

ABSTRAK

Judul : Bakteri Endofit Pinang Sebagai Penghasil Antioksidan dan Inhibitor α -Glukosidase
Penyusun : Tiara Balkis
NIM : 223307010030
Fakultas/Program Studi : FKKGIK/Pendidikan Dokter
Dosen Pembimbing : Dr. Edy Fachrial, S.Si., M.Si, CIQaR

Pendahuluan: Diabetes mellitus merupakan penyakit metabolik kronis dengan prevalensi tinggi dan risiko komplikasi serius. Fase prediabetes menjadi target penting pencegahan, salah satunya melalui inhibitor α -glukosidase. Namun, obat sintetik seperti acarbose sering menimbulkan efek samping gastrointestinal sehingga diperlukan alternatif yang lebih aman. Mikroba endofit dari tanaman obat, termasuk biji pinang (*Areca catechu*), berpotensi menghasilkan senyawa bioaktif dengan aktivitas antioksidan dan antidiabetes. **Tujuan:** Penelitian ini bertujuan mengeksplorasi bakteri endofit dari biji pinang segar sebagai sumber metabolit dengan aktivitas antioksidan dan inhibitor α -glukosidase. **Metode:** Biji pinang disterilisasi menggunakan metode *surface sterilization*, diisolasi bakteri endofit, lalu dikarakterisasi dengan pewarnaan Gram. Kultur difermentasi dalam Nutrient Broth, supernatan dipisahkan dengan sentrifugasi, kemudian diuji aktivitas antioksidan menggunakan metode DPPH serta uji inhibitor α -glukosidase secara *in vitro* dengan substrat p-nitrophenil α -D-glukopiranosida. Acarbose digunakan sebagai kontrol positif. **Hasil:** Diperoleh tujuh isolat endofit (BP1-BP7) berbentuk basil Gram negatif. Isolat BP1 menunjukkan aktivitas antioksidan tertinggi dengan inhibisi 45,7%. Supernatan BP1 mampu menghambat aktivitas enzim α -glukosidase hingga 93,6%, setara dengan acarbose (91%). **Kesimpulan:** Bakteri endofit biji pinang memiliki potensi sebagai sumber bioaktif dual-acting, yaitu antioksidan sekaligus inhibitor α -glukosidase, sehingga layak dikembangkan lebih lanjut sebagai terapi alternatif antidiabetes yang berkelanjutan.

Kata kunci: Pinang, antioksidan, α -glukosidase

ABSTRACT

Title : Antioxidant Activity and α -Glucosidase Inhibitory Activity Of Endophytic Bacteria Isolated from *Areca catechu* Seeds

Author : Tiara Balkis

NIM : 223307010030

Faculty/Study Program : FKKGIK/Medical Education

Supervisor : Dr. Edy Fachrial, S.Si., M.Si, CIQaR

Introduction: Diabetes mellitus is a chronic metabolic disorder with a high global prevalence and serious complications. The prediabetes stage is a critical target for prevention, often managed with α -glucosidase inhibitors. However, synthetic drugs such as acarbose are frequently associated with gastrointestinal side effects, highlighting the need for safer alternatives. Endophytic microbes from medicinal plants, including areca nut (*Areca catechu*), have the potential to produce bioactive compounds with antioxidant and antidiabetic activities.

Objective: This study aimed to explore endophytic bacteria from fresh areca nut seeds as a source of metabolites with antioxidant and α -glucosidase inhibitory activity. **Methods:** Fresh areca nut seeds were sterilized using the surface sterilization method, followed by endophytic bacterial isolation and Gram staining. Cultures were fermented in Nutrient Broth, and supernatants were obtained by centrifugation. Antioxidant activity was assessed using the DPPH method, while α -glucosidase inhibition was tested in vitro with *p-nitrophenyl α -D-glucopyranoside* as substrate. Acarbose served as the positive control. **Results:** Seven Gram-negative, rod-shaped endophytic isolates (BP1-BP7) were obtained. Isolate BP1 exhibited the highest antioxidant activity with 45.7% inhibition. Furthermore, the BP1 supernatant demonstrated potent α -glucosidase inhibitory activity up to 93,6%, comparable to that of acarbose (91%). **Conclusion:** Endophytic bacteria from areca nut seeds possess dual bioactivity as antioxidants and α -glucosidase inhibitors, suggesting their potential as sustainable alternative antidiabetic agents worthy of further investigation.

Key words: Areca nut seeds, antioxidant, α -Glucosidase