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SOCIALIZATION OF ANTIBACTERIAL ACTIVITY OF KERSEN LEAF EXTRACT (*Muntingia calabura L*) AGAINST BACTERIA *Staphylococcus aureus*

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Abstract

Kersen (Muntingia calabura) is one of the plants that grows a lot in tropical regions such as Indonesia. Until now, kersen trees are widely used as shade plants because of their shady leaves. Several studies have proven that kersen leaves have benefits in the treatment of kaarena containing several secondary metabolites such as flavonoids, tannins and terpenoids. Flavonoids have antibacterial power by denatured proteins and damage cell membranes and dissolve fats contained in bacterial cell walls. In 2011, the Word Health Organization confirmed that deaths worldwide are one-third caused by infectious diseases. One of the bacteria that many become infectious agents is Staphyloccus aureus. This socialization aims to provide information to the public that kersen leaves have benefits as antibacterials against Staphylococcus aureus. Previously, scientific research has been carried out on kersen leaf extract with several variations in extract concentrations of 15%,30%,45% and 60% and compared to one of the erythromicyn antibiotics. The results, it is proven that kersen leaf extract can inhibit the growth of this bacteria. So it can be concluded that kersen leaves can be used for the treatment of infections by Staphylococcus aureus such as skin diseases and lung infections. It is hoped that with this socialization, the community understands the benefits of kersen leaves in the treatment of medical diseases so that this plant is not only a shade tree.

Keywords: *Muntingia calabura; Staphylococcus aureus; Zone of inhibition*

1. Introduction

Infectious diseases are one of the problems in the health sector that many people suffer from. The WHO stated as many as 25 million deaths worldwide a third were infectious diseases. The most common causes include Staphyloccus aureus bacteria.

Staphyloccus aureus is a gram-positive pathogenic bacterium that

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saprophytes in the membrane channels of the human body, the surface of the skin, sweat glands, and the intestinal tract. This bacterium is very adaptable to the environment through its resistance to antimicrobials. Its infection in humans can be transmitted directly through the mucous membranes that meet the skin. Diseases that often occur strep throat, skin infections (ulcers) and infections of the central nervous system and lungs (Dafista Diyantika et al., 2017).

Kersen (*Muntingia calabura*) is a shady plant that is usually used as a shade. Several studies have shown that kersen leaves contain various bioactive compounds such as flavonoids, saponins, triterpenoids, steroids, and tannins (Evi mintowati, 2013). The results of kersen leaf isolation using ethanol and methanol extracts have antimicrobial power from auron, flavonol, and flavone compounds (Noni Alvianti, 2018).

Flavonoids have antibacterial properties by releasing transduction energy against the cytoplasmic membrane and inhibiting bacterial motility. Another mechanism was suggested that hydroxyl groups in flavonoid structures result in changes in organic components and nutrient transport that eventually cause toxic effects against bacteria (Dellyna, et al. 2014). Therefore it is necessary to provide information to the public about the benefit of *Muntingia calabura L* for medicine.

2. Methods

This service activity is carried out through seminars with the method of lectures, questions and answers, and demonstrations. Identification of flavonoid compounds in kersen leaves was carried out through phytochemical screening. The uptake of the active substance is carried out by maceration extraction. The antibacterial test is carried out using a petri dish that has been made into a medium where bacteria grow. The procedure in this service activity is:

1) Preparation

Prepare socialization materials containing the equipment and materials used as well as media that support this activity. The sample used was pureed kersen leaves.

Ingredients: ethanol, aquadest, nutritional agar, erythromicyn, cotton buds, Staphylococcus aureus and viscous extract of kersen leaves as active ingredients.

Equipment: rotary epavorator, laboratory glassware, scales, petri dish, test tube, ruler

2) Implementation stage

Socialization about the antibacterial power of kersen leaves is carried out directly to participants through seminar activities. This socialization is expected to open and expand the knowledge of participants, and can be used in the community considering that infectious diseases still occur frequently. In addition to pharmacy medicines, of course, using natural ingredients is a dream for the community in medicine.

This seminar explained the stages in detail how to prove antibacterials that have been carried out in scientific research. The procedure starts from simplicia extraction method, to antibacterial testing. As for the steps are:

Each petri dish contains 10mL of Nutrient Agar. After making it clear, take a sterilized cotton swab and put it in a test tube containing a bacterial suspension. Wipe over the entire surface to make it even.

Each petri dish is made 3 well holes (3 quadrants) with a diameter of 6 mm. At injection 50 µl of extract from each concentration including positive (erythromycin) and negative (aquadet) controls. Then so that the well is incubated for 24 hours at a temperature of 35ºC. Extracts used are said to be effective when it looks clear than the surrounding area. The inhibition area is measured using a manual calipers.

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3) Evaluation and Follow-Up

The seminar was conducted via zoom. Participants who participated were 160 people. The level of understanding of participants is measured through pre-test and post-test about the material that has been explained. Then there is also a system of throwing questions to participants randomly so that participants abilities can be measured in general.

3. Result and Discussion

The inhibition zone formed from the test results was measured using a manual saliper with millimeter (mm) accuracy.

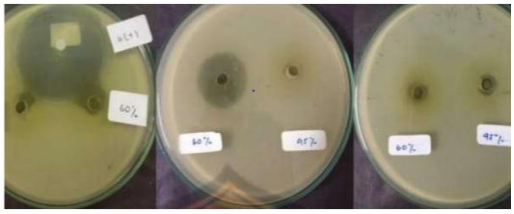

Figure 1. The Result of the antibacterial activity test.

Table 1. Diameter of the antibacterial inhibition zone

Cons.	I	II	III	average
15%	0	0	0	0
30%	1,25	0	0	0,42
45%	3,3	0	3,1	2,13
60%	4,3	14,5	1,55	6,78
K+	36	41,05	41,1	39,38
K-	0	0	0	0

In this test, it appears that the appearance of the clear zone produced is not the same. Variations in concentration can affect the strength of the inhibitory zone. Based on the test results, the highest strength is possessed by a concentration of 60% and a low of 15%. Although not very close to positive control, kersen leaves are proven to have antibacterial benefits.

The data were analyzed using the Analysia Of Varience (ANOVA) Test. First, test the normality and homogeneity of the data before conducting the ANOVA test. The normality test aims to show that the data carried out have a normal contribution or not, while the homogeneity test to determine the variance and several populations shows the same or not.

It is expected that seminar participants will give questions if there is seminar material that is not understood, so that discussions are held to solve the problem.

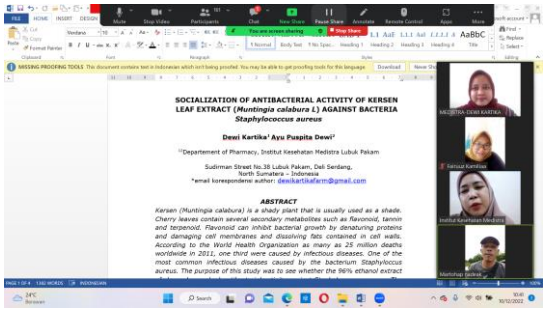

Figure 1. Sosialization by zoom application

4. Conclusion

The conclusion obtained from this service activity are:

1. Kersen leaf extract has antibacterial power against stapylococus aureus. The higher the concentration of kersen leaf extract, the stronger the antibacterial power given.
2. The average level of participants' understanding of the material is 90% as evidenced by the results of the pre-test and post-test.
3. Seminar participants gain new knowledge about the benefits of lkersen leaves as a treatment for several infectious diseases that often occur in the community.

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