International Journal of Pharmaceutical Science Invention
ISSN (Online): 2319 – 6718, ISSN (Print): 2319 – 670X
www.ijpsi.org || Volume 3 Issue 11 || November 2014 || PP.33-37

Inhibition Activities of Peel Exract of Garcinia mangostana Linn in bacteri Propioni acnes sp.

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ABSTRACT: *Mangosteen fruit extract is widely used as a medicine in, so it will be testing the effectiveness of extracts of mangosteen peel (Garcinia mangostana Linn) against the bacterium acnes propioni which will be used as an external medicine (topical). Performed by means of experimental tests. Mangosteen rind extracted rotary tool wear extracted tested microbiologically at bacteripropioni acnes with comparative material Tetracycline as an anti-bacterial. The results obtained on extracts of mangosteen peel (Garcinia mangostana Linn) extract of mangosteen peel in dilution of 10x, 15x, 20x, 30x, 40x have different effects on the bacteria P. acnes significantly when compared to the negative control distilled water (p = 0.000). . activity of mangosteen peel extract at 10x dilution, has a significantly different relationship to the antibiotic Tetracycline on dilution of 10x, 15x, 20x, 30x, 40x in inhibiting the growth of P. acnes bacteria (p = 0.000). activity of mangosteen peel extract at dilution 10 times have a relationship that was not significantly different to the antibiotic Tetracycline at 20 times dilution in inhibiting the growth of P. acnes bacteria (p = 0.930). activity of mangosteen peel extract at 10 times dilution have a relationship that was not significantly different to the antibiotic Tetracycline at 30 times dilution in inhibit the growth of P. acnes bacteria (p = 0963).*

KEY WORD: *Garcinia mangostana, bacteri Propioni acnes, Tetracyclin*

I. INTRODUCTION

P. acnes can lower the pH of the skin to produce short-chain fatty acids such as propionic acid. P. acnes genome encodes many genes with some similarity to the extracellular or proteins that bind to cell wall degradation associated with cell surface components for Eukaryotic Structural and tissue / matrix. Previously discovered 33 kDa triacylglycerol lipase Geha associated with degradation of sebum. Sebum is secreted by the sebaceous glands in the skin, is composed primarily of triglycerides and other lipids such as wax monoester, free fatty acids, and squalene. Excessive sebum is produced normally by the time puberts because pengruh androgens on sebaceous gland activity. Another lipase decode P.acnes genome.[1]

Based on P. acnes genomic data, dicode virulence factors by genome can degrade host tissue and trigger inflammation. There are several molecular virulence that may lead to the progression of acne. One of them is a factor Christie, Atkins, Munch, Peterson (CAMP), a secretory protein with activity against acid kohemitik afingomyelinase host (ASMase). The process of erythrocyte lysis induced reactions have been found in P. acnes CAMP. Sialidase, factor in the cell walls of bacteria produced by P. acnes can catalyze the hydrolysis of sialic acid on the surface of mammalian cells and cause cell death. P. acnes genome also encodes several extracellular hydrolases such as hyaluronic lyase, endoglycoceramidase and sialidase. Lipase produced by P. acnes plays a role in the colonization of bacteria in the sebaceous follicle. Other localized inflammatory reaction in acne lesions including kemoantraktan molecules that recruit polymorphonuclear leukocytes and lymphocytes, inflammatory cytokine production, and complement activation. The pathogenesis of acne can also be triggered via the toll-like receptor (TLR-2), which regulates many immune response genes. P. acnes pilosebaceous unit activates and induces the production of IL-12 and IL-8 monocytes through TLR2 pathway. TLR2 and TLR4 expression is increased in acne lesions in the epidermis. This inflammation can cause ductal hyperproliferation of the epidermis. IL-8 can recruit neutrophils to the pilosebaceous unit to the enzymes that can degrade and cause a rupture of the epithelial folikuler.[2] Propioni bacterium acnes (P. acnes) is the anaerobic gram-positive, rod-shaped without spores. P. acnes grows as obligate anaerobic bacteria, but some strains are aerotoleran, but still showed a better anaerobic nature. P.

acnes has the ability to produce propionic acid and catalase together with indole, nitrate, or keduanya.[3] P. acnes is a normal flora of the body are located in the skin, especially in the pores of the skin where the bacteria is taking nutrients from the sebum produced by glands within the sebaceous hair follicles. P. acnes is also present in the oral cavity, colon, konjugtiva, and ear canal.[4-5] P. acnes is an opportunistic pathogen, especially the role of infection in the bones and joints, mouth, Matam and brain. However, the role of these bacteria, especially in causing acne or jerawat.[6] Mangosteen fruit extract is commonly used for a variety of diseases, especially for the use of oral medications. The skin of the mangosteen fruit is known to contain vitamins, cathechin, polysaccharides, and stilbene.[7-8] Mangosteen rind is the outer part of the fruit mangosteen xanthones containing concentrations of terbesar.[9] Mangosteen rind contains several compounds with pharmacological activity, for example anti-inflammatory, antihistamine, treatment of heart disease, antibacterial, antifungal, antitumor, or antiviral. Xanthon class of compounds that are contained in the mangosteen rind of a role in the pharmacological activity.[9]

Xanton compounds that have been identified, such as 1,3,6-trihydroxy-7-methoxy-2,8-bis (3- methyl-2-butenyl)-9H-Xanten-9-on and 1,3,6,7-tetrahidroksi-2,8-bis(3-methyl-2-butenyl)-9-H-xanten-9-on. Both are known as alpha-mangostin and gamma-mangostin. Xanton compounds isolated from the bark of the mangosteen fruit, it also showed that pharmacological activity garcinon E. Furthermore, xanton content of the extract dissolved in dichloromethane, namely 2 xanton oxygenated prenylated and 12 other xanton. Two compounds are oxygenated prenylated xanton 8-hidroksikudraksanton G, and mangostingon [7-methoxy-2-(3-methyl-2-butenyl)-8-(3-methyl-2-oxo-3-butenyl) -1,3,6-trihidroksiksanton. While the other is twelve xanton: kudraksanton G,8-deoksigartanin, garsimangoson B, garsinon D, E garsinon, gartanin, 1-isomangostin, alfamangostin, gamma-mangostin, mangostinon, smeathxanthon A, and tovofillin A.[10]

II. MATERIALS AND METHODS

Extract of mangosteen peel (Garcinia mangostana L) 10 mg / 10 ml, Soxhlet equipment, test tubes, Erlenmeyer flasks, Petri dishes, Paper Disc, water bath, incubator, Cotton bud / Cotton swabs, gauge length, heavy gauge, Spiritus , micropipette, Vortex, Ose, Densitometer, Long slide, distilled water, ethanol, Mangosteen Fruit Leather, For Brucella, 0.9% NaCl solution, Propionibacterium acnes bacteria cultures, Tetracycline antibiotic solution Preparation of Extract: A total of 50 grams of mangosteen rind powder was weighed and wrapped in filter paper. Filter paper containing mangosteen rind powder is inserted into the Soxhlet apparatus. Solvents such as ethanol 70% as much as 1 L included in the flask. The extraction process is done by means of soxhletasi up penyari clear liquid and extracted all. This process runs for approximately 5 days to clear penyari fluid. Then evaporated with a Rotavapor. Preparations of Bacteria, Prepare the test tube containing 0.9% NaCl solution. Take the P. acnes bacteria cultures using a wire loop and insert it into the test tube. Ose wire must be heated in the fire before and after entering into any solution to keep it sterile. Mix the solution and use a vortex in order to spread evenly. Make checks to get the levels of the 0.5 McFarland densitometer. If obtained <0.5 McFarland, add a bacterial culture. If obtained> 0.5 McFarland, add 0.9% NaCl solution. Testing, dip a cotton bud (cotton swab) in bacterial culture and then press the cotton into the tube so that the water leak, Apply on the entire surface of the dish evenly Brucella order, let the cup for 5 minutes, Insert a 0.5 cm diameter wells into the cup . Pitting suppressed by using tweezers, but be sure not to pierce the bottom of the order. Enter into the well Tetracycline antibiotic solution by diluting 10x, 15x, 20x, 30x, and 40x into the cup. Label the cup that contains the tetracycline marked with the letter "T" Each cup is formed of three pieces (triplo). Incubation at 37 ° C for 48 hours with atmospheric CO ¬ 2.

Measured the diameter of inhibition zone (mm). Work procedures, tests will be performed by 5 stages and performed a total of 3 times (triplo), the first stage is that which contains the P. acnes bacteria and examined using mangosteen peel extract in dilution of 10x, 15x, 20x, 30x, and 40x as a result research. The second stage is that which contains the bacteria P. acnes and examined using Tetracycline antibiotics in dilution 10x, 15x, 20x, 30x, and 40x as a positive comparison. The third stage is that which contains microbes and examined using a placebo in the form of distilled water as a negative comparison. Assessment results of the study will be obtained on the inhibition zone diameter of each cup were tested. Inhibition zone diameter was measured using calipers.

III. RESULT AND DISCUSSION

Extract of mangosteen peel (Garcinia mangostana L) of the extraction was dissolved in 10 cc of distilled water and then carried retailing 10x, 15x, 20x, 30x, and 40x for testing. antibacterial effect. Antibiotics comparison as a positive control Tetracycline is an antibiotic. Taken 50 mg dissolved in 10 ml of distilled water and diluted as much as 10x, 15x, 20x, 30x, and 40x negative Comparative use distilled water . Extract along with an antibiotic solution is stored in a refrigerator.
Antibiotic solution and extract of mangosteen peel (Garcinia mangostana L) is then inserted into the wells that are within petri dishes containing bacterial cultures. Each of the wells containing 100 microliters. Each test was made 3 times (triplo).

- The cup with the label "E" pitting each containing 100 microliters of mangosteen peel extract with dilution 10x, 15x, 20x, 30x, and 40x as many as 3 pieces.
- cup labeled "T" pitting each containing 100 microliters of a solution of tetracycline antibiotics by dilution 10x, 15x, 20x, 30x, and 40x as many as 3 pieces.
- cup labeled "K" containing 100 microliters of distilled water wells three times.
- cup petri incubated anaerobically in anaerobic tubes with a temperature of approximately 370 ° C for 2 days. Inhibition zone of each petri dish were measured.

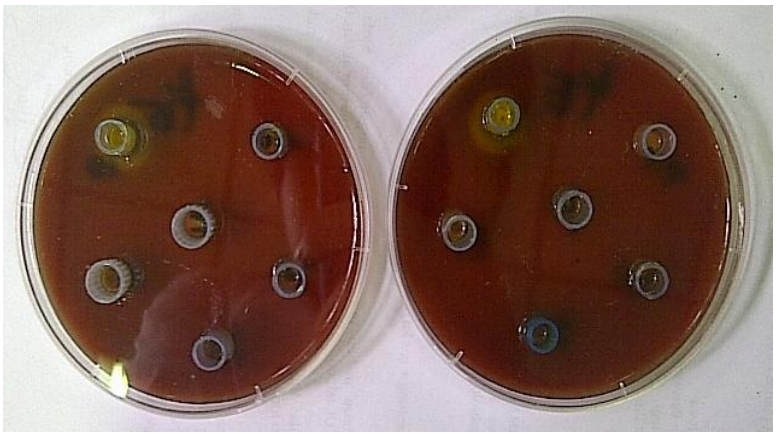

Figure 1.Testing Results of tetracycline and aquades

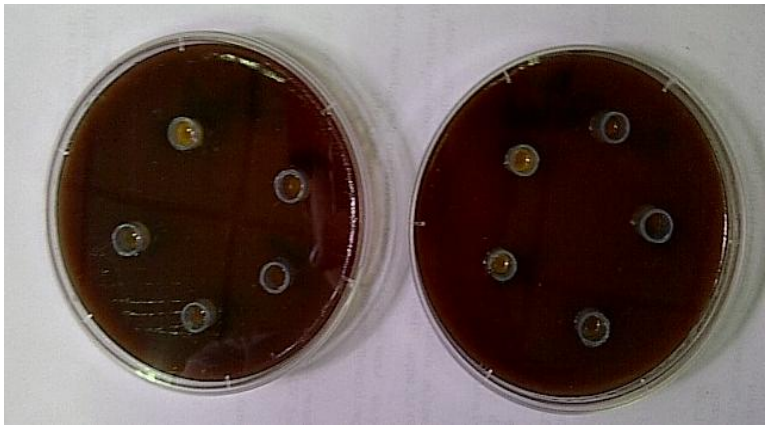

Figure 2.Testing Results of Extract skin of Mangos teen

Table 1.Results of Inhibition Zone Diameter

Control	**Σ** Inhibition Zone Diameter **(mm)**				
	Dilution				
	10x	**15x**	**20x**	**30x**	**40x**
Extract skin Garcinia mangos teen	38,17	32,16	30,5	16	0
Tetracycline	47	43,5	39,83	36,67	34,33
Aquades	0	0	0	0	0

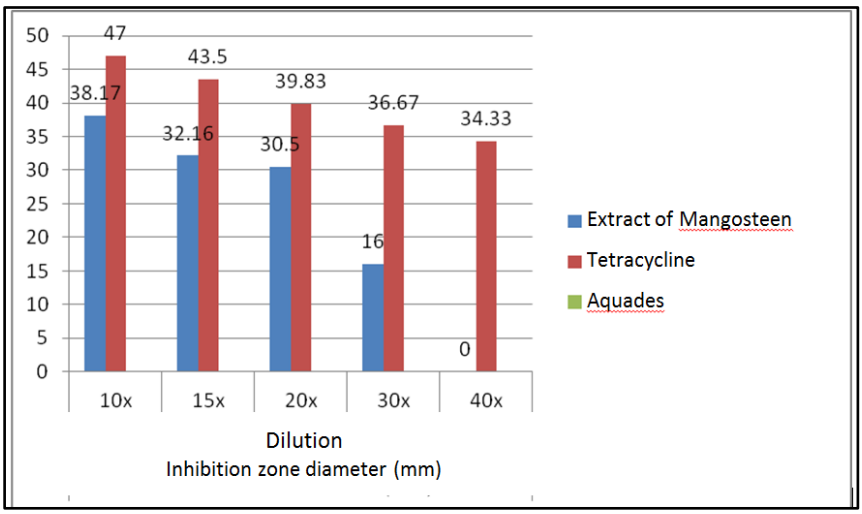

Figure 3.Results of Inhibition Zone Diameter

Research results obtained illustrate that the obtained inhibition zone diameter decreased with increasing the amount of dilution. Illustrates that the ratio of the amount of dilution solvent with mangosteen peel extract and tetracycline antibiotics, the greater. In this study, the higher the dilution of the extract, which means that the lower the concentration of resistance the smaller the diameter of the zone. The data obtained is then performed statistical analysis using SPSS. From the data obtained were then tested for normality by the Shapiro-Wilk test assessing the value of p> 0.05. Shapiro-Wilk testing because in this study using the analytic hypothesis testing with small samples (<50). At normality results showed that all normal data with p> 0.05 so that hypothesis testing is then performed with the parametric test, in this case using One-Way ANOVA test. Before you can do a One-Way ANOVA test first tested the data to assess the homogeneity of variance of data. In the homogeneity test p value = 0.073, which means p> 0.05 so the One-Way ANOVA test is valid for use. Then test the hypothesis using One-Way ANOVA.

Based on the results of the study showed that the test data is compared to the negative control (distilled water) that showed statistically significant (p = 0.000) when compared with tetracycline in the dilution of 10x, 15x, 20x, 30x, 40x; extract dilution 10x, 15x, 20x, and 30x. This suggests that the positive control has an antibacterial effect against P. acnes. Extract with 10x dilution has an antibacterial effect when compared with negative controls (p = 0.000). Relationships are also significant differences in the dilution of the extract 10x 10x when compared with tetracycline (p = 0.000) and tetracycline 15x (p = 0.000). However, the extract at 10x dilution there is no significant difference in relation to tetracycline at 20x dilution (p = 0.169), 30x dilution (p = 0.214). In this case, the antibacterial activity of the extract in retailing 10x relationships did not differ significantly with tetracycline antibiotic dilution 20x and 30x. However, there is a significantly different relationship when mangosteen peel extract dilution 10x compared to 40x dilution tetracycline antibiotics (p = 0.003). This indicates that the antibacterial properties of the mangosteen fruit extract significantly different with a 10x dilution effect resulting antibacterial tetracycline 40x. Having obtained these results statistically that mangosteen peel extract with 10x dilution antibacterial activity. Antibacterial activity of mangosteen rind was

not significantly different with the antibiotic tetracycline on 20x and 30x dilution with a significance level of P> 0.05 so that their activities are not different but the antibacterial activity of mangosteen rind at 10x dilution have significantly different activity with tetracycline dilution 10x, 15x, and 40x. It is stated that the results of which showed significantly different antibacterial activity can be higher or lower than the antibiotics. From the results obtained that extract of mangosteen peel at 10x dilution had lower activity compared to tetracycline dilution 10x and 15x, but higher antibacterial activity compared to tetracycline antibacterial extract 40x due to the dilution effects 10x have a relationship that was not significantly different with tetracycline dilution 20x and 30x.

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