

INTISARI

RINI, LAAF., 2020, SKRINING DAN IDENTIFIKASI BAKTERI PENGHASIL ENZIM SUPEROKSIDA DISMUTASE TAHAN PANAS DENGAN METODE PCR 16S rDNA. SKRIPSI, FAKULTAS FARMASI, UNIVERSITAS SETIA BUDI, SURAKARTA.

Enzim Superoksida Dismutase (SOD) diketahui sebagai antioksidan yang dapat meminimalkan kerusakan jaringan akibat radikal bebas. SOD dihasilkan dari bakteri termofilik pada daerah tahan panas. Penelitian ini bertujuan mengisolasi isolat yang menghasilkan SOD, menentukan aktivitas SOD dan mengidentifikasi isolat penghasil SOD dengan aktivitas tertinggi menggunakan metode molekuler PCR 16 rDNA

Sampel diambil dari sekitar sumber kawah Sikidang Dieng, pengambilan sampel dilakukan pada tiga kawah dengan masing-masing satu titik pengambilan. Sampel lumpur diambil pada permukaan kawah dan sedimen dibagian dasar kawah Sikidang Dieng. Sampel diisolasi dan dipilih tiga isolat bakteri berdasarkan perbedaan morfologinya. Data hasil uji aktivitas SOD dan karakterisasi spesies bakteri secara molekuler diperoleh dari kajian literatur, uji aktivitas SOD menggunakan spektrofotometri dengan menginduksi radikal superoksida yang dihasilkan dari reaksi antara xantin dan xantin oksidase, selanjutnya isolat bakteri diuji aktivitas SOD berdasarkan kemampuan SOD untuk menghambat reduksi Nitroblue Tetrazolium (NBT) oleh superoksida.

Hasil persen inhibisi dari kajian literatur menunjukkan semua isolat bakteri termofilik memiliki aktivitas SOD dimana aktivitas SOD tertinggi yaitu pada bakteri *Thermothrix* sp. dengan nilai persen inhibisi 15%. Identifikasi molekuler bakteri penghasil SOD dilakukan pada bakteri yang berasal dari mata air panas Manikaran. Spesies bakteri tersebut adalah *Anoxybacillus gonensis*. Berdasarkan pencarian dengan program database GenBank terbukti terdaftar SOD jenis Cu/znsOD

Kata kunci: SOD, radikal bebas, bakteri termofilik, mata air panas, PCR 16S rDNA

ABSTRACT

INI, LAAF., 2020, SCRINING AND IDENTIFICATION OF BACTERIAL PRODUCTS OF HEAT RESISTANT SUPERMYIDE DISMUTAGE ENZYMES WITH 16S rDNA PCR METHOD. ESSAY, FACULTY PHARMACY OF UNIVERSITY SETIA BUDI, SURAKARTA.

Superoxide Dismutase (SOD) enzyme is known as an antioxidant that can minimize tissue damage due to free radicals. It is produced from thermophile bacteria in heat-resistant area. This study aimed to isolate isolates that produced SOD, determine SOD activity, and identify SOD-producing isolates with the highest activity using 16 rDNA molecular PCR methods.

Samples were taken from the Sikidang Dieng crater area, of which they were undertaken in three different craters with each one sampling point. The mud samples were taken from the crater surface and the sediment laid at the bottom of the crater. The samples were isolated and three bacterial isolates were selected based on their morphological differences. Data of SOD activity test and bacterial species characterization were obtained from literature studies, where the test was administered using spectrophotometry by inducing superoxide radicals produced from the reaction between xanthine and xanthine oxidase. The bacterial isolates were tested for SOD activity based on SOD's ability to inhibit Nitroblue Tetrazolium reduction (NBT) by superoxide.

The results of the inhibition from the literature study showed that all thermophile bacterial isolates had SOD activity where the highest SOD activity was *Thermothrix sp.* with an inhibition value of 15%. Molecular identification of SOD-producing bacteria was carried out on the bacteria originating from Manikaran hot spring named *Anoxybacillus gonensis*. Based on a search with the database program GenBank proved that the bacteria was registered in SOD type Cu/znSOD.

Keywords: SOD, free radicals, thermophile bacteria, hot spring, PCR 16rDNA