

ABSTRAK

Diabetes melitus merupakan penyakit metabolik kronis yang ditandai dengan peningkatan kadar glukosa darah akibat gangguan produksi atau kerja insulin. Salah satu pendekatan dalam pengendalian kadar glukosa darah adalah melalui penghambatan enzim α -glukosidase yang berperan dalam pemecahan karbohidrat menjadi glukosa. Penggunaan obat sintetik seperti akarbosa diketahui efektif, namun penggunaannya dalam jangka panjang dapat menimbulkan efek samping sehingga diperlukan alternatif dari bahan alam. Sambiloto (*Andrographis paniculata*) diketahui mengandung senyawa bioaktif seperti *Andrographolide* yang berpotensi memiliki aktivitas antidiabetes. Simplisia diproses menggunakan metode dekoktasi dan *freeze drying*, kemudian dilakukan pengujian aktivitas penghambatan enzim melalui pengukuran absorbansi pada panjang gelombang 405 nm. Sebelum dilakukan uji sampel dilakukan validasi metode yaitu linearitas, LoD & LoQ, akurasi, dan presisi. Kemudian setelah dilakukan validasi metode, dilanjutkan dengan penghambatan enzim α -glukosidase melalui peningkatan aktivitas inhibisi dan diperoleh nilai IC50.

Kata kunci: Diabetes Melitus, Enzim α -glukosidase, Sambiloto (*Andrographis paniculata*), Spektrofotometri UV-Vis, IC50

ABSTRACT

*Diabetes mellitus is a chronic metabolic disease characterized by elevated blood glucose levels caused by impaired insulin production or insulin function. One approach to controlling blood glucose levels is through inhibition of the α -glucosidase enzyme, which plays a role in breaking down carbohydrates into glucose. The use of synthetic drugs such as acarbose is known to be effective; however, long-term use may cause side effects, creating the need for alternative natural sources. *Andrographis paniculata* is known to contain bioactive compounds such as andrographolide which potentially exhibit antidiabetic activity. The simplicial was processed using decoction and freeze-drying methods, followed by enzyme inhibition testing through absorbance measurement a wavelength of 405 nm. Prior to sample testing, method validation was conducted including linearity, Limit of Detection (LoD), Limit of Quantitation (LoQ), accuracy, and precision. After method validation was complete, α -glucosidase enzyme inhibition testing was performed through inhibition activity analysis and IC50 values werw obtained.*

Keywords: *Diabetes Mellitus, α -glucosidase enzyme, *Andrographis paniculata*, UV-Vis Spectrophotometry, IC50*