

INTISARI

Potensi *Agaro-Oligosaccharides* (AOS) Hasil Hidrolisis α -Agarase Sebagai Agen Anti-Inflamasi

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Agaro-oligosaccharides (AOS) merupakan polisakarida yang dapat diperoleh melalui hidrolisis agarose secara kimiawi maupun enzimatis. AOS diketahui memiliki banyak manfaat diberbagai bidang termasuk kesehatan seperti sebagai antioksidan, antitumor, dan anti-inflamasi. Inflamasi kronis menjadi masalah kesehatan yang mengancam. Inflamasi kronis dapat dicegah dengan mengkonsumsi obat anti-inflamasi yang tentunya memiliki efek samping negatif. Penelitian potensi AOS hasil hidrolisis asam sudah banyak dilaporkan akan tetapi hasil potensi AOS hasil hidrolisis secara enzimatis belum banyak dilaporkan termasuk sebagai agen anti-inflamasi. Penelitian ini bertujuan untuk menganalisis potensi AOS hasil hidrolisis enzim sebagai agen anti-inflamasi. Penelitian dilakukan menggunakan ekstrak AOS yang sudah dihidrolisis secara enzimatis kemudian dianalisis aktivitas antioksidannya dengan metode DPPH. Uji sitotoksitas dilakukan menggunakan metode *MTT Assay*. Aktivitas anti-inflamasi dilakukan secara *in vitro* menggunakan sel RAW 264.7 yang diinduksi LPS. Parameter uji anti-inflamasi yang digunakan adalah kadar *Nitric Oxide* (NO) serta ekspresi gen *iNOS* dan *COX-2*. Kadar NO diukur dengan metode *griess*. Ekspresi gen dilakukan menggunakan qPCR pada tingkat RNA. Data NO, sitotoksitas, dan Cycle Threshold (CT) qPCR dianalisis dengan MS. Excel. Signifikansi data diuji dengan ANOVA dan Duncan. Hasil DPPH menunjukkan ekstrak AOS memiliki aktivitas antioksidan dengan IC_{50} 992,52 μ g/mL. Hasil MTT menunjukkan ekstrak AOS tidak toksik terhadap sel RAW 264.7. Hasil penelitian juga menunjukkan adanya penurunan produksi NO dan ekspresi gene *iNOS* dan *COX-2* pada sel RAW 264.7 yang diinduksi LPS. Berdasarkan hasil penelitian, dapat disimpulkan bahwa ekstrak AOS hasil hidrolisis enzimatis berpotensi sebagai agen anti-inflamasi.

Kata kunci: AOS, anti-inflamasi, NO, *iNOS*, *COX-2*.

ABSTRACT

The Potential of *Agaro-Oligosaccharides* (AOS) from α -Agarase Hydrolysis as Anti-Inflammatory Agents

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Agaro-oligosaccharides (AOS) are polysaccharides obtained from chemical or enzymatic hydrolysis of agarose. AOS is known have many benefits in various fields including health such as antioxidant, antitumor, and anti-inflammatory. Chronic inflammation becoming threatening health problems. Chronic inflammation can be prevented by consuming anti-inflammatory drugs which certainly have negative side effects. Research on the potential of AOS from acid hydrolysis has been widely reported but the potential results of AOS from enzymatic hydrolysis have not been widely reported including as an anti-inflammatory agent. This study aims to analyze the potential of AOS from enzyme hydrolysis as an anti-inflammatory agent. The study was conducted using AOS extracts that had been enzymatically hydrolyzed. Antioxidant activity analyzed using DPPH assay. Cytotoxicity test was conducted using MTT assay. Anti-inflammatory activity was performed in vitro using LPS-induced RAW 264.7 cells. Nitric Oxide (NO) levels and iNOS and COX-2 gene expression was used as anti-inflammation parameters. NO levels were measured by Griess assay. Gene expression was performed using qPCR at RNA level. NO, cytotoxicity, and qPCR Cycle Threshold (CT) data was analyzed using MS. Excel. Data signification analyzed using ANOVA and Duncan test. DPPH results showed that AOS extract has antioxidant activity with IC_{50} 992.52 μ g/mL. MTT results showed AOS was not toxic to RAW 264.7 cells. The results also showed the decrease of NO production and gene expression of iNOS and COX-2 in LPS-induced RAW 264.7 cells. Based on the results, it can be concluded that AOS from enzymatic hydrolysis has potential as an anti-inflammatory agent.

Keywords: AOS, anti-inflammatory, NO, iNOS, COX-2