

INTISARI

Tumbuhan obat tradisional merupakan salah satu sumber utama dalam pengobatan berbagai penyakit di masyarakat provinsi Riau, Kabupaten Kuantan Singingi. Tumbuhan yang digunakan secara empiris adalah “*kaduduak*” (*Melastoma malabathricum* L.) untuk mengobati luka, diare, disentri, sakit gigi dan diabetes. Berdasarkan studi literatur, tumbuhan ini mengandung senyawa fenolik yang berperan penting dalam aktivitas biologisnya, sehingga pada penelitian ini dilakukan isolasi senyawa marker aktif daun *M. malabathricum* dan uji penangkapan radikal bebas DPPH, anti-MRSA dan penghambatan AGE. Kandungan metabolit tumbuhan dipengaruhi oleh faktor lingkungan seperti, tinggi tempat, jenis tanah dan unsur hara, sehingga dilakukan analisis *fingerprinting* ekstrak *M. malabathricum* dari letak geografis berbeda menggunakan analisis TLC densitometri dan HPLC.

Isolasi senyawa aktif diawali dengan ekstraksi, dilanjutkan uji penangkapan radikal bebas DPPH, anti-MRSA, dan penghambatan AGE. Ekstrak teraktif dilanjutkan pemisahan dan pemurnian menggunakan kromatografi kolom dan HPLC preparatif sehingga menghasilkan isolat F5-1 dan F5-2. Hasil uji kemurnian titik lebur diperoleh bahwa isolat F5-1 dan F5-2 telah murni dengan titik lebur masing-masing adalah 187-189°C dan 181-183°C. Uji aktivitas penangkapan radikal bebas DPPH, anti-MRSA, dan penghambatan AGE dari kedua isolat F5-1 dan F5-2 menunjukkan aktivitas yang potensial. Identifikasi struktur isolat dilakukan dengan interpretasi data UV, FTIR, NMR, dan MS menunjukkan bahwa isolat dari ekstrak etil asetat daun *M. malabathricum* adalah isokuersitrin (F5-1) dan kuersitrin (F5-2).

Analisis *fingerprinting* daun *M. malabathricum* dari letak geografis berbeda dilakukan dengan analisis TLC densitometri dan HPLC. Data perbedaan metabolit selanjutnya dianalisis kemometrika menggunakan *Principal Component Analysis* (PCA) dan *Hierarchical Component Analysis* (HCA). Analisis kemometrika menunjukkan metabolit di daerah kepulauan memiliki variasi lebih besar dibanding metabolit di daerah daratan. Uji aktivitas biologis masing-masing ekstrak dari letak geografis berbeda dilakukan dengan uji penangkapan radikal bebas DPPH dan anti-MRSA. Hasil pengujian aktivitas biologis menunjukkan bahwa ekstrak yang berasal dari daerah kepulauan memiliki aktivitas biologis lebih baik yaitu kabupaten Bintan (BN) dengan persen penangkapan radikal bebas DPPH sebesar $92,00\% \pm 0,67$ dan kabupaten Karimun (KR) dengan persen penghambatan anti-MRSA dengan nilai $71,63 \pm 2,00$.

Kata kunci: *Advanced Glycation End-product*, anti-MRSA, HCA, HPLC, kemometrika, *Melastoma malabathricum* L., PCA

ABSTRACT

Traditional medicinal plants are one of the main sources in the treatment of various diseases in the people of Riau province, Kuantan Singingi Regency. The plant used empirically is "kaduduak" (*Melastoma malabathricum* L.) to treat wounds, diarrhea, dysentery, toothache and diabetes. Based on the literature study, this plant contains phenolic compounds that play an important role in its biological activity, therefore in this study the isolation of active marker compounds in the leaves of *M. malabathricum* and tests for DPPH free radical scavenging, anti-MRSA and AGE inhibition were carried out. The content of plant metabolites is influenced by environmental factors such as altitude, soil type and nutrients, therefore the fingerprinting analysis of *M. malabathricum* extract from different geographical locations was carried out using TLC densitometry and HPLC analysis.

Isolation of the active compounds began with extraction, followed by free radical scavenging tests for DPPH, anti-MRSA, and AGE inhibition. The active extract was separated and purified using column chromatography and preparative HPLC to produce isolates F5-1 and F5-2. Melting point purity test results showed that isolates F5-1 and F5-2 were pure with melting points of 187-189°C and 181-183°C, respectively. Assays of DPPH free radical scavenging activity, anti-MRSA, and AGE inhibition of both isolates F5-1 and F5-2 showed potential activity. Identification of the structure of the isolate was carried out by interpreting the UV, FTIR, NMR, and MS data showing that the isolates from the ethyl acetate extract of the leaves of *M. malabathricum* were isoquercitrin (F5-1) and quercitrin (F5-2).

Fingerprinting analysis of *M. malabathricum* leaves from different geographic locations was performed by TLC densitometry and HPLC analysis. The data on different metabolites were then analyzed chemometrically using Principal Component Analysis (PCA) and Hierarchical Component Analysis (HCA). The chemometric analysis showed that the metabolites in the archipelagic area had a greater variation than the metabolites in the mainland area. The biological activity test of each extract from different geographical locations was carried out by DPPH free radical scavenging and anti-MRSA assays. The results of the biological activity test showed that the extracts from the archipelagic area had better biological activity, namely Bintan district (BN) with a percentage of DPPH free radical scavenging of $92.00\% \pm 0.67$ and Karimun district (KR) with a percent anti-MRSA inhibition with a value of 71.63 ± 2.00 .

Keywords: *Advanced Glycation End-product*, anti-MRSA, HCA, HPLC, chemometrics, *Melastoma malabathricum* L., PCA