



## Effectiveness of Rosy Periwinkle (*Catharantus roseus*), Cherry (*Muntingia calabura L.*), Comfrey (*Symphytum officinale*), and Figs (*Ficus carica*) Decoction Toward the reduction of SGOT and SGPT Level in Male Wistar Strain Rats with Acute Hepatitis Model

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### ABSTRACT

Hepatitis is inflammation of the liver caused by viruses, alcohol and drugs or other pathogens. The purpose of this study was to compare the effectiveness of rosy periwinkle (*Catharantus roseus*), cherry (*Muntingia calabura L.*), comfrey (*Symphytum officinale*), and figs (*Ficus carica*) decoction toward decreasing serum levels of SGOT and SGPT. The object of this study were 30 male Wistar strain rats aged 2-3 months with a weight of 180-200 grams which were adapted for 7 days. The rats then divided into 3 groups, namely the negative control group, the positive control group, and the treatment group. After 7 days of the adaptation process, the liver of the treatment group and the positive control group was induced Paracetamol 120 mg /day orally for 7 days. Boiled water therapy of 3.5 grams of Rosy Periwinkle (*Catharantus roseus*), 3.5 grams of cherry (*Muntingia calabura L.*), half a sheet of comfrey (*Symphytum officinale*), and 0.3 gram of figs (*Ficus carica*) was given to the treatment group during the treatment group in 7 days as much as 3.6 cc / orally per day. Data were analyzed using SPSS version 24, One Way ANOVA test to compare SGOT SGPT levels. The results showed a significant difference in SGOT levels between the treatment group, positive control group, and negative control group ( $p < 0.05$ ) and there were significant differences in SGPT levels between the treatment group and positive control group ( $p < 0.05$ ). The conclusion of this study is the mixed boiled water of Rosy Periwinkle (*Catharantus roseus*), Cherry (*Muntingia calabura L.*), comfrey (*Symphytum officinale*), and Figs (*Ficus carica*) have an effect on decreasing SGOT SGPT serum in male wistar rats with acute hepatitis model.

**Keywords:** Paracetamol, SGOT, SGPT, *Catharantus Roseus*, *Muntingia Calabura L.*, *Symphytum Officinale*, *Ficus Carica*

### INTRODUCTION

Hepatitis, or commonly known as jaundice, is an inflammatory disease of the liver. In the world, hepatitis regarded as a big problem, including in Indonesia (Dwi M, 2014). According to WHO (2016), hepatitis sufferers in Indonesia reached 28 million people, it means 1 of 10 people is suffering from hepatitis. About 70% have hepatitis B, 10 million suffer from liver fibrosis, 3 to 5 million have cirrhosis. Hepatitis is mostly caused by viruses but can also be

caused by exposure to alcohol, toxins, drugs and other chronic and acute pathogens. Chronic hepatitis can increase the risk of liver cancer (LeMone, Burke and Bauldoff, 2014).

The Indonesian Ministry of Health in 2014 stated that hepatitis is very close to lifestyle. According to Sievert w. Melvyn, G and Terry, B. (2010: p. 16) hepatitis can be transmitted by faecal-oral, sexual, parental and so on which is marked by a bulging abdomen, changing skin colour to yellow, urine colour is dark yellow, nausea, loosing appetite, feeling weak and lethargic. These signs are most often experienced by the community, so nowday hepatitis has become as public health problem.

Indonesia is one of the countries that have the most types of herbs which should be a pride of its own. Indonesia approximately has 30,000 types of herbal plants; it enables Indonesia to become a superior country in developing herbal products that have the same quality as modern medicine. People usually use herbal medicines to maintain health, prevent disease, treatment, recovery from illness, and also as a beauty ingredient, where the community in general still using it. People belief that herbal plants has low side effects, and low price. (Norm, Ulfa, Latif, and Usman, 2014). However, in Indonesia the use of herbal plants has not been carried out optimally. Research says only about 1,200 plant species have been studied and used as traditional medicine (Rustiah, 2014).

Traditional medicine is an original medicine from a country that has been used from generation to generation, the benefits of this plan have proven to be safe and beneficial for the surrounding community. Approximately 80% of the population of African countries take advantage of traditional medicine in their lives. This number is almost equal to Asia and Latin America. China, use herbal medicine in the treatment of diseases by 30-50%. San Fansico, London, and South Africa as much as 75% use traditional medicine, because they assume that the medical treatment cannot giving much hope (Azzami and Nugroho, 2019). This assumes that medicinal plants still play an important role in therapy to date. Medicinal plants or traditional medicines are still used by the community, especially in areas with no adequate health facilities.

Based on the research from Silalahi (cited in Sari, N. K. Y. and Putra, I. M. W. A.), he assumes that antioxidants have a very important role to neutralize free radicals that can damage important parts of cells such as DNA, proteins and lipoproteins that can cause degenerative diseases such as heart disease, cataracts, diabetes, arthritis, cancer and even liver disease. This condition makes body needs additional antioxidants from the outside of the body, especially when the body is attacked by the hepatitis virus.

Research from Ifhaa and Jasmin, (2014) explained that rosy periwinkle contain flavonoids composed of silybin, silychristin and silydianin which function as antioxidants which can neutralize free radicals by growing new liver cells. According to Triswanto S, Susianto P (2016) explained that cherry leaves contain various bioactive compounds such as saponin compounds, tannin steroids, and flavonoids that can be antioxidants. According to the study of Alfi S. R (2013), in addition to alkaloids, comfrey also contains saponins, flavonoids and polyphenols. According to Ahmad et al, (2013) tin leaves also have compounds that contain antioxidants that can reduce liver damage.

The purpose of this study was to determine the effectiveness of boiled water of rosy periwinkle leaves (*Charanthus Roseus*), Cherry leaves (*muntingia calabura L*), Comfrey leaves (*symphytum Officinale*), and Tin leaves (*ficus carica L*) on SGOT and SGPT levels in male wistar strain rats with acute hepatitis model induced using paracetamo 120 mg / oral every day for 7 days.

#### **LITERATURE REVIEW**

The liver is one of the most important organs with an average weight of 1,500 grams or 2.5% of body weight, and is the center of the formation of metabolism in maintaining life (Waluyo, 2011). The liver is an organ that functions as a regulation, metabolism and detoxification of foreign substances that enter the body where the liver can also become inflamed when exposed to alcohol, viruses, and drugs that cause the liver to decrease in function due to inflammation in the liver cells. (LeMone, Burke and Bauldoff, 2017)

According to the Indonesian Ministry of Health (2014), hepatitis is an inflammation of liver cells caused by infections (viruses, bacteria, and parasites), due to autoimmune, and alcohol exposure. When someone has hepatitis, their SGOT and SGPT levels will increase. This is due to hepatocyte damage (Aleya and Khairun N. B., 2015)

Heru S and Sugiarto, (2018) said that SGOT (Serum Glutamate Oxaloacetate Transaminase) and SGPT (Serum Glutamate Piruvate Transaminase) enzymes are a group of aminotransferase enzymes that are used as a specific idocator for liver damage. If the cell membrane is damaged, the GOT enzyme (Glutamate Oxaloacetate Transaminase) will come out of the damaged cytoplasm into the blood, then this is used as an indicator of liver damage. According to Riswanto (quoted from Nasution, A. Y., Adi, P. and Santosa, P. A.) serum Glutamic Pyruvic Transaminase (SGPT) is an enzyme found in the liver that is used to determine the presence or absence of hepatocellular destruction. SGPT enzymes are more

accurate enzymes to determine the level of liver damage when compared to the SGOT enzyme.

This study uses Paracetamol to damage the liver of the rats. According to (Fitri N, Asep S and Waluyo R, 2019) Paracetamol is an analgesic drug that can be obtained without a doctor's order / over the counter (OTC). According to (Correia and Castagnoli, 1989 in Hasan A study, 2005) the use of Paracetamol in large doses for a long time will damage the liver, because it can make the metabolites of N-acetyl-p-benzoquinoneimine (NAPQI) to be very reactive and continue to increase which results in an imbalance levels of glutathion in the liver. Then NAPQI will form macromolecules that can cause necrosis in liver cells.

Tread Dara (*Catharanthus roseus*) is better known by the local community as tapak doro, kembang sari cina (java), kembang serdadu, kembang tembaga beureum (sundanese), and sindapor (Sulawesi). In the society rosy periwinkle is usually planted only as an ornamental plant, but there are still many people who process it as an herbal medicine such as anti-cancer drugs. The active compounds of this plant is Vinkristi and Vinblastine has been successfully used as an anti-cancer. However, Rosy Periwinkle is also able to treat DM, hypertension, asthma, anemia, fever, dysentery, inflammation, skin ulcers, sores, and swelling. The active compounds contained in the tread are vincristine, vinrosidin, vinblastine, catharantine, vinleurosin, leurosin, locchnerine, aquammine, vincamine, reserpine, vindolinine, tetrahydroalstonine, vindoline and serpentine. (Azzami and Nugroho, 2019). According to Agung, B (2019), the general classification of treads is as follows: Kingdom: Plantae; Division: Magnoliophyta; Class: Magnoliopsida; Order: Gentianales; Family: Apocynaceae; Genus: *Catharantus*; Species: *Catharanthus roseus* L.

This plant can be classified as a wild plant because it can live in lowland or at an altitude of 800 meters above sea level. This plant has the characteristics of a round stem with a small diameter, hair, has a segment, and there is a seed house that is similar to cylindrical. This plant is single-leaved, its flowers are like small trumpets with downy surfaces (Abednego B, 2012).

According to the study from Muhammad, N (2018) Cherry (*Muntingia calabura* L), also known as china cherry, cherry is a plant that has trees with sweet little fruits that grow in tropical areas such as the Philippines, Mexico and Indonesia. This plant is easily found on the walls of houses and roadside (Steenis, 1981 in Handayani, V). Empirically, there are still many general public who trust kersen for the treatment of cough, jaundice, and gout. (Sentat and Pangestu, 2016). Based on research that has been done states that cherry leaves contain

antioxidant compounds in the form of flavonoids, tannins, triterpene, saponins, and polyphenols where this content shows antioxidant activity. Cherry leaves have pharmacological abilities as antioxidants, antifungal, antipyretic, anti-inflammatory, antiploriferative, antinoniseptive, and anti-staphylococcal. (Fiqh K. M., Siti A, Noor W). In the study of Sari (quoted from Zahara, M and Suryady 2018) classifies the cherry plants as follows: Kingdom: Plantae; Division: Magnoliophyta; Class: Magnoliopsida; Tribe: Elaeocarpaceae; Genus: Muntingia; Species: Muntingia calabura L.

Comfrey (*Symphytum Officinale*) is a plant known as *kompri*, or *komring* (Java) in local communities. Some people use it as herbal medicine, the leaves of this plant will be processed into herbal tea, the roots will be turned into powder and converted into capsule. Comfrey is usually used for the treatment of hypertension, diarrhea, inflammation of the joints, lowering blood sugar, indigestion, inflammation of the intestine, tonsils, hemorrhoids, cough with phlegm, and achy rheumatic pain. Compounds contained in the comfrey plants are symphytine, tannin, pyrolizidine alkaloids, anadoline, echimidine, essential oils, allantoin, vitamin C, vitamin E, vitamin B1, vitamin B2. Whereas the roots of the comfrey plant contain alkaloidpyrolizidine. (Azzami and Nugroho, 2019). Quoted from Nurida's writings, (2019) the general classification of comfrey plants is: Kingdom: Plantae; Division: Magnoliophyta; Class: Magnoliopsida; Order: Lamiales; Family: Boraginaceae; Genus: *Symphytum* species; Species: *Symphytum Officinale*.

The Fig plant (*Ficus carica* L) is a family of moraceae that is still commonly found in West Asia. In general, Figs plant is made as an ornamental plant, the fruit can be used as juice, syrup, jam, sweets and candies. But the fruit and leave of this plant is also commonly used as a medicine to treat diuretics, anti-inflammatories, and antioxidants (Azzami and Nugroho, 2019). Antispasmodic, anti-HSV, antimutagenic, anthelmintic, hepatoprotector and can also overcome hypoglycemia (Patil and Patil, 2011). Anti-inflammatory (Eteraf et al., 2015) antioxidants (Ahmad et al., 2013) Antiplatelet, antituberculosis, antinematode, anti-irritation (Mawa et al., 2013). The substances contained in this plant is high level of anthocyanin cyanidin-routineoside, flavonols such as quercetin-routineoside, phenolic chlorogenic acid and flavones such as luteolin, 6C-hexose-8C-pentose and apigenin-routineoside. (Vallejo et al, 2012). Quoted from Kartika's researchs, (2019) Classification of Fig plants as follows: Kingdom: Plantae; Division: Magnoliophyta; Class: Magnoliopsida; Order: Rosales; Family: Moraceae; Genus: *Ficus*; Species: *F. carica*.

## **METHODS**

This is an experimental laboratory study with 30 wistar strain male rats aged 2-3 months weighing 180-200 grams. The rats were randomly divided into 3 groups, group one (negative control group, only given food and drink), group two (positive control group, fed by drinking and its liver was destroyed liver using 120 mg / day paracetamol), group three treatment groups (given 120 mg / oral paracetamol each days to damage the liver and given therapy of 3.6 cc of theurpathic water from herbal plants (3.5 grams of rosy periwinkle, 0.3 grams of Figs leaves, 3.5 grams of cherry leaves, and 1,4 grams comfrey leaves every day for one week). The object under study was adapted to the environment for 7 days, 12 hours of light and 12 hours of darkness and the result was no change in body weight of  $\pm 10\%$  during adaptation.

After 7days adaptation, in the 8th day to the 15th day, the liver of group 2 (positive control group) and group 3 (treatment group) were damaged through induction of 120 mg paracetamol given orally every day for seven days. On the 15th day, SGOT (Serum Glutamate Oxaloacetate Transaminase) and SGPT (Serum Glutamate Pyruvate Transaminase) levels were examined to determine the pre-test results. On the 15th day the group 3 (treatment group) was given 3,6 cc therapy (3.5 grams of rosy periwinkle water, 0.3 grams of boiled water of fig plant, 3.5 grams of cherry, and 1,4 grams of comfrey decoction was given from 200cc until the remaining 100 cc of water every day for one week). On the 22nd day, the SGOT and SGPT were examined on the liver as a post-test results. Calculations were performed using SPSS version 24 One Way ANOVA test to compare the results of the SGOT and SGPT levels after administration of boiled water therapy.

This study used Rosy periwinkle, cherry leaves and comfrey leaves taken from Parompong. Figs leaf is taken from Cimenyan Bandung. The four types of leaves (Rosy periwinkle, Cherry, Comfrey and Figs) are boiled in 200 cc of water for 4 minutes 30 seconds until the water becomes 100 cc.

The process of making sick objects namely wistar strain rats with acute hepatitis model is by injecting paracetamol as much as 120 mg / day for 7 days. Which is marked by an increase in the levels of SGOT (Serum Glutamate Oxaloacetate Transaminase) and SGPT (Serum Glutamate Pyruvate Transaminase) enzyme in the positive group and the treatment group at the time of the laboratory examination.

Blood sampling was done by cutting the tails of male wistar rats and then getn the blood. The laboratory tests were performed to determine the levels of SGOT (Serum Glutamate Oxaloacetate Transaminase) and SGPT (Serum Glutamate Pyruvate Transaminase enzymes).

**RESULTS**

The result of calculating the level of SGOT and SGPT serum in Male wistar starin rats between group 1 (negative control group), group 2 (positive control group) dan group 3 (treatment group) which get oral treatment with 120 mg of paraetamol, by using one-way ANOVA test.

**Table 1. The result of SGOT Level in male Wistar Strain Rats before the Therapy**

Dependent Variable	(I) kelompok	(J) kelompok	Mean Difference (I-J)	Std. Error	Sig.
sgot_pre	1.00	2.00	-226.92000*	15.71217	.000
		3.00	-198.70600*	15.71217	.000
	2.00	1.00	226.92000*	15.71217	.000
		3.00	28.21400	15.71217	.190
	3.00	1.00	198.70600*	15.71217	.000
		2.00	-28.21400	15.71217	.190

In Table 1. The results of comparing the SGOT levels befor the treatment between group 1 (negative control) to group 2 (positive control) and group 3 (treatment) show a significant difference ( $p < 0, 05$ ) this is because group 1 (negative control) is not induced by paracetamol. While there is no significant difference ( $p = 0.190$ ) between group 2 (positive control) and group 3 (treatment) this is because group 2 (positive control) and 3 (treatment) were induced with 120 mg / oral paracetamols. This is in line with the study of Susilowati, A. E. (2009) that Paracetamol can be harmful with large doses of 12-20 tablets in one swallow and is also an acute toxicant with large amounts and long-term use.

**Table 2. The result of SGOT Level in male Wistar Strain Rats after the Therapy**

Dependent Variable	(I) kelompok	(J) kelompok	Mean Difference (I-J)	Std. Error	Sig.
sgot_post	1.00	2.00	-963.23000*	14.97753	.000

		3.00	-62.67000*	14.97753	.001
	2.00	1.00	963.23000*	14.97753	.000
		3.00	900.56000*	14.97753	.000
	3.00	1.00	62.67000*	14.97753	.001
		2.00	-900.56000*	14.97753	.000

In Table 2, the SGOT levels between group 1 (negative control) and group 2 (positive control) showed a significant difference ( $p < 0.05$ ), it means that group 2 (positive control) did not experience a decrease in SGOT that approached the normal rate as group value 1 (negative) because group 2 (positive control) did not receive any therapy. Group 1 (negative control) compared to group 3 (treatment) showed a significant difference ( $p = 0, 01$ ), it means that group 3 (treatment) experienced a decrease in SGOT levels. Group 2 (positive control) compared to group 3 (treatment) showed a significant difference ( $p < 0.05$ ), this condition happens because the group 3 (treatment) get the water therapy of rosy periwnkle, cherry, comfrey, and figs which is containing Flavonoids as antioxidants that help to repair the liver cell which is characterized by decreased levels of SGOT (Ifhaa and Jasmin, 2014). It was also found that significant differences between groups 1 (negative control) and 3 (treatment) were thought to occur due to the lack of time of therapy and the need for dose modification.

**Table 3. The result of SGPT Level in male Wistar Strain Rats before the Therpy**

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.
sgpt_pre	1.00	2.00	-83.17000*	9.21895	.000
		3.00	-71.60000*	9.21895	.000
	2.00	1.00	83.17000*	9.21895	.000
		3.00	11.57000	9.21895	.432
	3.00	1.00	71.60000*	9.21895	.000
		2.00	-11.57000	9.21895	.432

This table shows that group 1 (negative control) compared to group 2 (positive control) and group 3 (treatment) showed a significant difference ( $p < 0, 05$ ). This is because group 1 (negative control) did not experience liver damage. While group 2 (positive control) and group 3 (treatment) showed insignificant differences ( $p = 0.432$ ) this is because both groups were induced with paracetamol 120 mg / oral every day for 7 days so that they experienced liver damage marked by an increase in SGPT levels.

**Table 4. The result of SGPT Level in male Wistar Strain Rats after the Therapy**

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.
sgpt_post	1.00	2.00	-986.38000*	17.92435	.000
		3.00	-36.97000	17.92435	.117
	2.00	1.00	986.38000*	17.92435	.000
		3.00	949.41000*	17.92435	.000
	3.00	1.00	36.97000	17.92435	.117
		2.00	-949.41000*	17.92435	.000

Table 4 states that group 1 (negative control) compared to group 2 (positive control) showed a significant difference ( $p < 0.05$ ) this is because in group 2 (positive control) no therapy was given so that it still suffered liver damage. No significant difference was found ( $p = 0.117$ ) in the comparison of group 1 (negative control) to group 3 (treatment). This shows that the water therapy made from rosy periwinkle, cherry, comfrey and fig with a dose of 3.6 cc / orally every day for 7 days given to group 3 (treatment) was effective, it can be seen from the level of SGPT serum levels. While in group 2 (positive) compared to group 3 (treatment) showed a significant difference ( $p < 0, 05$ ). This happens because the administration of therapy is only given to group 3 (treatment). According to Sukohor, A; Soleha, T. U and Hafizfadillah, D (2019) that liver cell damage will be marked by an increase in SGPT due to the use of Paracetamol in large doses and long periods of time. Therefore, we need ingredients that contain antioxidants in repairing damaged liver cells, and it was found that herbal plants; rosy periwinkle, cherry, comfrey and figs contain antioxidants that can repair damaged liver cells.

## DISCUSSION

### Conclusion

Based on the findings of the study, the researchers concluded that the students in health-related programs of the Adventist University of the Philippines have “moderate” or normal sleeping patterns and are getting enough rest during the week and on weekends, despite not getting enough rest during clinicals or OJT. However, it should be noted that medical technology students in their OJT do not have any classes to attend, thus giving more time to rest whereas nursing and dentistry students are still required to attend classes and turn in assignments during the clinical duty. The students are also experiencing a “moderate” amount of stress based on the perceived stress scale. The academic behavior of the students in terms

of motivation, attitude, self-management, and activity is good, seeing as the results showed that the students range from moderate to high on the four determinants. There is also no significant relationship between stress and academic behavior, suggesting that the students' stress level does not affect how they study.

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