Uji aktivitas antibakteri senyawa analog antimycin A3 sebagai inhibitor pertumbuhan pseudomonas aeruginosa = Antibacterial susceptibility testing of antimycin A3 analogue compounds as pseudomonas aeruginosa growth inhibitor

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Abstrak

Antimycin A3 merupakan substansi dari bakteri Streptomyces sp. yang memiliki efek antikanker dan antifungi. Dari senyawa ini telah disintesis 15 senyawa analog antimycin A3 rantai terbuka beserta segmen aromatik sederhana, yang kemudian diuji aktivitas antibakterinya sebagai inhibitor pertumbuhan Pseudomonas aeruginosa. P. aeruginosa adalah salah satu bakteri tersering yang menyebabkan infeksi nosokomial dengan resistensi yang tinggi terhadap berbagai antibiotik. Antimycin A3 dan senyawa analognya dilarutkan dalam DMSO 1%. Tiap senyawa dibagi ke dalam enam kelompok konsentrasi, yaitu 50, 100, 200, 400, 800, dan 1600 g/mL. Sebagai kontrol positif digunakan antibiotik ceftazidim. Selain itu juga digunakan kontrol DMSO 1%, kontrol bakteri, dan kontrol senyawa.
Uji aktivitas antibakteri menggunakan metode makrodilusi broth dengan mengamati derajat kekeruhan larutan. Hasil uji dinyatakan dengan Minimum Inhibitory Concentration (MIC). Data penelitian dianalisis secara deskriptif, yang menunjukkan bahwa senyawa 14 dengan struktur kimia aromatik sederhana memberikan aktivitas penghambatan pertumbuhan bakteri P. aeruginosa dengan MIC 1600 g/mL. Hasil pengamatan kultur larutan dalam plat agar darah menunjukkan masih terdapat pertumbuhan bakteri, sehingga disimpulkan senyawa 14 memiliki sifat menghambat namun tidak dapat membunuh bakteri P. aeruginosa.
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Antimycin A3 is a substance isolated from Streptomyces sp. with an anticancer and antifungal effects. From it had been synthesized fifteen open-chained and simple aromatic segment analogue compounds, on which were tested for their antibacterial activity as Pseudomonas aeruginosa growth inhibitor. P. aeruginosa is one of the most common causes of nosocomial infection with high resistance against various antibiotics. Antimycin A3 and its analogue compounds were dissolved in DMSO 1%. Each compound was divided into six concentration groups, which were 50, 100, 200, 400, 800, and 1600 g/mL. Ceftazidim was used as the positive control. There were also a control for each of DMSO 1%, P. aeruginosa, dan all 17 compounds. Antibacterial activity was tested using macrodilution broth method by assessing the level of turbidity of each solution. The result was stated in Minimum Inhibitory Concentration (MIC). The data was analized descriptively and it showed that compound 14 with a simple aromatic chemical structure had a growth inhibiting activity against P. aeruginosa at an MIC of 1600 g/mL. The blood culture result of said compound showed there was still bacterial growth, and so it was concluded that compound 14 had an inhibiting property but it could not kill P. aeruginosa.