxins, drugs, and others. The liver is a unique organ, the unit functional cells called hepatocytes he is not able to renew damaged cells. Even so, for most of the liver cells are in a fine state of the liver can carry out its function as a whole.

The purpose of writing is to examine the toxicity acute skin mangosteen (*Garcinia mangostana* L.) and histopathologic study of liver.

## **MATERIALS AND METHODS**

### **Mangosteen Extract**

The skin of the mangosteen fruit is obtained mostly from sellers mangosteen in the district Sukadana Ham. The skin of the mangosteen fruit is collected and dried in the sun but covered with black cloth. Drying is done until dried mangosteen rind is marked by the skin can be broken by hand. The next stage is the drying oven. This process uses a heating 60-70°C for 2 days. Heating with moderate temperatures meant that in addition to the mangosteen peel dry but the essential elements are easily separated by heating is not easily broken. Oven drying process is done by reversing the mangosteen rind every day once. In this process akhirr obtained mangosteen skin is completely dry and can be mashed into powder / powder. Flouring is done with the grinder to be a size 40 or smaller mash. The smaller size will allow the extraction process more perfect.

The extraction process in the first year this is a solvent extraction process with water. The water used is water that has been deionized. Flour / powder mangosteen rind weighed as much as 100 grams. Followed by a maceration process for 24 hours with 100 ml of water. Making the extract can do multiplication as needed. The extract obtained is then evaporated in an oven at a temperature of 45 to 50 °C to have a volume of approximately 10 mL. The extract is further cooled at room temperature. With this method of extraction of water can be used as a pure extract or stock.

### **Experimental animals**

Animals in this study was 2 weeks old chickens with an average weight of 500 grams were divided into the test group; distilled water (blank), doses of 250, 500.1000, 2000.4000 mg; kg weight tubuh.ayam housed in individual cages and given food and drink adlibitum

### **Acute toxicity test**

Acute toxicity test is conducted on hewancoba. Giving the toxic dose in the treatment group performed one (single dosage) by intragastric using a stomach sonde. The control group was force-fed with 1 ml physiological saline. Before the first force-fed experimental animals were fasted for 24 hours. Observation of clinical symptoms and death carried out for 48 hours (Harnita and Radji, 2005). At the end of the study all the test animals sacrificed his life and dinekropsi

### **Histopathological observation**

Treated and control animals were observed for 48 hours. The organ is the liver observed. For microscopic examination (histopathology / HP) samples of liver were fixed in formalin normal buffer solution (BNF) 10%, dehydrated with various concentrations of alcohol, clearing in xylol and diembedded in paraffin. The tissue samples were cut with a thickness of 5 µm and preparations stained with hematoxylin eosin (HE). Microscopic examination performed by calculating the percentage of cell degeneration and necrosis of hepatocytes.

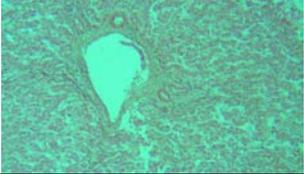
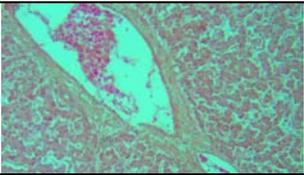
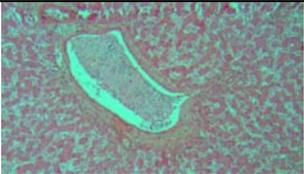
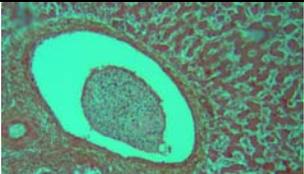
**RESULTS AND DISCUSSION**

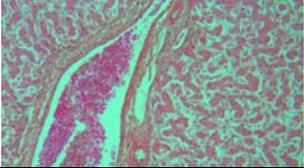
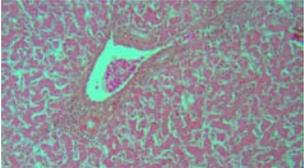
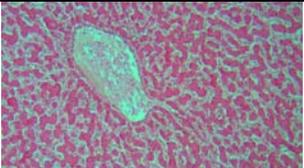
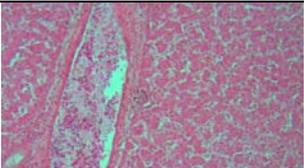
The range of provision of security (safety dose) in the provision of mangosteen peel is very long. It can be seen from the testing of acute toxicity in Table 1. In awarding up to 7x of doses did not cause death in experimental animals.

Table 1. Acute toxicity test of mangosteen skin in different doses

Doses/log	Blank	1x	2x	3x	4x	5x	6x	7x
Death	0	0	0	0	0	0	0	0
Criteria	Non toxic							

On histopathological examination of liver in the test toksikasi mangosteen rind extract the microscopic changes that occur are cell degeneration and necrosis of hepatocytes. In the treatment group occurred degeneration that occurs in hepatocyte cell degeneration and hidropis grained. In the control group was found hepatocyte cell degeneration with mild degree. Degeneration is one of the earliest occurrence of liver damage due to toxins and non-fatal damage is reversible and normal cells can be restored if kausanya removed (Husadha, 1996). If exposure to toxic substances in the cells was great enough or lasts long enough, it can lead to cell death / necrosis (Cheville 1999). Histopathology of liver degeneration and necrosis both showed more severe changes in line with the increase in dose.

	Vena centralist do not indicate (congestion) damming of blood vessels. Inflammatory cells around the vena centralis is relatively less indicates no histopathological changes occurred hearts
Liver 1x dose	
	Vena centralist do not indicate (congestion) damming of blood vessels. Inflammatory cells around the vena centralis is relatively less indicates no histopathological changes occurred hearts
Liver 2x dose	
	Vena centralis indicate damming indicated a buildup of blood in the central vein. Inflammatory cells around vena centralis found to be more prevalent with histopathological changes occurred mengondikasikan no heart
Liver 3x dose	
	Vena centralis indicate damming indicated a buildup of blood in the central venous severe. Inflammatory cells around vena centralis found to be more prevalent with liver histopathological changes
Liver 4x dose	

	Vena centralis indicate severe blood damming (severe) indicated a buildup in the central vein. Inflammatory cells around vena centralis found to be more prevalent with liver histopathological changes occurred
Liver 5x dose	
	Vena centralis indicate severe blood damming (severe) indicated a buildup in the central vein. Inflammatory cells around vena centralis found to be more prevalent with liver histopathological changes occurred
Liver 6x dose	
	Vena centralis indicate severe blood damming (severe) indicated a buildup in the central vein. Inflammatory cells around vena centralis found to be more prevalent with liver histopathological changes occurred
Liver 7x dose	
	Vena centralis indicate severe blood damming (severe) indicated a buildup in the central vein. Inflammatory cells around vena centralis found to be more prevalent with liver histopathological changes occurred
Liver 8x dose	

## CONCLUSION

The conclusion of this study is the provision that mangosteen skin extract has a broad safety index and does not cause the death of the administration is high (lethal dose 50 value amounted to 0) and does not cause a reaction in the cell toxicity to 1-100 x dose administration. This means that the candidate is in the range of this dose.

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