Antibacterial Activity Of Various Extracts From The Fruiting Bodies Of Ganoderma Lucidum Growing At Samanea Saman (Jacq.) Merr) Trunk

M. Natsir Djide, Sartini, Latifah Rahman, Nursiah Hasyim

Abstract: Ganoderma sp provides bioactive compounds that claim to posses antibacterial activity. The aim of this research is to know antibacteriall activity of various extract of Ganoderma. Fruiting bodies of Ganoderma were extracted by maceration method using 50 % aceton, 50 % ethanol, methanol and boiling water, respectively. Antibacterial activities were done against *Staphylococcus aureus* and *Pseudomonas aureuginosa* using disc diffusion assay. The result showed that the extracts had antibacterial activity and methanolic extract at concentration 500 ug/disc had higher antibacterial activity than ethanolic, acetonic, and water extract, with diameter of zone inhibition was 13.04 mm.

Keywords: *Ganoderma lucidum*, antibacterial, solvent extraction, *Samanea Saman*

1. INTRODUCTION

Mushroom, *Ganoderma lucidum* (Fr.) Karst, called “Lingzhi” in China, has been used in traditional medicines in many Asian countries. The chemical constituents of G. lucidum include polysaccharides, proteins, nucleosides, fatty acids, sterols, and triterpens (Yeung et al., 2004). The activities of *G. lucidum* are mainly due to polysaccharides and/or triterpenoids of the fungus. Some of the triterpenoids showed antioxidant, anticancer (Lin et al, 2003), antimicrobial (Prasad et al, 2008). Quereshi et al (2010) found that extracts of Ganoderma lucidum from the exposed dead trunk and roots of *Mangifera indica* had antibacterial activity. *Ganoderma* species like any other fungi grow wild on living or dead/dying wood log of hardwood and sometimes on dead roots. Typically found at the base of living hardwoods or occasionally on the stumps or roots of a wide range of deciduous hosts (Chang and Mshigeni, 2004). Mushroom fruit-bodies are complex structures, both morphologically and more physiologically with undoubted variations in chemical composition from batch to batch. In this research, we used Ganoderma lucidum that grow on dead wood of *Samanea saman (*Jacq.) Merr. (Fabaceae) generallu called as a rain tree. Rain tree is a folk remedy for cold, diarrhea, headache, intestinal ailment and stomache. The aim of this research is to know antibacterial activity of various extract of Ganoderma lucidum from Rain Tree against *Staphylococcus aureus* and *Pseudomonas aeroginosa* . Fruiting bodies of Ganoderma were extracted by kinetic maceration method using 50 % aceton, 50 % ethanol, methanol and boiling water, respectively.

2. MATERIALS AND METHODS

Material: Fruiting bodies of Ganoderma were collected from on dead wood/trunk of Rain tree (*Samanea saman (*Jacq.) Merr) at Tamalanrea Campus of Hasanuddin University.
Solvent: Aceton, methanol, ethanol, destilled water. Media: Muller Hinton Agar (Difco), paper disc (6 mm diameter).
Bacterial tests: *Staphylococcus aureus* and *Pseudomonas aeroginosa* (Pharmaceutical Microbiology Laboratory of UNHAS Collection)

Extraction Methods:
The dried fruiting body of ganoderma 10 g was extract by kinetic maceration at 200 rpm during 4 hours using each of 200 mL organic solvent viz., aceton 50 %, ethanol 50 %, methanol, and boiling water. After extraction, the solvent was evaporatored by using rotary evaporator.

Antibacterial Assay:
The antibacterial assay was performed by agar diffusion method using paper disc as reservoar. 10 mL melt Muller Hinton Agar was inoculated with 100 µl of inoculum test bacteria and poured in to petridish. Each 0.5 mg extract was diluted with 1 ml dimethylsulfooxide (DMSO). Ten microlitre extract was put in paper disc (every disc contained 500 µg the extract). The petridishes were incubated 24 hours at 37ºC, for each bacterial test. The results were obtained by measuring the diameter of zone of inhibition.

3. RESULT AND DISCUSSION

The result of fruiting body of Ganoderma extraction with organic solvent like 50 % ethanol, 50 %aceton, metanol, and water could be showed in table 1 below.

Table 1. The result of Ganoderma extraction using some organic solvent

Sample weight	Organic solvent	Extract weight (g)	Rendemen (%)
20 g	Ethanol 50 %	0.56	2,8
20 g	Aceton 50 %	0,70	3.5
20 g	Methanol	0,50	2,5
20 g	Pure water	0.02	0,1

Antibacterial activity of Ganoderma extracts represented in fig. 1 and table 2.

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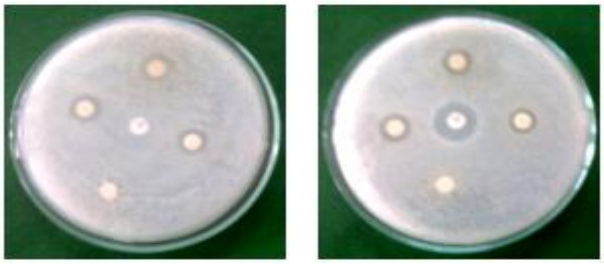
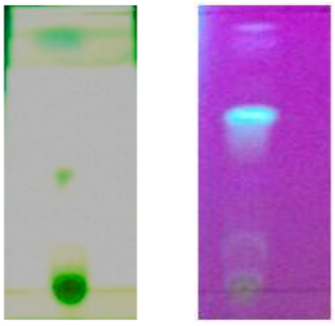


Fig. 1: Antibacterial activity of Ganoderma extract against *S. aureus* and *Ps. Aeroginosa* in MHA medium

Table 2. Diameter zone of inhibition (mm) of Ganoderma extracts Against *Ps. aeroginosa* and *S. aureus*

Bacterial test	Sample test				
	MeOH extract	Aceton extract	EtOH extract	Water extract	Ampicil-lin
Pseudomonas aeroginosa					
		12.54	11.56	7.70	18.43
	12.88	12.65	11.23	7,56	17,92
	13.04	12.42	11.88	7,45	18,18
Average	**13,04**	**12,54**	**11,56**	**7,57**	**54,53**
Staphylococcus aureus	13,00	13,10	11,42	7,45	11,17
	12,52	12,48	11,50	7,50	10,57
	12,75	12,78	11,57	7,47	11,77
Average	**12,76**	**12,79**	**11.50**	**7,47**	**11,17**

Data represented in Table 2 showed that methanolic extract had higher antibacterial activity than the others. Qureshi et al (2010) found that Acetone extract from fruiting bodies of Ganoderma lucidum,from the exposed dead trunk and roots of *Mangifera indica*. exhibited maximum antibacterial activity (18.00±0.20 mm at 40 μg/mL against *S. aureus* and against *Ps. Aeroginosa* (10.20±0.14 mm). Accroding to Prasad (2008), methanolic extract had higher antibacterial activity against Methicilin Resistance Staphylocccus aureus (MRSA) than the others extract. The antibacterial activity of ganoderma extracts depend on organic solvent, extraction methods, and Ganoderma species. From qualitative analysis by Thin Layer Chromatography using Silica Gel and ethylacetat/hexane (4:1) as eluent, and identified at UV lamp λ 254 nm and 366 nm. The data represented in figure 2. Fluorescent spot visualized at wavelength 366 nm. According to Lin et al (2003), Triterpenes were visualized as fluorescent spots under long wavelength UV light. Triterpenes had antibacterial acitivity.



λ 254 nm λ 366 nm

Fig2: TLC-Chormatogram of Methanolic extract of Ganoderma

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