



SCREENING PHYTOCHEMICAL AND TEST THE ACTIVITY AN EXTRACT OF THE PANDANUS A NEW SPECIES (FREYCISETIA SESSILIFLORA RIZKI.) AGAINTS BACTERIA STREPTOCOCCUS MUTANS AND ESCHERICIA COLI IN VITRO

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ABSTRACT

*F. sessiliflora*Rizki is one of pandanus new woodland species found in the year 2015 in west Kalimantan on mount Passi. The researchers found pandanus a new species that is quite different from other pandanus until an antonym of morphology. For his discovery of this a lot of scientific information that has not been widely is explored, so that more needs to be done in the defèrent of pandanus scientific study this. This study aims to to see of a metabolite secondary through skrinning phytochemical that is in them. In addition of the pandanus possessing the peculiar to the health of the skin and is fitting to the need of the mouth which is the result of Streptococcus mutans, Eschericia coli and Staphylococcus aureus. Plant extracts of the pandanus obtained by using a method of maceration with a solvent ethanol so getting extract viscous that will be used to screening phytochemical by pulling all of a metabolite secondary, viscous with an extract the result of the activity of bacteria by using the method or method of disc for Kirby-Bauer. Extract pandanus was variation concentration 5%, 10%, 15%, 20%, 25%, and 30%.Results obtained of the obstacles around paper discs, and obtained value force antibacteria. Data analyzed by anova one direction with standard trust 95%.

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INTRODUCTION

Indonesia is one of a country that has the third largest tropical rain forest in the world after Brazil and the Republic Democratic of Congo that has high potential as producer medicinal plants in the world (Lipu.S, 2010).Of the total of about 40.000, medicinal plants as many as of the plant is alleged 30.000 in Indonesia. Some of them have efficacy 7.000, as a and formed a kind of 2.500 medicinal plants (Masyhud, 2010).

West Kalimantan is the tropics programs that consisting of marshy areas , the highlands of , the lowlands, and which has the potential to as a place of living fo r drug crops. One crop that is in West Kalimantan of them was a plant that is native of the genus freycineticia that a new species of thepandanus (*Freycinetiasessiliflora*Rizki) who found in the mount Passi, Singkawang and attract the on exposure it has still not been widely.

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pandanusfragrant (*Pandanusamaryllifolius*Roxb.).To research plant formerly pandanus fragrant known to have efficacy as antimicroba can inhibit bacterial growth *Staphylococcus*aureus (Stevani, 2016).

The use of herbs as medicines have long used by a community, before even long before experts found the drug efficacy of plants. An alternative natural material used by a community as a media, prevention and the healing of diseases in an attempt to preserve health.It is crucial for people who are moving in the field of research to find new antibacterial agents be used as anby the public at large.

The discovery of agents antimicroba of medicinal plants would not easy, but it can be obtained by doing research on certain plants with an antibacterial in plants having metabolite secondary as flavonoid, saponin and phenolic compounds where this will synthesized by plants in response to microbial infection that is effective results and can be used as a powerful antibacterial against microorganisms.

MATERIALS AND METHODS

The tools used in this research among other: autoclave (American 75X), the stem a stirrer, a basin, a petri dish, enkas, erlenmeyer (pyrex), beaker (pyrex), measuring glass (pyrex), incubator (memmert) , spritus lights (insize), filter paper, paper

covers, micro pipet (dragon med), digital analytic (HWH), oven (memmert IN30), ose , a tube the reaction (pyrex), a jar glass and vacum rotary evaporators (scilogex).

The materials used in research are among others: alcohol and aquadest proinjection, bacteria *Streptococcus mutans*, *Staphylococcus aureus*, and *Eschericia coli*, ethanol 70%, FeCl₃, H₂SO₄, a solution of nacl, physiological Mueller-Hilton medium (MHA) and extract *F.sessiliflora*.

As many 500gr sample of *F. sessiliflora* inserted into jarred glass then poured solvent ethanol 96 % 1:3, And closed and left for 3x24 hours while often stirred.The maceration filtered using, flannel crunchy and squeezed to achieve extract liquid etanol.extract concentrated liquid ethanol using rotary evaporators at temperatures 40°C. This was done to coagulationobtainedextracts.Next done calculation randemenextract.

A kind of the research is experimental research laboratory conducted in the draft bacteria based on random complete with 5 treatment repeated as much as 3 times. Focus research is conducting a skrinningphytochemistry by pulling compound these secondary and antibacterial activity against *Streptococcusmutans*, *Staphylococcus aureus*, and *Eschericia coli*.

The zone obstruct grouped into (1) no zone obstruct, (2) weak the zone obstruct less than 5 mm, (3) a modest obstruct 5-10 mm zone, (4)

RESULTS

arrogant obstruct 11-20 mm zone, (5) very strong the zone obstruct 21-30 mm to research (David and stout, 1971).

Table 1 The results of a screening phytochemical plant the tangled maze of jungle species was using a pandanus new (*FreycinetiasessilifloraRizki.*)

No	Identification	Reagent	Replication	Theory	Hasil
1	Flavonoid	Shinoda test	1	Orange solution to red	+
			2		+
			3		+
2	Alkaloid	Dragendorff	1	The sediment of an orange	+
			2		+
			3		+
3	Fenol	FeCl ₃ 5%	1	Formed a deep blue color, blue dusky or a black greenish	+
			2		+
			3		+
4	Terpenoid/steroid	Salkowski	1	Formed a bluish shade ofgreen(sterol). Forming the ring tanned or violet (triterpenoid)	+
			2		+
			3		+
5	Tanin	Gelatin solution	1	The sediment is then white	+
			2		+
			3		+
6	Saponin	Aquadest	1	Formed froth could survive for 1-15 minutes or more	+
			2		+
			3		+

Table 2 The results of testing the activity of an extract of the pandanus the forest species new *F. sessiliflora Rizki.* To the growth of bacteria *Streptococcus mutans.* with the incubation period is complete for 24 hours

Concentration	Replication			Total (mm)	Avarage (mm)
	I	II	III		
5%	10,2	9,6	10,5	30,3	10,1
10%	10,6	11,6	11,6	33,8	11,2
15%	12,8	13,2	13,5	39,5	13,1
20%	13,55	14,8	14,8	42,4	14,1
25%	15,8	15,9	16,3	47,3	15,7
Control (+)	12,1	14,8	10,3	37,2	12,4
Control (-)	-	-	-	-	-

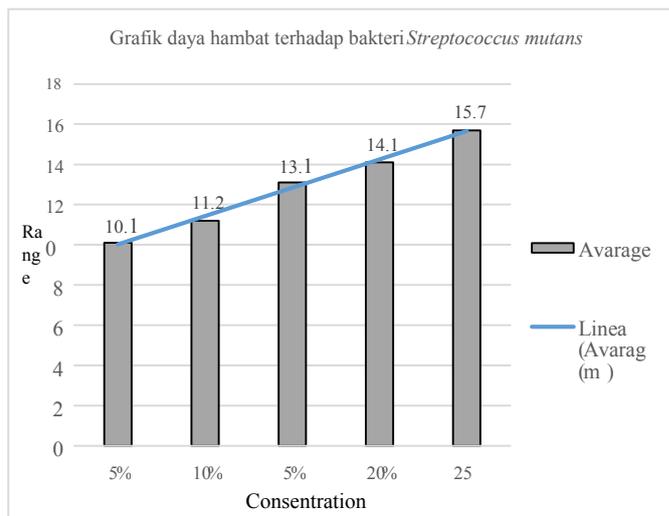
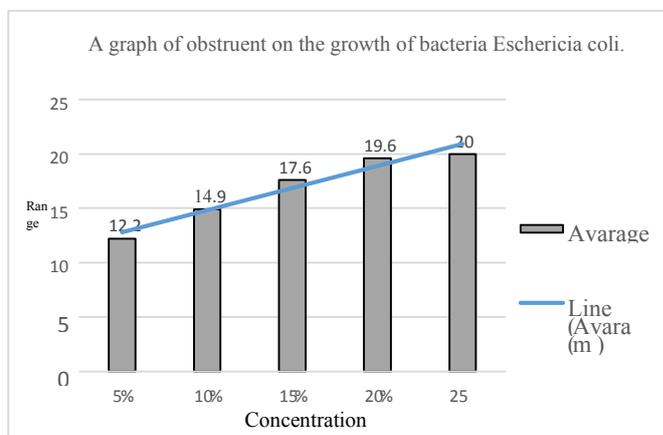


Table 3 The results of testing the activity of an extract of the pandanus the forest species new *F. Sessiliflora Rizki.* To the growth of bacteria *Esherichia coli* with the incubation period is complete for 24 hours

Concentration	Replication I	Replication II	Total (mm)	Avarage (mm)
5%	11,4	13,0	24,5	12,2
10%	13,4	16,4	29,8	14,9
15%	16,6	18,6	35,2	17,6
20%	18,0	21,2	39,2	19,6
25%	18,5	21,6	40,1	20,0
Control (+)	12,1	14,8	26,9	13,4
Control (-)	-	-	-	-



DISCUSSION

The sample used in this study is pandanus forest species new latin name *freycinetiasessiliflora*. Which sample taken from mount passi, singkawang, west kalimantan province. Sample and processed into simplisia dry with a heavy wetness 1.532,32 grams then dried using dry cabinet 24 for approximately three hours and a dry 620,78 grams.

Then use a solvent ethanol simplisia macerated 96% during illegal minimarts, hours and then filtrate obtained evaporated using evaporator rotary until then obtained the randemen extract 6,0% (>10%).

Before he testing akivitas, antibacterial extract tested organoleptis beforehand to know characteristic of the extract or color test plant extracts pandanus, dark green it is consistency thick and has a odor characteristic of the plant.

Before he did testing antibacterial activity, undergone a estimator test first by the way he did screening phytochemistry in plants that aims to look at compounds whatever contained in the plant. Here is the result screening phytochemistry committed in Laboratory of Pontianak State Politekhnik in table 1.

Screening phytochemistry was about the flavonoid, an alkaloid, terpenoid/steroid, saponin, tannin, and phenol. As for the result of filtering of phytochemistry this plant flavonoid, compounds containing positive an alkaloid, terpenoid, saponin, tannin, and phenol.

An obstruct power testing done in the laboratory microbiology an academy of pharmacy yarsipontianak by using 5% concentration, 10%, 15%, 20%, and 25% bacteria as well as *Streptococcus mutans* test that is used is suspected of being a any of the bacteria the main cause of whack/dental caries and bacteria *Esherichia coli* as any of the bacteria cause of diarrhea. Positive control that is used is antibiotic Amoksisilin and control negative use aquadest which are then incubated for 24 hours at a temperature of 37°C.

Based on observation after incubation, 24 for hours extract the leaves of the pandanus this new species has a obstruct against bacterial growth and *Streptococcus mutans* and *Esherichia coli* is clear the zone at concentrations which has tested. The diameter of an obstruct can be seen in table 2 and 3.

Based on each table 2 and 3 can be seen that the extract could hinder the growth of bacteria *Streptococcus mutans* and *Escherichia coli* in the category of inhibition, strong where an increased concentration of the affected zone obstruct formed. Each concentration extract inhibiting the growth of bacteria *Streptococcus mutans* with an average diameter obstruct concentration of 5% of 10,1 mm, the concentration of 10% of 11,2 mm, the concentration of 15% of 13,1 mm, the concentration of 20% of 14,1 mm and the highest concentration of 25% of 15,7 mm.

While in the bacterium *Escherichia coli*, obtained average yields obstacles concentration of 5 % of 12,2mm. the concentration of 10% of 14,9 mm. the concentration of 15% of 17,6 mm. the concentration of 20% of 19,6 mm. the concentration of 25% of 20,0 mm. See the result can be concluded that the higher concentration of inhibited. Extract more the clear sense of the larger the total number produced having bacterium that does not survive, this shows the increasing concentration of the more high levels of the active

ingredient that serves as antibacterial so their ability to inhibit bacterial growth bigger.

On each, concentration the results obtained having different values but antibacterial criteria are part of the same because the powerful category into range 1020 mm. this indicates that plant extracts pandanus this new forest species with an antibacterial very powerful and potent in inhibiting the growth of bacteria *Escherichia coli* and *Streptococcus mutans*. The acting as the antibacterial including, flavonoid, saponin capable of inhibiting the growth and tannin gram-positive bacteria (*Streptococcus mutans*) and gramnegative bacteria (*Escherichia coli*).

The bacterium *Streptococcus mutans* is gram-positive bacteria is not moving, facultative, anaerobic bacteria having the form of globular or ovoid, arrayed like a chain and do not form spores. *Streptococcus mutans* usually found in the cavity of the teeth of man who cuts and most conducive to bacteria that causes dental caries to tooth enamel (Manton, 2010).

While the bacterium *Escherichia coli* the walls of his cell having an arrangement more complex lipid content higher ranges from 11-22 % and it will be introduce non polar so it would easily penetrated by compound antibacterial introduce non polar also (hidayathulladkk , 2001)

An obstruct formed on the power plant extracts pandanus forest species because of this new active (flavonoid, contained therein, saponin and tannin). The compound has a third obstruct against bacteria *Streptococcus mutans* and *Escherichia coli*.

Flavonoid represent the largest of a compound of phenol. A compound bioaktif is suspected that this has the potential to as a compound antibacterial. Biological activity flavonoid compounds against bacteria done by tearing up the cell walls from bacteria which is made up of lipid and amino acids will react with an alcohol group to compounds flavonoid.

According to the Pendit et al (2016), said that the mechanisms of flavonoid as antibacterial is way hinder, synthesis of nucleic acids hinder, the cell membrane function and impeded energy metabolism. The polyfenol in flavonoid also has its antimicrobial against *Streptococcus mutans*. Polyfenol works denaturate proteins in bacteria. Proteins that experienced in denaturing will lose, physiological activity so when protein denatured all the activity of cell metabolism catalyzed by enzymes so bacteria my own survival and could not function properly. Changes in protein structure in the cell walls bacteria would increases the permeability, cells so cell growth will be stunted and then the cells become damaged.

Besides flavonoid, saponin having broad spectrum antibacterial activity which mechanism works in a destructive manner plasma membrane bacteria by raising the cell membrane bacteria. Saponin diffuses through a membrane can then increase the cytoplasm of disturbing and reduce the stability of the membrane and cause the cytoplasm of leaking out of the (Hopkins 1999).

A compound tannin is a compound bioakt if has any highest rank among other compound .The ability tannin as an antibacterial seen from its action against membrane (Marfuahdkk, 2018). Tannin have working mechanism together with other phenolic inhibit bacterial growth *Streptococcus mutans* and *Escherichia coli* and can reacted by

enzyme essential and destructor or inactivation function of genetic material (Brannen, 1993).

CONCLUSION

Now this research can be summed up as follows:

- ✓ A new species of pandanus latin name (*Freycinetiasessiliflora. Rizki.*) can inhibit bacterial growth *Streptococcus mutans* and *Escherichia coli*.
- ✓ An obstructive power that is produced on a bacteria of *Streptococcus mutans* by concentration of the 5 % as much as 10.1 mm, the concentration of 10 % as much as 11.2 mm, the concentration of 15 % as much as 13.1 mm, concentration of 20% as much as 14.1 mm and concentration of highest 25 % as much as 15.7 mm. while in the case of the bacterium *Escherichia coli*, obtained average yields obstacles concentration 5% as much as 12,2mm. 10% as much as 14.9 mm. 15% as much as 17.6 mm. 20% as much as 19.6 and 25% as much as 20,0 mm. in the classification of the effectiveness of antibacterial plant extracts of the pandanus the forest species are part strong this new category .

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