

ABSTRAK

Annisa Khofiyatus Sholikhah. 2025. *Metabolite Profiling* Bunga Telang (*Clitoria Ternatea L.*) Menggunakan UPLC-QTOF-MS/MS Dan Aktivitas Antioksidan Menggunakan Metode DPPH Dari Tiga Daerah Berbeda Di Indonesia. Skripsi. Program Studi Farmasi., Fakultas Ilmu Kesehatan dan Sains, Universitas PGRI Madiun. Pembimbing (I) Dr. drh. Cicilia Novi Primiani, M.pd., Pembimbing (II) Apt. Weka Shida Bhagawan, M. Farm.

Penelitian ini bertujuan untuk mengkaji profil senyawa metabolit sekunder dan aktivitas antioksidan ekstrak bunga telang (*Clitoria ternatea L.*) yang berasal dari tiga daerah berbeda di Indonesia: Jawa Timur, Jawa Tengah, dan Jawa Barat. Ekstraksi dilakukan menggunakan metode remaserasi dengan pelarut etanol 96%, sedangkan analisis senyawa dilakukan menggunakan instrumen UPLC-QToF-MS/MS. Aktivitas antioksidan dievaluasi melalui metode DPPH dan diukur menggunakan spektrofotometer UV-Vis, dengan parameter IC_{50} sebagai indikator kekuatan antioksidan. Hasil penelitian menunjukkan bahwa terdapat variasi komposisi senyawa metabolit sekunder di setiap daerah. Di Jawa Timur, senyawa utama yang teridentifikasi adalah Mitragynine (18,56%), sedangkan di Jawa Tengah didominasi oleh Ethyl-(2S)-2-[(3S,5aS,8aS,9aS)-3-methyl-1, 4-dioxodecahydro-2H-cyclopentapyrrolo[1,2a] pyrazin-2-yl]-4-phenylbutanoat (52,30%). Di Jawa Barat, senyawa mayor adalah N-Acetyl-L-histidyl-L-tryptophyl-L-alanyl-L-valylglycyl-N-[(4R)-2-methyl-4-decanyl]-L histidinamide (16,38%). Selain itu, ditemukan pula senyawa penanda seperti Tris(4-nitrophenyl)amine, Phenylglyoxylic acid, Quercetin, dan Euquinen di Jawa Timur dan Jawa Tengah, namun tidak terdeteksi di Jawa Barat. Uji aktivitas antioksidan menunjukkan bahwa ekstrak bunga telang dari ketiga daerah memiliki kategori aktivitas sedang dengan nilai IC_{50} berturut-turut: Jawa Timur 131,54 $\mu\text{g/mL}$, Jawa Tengah 129,98 $\mu\text{g/mL}$, dan Jawa Barat 127,55 $\mu\text{g/mL}$. Tidak terdapat perbedaan signifikan antara aktivitas antioksidan ekstrak bunga telang dari ketiga daerah maupun dibandingkan dengan vitamin C sebagai kontrol. Hasil ini menunjukkan bahwa ekstrak bunga telang dari ketiga wilayah dapat berpotensi sebagai sumber antioksidan alami yang setara efektivitasnya dengan vitamin C. Penelitian ini menegaskan pentingnya faktor geografis dalam mempengaruhi profil metabolit sekunder tanaman dan mendukung pengembangan bunga telang sebagai bahan baku pangan fungsional dan farmasi berbasis antioksidan.

Kata Kunci : Metabolit Profiling, Bunga Telang (*Clitoria ternatea*), Spektrofotometer UV-Vis, UPLC-QToF-MS/MS

ABSTRACT

Annisa Khofiyatus Sholikhah. 2025. Metabolite Profiling of Butterfly Pea Flower (*Clitoria Ternatea* L.) Using UPLC-QTOF-MS/MS and Antioxidant Activity Using DPPH Method From Three Different Regions in Indonesia. Thesis. Pharmacy Study Program., Faculty of Health and Science, Universitas PGRI Madiun. Supervisor (I) Dr. drh. Cicilia Novi Primiani, M.pd., Supervisor (II) Apt. Weka Shida Bhagawan, M. Farm.

This study aims to examine the profile of secondary metabolite compounds and antioxidant activity of butterfly pea flower extract (*Clitoria ternatea* L.) originating from three different regions in Indonesia: East Java, Central Java, and West Java. Extraction was carried out using the remaceration method with 96% ethanol solvent, while compound analysis was carried out using a UPLC-QToF-MS/MS instrument. Antioxidant activity was evaluated using the DPPH method and measured using a UV-Vis spectrophotometer, with the IC₅₀ parameter as an indicator of antioxidant strength. The results of the study showed that there were variations in the composition of secondary metabolite compounds in each region. In East Java, the main compound identified was Mitragynine (18.56%), while in Central Java it was dominated by Ethyl-(2S)-2-[(3S,5aS,8aS,9aS)-3-methyl-1,4-dioxodecahydro-2H-cyclopentapyrrolo[1,2-a]pyrazin-2-yl]-4-phenylbutanoate (52.30%). In West Java, the major compound was N-Acetyl-L-histidyl-L-tryptophyl-L-alanyl-L-valylglycyl-N-[(4R)-2-methyl-4-decanyl]-L-histidinamide (16.38%). In addition, marker compounds such as Tris(4-nitrophenyl)amine, Phenylglyoxylic acid, Quercetin, and Euquinene were also found in East Java and Central Java, but were not detected in West Java. Antioxidant activity test showed that butterfly pea flower extract from the three regions had moderate activity category with IC₅₀ values respectively: East Java 131.54 µg/mL, Central Java 129.98 µg/mL, and West Java 127.55 µg/mL. There was no significant difference between the antioxidant activity of butterfly pea flower extract from the three regions or compared with vitamin C as a control. These results indicate that butterfly pea flower extract from the three regions can potentially be a source of natural antioxidants that are as effective as vitamin C.

This study confirms the importance of geographical factors in influencing the secondary metabolite profile of plants and supports the development of butterfly pea flowers as raw materials for functional foods and antioxidant-based pharmaceuticals.

Keywords: Metabolite Profiling, Butterfly Pea Flower (*Clitoria ternatea*), UV-Vis Spectrophotometer, UPLC-QtoF-MS/MS