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Antioxidant Activity of Extracts of *Halodule pinifolia* Seagrass from Solvents with Different Polarities

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ABSTRACT

The purpose of this study was to analyze phytochemistry contents and antioxidant activity of extracts from seagrass of *Halodule pinifolia* from solvents with different polarities. Parameters of research were phytochemical content, DPPH scavenging activity and reducing power. The result showed content of phytochemical compounds of ethanol extract seagrass were flavonoids, tannins, saponins, steriods and triterpenoids. The use of ethyl acetate solvent showed phytochemical compounds were flavonoids, steroids and triterpenoids. For n-hexane solvent showed phytochemical compounds were steroids and triterpenoids. The highest of antioxidant activity with DPPH method (IC_{50}) of *H. pinifolia* was 18.7 ppm with ethanol extract. The highest of reducing power of *H. pinifolia* was 1.749.

Keywords: Seagrass, *Halodule pinifolia*, antioxidant.

INTRODUCTION

Seagrasses are flowering plants (angiosperms) which grow in marine, fully saline environments. Seagrasses are a rich source of structurally novel and biologically active metabolites which they produce in order to sustain the extreme environmental conditions prevailing under sea[1]

Seagrasses produce antioxidant compounds that inhibits the oxidation of other molecules and there are many reports describing antioxidant activities[2-5], antifungal[6], antiviral[7], anti-inflammatory[8], antidiabetic[9] and antibacterial[10-12]. However reports on the phytochemical constituents of seagrasses and their bioactive activity of Indonesian sea are limited with the exception of few studies in this research[13,14], we reported that antioxidant activity of extracts of *Halodule pinifolia* seagrass from solvents with different polarities.

MATERIALS AND METHOD

Preparation of Seagrass extract

Extraction of *Halodule pinifolia* seagrass by stratified maceration method using n-hexane, ethyl acetate and ethanol . Sea grass powder were soaked in 2 L with solvent (1:4 w/v), and kept for 2

x 24 h in a shaker. The solution is filtered using the number 42 Whatman filter paper to obtain the filtrate. The filtrate is dried using a freeze dryer to remove the solvent that may remain in the extract

Phytochemical Screening of *Halodule pinifolia*

Test of flavonoids, alkaloids, saponin, steroids, triterpenoids were determined by Harborne method[15].

DPPH radical scavenging activity

DPPH radical scavenging activity was measured based on methods described in Hanani *et al.*[16].

Reducing power

Reducing power was determined by Oyaiza method[17].

RESULT AND DISCUSSION

The phytochemical screening

As seen as Table 1 showed content of phytochemical compounds of extract of seagrass were flavonoids, alkaloids, tannins, saponins, steroids and triterpenoids.

The result showed content of phytochemical compounds of ethanol extract seagrass were flavonoids, tannins, saponins, steriods and triterpenoids. The use of ethyl acetate solvent showed the phytochemical compounds were flavonoids, steroids and triterpenoids. For n-hexane solvent showed phytochemical compounds were steroids and triterpenoids.

DPPH radical scavenging activity

Method of DPPH radical scavenging activity is very popular for the research of natural

Table 1: Phytochemical compound of extract of *H. pinifolia* seagrass

Sample	Parameter		Result
n-hexane	Flavonoids		Negative
	Alkaloids	Wegner	Negative
		Mayer	Negative
		Dragendorf	Negative
	Tannins		Negative
	Saponins		Negative
	Steroids		Positive
	Triterpenoids		Positive
Ethyl acetate	Flavonoids		Positive
	Alkaloids	Wegner	Negative
		Mayer	Negative
		Dragendorf	Negative
	Tannins		Positive
	Saponins		Negative
	Steroids		Positive
	Triterpenoids		Positive
Ethanol	Flavonoids		Positive
	Alkaloids	Wegner	Negative
		Mayer	Negative
		Dragendorf	Negative
	Tannins		Positive
	Saponins		Positive
	Steroids		Positive
	Triterpenoids		Positive

antioxidants[18]. The extraction with solvents of increasing polarity involves of separating compounds of a plant according to their degree of solubility. DPPH radical scavenging activity of hexane, ethyl acetate and ethanol extracts obtained of the *Halodule pinifolia* were shown in Figure 1. The maximum DPPH radical scavenging activity was recorded in ethanol extracts followed by ethyl acetate and n-hexane.

The IC 50 of extract was 18.7 ppm for ethanol extract, 696.2 ppm for ethyl acetate extract and 2,378.2 ppm for n-hexane extract. The IC 50 value for vitamin C was 7.7 ppm (Figure 2). The results

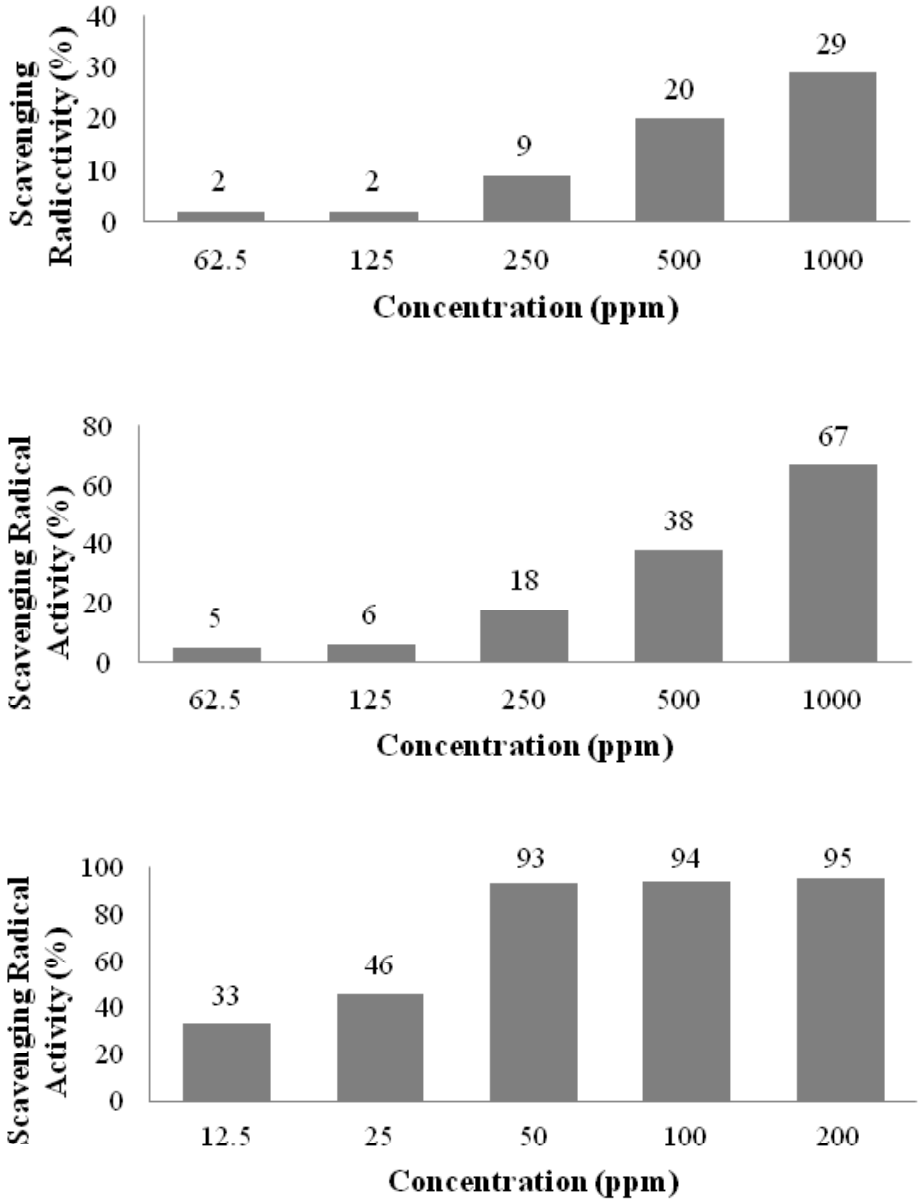

Fig. 1: Scavenging radical DPPH activity extract of *H. pinifolia* Seagrass (A= n-hexane, B=ethyl acetic and C= ethanol)

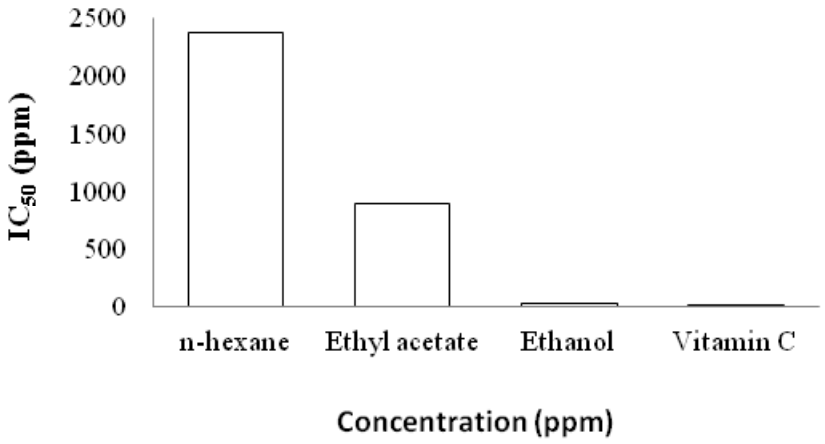

Fig. 2: IC_{50} from extract of *H. pinifolia* Seagrass

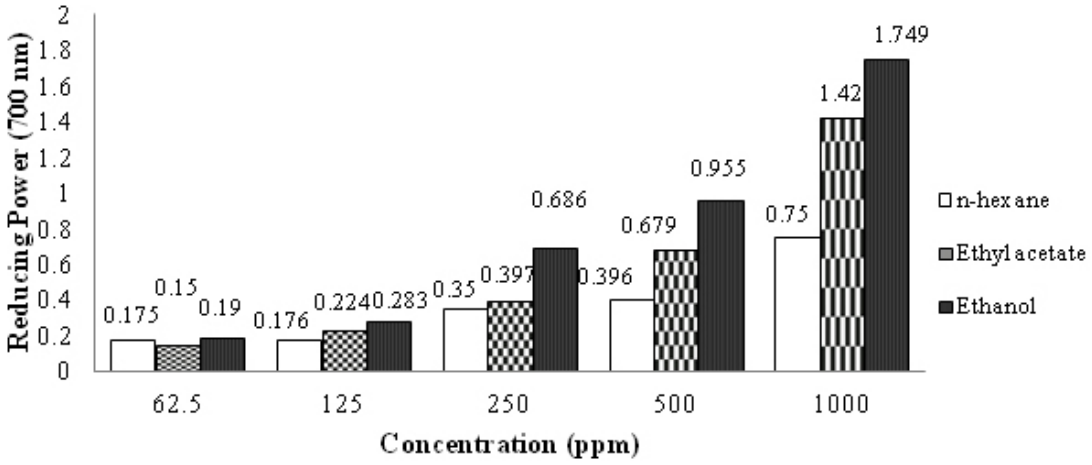

Fig. 3; Reduction power of extract of *H. pinifolia* Seagrass

indicate that the antioxidant activity of the methanol extract of *H. pinifolia* seagrass is higher than that of ethyl acetate and n-hexane extracts. Antioxidant activity of extract *Halodule pinifolia* could be due to their phytochemical compounds. The phytochemical compounds present in the extract, which are responsible for this activity. The phytochemical tests indicated the presence of flavonoids, tannins, saponins, steriods and triterpenoids in the crude methanolic extract.

Reducing power

Reducing power of extract of *H. pinifolia* depicted in Figure 2. Increasing of concentration of *H. pinifolia* indicates an increase in reducing power

The reducing power is considered as a significant indicator of potential antioxidant activity of compound or sample. A potential antioxidant will reduce the ferric ion to the ferrous ion. Reducing power of extract of *H. pinifolia* is probably due to the presence of phytochemical compounds that can serve as an electron donor.

REFERENCES

1. Neelima CSS, Seenivasan R. 2015. DPPH radical scavenging activity of selected Seagrasses from South East Coast of India. *Int. J Adv. Res*, **2015**, *3*, 950 – 956
2. Athiperumalsamy T, Devi Rajeswari V, Hastha Poorna S, Kumar V and Louis Jesudass L. Antioxidant activity of seagrasses and seaweeds. *Botanica Marina*, **2010**, *53*, 251–257.
3. Ragupathi Raja Kannan R, Arumugam R and Anantharaman P. In-vitro antioxidant activities of Enhalus acoroides. *Asian Pacific J Tropical Med*, **2010**, *11*, 898–901.
4. Ragupathi Ragupathi Raja Kannan R, Arumugam R, Grignon Dubois M and Anantharaman P. Antioxidant activity of seagrasses of the Mandapam coast, *India. Pharma. Biol,* **2012**, *50*, 182–187.
5. Ragupathi Raja Kannan R, Arumugam R, Meenakshi S and Anantharaman P. Thin layer chromatography analysis of antioxidant constituents of seagrasses of Gulf of Mannar. *Int J. ChemTech Res*, **2010**, *2*, 1526–1530.
6. Arumugam R., Ragupathi Raja Kannan R, Arivuselvan N and Anantharaman P. Antimicrobial potential of some seagrasses against phytopathogens. *Seaweed Res. Utilization,* **2010**, *32*, 177–183.
7. Rowley DC, Hansen MST, Rhodes D, Sotriffer CA, Ni H, McCammon JA, et al. Thalassiolins A–C: New marine – Derived inhibitors of HIV cDNA integrase. *Bioorganic Med. Chem,* **2002**, *10*, 3619–3625
8. Hua KF, Hsu HY, Su YC, Lin IF, Yang SS, Chen YM, et al. Study on the anti-inflammatory activity of methanol extract from seagrass Zostera japonica. *J. Agric. Food Chem,* **2006**, *54*, 306–311.
9. Gokce G and Haznedaroglu MZ. Evaluation of antidiabetic, antioxidant and vasoprotective effects of Posidonia oceanica extract. *J. Ethnopharma*, **2008**, *115*, 122–130
10. Ragupathi Raja Kannan R, Arumugam R, and Anantharaman P. Antibacterial potential of three seagrasses against human pathogens. Asian Pacific J, Tropical Med, **2010**, 11, 890–893.
11. Ragupathi Raja Kannan R, Arumugam R and Anantharaman P. Chemical composition and antibacterial activity of Indian seagrasses against urinary tract pathogens. *Food Chem,* **2012**, *135*, 2470–2473.
12. Sreenath Kumar C, Sarada DVL, Gideon TP and Rengasamy R. Antibacterial activity of three South Indian seagrasses, Cymodocea serrulata, Halophila ovalis and Zostera capensis. *World J. Microbiol. Biotechnol*, **2008**, *24*, 1989–1992.
13. Baehaki A, Supriadi A and Pratama, MC. Antioxidant Activity of Methanol Extract of *Halodule uninervis* Seagrass from the Coastal of Lampung, Indonesia. *Res. J.Pharma. Biol. Chem Sci,* **2016**, *7*, 173-177
14. Supriadi A, Baehaki A and Pratama, MC. Antibacterial Activity of Methanol Extract from Seagrass of *Halodule Uninervis* in the Coastal of Lampung, **2016**, *8,* 77-79
15. Harborne JB. 1987. Phytochemical Methods 2nd edition. Chapman and Hall, New York.
16. Hanani E, Moneim B, Sekarini R. Identification of antioxidant compounds in the sponge *Callispongia* sp of the Thousand Islands. *Magazine Pharm. Sci* **2005**, *2*, 127-133.
17. Oyaizu, M.. Studies on products of browning reaction: Antioxidative activities of products of browning reaction prepared from glucosamine. *Japanese J Nutr,* **1986**, *44*, 307–315.
18. Villano D, Fernandez-Pachon MS, Moya ML, Troncoso AM, Garcia- Parilla MC. Radical scavenging ability of phenolic compounds towards DPPH free radical. *Talanta,* **2007**,*71*, 230–235.