

# Uji Fitokimia dan Efek Penghambatan in vitro Ekstrak Etil Asetat, Heksana, dan Etanol Buah Okra (*Abelmoschus esculentus*) terhadap Enzim Alfa-Glukosidase sebagai Antidiabetik = Phytochemical Test and In Vitro Inhibitory Effect of Ethyl Acetate, Hexane, and Ethanol Okra Fruit (*Abelmoschus esculentus*) Extract on Alpha-Glucosidase Enzyme as Antidiabetic

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## Abstrak

Latar belakang: Diabetes melitus (DM) merupakan salah satu penyakit metabolik kronis dengan jumlah penderita tertinggi di dunia. DM tipe 2 mencakup 90% kasus DM. Hiperglikemia pada DM tipe 2 menyebabkan kerusakan sel beta pankreas dan resistensi insulin. Salah satu opsi pengobatan DM tipe 2 adalah inhibitor alfa-glukosidase seperti acarbose. Okra (*Abelmoschus esculentus*) merupakan tanaman obat yang digunakan untuk pengobatan diabetes melitus di Turki dan banyak ditemukan di Indonesia. Penelitian yang menguji efek inhibisi buah okra terhadap alfa-glukosidase masih belum umum. Metode: Buah okra (*Abelmoschus esculentus*) merah diekstraksi menggunakan 3 pelarut dengan polaritas berbeda, yaitu etanol, etil asetat, dan heksana. Selanjutnya dilakukan uji fitokimia dan uji inhibisi ekstrak terhadap alfa-glukosidase secara in vitro dengan kontrol positif acarbose untuk menentukan persentase inhibisi dan nilai IC50. Hasil: Ekstrak etanol, etil asetat, dan heksana buah okra (*Abelmoschus esculentus*) memiliki kandungan metabolit sekunder flavonoid, triterpenoid, alkaloid, tanin (hanya etanol), glikosida (hanya etanol), dan steroid (hanya etil asetat dan heksana). Dari ketiga ekstrak, ekstrak etanol buah okra memiliki nilai IC50 terendah sebesar  $72,038 \pm 27,852$  g/mL, diikuti dengan ekstrak etil asetat sebesar  $107,330 \pm 3,025$  g/mL, dan ekstrak heksana sebesar  $193,618 \pm 18,514$  g/mL dengan kontrol positif acarbose sebesar  $0,978 \pm 0,326$  g/mL. Kesimpulan: Ekstrak buah okra terbukti mengandung flavonoid, triterpenoid, dan alkaloid serta tambahan tanin dan glikosida pada ekstrak etanol yang berpotensi sebagai inhibitor alfa-glukosidase. Ekstrak etanol, etil asetat, dan heksana buah okra memiliki kemampuan inhibisi alfa-glukosidase namun lebih rendah dari acarbose.

.....Introduction: Diabetes mellitus (DM) is one of the chronic metabolic diseases with the highest number of prevalence in the world. Type 2 DM covers 90% of DM cases. Hyperglycemia in type 2 DM leads to damage to pancreatic beta cells and insulin resistance. One of the treatment options for type 2 DM is an alpha-glucosidase inhibitor such as acarbose. Okra (*Abelmoschus esculentus*) is a medicinal plant used for the treatment of diabetes mellitus in Turkey and is widely found in Indonesia. Studies testing the inhibition effect of okra fruit on alpha-glucosidase are still not common. Method: Red okra (*Abelmoschus esculentus*) fruits were extracted using 3 solvents with different polarities, namely ethanol, ethyl acetate, and hexane. Furthermore, phytochemical tests and in vitro inhibitory activity tests against alpha-glucosidase were carried out compared to acarbose to determine the inhibition percentage and IC50 value. Result: Ethanol, ethyl acetate and hexane extracts of okra fruit (*Abelmoschus esculentus*) contain secondary metabolites of flavonoids, triterpenoids, alkaloids, tannins (only ethanol), glycosides (only ethanol), and steroids (only ethyl acetate and hexane). Of the three extracts, okra fruit ethanol extract had the lowest IC50 value of  $72.038 \pm 27.852$  g/mL, followed by ethyl acetate extract of  $107.330 \pm 3.025$  g/mL, and hexane extract of

193.618 ± 18.514 g/mL with acarbose as positive control of 0.978 ± 0.326 g/mL. Conclusion: Okra fruit extract has been shown to contain flavonoids, triterpenoids, and alkaloids as well as additional tannins and glycosides in ethanol extracts that have the potential to be alpha-glucosidase inhibitors. Ethanol, ethyl acetate, and hexane extracts of okra fruit have alpha-glucosidase inhibition ability but are lower than acarbose.