ABSTRAK

Josua Pantri Natal Manullang, NIM 4181220020 (2018), Uji Aktivitas Antibakteri Ekstrak Metanol Daun Kirinyuh (*Chromolaena odorata*) terhadap Bakteri Patogen dengan Metode KLT Bioautografi

Penelitian ini bertujuan untuk mengetahui aktivitas antibakteri ekstrak metanol daun kirinyuh terhadap bakteri patogen MDR, yaitu *Staphylococcus aureus* MRSA, *Klebsiella pneumoniae* ESBL, dan *Pseudomonas aeruginosa* ESBL, menggunakan metode Kromatografi Lapis Tipis (KLT) Bioautografi. Ekstraksi daun kirinyuh dilakukan dengan metode maserasi menggunakan pelarut metanol p.a., menghasilkan ekstrak kental dengan rendemen 11,15%. Uji fitokimia menunjukkan ekstrak ini positif mengandung alkaloid, fenolik, flavonoid, saponin, dan steroid. Uji aktivitas antibakteri ekstrak kasar menggunakan metode difusi cakram menunjukkan bahwa ekstrak metanol daun kirinyuh pada konsentrasi 20% dan 40% memiliki aktivitas penghambatan terhadap ketiga bakteri uji. Pada *S. aureus* MRSA, zona hambat rata-rata-rata 9,3 mm (20%) dan 14,8 mm (40%). Terhadap *K. pneumoniae* ESBL, zona hambat rata - 8,0 mm (20%) dan 12,3 mm (40%). Sementara itu, pada *P. aeruginosa* ESBL, zona hambat rata-rata 6,7 mm (20%) dan 10,8 mm (40%). Kontrol positif (kloramfenikol) menunjukkan zona hambat yang jauh lebih besar (20,8 dan 25,8 mm), sedangkan kontrol negatif (metanol p.a.) tidak menunjukkan zona hambat. Uji KLT Bioautografi mengkonfirmasi adanya senyawa bioaktif dalam ekstrak metanol daun kirinyuh yang bertanggung jawab atas aktivitas antibakteri. Terhadap *S. aureus* MRSA, spot aktif teridentifikasi pada Rf 0,47 cm (diduga fenol). Untuk *K. pneumoniae* ESBL, spot aktif ditemukan pada Rf 0,6 cm (diduga flavonoid). Untuk, pada *P. aeruginosa* ESBL, spot aktif teridentifikasi pada Rf 0,47 cm (diduga fenol). Senyawa golongan alkaloid, flavonoid, dan fenol diduga berperan dalam menghambat pertumbuhan bakteri melalui berbagai mekanisme, seperti mengganggu dinding sel, membran sel, dan metabolisme energi bakteri.

Kata kunci: *Chromolaena odorata*, Antibakteri, KLT Bioautografi, Bakteri Patogen, *Staphylococcus aureus* MRSA, *Klebsiella pneumoniae* ESBL, *Pseudomonas aeruginosa* ESBL.

ABSTRACT

Josua Pantri Natal Manullang, NIM 4181220020 (2018), Antibacterial Activity Test of Methanol Extract of Kirinyuh Leaves (*Chromolaena odorata*) Against Pathogenic Bacteria Using Bioautography TLC Method

This study aims to determine the antibacterial activity of methanol extract of kirinyuh leaves against MDR pathogenic bacteria, namely *Staphylococcus aureus* MRSA, *Klebsiella pneumoniae* ESBL and *Pseudomonas aeruginosa* ESBL, using Thin Layer Chromatography (TLC) Bioautography method. The extraction of kirinyuh leaves was carried out using the maceration method with p.a. methanol solvent, resulting in a thick extract with a yield of 11.15%. Phytochemical tests showed that this extract positively contains alkaloids, phenolics, flavonoids, saponins, and steroids. The antibacterial activity test of the crude extract using the disc diffusion method indicated that the methanol extract of kirinyuh leaves at concentrations of 20% and 40% exhibited inhibitory activity against all three tested bacteria. In *S. aureus* MRSA, the average inhibition zone is 9.3 mm (20%) and 14.8 mm (40%). Against *K. pneumonia* ESBL, the average inhibition zone is 8.0 mm (20%) and 12.3 mm (40%). Meanwhile, for *P. aeruginosa* ESBL, the average inhibition zone is 6.7 mm (20%) and 10.8 mm (40%). The positive control (chloramphenicol) showed much larger inhibition zones (20.8 and 25.8 mm), while the negative control (methanol p.a.) did not show any inhibition zone. The Bioautography TLC test confirmed the presence of bioactive compounds in the methanol extract of kirinyuh leaves responsible for antibacterial activity. Against *S. Aureus* MRSA, an active spot was identified at Rf 0.47 cm (suspected phenol). For *K. Pneumoniae* ESBL, an active spot was found at Rf 0.6 cm (suspected flavonoid). In *P. aeruginosa* ESBL, an active spot was identified at Rf 0.47 cm (suspected phenol). Compounds of alkaloids, flavonoids, and phenols are believed to play a role in inhibiting bacterial growth through various mechanisms, such as disrupting the cell wall, cell membrane, and bacterial energy metabolism.

Keywords: *Chromolaena odorata*, Antibacterial, Bioautography TLC, Pathogenic Bacteria, *Staphylococcus aureus* MRSA, *Klebsiella pneumoniae* ESBL, *Pseudomonas aeruginosa* ESBL.