Uji aktivitas antifungi senyawa novel analog antimycin a3 sebagai penghambat pertumbuhan candida albicans = Antifungal susceptibility testing of antimycin a3 novel analogues against the growth of candida albicans

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Abstrak

[Pendahuluan: Candidiasis merupakan infeksi jamur tersering di Dunia. Masalah utama candidiasis adalah resistensi obat. Fakta ini mengindikasikan penelitian dan pengembangan obat antifungi yang baru. Antimycin A3 dikenal sebagai salah satu senyawa yang memiliki aktivitas biologis sebagai antifungi namun toksik bagi tubuh. Arsianti et al. berhasil memodifikasi struktur antimycin A3 dengan membuka cincin dilakton lingkar-9 dan menambahkan beberapa gugus hidroksil pada rantai samping ester tersebut. Modifikasi ini diharapkan dapat meningkatkan kemampuan biologis dan menurunkan toksisitas senyawa analog tersebut. Metode: Pada penelitian ini, dilakukan uji aktivitas antifungi senyawa-senyawa hasil modifikasi tersebut kepada Candida albicans dengan menggunakan teknik macrodilution MIC assay. Senyawa analog dibagi dalam kelompok konsentrasi 50, 100, 200 dan 400 µg/mL kemudian diujikan pada C. albicans sekitar 3 × 107 CFU/ml. Semua kelompok dibandingkan dengan kontrol positif (Fluconazole) dan kontrol senyawa standar (antimycin A3). Penelitian ini menggunakan 2 kali pengulangan. Hasil: Hasil pengujian menunjukkan bahwa terjadi penghambatan pertumbuhan C. albicans pada kontrol positif dan senyawa analog 13 pada konsentrasi 400 µg/mL. Sedangkan, pada antimycin A3 dan kelompok senyawa analog lainnya tidak menunjukkan penghambatan pada konsentrasi 400 µg/mL. Diskusi: Sehingga dapat disimpulkan bahwa modifikasi struktur dilakton lingkar-9 menjadi rantai terbuka dan peneambahan gugus hidroksi pada senyawa analog 13 berkontribusi meningkatkan aktivitas antifungi terhadap C. albicans. ;Introduction: Candidiasis is the most frequent yeast infection in the world with drug resistence being its main problem. Thus, research and drug development for antifungal agent is highly required. Antimycin A3 is a compound that has antifungal activity. Arsianti et al. modified this compound by opening the nine dilactone ring system and introducing the hydroxyl groups into the side chain of the ester groups. This modification is to increase the biological activity and reduce toxicity of this molecule. Method: In this research, antifungal activity of the antimycin A3 analogues were tested against Candida albicans using Macrodillution MIC Assay. These analogues were devided in 4 groups concertration, which were 50, 100, 200, and 400 µg/mL, and than tested against around 3 × 107 CFU/ml of C. albicans. All groups were compered with positive control (Fluconazole) and standard compound control (Antimycine A3). This research used a duplo principle. Result: The result showed that there were growth inhibition in positive control groups and Analogue 13 at 400 µg/mL concentration. However, in other groups, including Antimycin A3 itself, there were no growth inhibiton. Discussion: With these results, it was concluded that this modification contributed to the increase of antifungal activity against C. albicans.
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