Antimicrobial Activities of the Leaves Extracts of Dissochaeta gracilis

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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 Areyu’ (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

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

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.](image)

![Figure 1.2 MIC and MBC value of methanol extract of D. gracilis](image)

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

