



(Brief Communication)

Antibacterial Activity of Extract from Swamp Plant, *Eleocharis dulcis*

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ABSTRACT

The purpose of the research was to access bacterial activity from swamp plant extract of *Eleocharis dulcis* against *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Vibrio cholera*. The phytochemical compounds of ethanol extract of *Eleocharis dulcis* were tannins, flavonoids and triterpenoids. Phytochemical compounds of ethyl acetate and n-hexane extracts were flavonoids and triterpenoids. The maximum antibacterial activity the all of solvents in 2.000 ppm concentration. The bacterial activity of *Eleocharis dulcis* extract against *Bacillus subtilis* higher than that of *Pseudomonas aeruginosa* and *Vibrio cholera*.

Keywords: Swamp plant, *Eleocharis dulcis*, antibacterial

INTRODUCTION

Research on various types of plants, both marine plants and freshwater plants has been conducted to assess the potential of bioactive components that are useful as antioxidants and antibacterials. Each plant contains several types of bioactive substances which are natural chemicals contained in the plant and can be a member of the taste, aroma and color of the plant¹. Phytochemical compounds in plants also serve to protect themselves from environmental factors that cause

damage such as free radicals and pathogenic bacteria².

Some Plant produce antibacterial compounds that inhibits or killed many bacteria and there are many reports describing antioxidant activities³⁻⁵, anti-inflammatory⁶, and antidiabetic⁷. However reports on the phytochemical constituents of swamp plant and their bioactive activity of swamp plant are limited, we reported that antibacterial activity of extracts of Purun Tikus (*Eleocharis dulcis*) used n-hexane, ethyl acetate and etanol as solvents.



MATERIALS AND METHODS

Preparation of *Eleocharis dulcis*

Leaves of *Eleocharis dulcis* were collected from Indralaya swamp and immediately brought to the laboratory in sterile plastic bags containing water to prevent evaporation. Leaves of *Eleocharis dulcis* were washed thoroughly with distilled water to remove extraneous materials and shade-dried for 10 days at room temperature until constant weight obtained. The dried Leaves of *Eleocharis dulcis* were powdered and stored in refrigerator for future use.

Extraction of *Eleocharis dulcis*

Extraction of *Eleocharis dulcis* by stratified maceration method using n-hexane, ethyl acetate and ethanol.

Phytochemical Screening of *Eleocharis dulcis* extract

Phytochemical Screening of alkaloids, flavonoids, triterpenoids steroids, saponin, were determined by Harborne method⁶.

Antibacterial test

Pathogens bacterial (*Pseudomonas aeruginosa*, *Bacillus subtilis* and *Vibrio cholera*) used in this study. Antibacterial activity was evaluated using diffusion method⁹.

RESULT AND DISCUSSION

Screening of phytochemical from extract of *Eleocharis dulcis*

Screening of phytochemical from extract of *Eleocharis dulcis* can be seen Table.1.

The result showed content of phytochemical compounds of ethanol extract of *Eleocharis dulcis* were tannins, flavonoids and triterpenoids. The phytochemical compounds of ethanol extract of *Eleocharis dulcis* were tannins, flavonoids and triterpenoids. Phytochemical compounds of ethyl acetate and n-hexane extracts were flavonoids and triterpenoids.

Antibacterial activity

Antibacterial activity from *Eleocharis dulcis* with different concentration of extract pathogenic bacteria are depicted in Table. 2. The Antibacterial activity from *Eleocharis dulcis* againsts *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Vibrio cholera* were peaked after 2.000 ppm of extract concentration.

Table. 2 showed that the maximum antibacterial activity was recorded from the ethanol extracts of *Eleocharis dulcis* against *Pseudomonas aeruginosa* (9 mm), *Bacillus subtilis* (9.5 mm) and *Vibrio cholera* (10 mm). The maximum antibacterial activity from the ethyl acetate extracts of *Eleocharis dulcis* against *Pseudomonas aeruginosa* (9 mm), *Bacillus subtilis* (10 mm) and *Vibrio cholera* (10.5 mm). The maximum antibacterial activity from the n-hexane extracts of *Eleocharis dulcis* against *Pseudomonas aeruginosa* (10 mm), *Bacillus subtilis* (12 mm) and *Vibrio cholera* (8.5 mm). The bacterial activity of *Eleocharis dulcis* extract against *Bacillus subtilis* higher than that of *Pseudomonas aeruginosa* and *Vibrio cholera*.

Antimicrobial activity of *Eleocharis dulcis* extract may be primarily due to the presence of tannins and phenolic compound. Tannins have been traditionally used for treatment of *catarrh*, *hemorrhoids* and *diarrhea*¹⁰.

Table. 1: Screening of phytochemical from extracts of *Eleocharis dulcis*

Phytochemical	Solvent		
	n-hexane	Ethyl acetate	Ethanol
Alkaloid	-	-	-
Terpenoid	+	+	+
Tannin	-	-	+
Saponin	-	-	-
Flavonoid	+	+	+

Table. 2: Antibacterial activity of from extracts of *Eleocharis dulcis*

Pelarut	Bacteria	Concentration (ppm)				Control Positive	Control Negative
		500	1000	1500	2000		
N-hexane	<i>Pseudomonas aeruginosa</i>	7,5	8	9	10	31	6
	<i>Bacillus subtilis</i>	9,5	9,5	10,5	12	30	6
	<i>Vibrio cholera</i>	6,5	7	7,5	8,5	28	6,5
Ethyl acetate	<i>Pseudomonas aeruginosa</i>	7	7	8	9	30	6
	<i>Bacillus subtilis</i>	9	9,5	11	10	31,5	6
	<i>Vibrio cholera</i>	8,5	9,5	10	10,5	27,5	7
Ethanol	<i>Pseudomonas aeruginosa</i>	7	7,5	8	9	30,5	6
	<i>Bacillus subtilis</i>	7	7,5	8,5	9,5	30	6,5
	<i>Vibrio cholera</i>	7	8	9	10	26,5	7

CONCLUSION

The phytochemical compounds of ethanol extract of *Eleocharis dulcis* were tannins, flavonoids and triterpenoids. The phytochemical compounds of ethanol extract of *Eleocharis dulcis* were tannins, flavonoids and triterpenoids. Phytochemical compounds of ethyl acetate and n-hexane extracts were flavonoids and triterpenoids. The bacterial

activity of *Eleocharis dulcis* extract against *Bacillus subtilis* higher than that of *Pseudomonas aeruginosa* and *Vibrio cholera*.

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