

Analisis Kandungan Fenolik, Flavonoid Total, dan Aktivitas Inhibisi Alfa-Amilase Secara in Vitro pada Ekstrak Spirulina Platensis = Analysis of Total Phenolic, Flavonoid Content, and in Vitro Alpha-Amylase Inhibitory Activity of Spirulina Platensis Extracts

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Abstrak

Latar belakang: Diabetes melitus (DM) ditandai dengan kenaikan kadar gula darah. Jumlah penderita DM di Indonesia terus meningkat. Acarbose sebagai obat DM penghambat -amilase memiliki banyak efek samping, sehingga diperlukan alternatif dari bahan alami lain dengan kemampuan setara. Spirulina platensis dapat diteliti potensi inhibisi -amilasanya mengingat sumber daya perairan Indonesia yang besar dan manfaat kandungannya dalam kesehatan. Tujuan: Mengidentifikasi jumlah kandungan fenolik dan flavonoid total serta membandingkan aktivitas inhibisi -amilase secara in vitro pada ekstrak Spirulina platensis yang berasal dari perairan Indonesia dengan acarbose. Metode: Spirulina platensis diekstraksi menggunakan etanol, etil asetat, serta n-heksana kemudian dilakukan uji fenolik, flavonoid total, dan aktivitas inhibisi -amilase secara in vitro. Hasil: Kandungan fenolik dan flavonoid total pada ekstrak etanol, etil asetat, dan n-heksana Spirulina platensis yang berasal dari perairan Indonesia berturut-turut adalah $0,460 \pm 0,018$; $25,5 \pm 0,012$; $19,064 \pm 0,007$ mg GAE/g ekstrak serta $17,040 \pm 0,055$; $49,764 \pm 0,010$; $42,460 \pm 0,098$ mg QE/g ekstrak. IC₅₀ inhibisi -amilase adalah $1,17 \pm 0,13$; $1,09 \pm 0,04$; $1,24 \pm 0,04$; dan $0,185 \pm 0,008$ µg/mL untuk acarbose. Terdapat perbedaan IC₅₀ yang signifikan antara setiap ekstrak Spirulina platensis dengan acarbose. Kesimpulan: Ekstrak Spirulina platensis yang berasal dari perairan Indonesia terbukti memiliki kandungan fenolik dan flavonoid. Aktivitas inhibisi -amilase secara in vitro pada ekstrak Spirulina platensis tergolong sangat aktif, namun lebih rendah apabila dibandingkan dengan acarbose.

.....Background: Diabetes mellitus (DM) is characterized by an elevation of blood sugar levels. The number of DM patients in Indonesia continue to increase. Acarbose as -amylase inhibitor DM drug has many side effects, so alternatives from other natural ingredients with equivalent capabilities are needed. Spirulina platensis can be investigated for its -amylase inhibition potential considering Indonesia's large water resources and its health benefits. Objective: To identify the total phenolic and flavonoid content and to compare the in vitro -amylase inhibitory activity of Spirulina platensis extracts from Indonesian waters with acarbose. Method: Spirulina platensis was extracted using ethanol, ethyl acetate, and n-hexane. The extracts were then tested for total phenolic and flavonoid content and their in vitro inhibitory activity against -amylase. Results: The total phenolic and flavonoid content in the ethanol, ethyl acetate, and n-hexane extracts of Spirulina platensis were 0.460 ± 0.018 ; 25.5 ± 0.012 ; 19.064 ± 0.007 mg GAE/g extract and 17.040 ± 0.055 ; 49.764 ± 0.010 ; 42.460 ± 0.098 mg QE/g extract, respectively. The IC₅₀ of -amylase inhibition were respectively 1.17 ± 0.13 ; 1.09 ± 0.04 ; 1.24 ± 0.04 ; and 0.185 ± 0.008 µg/mL for acarbose. There were significant IC₅₀ difference between each extracts of Spirulina platensis with acarbose. Conclusion: Spirulina platensis extracts from Indonesian waters were proven to contain phenolic and flavonoid. The in vitro -amylase inhibitory activity of extracts were classified as very active, but lower compared to acarbose.