

Antimicrobial, Antioxidant, Cytotoxicity and Phytochemical Content of the Rhizome Hairs of *Cibotium barometz*

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ABSTRACT

Cibotium barometz (L.) J.Sm. is a tropical tree fern in the family Cibotiaceae. This study aims to evaluate the antibacterial, antifungal and antioxidative activities, cytotoxicity and phytochemical content of the rhizome hairs of *C. barometz*. The hairs were subjected to sequential extraction in order to obtain hexane, chloroform, ethyl acetate, ethanol, methanol and water extracts for bioassays. The ethyl acetate extract showed the strongest antibacterial and antifungal activities among the extracts with minimum inhibitory concentration (MIC) ranges of 0.31–1.25 mg/mL and 0.02–0.31 mg/mL against six species of bacteria and six species of fungi, respectively. It was the only extract showing inhibitory activity against the bacteria *Escherichia coli* (MIC=0.63 mg/mL) and the filamentous fungus *Aspergillus fumigatus* (MIC=0.31 mg/mL). In terms of antioxidative activity, the ethyl acetate, ethanol, methanol and water extracts showed strong inhibition (> 80%) in the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay. The mean (\pm s.d.) half-maximum inhibitory concentrations (IC₅₀) for these extracts were 6.5 \pm 0.4, 24.3 \pm 1.3, 32.2 \pm 2.5 and 34.4 \pm 3.7 μ g/mL, respectively. The ethyl acetate extract also exhibited the strongest ferric-reducing antioxidant power (FRAP) with a mean (\pm s.d.) value of 35.1 \pm 1.7 mM Fe²⁺/mg of extract. Only the chloroform and ethyl acetate extracts were found significantly toxic ($p < 0.05$) towards the African monkey kidney epithelial (Vero) cells with their respective mean (\pm s.d.) half-maximum cytotoxic concentrations (CC₅₀) of 382.5 \pm 8.5 and 316.7 \pm 11.0 μ g/mL. Phytochemical screening indicated the presence of anthraquinones, flavonoids, tannins, phenolics, phytosterols and triterpenoids in the rhizome hairs. The results indicate that the rhizome hairs of *C. barometz* is a potential source of bioactive compounds with antimicrobial and antioxidative activities.