

RINGKASAN

Aktinomisetes, terutama spesies anggota genus *Streptomyces* adalah penghasil beberapa produk bioaktif alami, terutama metabolit sekunder seperti senyawa antibakteri. Isolat *Streptomyces* sp. E404 diisolasi dari rizosfer tanaman mangrove Segara Anakan dan terbukti menghasilkan senyawa antibakteri yang menghambat pertumbuhan *Staphylococcus aureus* dan *Escherichia coli*. Produksi senyawa antibakteri dipengaruhi oleh beberapa faktor, diantaranya persediaan nutrisi dan waktu inkubasi. Formulasi medium fermentasi dan penentuan waktu inkubasi yang tepat sangat penting dalam proses produksi dan daya hambat senyawa antibakteri.

Tujuan penelitian adalah mengetahui pengaruh perbedaan jenis medium, waktu inkubasi dan interaksi antara jenis medium dan waktu inkubasi terhadap kemampuan penghambatan senyawa antibakteri isolat *Streptomyces* sp. E404. Penelitian dilakukan secara eksperimental menggunakan rancangan penelitian Rancangan Acak Lengkap (RAL) pola faktorial dengan 2 perlakuan dan 3 ulangan. Hasil penelitian ini memberikan informasi tentang jenis medium, waktu inkubasi dan interaksi keduanya yang berpengaruh terhadap kemampuan penghambatan senyawa antibakteri isolat *Streptomyces* sp. E404. Parameter yang diukur adalah bobot ekstrak kasar, diameter zona hambat ekstrak isolat *Streptomyces* sp. E404, bobot biomassa miselium, nilai pH medium, konsentrasi glukosa substrat, dan diameter zona hambat yang dihasilkan oleh filtrat kultur isolat *Streptomyces* sp. E404.

Hasil penelitian didapatkan jenis medium dan waktu inkubasi yang menghasilkan penghambatan tertinggi terhadap *E. coli* adalah medium D (sumber karbon *oatmeal* dan sumber nitrogen *sodium nitrate*) dan waktu inkubasi 21 hari dengan diameter zona hambat sebesar 14,5 mm. Sementara itu, jenis medium dan waktu inkubasi yang menghasilkan penghambatan tertinggi terhadap *S. aureus* adalah medium D (sumber karbon *oatmeal* dan sumber nitrogen *sodium nitrate*) dan waktu inkubasi 14 hari dengan diameter zona hambat sebesar 23,5 mm.

Kata kunci: Isolat *Streptomyces* sp. E404, antibakteri, medium pertumbuhan, waktu inkubasi

SUMMARY

Actinomycetes, especially species of the genus *Streptomyces* are the producers of some natural bioactive compounds, especially secondary metabolites such as antibacterial compounds. *Streptomyces* sp. E404 was isolated from the rhizosphere of mangrove plant from Segara Anakan and proved to produce antibacterial compounds that inhibit the growth of *Escherichia coli* and *Staphylococcus aureus*. The production of antibacterial compounds is influenced by several factors, including nutrient supply and incubation time. The formulation of the fermentation medium and determining the proper incubation time is essential in the production process and the ability of inhibition of antibacterial compounds.

The aims of this study are to know the effect of different types of medium, incubation time and interaction between medium and incubation time on the ability of inhibition of antibacterial compounds by *Streptomyces* sp. E404. The research was conducted experimentally using the design of Completely Randomized Factorial Design with 2 treatments and 3 replications. The results of this study provide information about the type of medium, incubation time and interaction between medium and incubation time that affect the ability of inhibition of antibacterial compounds by *Streptomyces* sp. E404. The parameters measured were weight of extract of antibacterial compound, diameter of extract inhibitory zone by *Streptomyces* sp. E404, weight of biomass of mycelium, pH value of medium, glucose concentration, and diameter of filtrate inhibitory zone by *Streptomyces* sp. E404.

The result showed that the type of medium and incubation time with the highest inhibition to *E. coli* was medium D (carbon source of oatmeal and nitrogen source of sodium nitrate) and 21 days of incubation time with a diameter of inhibition zone of 14,5 mm. Meanwhile, the type of medium and incubation time resulting in the highest inhibition of *S. aureus* was medium D (carbon source of oatmeal and nitrogen source sodium nitrate) and 14 days of incubation time with a diameter of inhibition zone of 23,5 mm.

Key word: *Streptomyces* sp. E404, antibacterial compound, fermentation medium, incubation time