



Antimicrobial Activities of the Leaves Extracts of *Dissochaeta gracilis*

Azizah Abd Rahman, Muhammad Taher Bakhtiar,
 Department of Biomedical Science, Kulliyah of Allied Health Science
 Department of Pharmaceutical Technology, Kulliyah of Pharmaceutical
 International Islamic University of Malaysia



Introduction

The interest in the antimicrobial study of natural product has been rises since the emergence of multi-drug resistance in human and animal pathogenic bacteria as well as the presents of unwanted side effects of certain antibiotics. *Dissochaeta sp.* is a species belong to Melastomataceae family which is the major group of angiosperms and was strongly supported as monophyletic group. The common names of *D. gracilis* in Malay is 'Senduduk' or also called as 'Cong Keradak' while in Sunda it is known as 'Harendong Areuy' (Kramadibrata et al., 2010). The *Dissochaeta sp.* can be found mostly in Thailand, Malay Peninsula, Sumatra, Java and Borneo. Up until 2007, the members of this plant have been proved to contain different types of valuable properties including ornamental, medicinal, herbal, and phytoremediative effects (Ong et al., 2007). Grosvenor et al. (1995) have reported that the leaves of *D. gracilis* are able to cure diarrhea.

Objective

To evaluate the antimicrobial activity of *D. gracilis* extracts against some pathogenic microorganisms.

Methods

Sample extraction by using different solvents
 • *n*-Hexane, dichloromethane (DCM), methanol

Antimicrobial Study
 Microorganisms tested:

Bacillus cereus, *Staphylococcus aureus*, *Escherichia coli*,
Pseudomonas aeruginosa, *Candida albicans*, *Aspergillus spp.*

Disc Diffusion Method

Minimum Inhibitory Concentration (MIC)

Minimum Bactericidal/Fungicidal Concentration (MBC)

Results and Discussion

Microbes	<i>n</i> -Hexane	DCM	Methanol	Positive Control			Negative Control
	100(mg/mL)	100(mg/mL)	100 (mg/mL)	Erythromycin 15(mg/mL)	Streptomycin 10(mg/mL)	Nystatin 100(mg/mL)	Solvent extract
<i>B. cereus</i>			13.67±0.58	28.33±1.53	NT	NT	
<i>S. aureus</i>			12.33±1.53	20.33±3.78	NT	NT	
<i>E. coli</i>				NT	9.63±1.73	NT	
<i>P. aeruginosa</i>			10.33±0.58	NT	16.33±1.15	NT	
<i>C. albicans</i>				NT	NT	29.33±0.58	
<i>Aspergillus spp.</i>				NT	NT	11.67±1.15	

Figure 1.1 Diameter of zone inhibition of *D. gracilis* leaves extracts for disc diffusion test. *(NT=not test, – = no activity)

Based on the result of the disc diffusion test, only methanol extract exhibit activity against few selected microorganisms which are *B. cereus*, *S. aureus* and *P. aeruginosa*. This result indicated that methanol extract is more active and various bioactive compounds might be presence in the extract

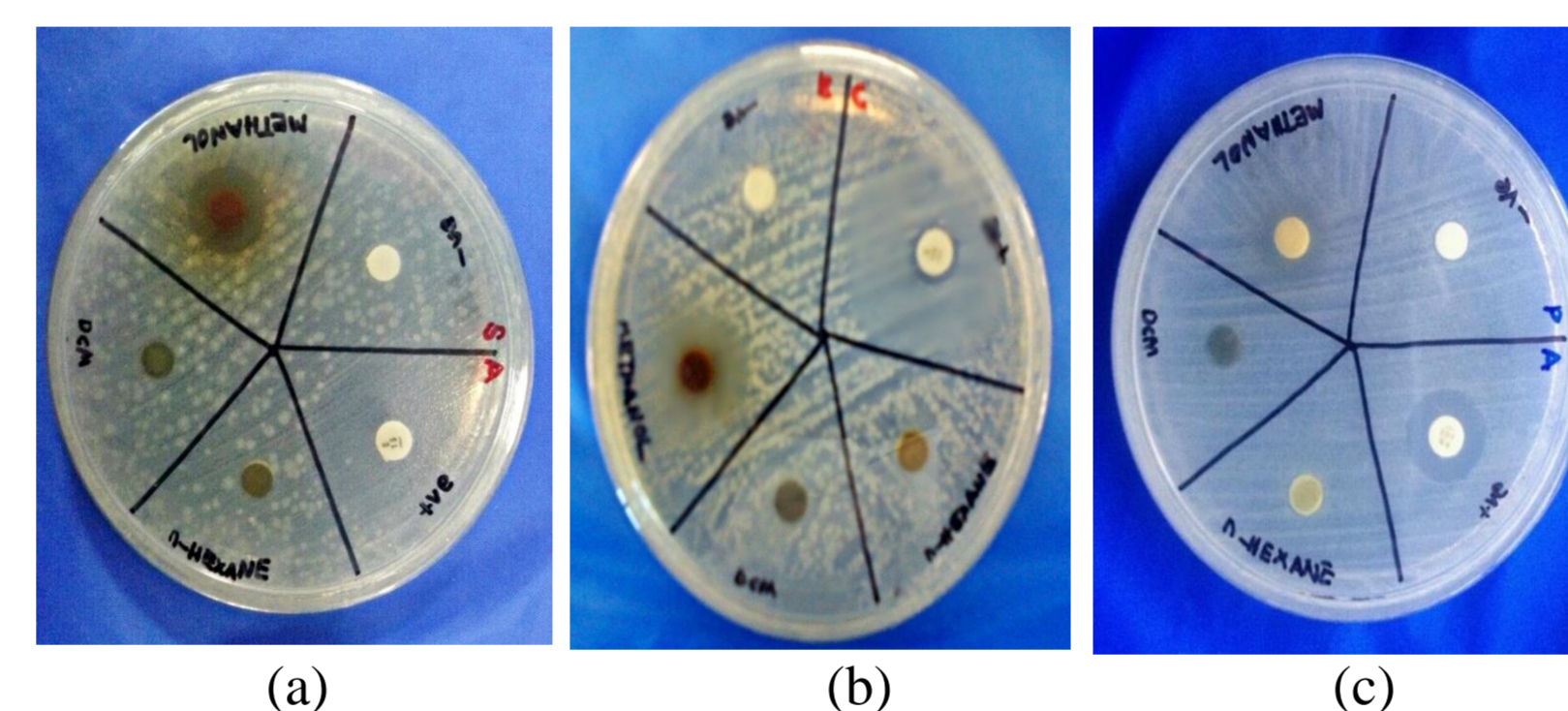


Diagram of zone inhibition. (a) *D. gracilis* extracts against *S. aureus*. (b) *D. gracilis* extracts against *B. cereus*. (c) *D. gracilis* extracts against *P. aeruginosa*

Microbes	MIC Value (mg/mL)	MBC Value (mg/mL)
<i>B. cereus</i>	6.25	12.5
<i>S. aureus</i>	12.5	25.0
<i>P. aeruginosa</i>	25.0	50.0

Figure 1.2 MIC and MBC value of methanol extract of *D. gracilis*

Lower concentration of methanol extract of *D. gracilis* is required to inhibit the growth and completely kill the *B. cereus* compared to the *S. aureus* and *P. aeruginosa*.

Conclusion

The methanol extract of *D. gracilis* leaves was active and possessed antimicrobial properties against some of bacteria tested which are *B. cereus*, *S. aureus* and *P. aeruginosa*.

References

- Grosvenor, P. W., Supriono, a, & Gray, D. O. (1995). Medicinal plants from Riau province, Sumatra, Indonesia. Part 2: Antibacterial and antifungal activity. *Journal of Ethnopharmacology*, 45(2), 97–111.
- Kramadibrata, K., Darnaedi, D., Partomihardjo, T., Rahajoe, J. S., Triono, T., Ardiyani, M., Suzuki, E., Wen, J. (2010). A Journal on Taxonomic Botany, Plant Sociology and Ecology. *Reinwardtia*, 13(2), 95–220.
- Ong, J., Wilson, A., & Lym, T. (2007). Melastomataceae : Inherent Economical Values Substantiating Potential Transgenic Studies in the Family. *Transgenic Plant Journal*, 1(1), 237–243.