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ISHS 2017

"Strengthen Collaboration in Health Sciences for Supporting Sustainable Development Goals".

Saturday, April 22nd,2017

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FOREWORD

The 1st International Seminar of Health Science 2017 (ISHS 2017) is organized and hosted by Bakti Tunas Husada Health Science College and collaboration with another college and university.

The 1st ISHS 2017 theme this year is "Strengthen Collaboration in Health Sciences for Supporting Sustainable Development Goals". The seminar will cover a breath subjects including: Nursing, Pharmacy, Medical Laboratory Technology, Midwifery, Public Health and Other relevant sciences with Health. The objectives of this seminar are to disseminate the recent advancement in health sciences and to strengthen the network and collaboration among lecturers, researchers and institutions.

I would like to use this opportunity to express our sincere gratitude to keynote speaker (Dr. Parlis, Prof. Habibah, Prof. Hamidah, Dr. Ratana and Dr Ummy Mardiana) for coming and sharing their knowledge with us and all delegates for their contributed talks. My sincere gratitude also goes to Bakti Tunas Husada Health Science college and The Foundation of Bakti Tunas Husada in particularly. I would like to thank the collaboration organizing team from Madani Health Science College Yogyakarta, Buana Perjuangan University Karawang, Muhammadiyah University Tasikmalaya, Mitra Kencana Health Science College Tasikmalaya, Muhammadiyah University Tasikmalaya, Paguwarmas Health Science College Cilacap and Serulingmas Nursing Academy Cilacap as well as all members of the scientific committee, for their hard work.

The editorial team has made some editing and correction needed in some cases. Most of the editing correction are conducted and concentrated in the organization of the paper based on the guideline and the language. Some figures and tables were corrected, and placed accordingly. In addition, the language is the most time-consuming work; hence on behalf of the committee we apologize for the late publishing of this book and for any inconvenience as a result of the delay.

We give our gratitude to the reviewing and editing team for their hard work and for making the publication of this proceeding happen. We again thank all participants and presenters for the kindness to be part of the 1st ISHS 2017. We hope the readers of this book could gain new knowledge, information, and idea for a research and further research collaboration, particularly in the topics or subjects related to basic sciences.

Warms regards,

Dr. Ruswanto, M.Si.
Chairman of ISHS 2017

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THE ACTIVITY TEST OF MUCOLYTIC INFUSA of KARUK LEAF (*Piper Sarmentosum Roxb. Ex. Hunter*) TO THE MUCUS OF COW'S INTESTINE

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Abstract. Daun Karuk-Karuk Leaf (*Piper sarmentosunRoxb. Ex. Hunter*.) is a herbal plant which has the function as medicine forcoughing, purify the voice, asthma, difficulty urinating (cause to fall the urine), stomachache, malaria, toothache, bone pain, tineaversicolor, bronchitis, energy supplement for women after gave birth, and could be used as feminine hygiene (Hidayat, S. 2015). It is known that Karuk leaf contains chemical substance of polyphenolate, saponin, flavonoid and essential oil (Hutapea, dkk., 2001). Saponin is one of the secondary metabolitewhich has mucolytic activity(GunawandanMulyani, 2004). This research has a purpose to acknowledge the activity of mucolyticinfusa of Karuk leaf to the mucus of cow's intestine with in-vitro. The water extract of Karuk leaf (*Piper sarmentosunRoxb. Ex. Hunter*.)is made with infusa method, where the concentration that is used with the Karuk leaf infusa is each within 1.4%, 0.7% dan 0.35% in 80% solution of cow's mucus.Mucolytic activity is tested using viskometer Stormer NDJ-5S type with the comparison of acetylcysteine 0,1%. The cow's mucus viscosity is analyzed statistically withAnova Post hoct test method.
This research shows that three of the Karuk leaf infusa have mucolytic activity. Statistic test use Anova Post hoct test method shows that there are meaningful different between the negative control and positive control group and the infusa test of Karuk leaf group, and there are not meaningful different between positive control and the group test of all concentration. Infusa of Karuk leaf (*Piper sarmentosunRoxb. Ex. Hunter*.) has mucolytic activity where the concentration of infusa of Karuk leaf are each within 0,35%, 0,7% and 1.4% has mucolytic activity which are not meaningful different with positive control (acetylcysteine 0,1%).

Keywords: Daunkaruk-Karuk leaf, Infusa, Mucolytic.

INTRODUCTION

The population and the development of the traditional medicine in this country is getting increase with the slogan "kembalikealam" (back to the nature) and also it is supported by the abundance of Indonesia natural resources, most of the plant that had already been cultivating since our ancestor for the cure of many diseases. One of the traditional plant that it is known for having therapeutic function as a medicine, that is, Karuk plant (*Piper Sarmentosum Roxb. Ex. Hunter*).

Karuk plant(*Piper SarmentosumRoxb. Ex. Hunter*) is known for havingthe function as medicine for coughing, purify the voice, asthma, difficulty urinating (cause to fall the urine), stomachache, malaria, toothache, bone pain, tineaversicolor, bronchitis, energy supplement for women after gave birth, and could be used as feminine hygiene (Hidayat, S. 2015).

It is known that Karuk leaf contains chemical substance of polyphenolate, saponin, flavonoid and essential oil(Hutapea, dkk., 2001). WhereSaponin is one of the secondary metabolite which has mucolytic activity (GunawandanMulyani, 2004).

Coughing is a physiology mechanism that has the function to release and clean breathing systemfrom sputum, foreign stimulant substances, and infectious element. Therefore, coughing is a protection mechanism.Coughing is especially caused by virus infection, such as common cold virus, influenza, chickenpox, and also the inflammation in the throat (*bronchitis*, *pharingitis*). These viruses could damage the mucosa of breathing system., therefore, this could create "the access door" for the infection by germ and virus, such as *Pneumococci* and *Haemophillus*(Tjay dan Rahardja, 2015). To ease and to decrease the frequency of the coughing itself, the patients are given the symptomatic therapy by giving them the cough medicine relieve. One of them are mucolyticthat could thin the sputum and to decrease the viscosity, therefore it is easier to be coughed. (Tjay dan Rahardja, 2015).

This research has a purpose to acknowledge the activity of mucolytic infusa of Karuk leaf to the mucus of cow's intestine with in-vitro.

MATERIALS AND METHODS

Materials

The plant that is used in this research is Karuk leaf (*Piper SarmentosumRoxb. Ex. Hunter)* The *in vitro* test substanceinclude cow intestine mucosa, acetylcysteine, aqua destilata, NatriumDihydrogen Phosphate, the

solution of phosphate buffer (daparfosfat) pH 7 of kaliumdihydrogen phosphate 0,2 M with NaOH 0,2 M (E. Merck).

Equipment

The equipment that is used in this research areviskometerStormer NDJ-5S (Kaneko, Tokyo), thermometer (RRC), incubator (Digisytem Lab. glass tool, pipette, strain paper, parchment paper, scale weigh, Spindle No.4)

Research Method

The negative control that is used is 90 ml of 80% mucus solution in phosphate buffer (daparfosfat) pH 7 and 10 ml aquadest, thenit is incubated in the temperature of37º C for 30 minutes. After that, it is measured the viscosity before and after adding, then it is recorded the difference of the viscosity of the result.

Provide the test solution of the infusa within the concentration of 1,4%, 0,7% dan 0,35%. To get the result of the infusa of Karuk leaf, provide 10 gram within 100 ml of Karuk leaf, then boil them for 15 minutes in the temperature of 90^0 C. (The result is theinfusawith the concentration of 10%). Next, do the thinning to get the concentration of 1,4%, 0,7%, dan 0,35%. The comparison substance that is used is acetylcysteine 0,1 %. After that, do the test of the mucolytic activity to the artificial mucus solution, that is, 80% of cow's intestine mucus within pH 7 of acidity degree, and processing the cow's intestine mucus 80% that it has already incubated in the temperature of 37^0C for 15 minutes to make the condition of the sample reaction is according with the human physiology condition. After that, measure the viscosity of each concentration.

Analyzes Data

The data of the observation result is presented in the form of tables and graphics. The data is analyzed statistically with Anova Post hoct test method with the extent trust of 95%.

RESULTS AND DISCUSSION

The test research of the mucolytic activity of Karuk leaf (*Piper Sarmentosum Roxb. Ex. Hunter)* with*in vitro* is done with the first step, that is, to do the determination of the plant proving that the plant is being used in the research is Karuk (*Piper SarmentosumRoxb. Ex. Hunter)*(Hutapea, J.R, dkk., 2001). The test of mucolytic activity has a purpose to witness the decrease of the thickness value of the sample that will be tested. *In vitro* is an experiment that is held out side of the part of animal body with the isolated organ or cell, and its condition is kept in the environment that will keep it alive and in the physiology situation during the observation.In this test of mucolytic activity is used Stormer viscometer, because the mucus has non-Newton flow type, that is, pseudoplastis type. The extraction method that is used is infusa, with the benefit of infusa method, and if it compares with other methods, are the equipments which are usedis simple and easy to operate, and also it does not cost much, it could extract easily the sample with the water solution in short time, infusamethod is an extraction methodthat could operated easily in the daily use in society, therefore, the possibility of the chemical compound which is drawn by this method will be the same with the compound that is being used. The test is done with the first stage to divide the analog of the artificial mucus in 5 group, they are, positive control, negative control, concentration sample of 1,4%, concentration sample of 0,7%, and concentration sample of 0,35%. The positive control that is used is acetylcysteine. Acetylcysteine works with breaking glycoprotein which is contained in the mucus and turns them into smaller molecules until become thinner. The mucus solution of 80% is made with thinning within phosphate buffer pH 7, with the purpose to maintain the composition of the mucus will not change and because of the mucolytic activity can be going on with the maximum of level pH 7. Incubation process and the test are held in the temperature of 37^oC, therefore, the result will be gained with the reaction condition between the test solution with mucus according to the human physiology condition. When the test is being done in the steady temperature of 37°C , because the thickness will decrease with the increasing of the temperature or the other way around, therefore, the measurement will less precise (Anonim, 1995). Each group will be added with 100 ml of analog of artificial mucus in glass beaker of 100 ml, then will be tested for the thickness using stormer viscometer with the purpose to gain the viscosity value from the analog of artificial mucus before the treat. Next, incubate the 5 test group in the temperature of 37^0Cfor 15 minutes, then test again using viscometer before giving the treat and record the viscosity, and also give the treat with adding 10 ml of the test sample and test control, next, test the viscosity again. After that, the test will do at the 15 minutes interval for one hour with the steady temperature of 37^0C, with the purpose to gain a reaction according to physiology of human body which is in the temperature of 37^0C. The mucolytic activity test will be held in 3 replications.

Viscosity of test solution and control solution with the 10 grams substance can be shown in picture 1 below.

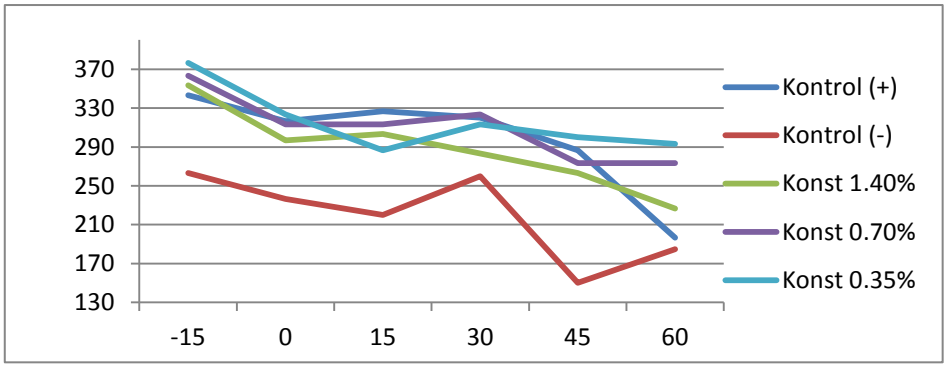

Figure 1. Histogram of viscosity of mucus before and after added with infusa extract of karuk leaf

The result showed the decreasing of the viscosity of the test group of infusa of karuk leaf with the concentration 1,4% bigger than positive control (acetylcysteine) . If we observe the viscosity of the infusa of karuk leaf carefully with the concentration of 0,7%, has the potential equal to the positif control (acetylcysteine) according to the data in Tabel 4.2 with the concentration of 0,35%, that almost has the equal concentration with the positive control, but not stabile. The result also can be influenced by time, temperature and the sensitivity of the instrument, that is, viscometer.

Tabel 1. The result Data of Viscosity reading

Test System		The average viscosity reading each 15 minute ± Devisiation standard					
		- 15	0	15	30	45	60
control	(+)	343.3 ± 248.2	316.6 ±167.4	326.6 ± 150.1	320 ± 121.	286.6 ± 150.1	296.6 ± 184.7
	(-)	263.3 ± 127.0	236.6 ± 80.8	220 ± 69.2	260 ± 34.6	213.3 ± 75.0	263.3 ± 5,7
Consentration	1.40%	353.3 ± 231.8	296.6 ± 196.5	303.3 ± 153.0	283.3 ± 140.1	263.3 ± 162.8	226.6 ± 134.2
	0.70%	363.3 ± 240.0	313.3 ±113.7	313.3 ± 144.6	323.3 ± 142.9	273.3 ± 153.7	273.3 ± 147.4
	0.35%	376.6 ± 167.7	323.3 ± 111.6	286.6 ± 112.3	313.3 ± 145.7	300 ± 157.1	293.3 ± 130.5

Statistic test using anova post hoct test method with the extent of trust 95% shows that there is the meaningful different between negative control with positive control group and test group of infusa of karuk leaf, in the other hand, between the positive control and the test group of infusa of karuk leaf is observed that both groups are not meaningful different, this is showing that the infusa of Karuk leaf has the mucolytic activity equal with acetylcysteine positive control.

CONCLUSION

Infusa karuk leaf (*Piper sarmentosunRoxb. Ex. Hunter*.) has the mucolytic activity where the infusa of karuk leaf concentration of 0,35%, 0,7% and 1.4% have the mucolytic activity that are not meaningful different with positif control (acetylcysteine 0,1%).

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