

Modification of Manufacturing Carbol with Lemongrass as a Disinfectant

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Abstract

Carbolic acid is a cleaning fluid or disinfectant that can be used to clean various surfaces, especially floors. Carbolic acid is used to prevent germs and viruses from growing so as to prevent disease and its spread. Most housewives often use chemical-based floor cleaners that are ready-made or more practical. Long-term and too frequent use can be harmful to the body and the environment. Therefore, one solution to minimize this is to use natural ingredients that are already available and developed in Lubuklinggau City, such as lemongrass to be used as carbolic acid. The preparation begins by dissolving the arpus into the NaOH solution until it dissolves, then adding a mixture of pine oil, teepol and propylene glycol until everything is homogeneously mixed. Carbol is ready to use. The resulting product is carbolic floor disinfectant. The results showed that the greater the content of lemongrass essential oil, the greater the inhibition zone, meaning that the greater the amount of lemongrass essential oil added, the Carbol solution would be better for cleaning or killing bacteria, and the better the disinfectant properties.

Keywords: Carbol, Arpus, Lemongrass, Disinfectant



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INTRODUCTION

Health is the dream of all humans, the human body has its own defense, in certain ways the parts of the body are able to survive and fight disease. Preventing a disease and its spread can be done starting from oneself and the environment as a means to reduce the spread of disease due to microorganisms.

Carbolic acid is generally used by housewives in sweeping and mopping activities. Most housewives often use chemical-based floor cleaners that are immediate or more practical. Iswanto, et al (2016) stated that long-term and too frequent use can be harmful to the body and the environment, such as 1) skin and eye irritation, especially for those who are sensitive; 2) the SLS material used is a material that causes water pollution and can cause poisoning to fish and organisms that live in water; 3) pollute the surrounding soil; and 4) the content of Cresylic acid compounds in products on the market can cause cancer in humans, irritate the respiratory tract, blood circulation, liver, kidneys, and nervous system. Therefore, one solution to minimize this is to use natural ingredients that are already available and developed in Lubuklinggau City, such as lemongrass to be used as carbolic acid.

LITERATURE REVIEW

Lemongrass is believed to have come from Southeast Asia or Sri Lanka. This plant grows naturally in Sri Lanka, but can be grown in a variety of soil conditions in the tropics that is humid, sunny and has relatively high rainfall. Most lemongrass is grown to produce its essential oil commercially and for the local market as a flavoring or spice (Chooi, 2008). Lemongrass plants are found in many areas of Java, namely in the lowlands which have an altitude of 60-140 meters above sea level (Armando, 2009).

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Lemongrass plants are known by different names in each region. The Java area knows lemongrass by the name of lemongrass or lemongrass. The Sumatra area is known as lemongrass, sorai or sanger-sanger. Kalimantan knows the name lemongrass by the name belangak, senggatau or salai. Nusa Tenggara knows lemongrass by the name see, nau sina or bu muke. Sulawesi recognizes lemongrass as tonti or sare while in Maluku it is known as hisa or isa (Syamsuhidayat and Hutapea, 1991).

Lemongrass plants contain essential oils or essential oils. The essential oil from lemongrass leaves averages 0.7% (about 0.5% in the rainy season and can reach 1.2% in the dry season). Distilled citronella oil is pale yellow in color. The main active ingredients produced are aldehyde compounds (citronellol-C₁₀H₁₆O) of 30-45%, alcohol compounds (citronelol-C₁₀H₂₀O and geraniol-C₁₀H₁₈O) of 55-65% and other compounds such as geraniol, citral, nerol, mentol, heptanone and dipentene (Khoirotunnisa, 2008). The compounds that make up lemongrass essential oil can be seen in Table 1:

Tabel 1 Senyawa Penyusun Minyak Atsiri Serai

constituent compounds	percent (%)
Sitronelal (antioksidan)	32-45
Geraniol (antioksidan)	12-18
Sitronellol	12-15
Geraniol asetat	3-8
Sitronellil asetat	2-4
L- Limonene	2-5
Elemol & Seskwiterpene lain	2-5
Elemene & Cadinene	2-5

(Guenther, 2006)

The roots of the lemongrass plant contain approximately 0.52% of the alkaloids of 300 g of plant material. The leaves and roots of the lemongrass plant contain flavonoids, namely luteolin, luteolin 7-O-glucoside (cynaroside), isoscaparin and 2''-O-rhamnosyl isoorientin. Other flavonoid compounds isolated from aerial parts of the lemongrass plant are quercetin, kaempferol and apigenin (Opeyemi Avoseh, 2015).

Phenol (carbolic acid) was first used as a germicide or bactericidal disinfectant to prevent postoperative infections. Phenol solution is useful as a disinfectant at a concentration of 2% - 4%. Phenol is a slow-acting disinfectant that can damage cell membranes by lowering surface tension and actively precipitation of proteins at high concentrations, while at low concentrations it inactivates important enzymes from bacteria (Levinson, 2010; Rutala et al., 2002). Phenol is effective against contaminated materials such as vomit, pus, saliva, and feces, but is less effective against spores.

The addition of halogens such as chlorine will increase phenol activity (Chatim, A and Suharto, 1994). Hexachlorophene, a phenol derivative, turns out to have side effects as a cause of brain damage in infants, so now phenol is only used in children's rooms that are heavily contaminated with Staphylococcus (Bauman et al, 2011).

Propylene glycol is widely used as a solvent and carrier in the manufacture of pharmaceutical and cosmetic preparations, especially for substances that are unstable or insoluble in water. Propylene glycol is a clear, colorless, viscous, and almost odorless liquid. Has a slightly sharp sweet taste resembling glycerol. Under ordinary conditions, propylene glycol is stable in a well-closed container and is also a chemically stable substance when mixed with glycerin, water, or alcohol. Propylene glycol is also used as a fungal growth inhibitor. Clinical data have shown skin irritation reactions to the use of propylene glycol below 10% and dermatitis below 2% (Lodèn, 2009).

Propylene glycol has been widely used as a solvent and preservative in various parenteral and nonparenteral formulations. Propylene glycol is generally a better solvent than glycerin and

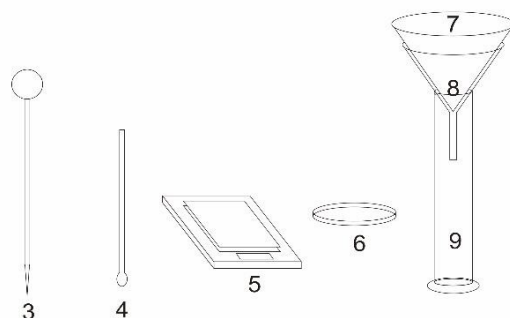
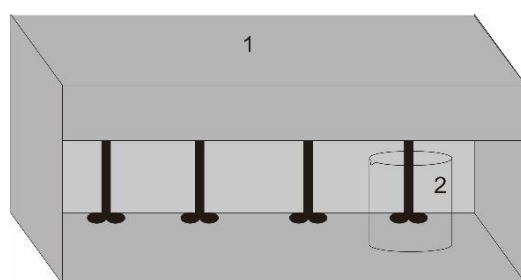
can dissolve a variety of substances, such as corticosteroids, phenols, sulfa drugs, barbiturates, vitamins A and D, alkaloids, and many local anesthetics (Rowe et al., 2005).

RESEARCH METHODOLOGY

Material

1. Arpus
2. NaOH
3. Teepol
4. Propilenglikol
5. Aquadest
6. Champora
7. Minyak Atsiri

Alat



Keterangan :

1. Alat Pengaduk
2. Gelas Beker 500 ml
3. Pipet Ukur 25 ml
4. Gelas Pengaduk
5. Neraca Digital
6. Gelas Arloji
7. Kertas Saring
8. Corong
9. Gelas Ukur 250 ml

Methods

Make an M1 solution by grinding 250 grams of Arpus to a size of 200 mesh. Add 1 L NaOH 0.625 N to have a pH of 14.

Carbol is made by mixing a solution of M1, Teepol, Pine oil, campora with a certain composition. Then add essential oils as much as 1, 2, 3, 4 and 5 mL in each sample. In order for the solution to be homogeneous, the mixture was added to propylene glycol.

RESULT AND DISCUSSION

Experiments were carried out by trying various sizes of the ingredients for making Carbolic acid, until a homogeneous solution was obtained, and after that it was mixed with lemongrass essential oil with variations of 1, 2, 3, 4, 5 ml. using a gram negative test using E Coli bacteria, with the Diffusion method, with a standard plate diameter of 6 mm

Table 2 Solubility Test in the experiment of making carbolic acid by varying the lemongrass essential oil

No.	M1	Camphor a (gr)	Pine Oil (gr)	Teepo l (gr)	Atsiri Serai (ml)	Propylene Glikol (ml)	Kondisi Sample
1	15	5	20	40	1	5	Larut
2	15	5	20	40	2	5	Larut
3	15	5	20	40	3	5	Larut
4	15	5	20	40	4	5	Larut
5	15	5	20	40	5	5	larut

From table 2, it can be seen that the carbolic acid solution was added with essential oil with variations of 1,2,3,4,5 ml, stirred until dissolved and allowed to stand for up to one month still well dissolved, meaning that Teepol as a surfactant still works well, Teepol is still able to lower the voltage. the surface of the solution or can disperse well, so that water and oil can mix.

Table 3 Disinfectant ability test on carbolic acid, with a gram negative test using E Coli bacteria and the Diffusion method

sample	Atsiri Serai (ml)	result mm	Average Test Results mm	obstacles zone
1	1	1 8,0 2 7,3	7,65	1,65
2	2	1 8,3 2 9,3	8,8	2,8
3	3	1 8,9 2 9,5	9,2	3,2
4	4	1 16,4 2 17,4	16,9	10,9
5	5	1 18,1 2 19,2	18,65	12,65

CONCLUSION

From table 3 it can be seen that the greater the content of lemongrass essential oil, the greater the inhibition zone, meaning that the greater the amount of lemongrass essential oil added, the Carbolic solution will be better for cleaning or killing bacteria, and the disinfectant properties are getting better.

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