ANTIBACTERIAL ACTIVITY OF *Persicaria minor* (Huds.) LEAF-EXTRACTS AGAINST BACTERIAL PATHOGENS

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DEDICATION

To

AR-RAZAQ

The provider of assets and all Biotechnogists and Microbiologists who work assiduously towards ensuring the Nutritional values and Antimicrobial actions of naturally occurring plants

HIS EXCELLENCY ENGR. DR. RABIU MUSA KWANKWASO

for providing the scholarship and may the blessings of Allah continue to follow him throughout his future endeavour- Amen.
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**ABSTRACT**

*Persicaria minor* (Huds.) Opiz known as Small water-pepper and well recognized locally in Malaysia as “daun kesum” is an edible vegetable with nutritional and medicinal benefits utilized generally by South-east Asians. The present study was conducted to evaluate the antibacterial activity of standardized aqueous-ethanolic and water extracts of *P. minor* leaves. The leaves of the plant undergone extraction based on Malaysian Standard Guideline which is 30% aqueous-ethanol and absolute water as normally used in traditional medicine to produce the respective extract concentrates. Both extracts were evaluated for total protein and polysaccharide contents in which aqueous-ethanolic extract was found to possess high contents of proteins (1713.67 µg/ml) while contents of polysaccharides were high in absolute water extract (17.6 µg/ml). These measurements were used as a standard for different batch extract. The extracts were then tested against four standard strains of bacteria which are *Enterococcus faecalis* ATCC 29212, *Escherichia coli* ATCC 11229, *Staphylococcus aureus* ATCC 6538 and *Pseudomonas aeruginosa* ATCC 15442 at different concentrations using disc-diffusion (qualitative) and microplate dilution (quantitative) assays. For positive and negative control, penicillin and dimethylsulfoxide were used as controls, respectively. Both extracts showed antibacterial activity with minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values in the range of 50 to 100 mg/mL against *S. aureus*, *E. faecalis*, and *E. coli*, respectively with aqueous-ethanolic extract being more potent. However, none of the extracts were active against *P. aeruginosa*. Results from this study truly illustrated high potential of *P. minor* leaves as natural antibacterial agent for the elimination of various bacterial disease and infections.
ABSTRAK

Sejumlah besar herba telah digunakan sebagai sumber pemakanan dan perubatan berasaskan tumbuhan dan dianggap berperanan dalam meningkatkan taraf kesehatan. *Daun kesum* dikenali sebagai Kecil watter-lada dan juga dikenali di Malaysia sebagai adalah sayuran yang membekalkan manfaat nutrisi dan perubatan yang diambil oleh kebanyakan penduduk Asia Tenggara. Kajian ini dijalankan bagi menganalisa aktiviti antibakteria daripada ekstrak daun *P. minor* iaitu ekstrak akues-etanol dan ekstrak. Untuk penghasilan ekstrak, daun diesktrak mengikut Garis Panduan Piawai Malaysia di mana 30% akeus-etanol digunakan dan juga teknik ekstrak air yang sering digunakan dalam perubatan tradisional. kandungan jumlah protin dan dan didapati ekstrak ekues-etanol mempunyai kandungan protein yang tinggi (1713,67 μg / ml) manakala kandungan polisakarida yang tinggi dalam ekstrak air (17.6 μg / ml). Sukatan ini telah digunakan sebagai piawai untuk kumpulan ekstrak yang berbeza. Ekstrak kemudiannya diuji terhadap empat jenis bacteria iaitu yang *Enterococcus faecalis* ATCC 29212, *Escherichia coli* ATCC 11229, *Staphylococcus aureus* ATCC 6538 and *Pseudomonas aeruginosa* ATCC 15442 pada kepekatan yang berbeza menggunakan kaedah kualitatif (resapan cakera) dan kaedah kuantitatif (pencairan papan kecil) dengan penisilin digunakan sebagai kawalan positif dan dimethylsulfoxide (pembawa) sebagai kawalan negatif. Kedua-dua ekstrak menunjukkan aktiviti antibakteria dengan nilai kepekatan perencatan minimum (MIC) dan kepekatan bakteria minimum (MBC) masing-masing dalam lingkungan 50 hingga 100 mg/mL terhadap *S. aureus, E. faecalis, dan E. Coli* dengan ekstrak akues-etanol menunjukkan kesan yang lebih ketara. Walau bagaimanapun, tiada ekstrak aktif terhadap *P. aeruginosa*. Oleh itu, keputusan yang diperolehi dalam kajian ini telah menunjukkan nilai-nilai nutrisi potensi tinggi daun *P. minor* untuk digunakan sebagai agen antibakteria semulajadi bagi menghapuskan kebanyakan penyakit dan jangkitan bawaan bakteria.