

INTISARI

ANALISIS URUTAN NUKLEOTIDA FRAGMENT GEN PENGKODE LIPASE DARI BAKTERI *Alcaligenes sp. JG3*

Oleh

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Penelitian ini bertujuan untuk uji konfirmasi isolat bakteri, analisis urutan nukleotida fragmen gen pengkode lipase dan analisis struktur 3D lipase bakteri *Alcaligenes sp. JG3*. Konfirmasi isolat bakteri *Alcaligenes sp. JG3* menggunakan gen 16S rRNA. Primer didesain dengan menggunakan *software* Primer Blast berdasarkan urutan gen pengkode lipase bakteri *Alcaligenes faecalis* subsp. *faecalis* NCIB 8687. Sekuensing hasil amplifikasi DNA secara PCR dilakukan dengan *genetic analyzer*. Urutan nukleotida gen pengkode lipase bakteri *Alcaligenes sp. JG3* disejajarkan untuk mengetahui persentase kemiripan dengan urutan nukleotida acuan. Prediksi struktur 3D menggunakan server I-TASSER.

Analisis menggunakan gen 16S rRNA mengkonfirmasi bahwa isolat bakteri memiliki persentase kemiripan 99% dengan bakteri spesies *Alcaligenes sp.* Pasangan primer *foward* 5'-CATGAGCCTGAACAAAGGTG-3' dan *reverse* 5'- TACATGCTGGTGGATAGCTG-3 mampu mengamplifikasi DNA gen pengkode lipase bakteri *Alcaligenes sp. JG3* menghasilkan ukuran fragmen 864 pb (0,8 kb). Fragmen 0,8 kb gen pengkode lipase bakteri *Alcaligenes sp. JG3* memiliki persentase kemiripan sebesar 91% dan 87,5% terhadap urutan nukleotida lipase *Alcaligenes faecalis strain ZD 02* dan *Alcaligenes faecalis* subsp. *faecalis* NCIB 8687. Fragmen tersebut menunjukkan kemiripan identitas struktur 3D dan sisi aktif terhadap *Alcaligenes faecalis* subsp. *faecalis* NCIB 8687.

Kata kunci: *Alcaligenes sp. JG3*, gen lipase, I-TASSER

ABSTRACT

ANALYSIS of NUCLEOTIDE SEQUENCE of GENE FRAGMENT ENCODING LIPASE FROM *Alcaligenes sp. JG3* BACTERIUM

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This research aimed to confirm the bacterial isolate, to perform nucleotide sequencing encoding lipase and to analysis the 3D structure of lipase gene from *Alcaligenes sp. JG3* bacterium. The isolate confirmation of *Alcaligenes sp. JG3* has been done using 16S rRNA gene. Primers were designed based on the nucleotide sequence encoding lipase present in *Alcaligenes faecalis* subsp. *faecalis* NCIB 8687. The DNA sequencing was performed with a *genetic analyzer*. Nucleotide sequence encoding lipase of *Alcaligenes sp. JG3* was aligned to know its percentage of similarity with reference nucleotide sequence. The model of 3D structure was predicted using I-TASSER.

The analysis of 16S rRNA gene confirmed that the bacterial isolates had 99% similarity towards *Alcaligenes sp.* The selected primers were *foward* 5'-CATGAGCCTGAACAAAGGTG-3' and *reverse* 5'-TACATGCTGGTGGATAGCTG-3 could amplify the DNA template of this bacterium resulting 864 pb (0.8 kb) respectively. The sequence analysis showed that the fragment had 91% similarity towards *Alcaligenes faecalis strain ZD 02*. The 3D structure and active side showed that the fragment had similarity towards *Alcaligenes faecalis* subsp. *faecalis* NCIB 8687.

Keywords: *Alcaligenes sp. JG3*, lipase gene, I-TASSER