

ABSTRACT

Helen Chang. 24020221130034. Antioxidant Activity of Intracellular Metabolites from Endophytic Bacteria Associated with Dragon's Blood Rattan (*Daemonorops draco*) under Varying Growth Media. Supervised by Dr. Sri Pujiyanto, S.Si., M.Si. and Dr. Muhammad Eka Prastya, S.Si., M.Si.

Degenerative diseases triggered by the accumulation of free radicals are among the leading causes of global mortality. The search for new natural antioxidant sources continues to expand, one of which is through the exploration of endophytic bacteria capable of producing diverse potential metabolites. *Daemonorops draco* is a medicinal plant known to possess antioxidant activity; however, the potential of metabolites from its endophytic bacteria has not yet been investigated. This study aimed to determine the antioxidant activity of intracellular metabolites produced by endophytic bacteria of *D. draco*, to elucidate the compound profile of the intracellular metabolite extract, and to identify potential bacteria based on 16S rRNA gene analysis. A total of 11 intracellular metabolite extracts were tested for antioxidant activity using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method to obtain IC₅₀ values. The best isolate, DKB21, was fermented in various media, namely Nutrient Broth (NB), Luria Bertani Broth (LB), and Tryptic Soy Broth (TSB), followed by solvent partition extraction (hexane, chloroform, ethyl acetate, and methanol), and analyzed using Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). Molecular identification was carried out through 16S rRNA gene amplification, sequencing, and phylogenetic analysis. The results showed that isolate DKB21 cultured in NB medium exhibited the best antioxidant activity with an IC₅₀ value of $126.87 \pm 11.84 \mu\text{g/mL}$, while its methanol fraction displayed an IC₅₀ value of $261.57 \pm 56.45 \mu\text{g/mL}$. LC-MS/MS analysis revealed the presence of several potential compounds such as phenolics, nonribosomal peptides, and aromatic derivatives, which are presumed to contribute to the antioxidant activity. Molecular identification demonstrated that isolate DKB21 is closely related to *Bacillus* sp. RAB18 strain B2 (similarity >99%).

Keywords: Bacillus sp., Daemonorops draco, DPPH, Endophyte, LC-MS/MS