DETEKSI GEN *$FADH_2$ DEPENDENT HALOGENASE* DAN UJI AKTIVITAS ANTIVIBRIO PADA AKTINOBAKTERIA ASOSIASI ALGA MERAH *Gracillaria edulis*

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Intisari

Kebutuhan antibiotik terus meningkat seiring dengan timbulnya berbagai penyakit infeksi baru yang disebabkan oleh patogen. Selain itu kasus resistensi, sifat antibiotik yang memiliki *limited self-time*, dan tidak dapat digunakan untuk semua jenis patogen menjad penyebab lain perlunya penemuan antibiotik baru. Berbagai antibiotik seperti chlortetracycline, vancomycin, dan chloramphenicol merupakan senyawa organohalogen. *$FADH_2$ dependent halogenase* merupakan enzim penghalogenasi terbesar yang berperan penting dalam penambahan gugus halogen sebagai penentu bioaktifitas berbagai senyawa bioaktif. *Marine natural products* terutama dari *marine actinobacteria* merupakan sumber yang menjanjikan dalam upaya penemuan kandidat obat baru secara berkelanjutan. Oleh karena itu, dilakukan deteksi gen *$FADH_2$ dependent halogenase* dan uji akrivitas antivibrio pada aktinobakteria asosiasi *Gracilaria edulis* dari Pantai Drini. Sebanyak 38 isolat berhasil diisolasi pada 5 medium yang berbeda yakni AIA, SC-SW, NA, MA, dan Med-A. Amplifikasi 16S rDNA dilakukan menggunakan primer 243F dan 1378R (1100 bp) serta F243 dan R513GC (270 bp). 16S rDNA berhasil diamplifikasi dari 30 isolat (78,95%). Setelah terkonfirmasi aktinobakteria, dilakukan deteksi gen *$FADH_2$ dependent halogenase* dan gen *nrps*. Tidak ditemukan adanya gen target (550 bp) pada hasil PCR *$FADH_2$ dependent halogenase* dengan primer Halo-B4-FW dan Halo-B7-RV. Sedangkan, keberadaan gen *nrps* dideteksi menggunakan primer A3F dan A7R (700 bp). Sebanyak 28 isolat (93,33%) positif gen *nrps*. Isolat terpilih kemudian ditumbuhkan pada 6 medium fermentasi M-25, M-26, M-28, M-30, M-32, dan M-43 diuji aktivitas antivibrionya pada 6 *well plate* dengan indikator resazurin. Sebanyak 22 hasil kultivasi kuat melawan V. *alginolyticus*, 13 lemah, dan 7 tidak memiliki aktifitas.

Kata kunci : *natural products, aktinobakteria, $FADH_2$ dependent halogenase, nrps, antivibrio, G. edulis*

DETECTION OF *FADH$_2$ DEPENDENT HALOGENASE* AND ANTIVIBRIO ASSAY OF ACTINOBACTERIA ASSOCIATE RED ALGAE *Gracillaria edulis*

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Abstract

The increase demand of antibiotic occurs due to the emergence of new infectious diseases caused by pathogens. In addition development of resistant bacteria, antibiotic properties which have limited self-time, and its property that can not be used for all types of pathogens become an essential reasons to discover novel antibiotics. Various antibiotics such as chortetracycline, vancomycin, and chloramphenicol are organohalogen compounds. Enzyme *FADH$_2$ dependent halogenase* is the greatest instrument in adding halogen groups as a determination of the bioactivity of many bioactive compounds. Marine natural products mainly from marine actinobacteria are a promising source for sustainable drug discovery. The aim of this study is to detect *FADH$_2$ dependent halogenase* gene and antivibrio assay of actinobacteria associate *Gracilaria edulis* from Drini Beach. A total of 38 isolates were isolated in five different mediums namely AIA, SC-SW, NA, MA, and Med-A. Amplification of 16S rDNA was performed using primer 243F and 1378R (1100 bp) and F243 and R513GC (270 bp). Band of 16S rDNA successfully amplified from 30 isolates (78.95%). About 30 isolates that confirmed as actinobacteria were detected its *FADH$_2$ dependent halogenase* and *nrps* gene. Targeted gene (550 bp) can not be found in detection of *FADH$_2$ dependent halogenase* gene with primer Halo-B4-FW dan Halo-B7-RV. Meanwhile, *nrps* gene was detected using a primer A3F and A7R (700 bp). A total of 28 isolates (93.33%) are positive *nrps*. Selected actinobacteria cultivate in 6 medium such as M-25, M-26, M-28, M-30, M-32, and M-43 and were tested its antivibrio activity on a 6 well plate with resazurin as an indicator. About 22 cultivation products strongly inhibit V. *alginolyticus* growth, 13 weak, and 7 others have no activity.

Keywords : *natural products, actinobacteria, FADH$_2$ dependent halogenase, nrps, antivibrio, G. edulis*