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Antioxidant and **Antibacterial Effect of Crinum asiaticum** leaves Ida Duma Riris 1 Faculty of mathematics and Natural Sciences, State University of Medan Indonesia dumariris@gmail.com Abstract This study is a test of **antibacterial and antioxidant activity of the** extract acetate acid leaves of Crinum asiaticum L. The bacteria used were Escherichia E. coli as gram-negative and gram-positive staphylococci axes.

The diameter of leaves to extract the resistance **of gram positive and** negative bacteria ranging from (10,1mm-12,5mm), Antibacterial inhibition Compared to extract from leaves of chloramphenicol was 36.07% - 36.33%. Showed strong inhibition. **Antioxidant potential of the same extract was** evaluated by 2,2-diphenyl 1-picrylhydrazyl (DPPH) method, the **extract of the leaves** Showed IC<sub>50</sub> 208.98 Key word: Crinum asiaticum L; DPPH; antibacterial; Chloramphenicol Introduction Antioxidants are substances that the body needs to neutralize free radicals and prevent **damage caused by free radicals** on normal cells. Formation reaction of free radicals can cause oxidative stress (Holistic Health Solutions, 2011).

Utilization of antioxidants derived from plants is better than synthetic antioxidants, for allegedly synthesis antioxidant Negative impact on health (El Ghany et al., 2010). Various plants are plants that have been tested with DPPH has antioxidant properties as Caryotaurens leaves (Azam S, et al, 2016); Cassia Tora Linn (Vijayalaksmi A et al, 2015).

Besides, the following was found to have antioxidant plant also has an activity as a antibacterial namely: Lantana Camara L (GSE Baroty et al, 2016) ; Syzygium cumini (L) Skeel (Myrtaceae) was found to inhibit the growth of Escherichia coli bacteria that can cause diarrhea (Milton Rich RD and De Castro GEM, 2016). Utilization of antioxidants **can be used to** prevent the effects of free radicals for protection from toxins and increase

endurance (Pam Hui LA et al, 2008).

/ Figure 1. The impact of free radicals in humans (Pam Hui LA et al, 2008). Analysis of DPPH was used as a test to look for the ability to capture a radical compound in plant extracts. DPPH is a component that purple is not dimerize and crystalline.

In this method, DPPH will transfer electrons or hydrogen atoms to free radicals that cause characters neutralized free radicals. When radical DPPH(1,1-diphenyl-2-picrylhydrazyl) reacts with an antioxidant compound that can donate a hydrogen radical, radical DPPH(1,1-diphenyl-2-picrylhydrazyl) will continue reduced forming DPPH-H.

The color changes from purple to yellow occurs when electrons of free radical DPPH(1,1-diphenyl-2-picrylhydrazyl) paired with a hydrogen from a free radical trapping antioxidant. The mechanism of inhibition of DPPH radical(1,1-diphenyl-2-picrylhydrazyl) can be seen in the following figure. / Figure 2. Mechanism of Inhibition of Radical DPPH (Blois, 1985).

As a tropical country warm climates the bacteria are easily flourish in Indonesia, including among others, the type of bacteria that are pathogenic. Diseases caused by bacteria become serious enough problem to overcome when needed drugs that cost is quite high antibacterial. Another problem that may arise is the high bacterial resistance to antibacterial compounds. (Sholeh., 2009). E.

coli bacteria that cause gastrointestinal disorders in humans and gastric organ system work. These bacteria are very detrimental to humans that need their inhibitory compounds of pathogens (Jawetz et al., 2001). White Hyacinths plants(Crinum asiaticum L), derived from the sub-district Laguboti Porse named as Ompu-Ompu area planted in the yard as an ornamental plant.

This plant is believed to bring good luck to those who have been abandoned by their grandparents if Ompu-ompu were planted in their grandparent graveyard. It seems this is where the origin of the so-called plant as Ompu-Ompu. According to the people around this plant is useful for treating wounds, ankle, back pain, cancer, Anyang-anyangan cure, the symptoms of arthritis, and swelling reduce of lymph glands.

To the authors have done research Antioxidant Activity Test, ethyl acetate Leaf Extract Antibacterial Hyacinths White Flowers(Crinum asiaticum L) and expose it in this paper. 1.1 Problem Formulation The problem in this research is formulated as follows: Is the ethyl acetate extract of lily plants Leaves (Crimum asiaticum L) has antibacterial activity against

Escherichia coli and Staphylococcus aureus? Is the ethyl acetate extract of lily plants Leaves (Crinum asiaticum L) has antioxidant activity? Objective Knowing the antibacterial activity of ethyl acetate extracts of plant lily leaves (Crinum asiaticum L) against Escherichia coli and Staphylococcus aureus bacteria.

Knowing the antioxidant activity of ethyl acetate extracts of lily plant leaves (Crinum asiaticum L) Benefit of Research Informing the antibacterial activity of ethyl acetate extracts of white lily plant leaves (Crinum asiaticum L) against Escherichia coli and Staphylococcus aureus bacteria. Provide information test the antioxidant activity of ethyl acetate extracts lily white lily plant leaves (Crinum asiaticum L) RESEARCH METHODOLOGY 2.1.

Equipment and Materials Research The tools used in this study is branched-erlenmeyer, measuring cups, beaker glass, stir bar, watch glass, test tubes, measuring pipettes, flask, tube rack, glass funnel, analytical balance, hot plate, autoclave, petri dishes, eppendorf tubes, vortex, disc paper, tool of rotary vacuum evaporation (evaporator), blender, ceiling fan micropipette / siring, incubators, and aluminum foil, blenders, fans, appliances maceration, UV-VIS, analytical balance, glassware, refrigerator, and the antioxidant test equipment, aluminum foil, pipette volume, flask. 2.1.1.

Materials Plant that used in this study is the Lily plant leaves (Crinum asiaticum L) obtained from the sub-district Laguboti Porsea Indonesia. Chemicals used in the study are: citric acid, some technical degree solvent for maceration purposes such as ethanol, ethyl acetate, NA (nutrient gel), distilled water, Escherichia coli uric bacterium and Staphylococcus aureus. NaCl, chloramphenicol, ammonia, petroleum ether, chloroform, HCl, Dragendroff reagents, Mayer reagent, CH<sub>3</sub>COOH anhydrous, H<sub>2</sub>SO<sub>4</sub>, Buchard-Lieberman reagent, magnesium plate, amyl alcohol, FeCl<sub>3</sub>, Stiasny reagent, sodium acetate and sodium hydroxide.

Vitamin C, which serves as a positive control, DPPH, methanol (pa), namely as a solvent and a negative control, distilled water, 1% lead acetate. 2.1.2. Procedure This study was initiated of sampling is the lily plant (Crinum asiaticum L) obtained from the sub-district Laguboti Porsea. 2.1.3. Sample Preparation To maximize the activity test on plant extracts first performed with Blanching (Kwan et al, 2007).

A total of 5 Kg fresh lily plant leaves (Crinum asiaticum L) separated and tubers then do the washing. Blanching lily plant is done by means of boiling at 100°C for 5 minutes with the media of 0.05% citric acid solution was drained, dried in the room, fanned once in a while and flipped upside down.

The drying process is done in the shade, protected from the sun for 14 days, during the drying process using fans to avoid mildew and worm. Drying is done in the shade intended to avoid damage to the metabolite content of the sample as a result of direct contact with sunlight. By such drying conditions, the expected content of secondary metabolites in the sample will not be broken, after leaves have dried crushed with a blender to expand the surface area so that the maximum leaf powder can be extracted.

#### 2.1.4. Tuber and Rod Extraction of Lily Plant (*Crynum asiaticum* L.)

Tubers and stems powder from drying results are macerated with 3 L of ethyl acetate solvent for 2x24 hours. In the maceration process performed 3 repetitions then filtered using a Buchner order to obtain a filtrate and a residue. The filtrate obtained is concentrated by means of rotary vacuum evaporator to obtain concentrated extract.

Then, test will be done as an antibacterial and antioxidant activity.

#### 2.1.5. Antibacterial Test Diffusion Method Media and Equipment Sterilization Tools are made of glass sterilized using an oven at 180°C for 2 hours. Metal tools sterilized using spirit glow light way, while for devices that are not resistant to heat and medium on heating to high temperatures, sterilized in an autoclave at 121°C a pressure of 2 atm. for 15 minutes.

#### Making Gel media A total of 2.3

g of NA was added into beaker glass then, added with 100 ml of distilled water. The mixture is stirred using a hot plate with a magnetic stirrer until homogeneous. Once homogeneous, the medium is inserted into a 20 ml beaker glass and then inserted into autoclave to be sterilized. Then the UV light is turned on laminary for 15 minutes and the blower for 10 minutes, then prepare medium and pour into a petri dish.

Rejuvenation of Pure culture Bacteria test such as *Escherichia coli* taken one loop of media that are available aseptically, then inoculated by means of streaking to gel medium (NA) was then incubated at 37°C for 24 hours. Making the suspension of Microbial Test Total of 10<sup>8</sup> of bacteria that have been rejuvenated taken from media that are available aseptically. Then, inserted into the test tube which already contains NaCl 0.9% then vortex.

Antimicrobial Activity Testing of Gel Media Diffusion Purification Results of extracts acetate weighed as much as 5 mg inserted into the Ependroftube and dissolved by 30 mL with the solvent. Furthermore homogenized using a vortex and ready to be tested. The results of the test microbial suspension manufacture taken as many as 200 mL test microbe suspension was mixed in 20 mL of media in order to warm and stirred slowly in a petri dish and allowed to solidify.

Then extract is dropped as much as 30 mL in the different disc paper and then allowed

to evaporate so it really dried and then placed carefully on the surface and aseptic media that has been homogenized by the microbial. Following, incubated for 24 hours. Kroramfenikol used as positive control, and the solvent as a negative control.

After incubation, the antimicrobial activity is shown by the inhibition zone (clear zone / halo zone) around the paper disk where it shows the inhibition of microbial growth is then measured by using calipers as the flow chart, 'Conducted Test of antibacterial activity against gram positive and negative bacteria, namely Escherichia coli and bacteria Staphylococcus aureus using Gel diffusion method (Diffusion Assay). Activities indicated by a clear zone or halo around the paper disk which had previously been etched with ethyl acetate extracts of lily leaves. 3. RESULTS AND DISCUSSION 3.1.

Determination of Plant Identification in the Herbarium Medanese (MEDA) North Sumatra University stated that the plants used in this study is *Crynum asiaticum* L. 3.2. Sample Preparation Weight of the sample obtained after drying the leaves gained 2.5 kg dry weight of leaves (16%) with a reduction of approximately 84% water content. White lily leaf (*Crynum asiaticum* L.)

after 200 grams of leaves macerated with 1 liter of ethyl acetate solvent done 3 times repetition, then obtained a yield of 7.288% is as follows Antibacterial Activity Test Test diffusion wells is a test to demonstrate inhibition of white daffodil plant leaf extract (*Crynum asiaticum* L.) against *Escherichia coli* and bacteria.

*Staphylococcus aureus* Antibacterial activity was measured from a clear zone diameter (mm) NA media compared to standard antibacterial compound chloramphenicol as a positive control and solvents used in the extraction process as a negative control. White narcissus plant leaf extract (*Crynum asiaticum* L.) created various in the concentration of 2.5% and 5%. Results of inhibition diameter plant leaf extract and white daffodils (*Crynum asiaticum* L.)

against *Escherichia coli* and *Staphylococcus aureus* can be seen in the following table.

Table. Data Value of barrier diameter against this type of bacteria extract Parts Plant

Bacteria Type	Concentration (%)	d1 (mm)	d2 (mm)	to3 (mm)	d (mm)
Ethyl acetate extract of leaves of <i>Escherichia coli</i>	0.02	0	0	0	0
	2.5	6	6	6	6
chloramphenicol	0.02	31.4	31.4	31.4	31.4
	0.02	34.4	34.4	34.4	34.4

34.4 *Staphylococcus aureus* 0 0 0 0 0 0 2.5 8.6 8.6 10.1 10.1 5 10 10 10.7 10.7 chloramphenicol 0.02 23.7 to 28.1 28.1 Description: d1: a diameter of 1 to3: diameter of 3 to2: diameter 2 d: diameter of the widest From the data table shown that the ethyl acetate extract having a low resistance activity compared with

the control kloramphenikol for barriers against E. coli of 11.1 mm while kloramphenikol of 34.4

mm, and for ethyl acetate leaf extract barriers against staphylococcus bacteria by 10.7 mm whereas control kloramphenikol 28.1 mm, it shows the obstacles that are still low when compared with the control. Based on activity, antibacterial substances can be divided into two types, whose activity has bacteriostatic (inhibits bacterial growth) and which has a bactericidal activity (kill bacteria). Some antibacterial agent is bacteriostatic at low concentrations and bactericidal at high concentrations (Schunack et al., 1990).

The antibacterial activity on lily bulbplant (Crinum asiaticum L) wherein the antibacterial effects (Crinum asiaticum L) tuber extract (1 mg / disc) was tested on four gram-positive and six gram-negative bacteria with a diffusion method using kanamycin (30 lg / disc) as standard antibiotic discs. Tuber extract (250-1000mg / disc) showed a significant zone of inhibition against Gram-positive all negative and Gram- ranging 12-14 mm (Rahman MA, et al, 2011).

It is possible that the production of organic compounds secondary metabolites from a plant closely related to environmental factors place to grow (Kutchan, 2001)

Antioxidants Test Table Test Results antioxidants Extract Ethanol and Ethyl Acetate Hyacinths White Extract

Concentration (ppm)	Absorbance	Mean%	Barriers	IC50 (ppm)
A1	A2	A3		5
0.1149	0.1274	0.1320	0.1139	0.1244
77.29	10	0.1149	0.1149	0.1149
Ethyl Acetate	25	0.0980	0.1085	0.0953
0.1006	81.66	208.98		
leaves	50	0.0578	0.0593	0.0687
0.0619	88.70	100	0.0457	

Description: Blanco DPPH = 0,4mM. Uptake = 0.5480) / IC50:  $y = 0,1347x + 78.15 + 78.15 + 50 = 0,1347x$   $0,1347x = 78.15$  to  $50$   $x = 28.15$   $0,1347 = 208,98$  Thus, IC50 = 208.98 ppm Antioxidant activity expressed as inhibitory concentration (inhibition concentration) or IC50. IC50 is a value that indicates the ability of inhibition of oxidation of 50% of a sample concentration (ppm).

A compound is said to have a very strong antioxidant activity if the IC values 50 of less than 50 ppm is a powerful antioxidant for, the IC50 value-50-100 ppm antioxidant was if worth IC50 100-150 ppm, and antioxidants weak if the value of the IC50 value-151-200 ppm (Blois, 1985). The antioxidant activity test of ethyl acetate extracts of the leaves of 208, 98 ppm, if noted that the ethyl acetate extract of the leaves is very weak antioxidant properties. In contrast to methanol extract from Crinum lily bulbs asiaticum L which has a very strong antioxidant activity IC50:5.62 with vitamin C control IC50: 5.46 significantly compared with the control (Rahman MA, et al, 2011).

It is possible because the compounds present in the ethyl acetate extract from the

daffodils leaves do not have good antioxidant activity. The Conclusion Antibacterial activity of ethyl acetate extracts of the leaves of daffodils are derived from the sub-district PorseaLaguboti potential as an antibacterial against erchechisia Coli and staphylococcus bacteria, but for activity as an antioxidant does not show as a powerful antioxidant.

Therefore, it still needs further study to the activities of the lily plant using a variety of solvents for the solvent. The research was funded by the Development Activity / PO UNIMED Research Institute for Fiscal Year 2017. References Azam S, Mahmud M.K, Naquib M.H, Hossain M.S, Alam N.M, Uddin M.J, Irvan S, Hossain S.M, Karim M.S, and Hasan A.M, 2016, In Vitro Anti-Oxidant and Anti-Microbial.

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