

Dereplikasi Senyawa Antivibrio dan Sitotoksitas dari Aktinobakteria yang Berasosiasi dengan Rumput Laut Merah *Gelidiella acerosa* (Forsskal) Feldmann & Hamel

Maria Ulfah
18/435053/PMU/09564

INTISARI

Kebutuhan antibiotik untuk mengatasi vibriosis semakin mendesak disebabkan karena kasus resistensi dan pilihan antibiotik yang terbatas. Aktinobakteria asosiasi rumput laut merah merupakan sumber senyawa bioaktif yang kaya dan potensial sebagai antivibrio. Penelitian ini bertujuan untuk mengidentifikasi senyawa dalam ekstrak Aktinobakteria yang memiliki aktivitas antivibriosis melalui teknik dereplikasi. Rekultur 10 isolat Aktinobakteria menggunakan media ISP-2. Identifikasi bakteri berdasarkan gen 16S rRNA dilakukan menggunakan primer 27F/ 1492R. Fermentasi sebanyak 1L menggunakan media MB, M26, M43, M65, MSYP, dan MD2 dan ekstraksi dengan etil asetat. Skrining awal untuk memilih ekstrak yang mengandung senyawa terpenoid menggunakan KLT fase gerak hexane:etil asetat (7:3) dengan reagen *p*-anisaldehida dan uji bioautografi terhadap *V. alginolyticus*. Ekstrak terpilih dilakukan uji antivibrio terhadap *V. alginolyticus* dan *V. parahaemolyticus* serta uji sitotoksitas terhadap sel Vero. HPLC dilakukan untuk *profiling metabolites* ekstrak dan LC-MS untuk mengidentifikasi kandungan senyawa. Dereplikasi berdasarkan berat molekul menggunakan database MarinLit, ChEMBL, Dictionary of Marine Natural Product, dan Metabolomic Workbench. Sepuluh isolat yang digunakan teridentifikasi sebagai genera *Nocardiopsis*, *Brevibacterium*, *Brachybacterium*, dan *Allokutzneria*. Hasil penelitian menunjukkan 5 isolat aktif sebagai antivibrio dengan nilai MIC berkisar antara 0,625-5 µg/µL dan satu ekstrak yang dihasilkan DR-2R-115-8 toksik terhadap sel Vero dengan nilai IC₅₀ 22,18 µg/mL. Hasil dereplikasi 3 isolat terpilih (DR-2S-115-5, DR-2R-115-35, dan DR-2R-115-12) menunjukkan 10 senyawa teridentifikasi dan 7 senyawa yang belum dilaporkan sehingga memiliki kemungkinan sebagai senyawa baru atau novel.

Kata kunci: *aktinobakteria*, *antivibriosis*, *dereplikasi*, *alga merah*.

**Dereplication of Antivibrio and Cytotoxicity Compound of Actinobacteria
Associated Red Algae *Gelidiella acerosa*
(Forsskal) Feldmann & Hamel**

Maria Ulfah

18/435053/PMU/09564

ASBSTRACT

The discovery of new antivibrio compound is urgently needed due to the emergence of antibiotic resistance and limited choice of antibiotic to combat vibriosis. Red seaweed-associated actinobacteria are rich source of potential bioactive compounds as antivibrio. This study aim to identify compounds in actinobacteria extracts with antivibrio activity using dereplication method. Reculture of 10 actinobacteria isolates was conducted in ISP-2 media. Molecular identification of Actinobacteria based on the 16S rRNA gene was carried out using 27F/ 1492R primers. Six media (MA, MB, M26, M43, M65, and MSYP) was used to fermentation with 1L of total volume. Chemical screening to select extracts containing terpenoid compounds was conducted using TLC with mobile phase hexane: ethyl acetate (7:3) and p-anisaldehyde as staining reagent. Biological screening was carried out using bioautography against *V. alginolyticus*. The selected extracts were determined the MICs value against *V. alginolyticus* and *V. parahaemolyticus* and IC₅₀ toward Vero and T47D cells. HPLC was performed to analyze the metabolite profiles and LC-MS for compounds identification based on molecular weight. Dereplication of compounds using the MarinLit, ChEMBL, Dictionary of Marine Natural Product, and Metabolomic Workbench. Ten isolates were identified as the genera *Nocardopsis*, *Brevibacterium*, *Brachybacterium*, and *Allokutzneria*. The results showed that 5 isolates were active as antivibrio with MIC values ranging from 0,625-5 µg/µL and one extract produced by DR-2R-115-8 was toxic to Vero cells with IC₅₀ value of 22,18 µg/mL. The dereplication results revealed three potential isolates (DR-2S-115-5, DR-2R-115-35, dan DR-2R-115-12) exhibited 10 identified compounds and 7 unkwon potentially new or novel compounds. This study reveal that the actinobacteria associated red algae *Gelidiella acerosa* were potential to be further exploited for controlling vibriosis biologically and important for elucidation of bioactive compounds.

Keywords: *actinobacteria*, *antivibriosis*, *dereplication*, *red algae*.