PROCEEDING

The 2nd International Seminar of Basic Science

Natural Science For Exploration The Sea-Island Resources

Ambon, May 31st 2016

Organized by

Faculty of Mathematics and Natural Science

Pattimura University

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"Natural Science for Exploration The Sea-Island Resources"

Poka-Ambon, 31st May 2016

Mathematic and Natural Science Faculty
Universitas Pattimura
Ambon
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Welcoming Address By The Organizing Committee

Today, We have to thank the The Almighty Allah SWT for the implementation of this international seminar. This is the second seminar about Basic Science in The Faculty of MIPA Pattimura University. The seminar under the title “Natural Sciences for Exploration the Sea-Island Resources” will be carried out on May 31st 2016 at Rectorate Building, Pattimura University. There are 200 participants from lecturers, research institute, students, and also there are 34 papers will be presented.

My special thanks refer to the rector of Pattimura University and the Dean of MIPA Faculty, Prof. Dr. Pieter Kakissina, S.Pd., M.Si. I also would like to express my deepest gratitude to Prof. Amanda Reichelt-Brushett, M.Sc., Ph.D. ; Kazuhiko Ishikawa, Ph.D. ; Nicolas Hubert, Ph.D. ; Prof. Dr. Kirbani Sri Brotopuspito ; Prof. Dr. Marjono, M.Phil. ; Gino V. Limon, M.Sc., Ph.D. as the keynote speakers.

The last, We hope this international seminar usefull for all of us, especially Mollucas People and very sorry if any mistake. Thank you very much.

Dr. La Eddy, M.Si.
Chairman of Organizing Committee

Opening Remarks
By Dean of Mathematic and Natural Sciences Faculty

I express my deepest gratitude to The Almighty God for every single blessing He provides us especially in the process of holding the seminar until publishing the proceeding of International Seminar in celebrating the 18th anniversary of MIPA Faculty, Pattimura University. The theme of the anniversary is under the title "Natural Sciences for Exploration the Sea-Island Resources". The reason of choosing this theme is that Maluku is one of five areas in Techno Park Marine in Indonesia. Furthermore, it is expected that this development can be means where the process of innovation, it is the conversion of science and technology into economic value can be worthwhile for public welfare especially coastal communities.

Having the second big variety of biological resources in the world, Indonesia is rich of its marine flora and fauna. These potential resources can be treated as high value products that demand by international market. Basic science of MIPA plays important role in developing the management of sustainable marine biological resources.

The scientific articles in this proceeding are the results of research and they are analyzed scientifically. It is expected that this proceeding can be valuable information in terms of developing science and technology for public welfare, especially people in Maluku.

My special thanks refer to all researchers and reviewers for your brilliant ideas in completing and publishing this proceeding. I also would like to express my gratefulness to the dies committee-anniversary of MIPA Faculty for your creativity and hard working in finishing this proceeding, God Bless you all.

Prof. Dr. Pieter Kakisina, S.Pd., M.Si.
Dean of Mathematic and Natural Sciences Faculty

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"The 2nd International Seminar of Basic Science 2016"

Hotel Mutiara Ambon

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THE EFFECT OF ESSENCE RED FRUIT (Pandanus conoideus Lam) TO GASTRIC MUCOSA RAT (Rattus novergicus) INDUCED TYPE OF ALCOHOL DRINKS SOPI

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ABSTRACT

Red Fruit (*Pandanus conoideus* Lam) is one type of plant that contain antioxidant tocoferol, alfatocoferol, and betacaroten, which supposedly netralizise of free radical and heal gastric mucosa damaged of rat (*Rattus novergicus*) which induced by sopi. This research was perfomed to investigate the effect red fruit (*Pandanus conoideus* Lam) the gastric mucosa of rat which is induced by sopi. Rats with an average weight of 200 grams were given a dose of 2.5 ml/200g BB twice daily for 60 days. Then the rat (*Rattus novergicus*) was given the red fruit (*Pandanus conoideus* Lam) at a dose of 0.2 ml/200g BB, 0.4 ml/200g BB, and 0.6 ml/200g BB twice daily for 30 days. The results of this study indicate that the red fruit (*Pandanus conoideus* Lam) effect to histology of the gastric mucosa of white rats (*Rattus novergicus*). Provision of red fruit (*Pandanus conoideus* Lam) with an effective dose of 0.6 ml/200g BB of gastric mucosal repair and gastric ulcer rat (*Rattus novergicus*) were exposed to The type of alcoholic drinks sopi.

Key words : Red Fruit (*Pandanus conoideus* Lam), tocoferol, sopi, gastric mucosa

INTRODUCTION

Indonesia is known in some local beverages containing alcohol such as liquid Brem, wine, saguer, and ciu (Anonymous, 2002). One local alcoholic beverages, namely gin. These drinks can be produced traditionally by the people of Maluku. In mountainous areas gin still produced by locals such as Ambon Island, Ceram and Southwest Maluku. Many locations in the jungle that is traditionally produced gin. In Maluku in general, Sopi usually consumed in ceremonies or feasts customary, but this time the gin has been used widely by the people of Maluku. Excessive alcohol consumption in the long term can lead to chronic diseases such as heart failure, high blood pressure, stroke, liver damage, gastrointestinal cancer, gastrointestinal disorders (eg gastric ulcer) and reduced fertility. Besides alcohol can cause brain damage and difficult to remember and concentrate (Woteki. 1991).

Alcohol is absorbed quickly by the stomach and small intestine into the bloodstream and distributed throughout the body (Fleming et al. 2007). Alcohol can damage the barrier of the gastric mucosa due to alcohol quickly penetrate the gastric mucosa by releasing free radicals, resulting in damage to the gastric mucosal tissue, this damage is particularly true in the blood vessels and the parietal cells located in the gastric mucosa that can cause ulcers (Suleyman, H . 2001; Narayan, S. 2004; Khazaei, M. 2006). Hull is an organ that plays a role

in secreting HCl and enzymes that digest protein. Not always the free radicals found in the body that hurt. In certain conditions presence is needed. For example, to kill the bacteria that enter the body. Therefore, their existence should be controlled by a system of antioxidants in the body.

Antioxidants are substances that the body needs to neutralize free radicals and prevent the damage caused. Antioxidants may be enzymes (eg, catalase). In addition to the enzymatic antioxidant nature, there are also non-enzymatic antioxidants. These antioxidants can be obtained from the intake of food ingredients, such as vitamin C, E, A, and beta-carotene. These antioxidant compounds found in many turns red fruit (*Pandanus conoideus*).

Red fruit has an active compound content of beta carotene, tocopherol, oleic acid, linoleic acid (omega-9), linolenic acid (omega-3), and decanoate (Budi, 2005). The content of this active seyawa very important role in enhancing the immune, intelligence, and repair damaged cells. Based on the active compounds contained in red fruit, most of which are compounds such as tocopherols, alfatokoferol, and beta-carotene contained in the red fruit can function in the repair of damaged cells and as an antioxidant that can counteract free radicals. This study aims to determine the effect of red fruit (*Pandanus conoideus* Lam) against gastric mucosal white rat (*Rattus novergicus*) exposure to the type of alcoholic drink gin.

MATERIALS AND METHODS

Type of Research

This study was an experimental study.

Time and Location Research

This research was carried out for 4 months at the Laboratory of Zoology Department of Biology, Faculty of Science, University of Pattimura and making preparations for organ testis conducted at the Laboratory of Anatomy R.S Dr. Soetomo.

Tools and Materials

The tools used in this study is Kennels animal experiments, digital Ohaus Scales, surgical instruments (scalpel, tweezers, scissors, needle, mejalilin), Glass Objects, microtomes, Incubator, Roll Film and microscopes.

The materials used in this study are Sopi, Red Fruit, Formalin 4%, Rats Male Rattus novergicus, distilled, Paraffin, Alcohol 30%, 50%, 70%, 80%, 90%, 100%, Xylol and hematoxylin eosin.

Animal Selection Test

Experimental animals used were male rats wistar strain of healthy adult (white glossy and agile movement) aged 2-3 months, weighing 200 grams as many as 30 individuals.

Research Procedures

Determination of the dose

a. Dose Determination of Sopi

According Louhenapessy (2010), as an initial dose used in the chronic doses of the community, namely 100 ml (weighing 50 kg). If used for a human weighing 70 kg, 70/50 × 100 mL = 140 mL. The conversion factor for humans (70 kg) to rats (200 g) = 0,018 (Ngatidjan, 1991), so the dose rat 0,018 × 140 mL = 2.5 mL. So based on the above results use a dose of 2.5 ml / 200g BB rats.

b. Dose Determination of Red Fruit

As an initial dose, dosage used in society is ± 8 ml (weighing 50 kg). If used for a human weighing 70 kg, 70/50 × 8 mL = 11.2 mL. The conversion factor for humans (70 kg) to rats (200 g) = 0,018 × 0,018 mice so that the dose of 11.2 mL = 0.2 mL. So based on the above results I used a dose of 0,2 mL/200gr BB, II dose as much as 0.4 mL/200gr BB, and the third dose by 0.6 mL/200gr BB. According Revianti et al (2007), red fruit juice dosage of 0.3 mL/BB already provide protection against the effects of elevated levels of ALT.

Treatment of Animal Testing

Thirty male rats were divided randomly into 5 groups, each test group consisted of six male rats. Twenty-four male rats were given gin 2.5 ml / 200gr BB conducted orally twice a day for 4 weeks (1 month).

1) Group I (negative control) is a white male rats were given distilled water for eight weeks as normal controls
2) Group II (positive control) is a white male rats were given gin 2.5 ml / 200gr BB twice a day for eight weeks
3) Group III is a white male rats were given red juice of 0.2 ml / 200gr BB once every two days for four weeks
4) Group IV is a white male rats were given red juice 0.4 ml / 200gr BB twice a day for four weeks.
5) Group V is a white male rats were given red juice of 0.6 ml / 200gr BB twice a day for four weeks.

Making preparations Gastric Histology

Preparation of gastric according Kurniadi Organ (2008)

1) Gastric which has been fixed with 4% formalin washed with distilled water for 5 minutes, dehydrated in graded alcohol ranging from 30%, 50%, 70%, 80%, 90%, 100%, respectively for 30 minutes.
2) The rest of the alcohol cleared by clearing process, the hull immersed in xylol I, xylol II respectively for 1 hour
3) The process of infiltration, organ included in paraffin I, II paraffin, paraffin III 60 ° C, each for 1 hour
4) The process of embedding or planting, paraffin box is inserted into the stomach for 24 hours. Then do sectioning or slicing through the standing in paraffin blocks for a few moments and then cut with a microtome with a thickness of 6 microns

5) After making the incision results, object glass smeared with glycerine albunin that the results of the incision can be attached to the object glass and then placed on a hot plate at a temperature of 40 ° C which aims to spread the results of the slices and melted paraffin in the measuring cup.
6) Process staning / coloring with the preparation process immersed in xylol I, xylol II, respectively for 15-30 minutes, and then input into the preparations of alcohol 100%, 90%, 80%, 70% and 30%, respectively for 3 minutes.
7) Mixture soaked in hematoxilin 1% in distilled water for 2-10 minutes, washing with water for 3 minutes later preprat I soaked in alcohol 50% eosin, eosin II Alcohol 100%, respectively for 3 minutes.
8) Mixture immersed in xylol I, xylol II respectively for 3 minutes, then dried preparations, then covered with entelan then covered with glass cups. Mixture was observed under a microscope.

Data Analysis

Results have been obtained will be analyzed descriptively by observing preparations testicular histology.

RESULTS AND DISCUSSION

Results

Provision of alcoholic beverages types of gin for 60 days in the rat (*Rattus novergicus*) can damage the gastric mucosa, and even ulceration of the stomach, but after the rats were given red juice for 30 d showed their gastric mucosal was repair. The results can be seen in the stomach histologimukosa by HE staining in Figure 7 to Figure 1

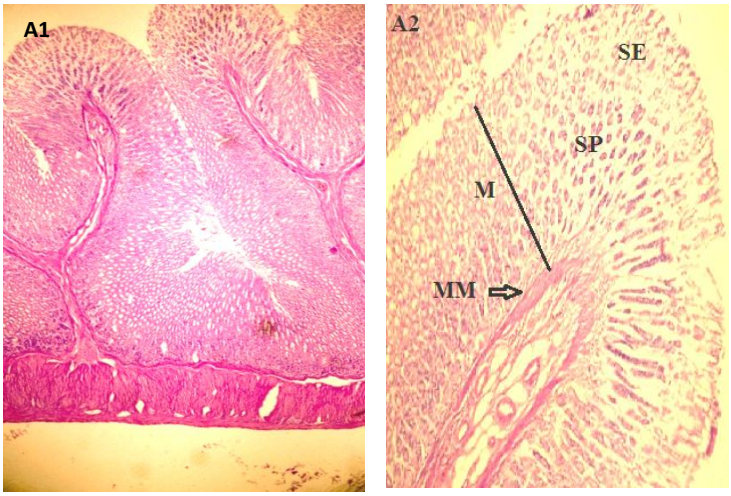

Figure 1. Gastric Mucosal Histology Control Group

Information	:	
A1	:	Histology white rat gastric mucosa 40x magnification control group
A2	:	Histology white rat gastric mucosa 100x magnification control group. (SE), Gastric mucosa (M), the muscularis mucosa (MM), Parietal Cells (SP) Histology gastric mucosa white rat control group showed that there was no damage to the gastric mucosa

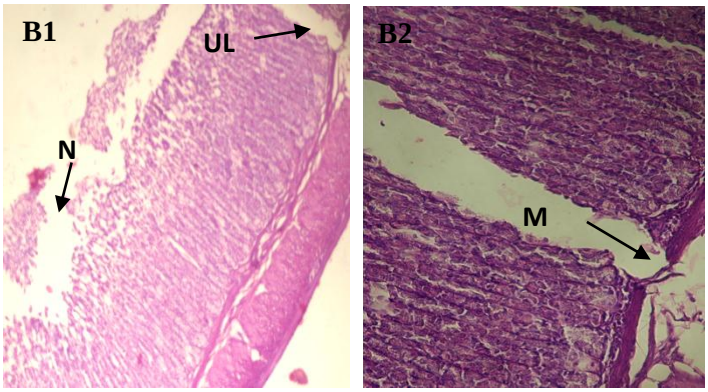

Figure 2. Gastric Mucosal Histology Group Sopi dose 2.5 ml / 200g BB

Information :
B1 : Gastric mucosal histology groups of rats that were given cows 2.5 mL / 200g BB 100x magnification for 60 days, necrosis of cells (N), Gastric ulcer (UL), Lamina Propria (LP)
B2 : Histology of the gastric mucosa group of rats who were given cows with a dose of 2.5 mL / 200g BB 200x magnification for 60 days, the muscularis mucosa (MM).

Groups of rats that were given gin with a dose of 2.5 ml / 200g BB for 60 days showed that administration of gin may result in damage to the gastric mucosa (epithelial cells, parietal cells) and gastric ulceration.

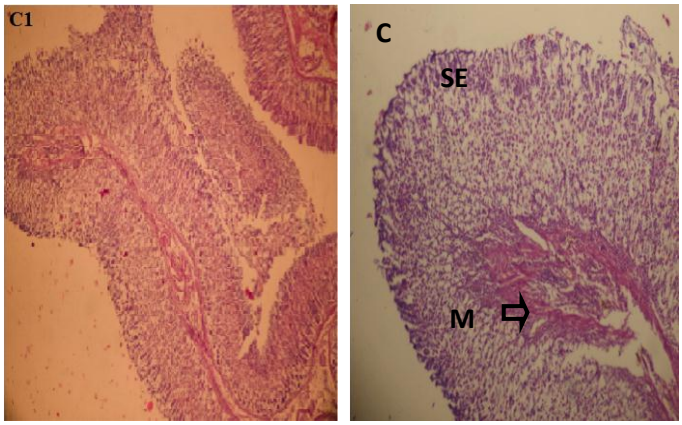

Figure 3. Histology Gastric Mucosal Dosage Red Fruit Group of 0.2 ml / 200g BB

Information :
C1 : Histology of the gastric mucosa group of rats who were given red juice with a dose of 0.2 ml / 200g BB for 30 days 40x magnification
C2 : Histology of the gastric mucosa group of rats who were given red juice for 30 days with a dose of 0.2 ml / 200g and 100x magnification, Epithelial Cells (SE), the muscularis mucosa (MM)

Provision of red juice with a dose of 0.2 ml / 200g BB for 30 days to groups of rats were exposed gable with a dose of 2.5 ml / 200g BB for 60 days visible improvement of the gastric mucosa.

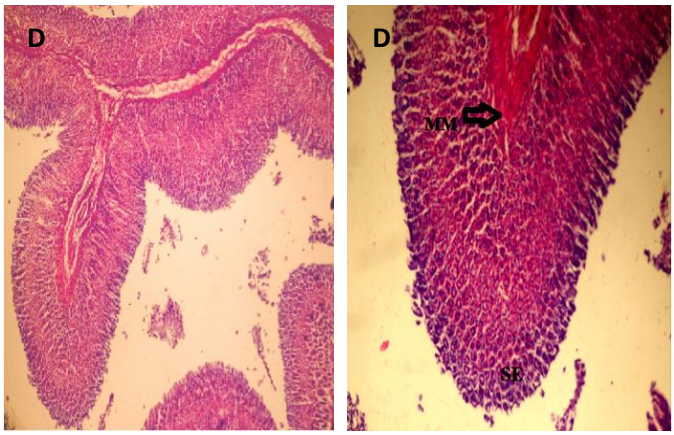

Figure 4. Histology Gastric Mucosal Dosage Red Fruit Group of 0.4 ml / 200g BB

Information :
D1 : Histology of the gastric mucosa group of rats who were given red juice with a dose of 0.4 ml / 200g BB for 30 days 40x magnification
D2 : Histology of the gastric mucosa group of rats who were given red juice with a dose of 0.4 ml / 200g BB for 30 days 100x magnification, Epithelial Cells (SE), the muscularis mucosa (MM)

Giving a group of white mice who were given red juice with a dose of 0.4 ml / 200g B cells of the gastric mucosa more visible than in the group of rats who were given red juice with a dose of 0.2 ml / 200g body weight.

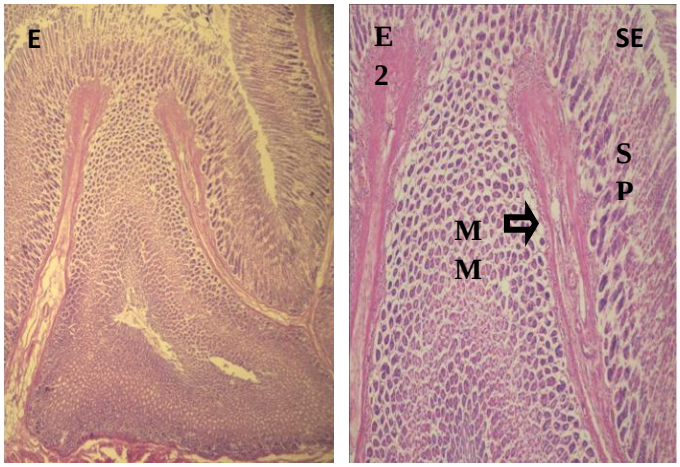

Figure 5. Histology Gastric Mucosal Dosage Red Fruit Group of 0.6 ml / 200g BB

Information :
E1 : Histology of the gastric mucosa group of rats who were given red juice with a dose of 0.6 ml / 200g BB for 30 days 40x magnification

E2 : Histology of the gastric mucosa group of rats who were given red juice with a dose of 0.6 ml / 200g BB 100x magnification for 30 days, the muscularis mucosa (MM), Parietal Cells (SP), Epithelial Cells (SE)

Provision of red juice with a dose of 0.6 ml / 200g BB for 30 days to groups of rats were exposed gable with a dose of 2.5 ml / 200g BB looks pebaikan gastric mucosa, so that together with histological gastric histologinya white rat control group

Table 1. Results of Gastric Mucosal Histology Observation

Treatment	**Observation result**
Normal	No damage to the gastric mucosa (epithelial cells, parietal cells)
Sopi dose 2.5 mL / 200 g BB	Gastric mucosa (epithelial cells, parietal cells) undergo necrosis and ulceration of the stomach
Red Fruit dose of 0.2 mL / 200 g BB	Visible improvement of the gastric mucosa (epithelial cells, parietal cells)
Red Fruit dose of 0.4 mL / 200 g BB	Visible improvement of gastric mucosal cells in the gastric mucosa (epithelial cells, parietal cells) more visible.
Red Fruit dose of 0.6 ml / 200 g BB	Fixes the gastric mucosa (epithelial cells, parietal cells) to the same as the normal gastric mucosa

Discussion

Observation of histological preparations stomach white rats in a control group given only distilled water showed that no changes in the gastric mucosa (Figure 7.A) .In the group of rats that were given gin with a dose of 2.5 ml / 200g BB showed that introducing gin can cause damage to the gastric histological structure (Figure 8.b).

This can be seen on a microscopic picture of the gastric mucosa which mostly shows kerusakan.Terjadinya hull damage in the group of rats that were given gin with a dose of 2.5 ml / 200g BB can through some mechanisms: irritation of the gastric mucosa due to the effects of alcohol contained in the gin and the inhibition of the synthesis of prostlagandin which is an aspect of the gastric mucosal defenses apart bicarbonate mucus, mucosal resistance, and mucosal blood flow (Katzung, 1998). Gastric mucosal blood supply strong need to maintain their integrity. If the amount of the blood supply has decreased the gastric mucosa tend to undergo necrosis and ulcers. Gin irritating effects may lead to increased permeability of the mucosa of the stomach.

Increased permeability of the mucosa which can cause back diffusion HClke in the gastric mucosa, so that it stimulates local histamine expenditure (among others by mast cells in the lamina propria of the gastric mucosa). Histamine then binds to its receptor in gastric parietal cells, which eventually can increase the secretion of gastric acid by parietal cells (Price & Wilson, 2006). Decrease prostlagandin synthesis can lead to impaired gastric protection factor role for prostlagandin as a defensive factor able to increase mucus secretion and bicarbonate ions, increases mucosal blood flow, enhance mucosal resistance and accelerate growth and cell division (Amirudin, 1991).

In this research, gastric mucosal damage (epithelial cells and gastric parietal cell necrosis) and the presence of gastric ulcers. Necrosis is cell death resulting amorphous tissue in the stomach intact, while ulkusmerupakan wounds in the stomach. However, in view of histologiulkus a loss of epithelial cells that reach or penetrate the muscularis mucosa that is shaped like this erosi. Opinion accordance with Suleyman (2001), Narayan (2004), Khazaei, (2006) which states that alcohol can damage the gastric mucosa due to alcohol can release free radicals, damage often occurs in blood vessels and the parietal cells located in the stomach wall which can cause ulcers / ulcer. Gastric have pertahanandalam system counteract the irritation of the stomach. There gastric mucosal defense system that maintains the integrity of gastro duodenal and gastric mucosal repair in case of damage. The system consists of three layers namely pre epithelium, epithelial and post epithelium. Pre epithelial layer contains mucus-bicarbonate works as a barrier fisikokemikal to molecules like hydrogen ions. Mucus secreted surface epithelial cells containing 95% water and lipid mixtures with glycoproteins. Mucus secretion is stimulated in part by prostaglandin E (PGE).

PGE increase mucus production and reduce the production of stomach acid. This effect helps protect the gastric mucosa. Besides being able to release free radicals, alcohol can solve mucus gel and phospholipid layer that will cause back diffusion of acid and gastric mucosal damage. Bicarbonate is a protective mucus layer of epithelial pre-primary. But the defense of the stomach is not always able to protect the stomach from damage. If free radicals are released amount exceeds the capability of the defense system, the hull will be damaged so need extra antioxidants from outside the body through food. In this study, given the red juice as an antioxidant from outside the body.

Provision of red juice with a dose of 0.2 ml / 200g BB for 30 days to groups of rats were exposed gable with a dose of 2.5 ml / 200g BB evident and repair cells in the gastric mucosa (Figure 9.C). Award red juice can reduce the damage to the gastric mucosa white mice that were given gin because of the antioxidant content of red fruit such as tocopherols, alfatokoferol, as well as beta-carotene is able to neutralize free radicals and repair the damaged cells so as to overcome damage to the gastric mucosa and gastric ulcer.

Tocopherol is naturally to increase prolifersai / reproduction selyang is one process in the mechanism of gastric ulcer healing. Proliferation / multiplication of cells important in the healing of ulcers because this process supplies the epithelial cells, which are essential to the mucosal surface and repair reepitelisasi gastric glands. Provision of red juice with a dose of 0.4 ml / 200g BB for 30 days to groups of rats were exposed gable with a dose of 2.5 ml / 200g BB results are slightly different, because in addition to improvements cells in the gastric mucosa, picture cell- mucosal cells look a lot more than in the group of rats who were given red juice with a dose of 0.2 ml / 200g BB (Figure 10.D). This is because the dose of red juice given more than that of the red juice on a group of white mice who were given a dose of 0.2 ml / 200g BB so that the antioxidants contained too much. While the provision of red juice with a dose of 0.6 ml / 200g BB for 30 days to groups of rats were exposed gable with a dose of 2.5 ml / 200g BB repair gastric mucosa looks so similar to the histological gastric white rat control group (Figure 11 .e). So there are differences in the histology of the stomach of the five groups of rats that white rat control group, a group of white mice were exposed gable with a dose of 2.5 ml / 200g BB, groups of rats were given a red juice with a dose of 0.2 ml / 200g BB, groups of rats that were given red juice with a dose of 0.4 ml / 200g body weight and white rat groups were given red juice with a dose of 0.6 ml / 200g body weight.

Award red juice to a group of rats exposed gable with a dose of 2.5 ml / 200g BB for 60 days showed that red juice can memperbaki damage to gastric mucosa (epithelial cells,

lamina propria, parietal cells) and gastric ulcers. This is because the red juice contains tocopherol (natural vitamin E) that is able to repair damaged cells, or alfatokoferol and beta-carotene that act as antioxidants which can counteract free radicals caused by gin.

CONCLUSION

1. Provision of red fruit (*Pandanus conoideus* Lam) has the effect of fixing the gastric mucosa in rats (Rattus novergicus) exposure to the type of alcoholic drink gin.
2. Provision of red fruit (*Pandanus conoideus* Lam) at a dose of 0.6 ml / 200g BB, effectively improve the gastric mucosa and gastric ulcer rat (*Rattus novergicus*) were exposed to alcohol types of gin.

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