ABSTRAK

Elizabet Silaban, NIM. 4213510008 (2026). Isolasi Senyawa Bioaktif Golongan Flavonoid dari Getah Kemenyan Sumatra (*Styrax benzoin*) dan Uji Antioksidan.

Getah kemenyan Sumatra (*Styrax benzoin*) merupakan salah satu hasil hutan bukan kayu yang memiliki potensi bioaktif tinggi, terutama dari golongan flavonoid yang diketahui memiliki aktivitas farmakologis penting seperti antioksidan. Namun, informasi mengenai isolasi fraksi flavonoid serta aktivitas antioksidannya masih terbatas. Penelitian ini bertujuan untuk mengisolasi senyawa golongan flavonoid dari getah kemenyan Sumatra serta menentukan kadar flavonoid total dan aktivitas antioksidannya. Penelitian diawali dengan preparasi sampel dan ekstraksi menggunakan metode maserasi dengan pelarut metanol 70%. Isolasi senyawa dilakukan melalui uji skrining fitokimia, Kromatografi Lapis Tipis (KLT), Kromatografi Vakum Cair (KVC), dan Kromatografi Kolom untuk memperoleh fraksi flavonoid. Identifikasi gugus fungsi dilakukan menggunakan spektrofotometer FTIR. Penetapan kadar flavonoid total dilakukan melalui pembuatan larutan standar kuersetin dengan deret konsentrasi 6–14 ppm. Kurva kalibrasi menghasilkan persamaan regresi linear $y = 0{,}0448x + 0{,}0141$ dengan nilai $R^2 = 0{,}989$, menunjukkan hubungan yang sangat baik antara konsentrasi dan absorbansi. Ekstrak sampel dianalisis pada tiga replikasi dengan nilai absorbansi 0,381–0,400 yang dikonversi menjadi konsentrasi flavonoid 8,819–9,243 mg/L. Kadar flavonoid total yang diperoleh adalah 5,8794 mgQE/g, 6,0729 mgQE/g, dan 6,1622 mgQE/g, dengan rata-rata 6,0381 mgQE/g ekstrak. Uji aktivitas antioksidan dilakukan menggunakan metode DPPH pada berbagai konsentrasi sampel (5–100 ppm). Persamaan regresi antara konsentrasi dan persen inhibisi adalah $y = 0{,}7299x + 20{,}403$ dengan $R^2 = 0{,}8817$. Nilai IC_{50} flavonoid sebesar 40,55 ppm, yang termasuk kategori antioksidan sangat kuat ($IC_{50} < 50$ ppm). Kuersetin digunakan sebagai kontrol positif dan menunjukkan nilai IC_{50} sebesar 10,94 ppm, juga termasuk kategori sangat kuat, sesuai dengan karakteristik antioksidan kuersetin yang telah dikenal secara luas. Hasil penelitian menunjukkan bahwa ekstrak metanol getah kemenyan memiliki kadar flavonoid yang cukup tinggi dan aktivitas antioksidan yang sangat kuat. Temuan ini mengindikasikan bahwa getah kemenyan berpotensi dikembangkan sebagai sumber senyawa bioaktif alami yang bermanfaat dalam bidang kesehatan dan farmasi.

Kata kunci: *Styrax benzoin*, flavonoid total, $AlCl_3$, DPPH, Antioksidan, IC_{50}.

ABSTRACT

Elizabet Silaban, NIM. 4213510008 (2026). ***Isolation of Bioactive Flavonoid Compounds from Sumatra Benzoin Resin (Styrax benzoin) and Antioxidant Activity Assay.***

Sumatra benzoin resin (Styrax benzoin) is a non-timber forest product known to contain various bioactive secondary metabolites, particularly flavonoids, which possess important pharmacological properties such as antioxidant activity. However, studies regarding the isolation of flavonoid fractions and their antioxidant potential remain limited. This research aims to isolate flavonoid compounds from Sumatra benzoin resin and to determine their total flavonoid content and antioxidant activity. The study began with sample preparation and extraction using the maceration method with 70% methanol. Isolation of the compounds was carried out through phytochemical screening, Thin Layer Chromatography (TLC), Vacuum Liquid Chromatography (VLC), and Column Chromatography to obtain flavonoid fractions. Functional group identification was conducted using FTIR spectroscopy. Determination of total flavonoid content was performed using quercetin as a standard at concentrations ranging from 6 to 14 ppm. The calibration curve produced a linear regression equation of $y = 0.0448x + 0.0141$ with an R^2 value of 0.989, indicating an excellent correlation between concentration and absorbance. The extract samples analyzed in three replications showed absorbance values of 0.381–0.400, corresponding to flavonoid concentrations of 8.819–9.243 mg/L. The resulting total flavonoid contents were 5.8794 mgQE/g, 6.0729 mgQE/g, and 6.1622 mgQE/g, with an average of 6.0381 mgQE/g extract. The antioxidant activity test was performed using the DPPH method at various sample concentrations (5–100 ppm). The regression equation obtained between concentration and percent inhibition was $y = 0.7299x + 20.403$ with an R^2 value of 0.8817. The IC_{50} value of the isolated flavonoids was 40.55 ppm, which falls into the category of very strong antioxidant activity ($IC_{50} < 50$ ppm). Quercetin, used as a positive control, exhibited an IC_{50} value of 10.94 ppm, also categorized as very strong, consistent with its widely recognized antioxidant potency. These findings demonstrate that methanolic extract of Sumatra benzoin resin contains a substantial amount of flavonoids with very strong antioxidant activity. This indicates that Styrax benzoin has promising potential as a natural source of bioactive compounds for applications in health and pharmaceutical fields.

Keywords: *Styrax benzoin, total flavonoid, $AlCl_3$, DPPH, antioxidant, IC_{50}.*