

INTISARI

Malaria adalah salah satu penyakit pengancam hidup di daerah tropis yang disebabkan oleh infeksi parasit dari genus Plasmodium. Munculnya strain plasmodium yang resisten terhadap obat-obat antimalaria telah banyak dilaporkan sehingga perlu upaya untuk menemukan ekstrak aktif antiplasmodium guna menjawab masalah resistensi parasit Plasmodium. Salah satu alternatif untuk mencari obat antimalaria yaitu ekstrak aktif yang terdapat pada *actinomyces* dari sedimen laut.

Actinomyces diisolasi dari sedimen laut yang merupakan koleksi Pusat Penelitian Bioteknologi, LIPI dan berpotensi menghasilkan bahan aktif, kemudian diekstraksi dengan etil asetat, hingga dihasilkan ekstrak kental etil asetat. Selanjutnya dilakukan skrining dengan metode uji aktivitas antiplasmodium *in vitro* pada kultur *Plasmodium falciparum*. Kultur *P. falciparum* yang mengandung parasit dengan parasitemia 0,5-1% dimasukkan dalam mikrokultur 96 sumuran. larutan yang mengandung bahan uji pada berbagai konsentrasi ditambahkan pada kultur untuk selanjutnya diinkubasikan selama 72 jam.

Hasil skrining 15 ekstrak *actinomyces* dengan konsentrasi 10 µg/mL diperoleh 5 ekstrak dengan persentase penghambatan tertinggi yakni ekstrak A 25,69%; ekstrak B 35,55%; ekstrak C 29,18%; ekstrak E 30,66%; dan ekstrak N 43,26%. Selanjutnya, kelima ekstrak *actinomyces* dilakukan penelitian lanjutan dengan menggunakan seri konsentrasi 1,25; 2,5; 5; 10; 20; 40 µg/mL dan diperoleh IC₅₀, dimana ekstrak A (IC₅₀=34,94 µg/mL±20,64); ekstrak B (IC₅₀=22,87 µg/mL±7,73) ekstrak C (IC₅₀=33,82 µg/mL±11,92); E (IC₅₀=29,88 µg/mL±22,46); N (IC₅₀=15,88 µg/mL±1,91) memiliki aktivitas antimalaria kategori potensial sedang. Hasil uji sitotoksitas pada sel vero menunjukkan bahwa ekstrak *actinomyces* pada konsentrasi 62,5 dan 125 µg/mL dapat meningkatkan viabilitas sel vero, namun pada konsentrasi 250; 500; dan 1000 µg/mL dapat menurunkan viabilitas sel vero. Untuk penentuan indeks selektivitas diperoleh hasil bahwa ekstrak B (10,69) dan N (14,71) tergolong ekstrak antimalaria yang aktif dan aman, ekstrak C (6,93) tergolong aktif parsial sedangkan ekstrak A dan E tergolong tidak selektif sebagai antiplasmodium dengan nilai indeks selektivitas kurang dari 4. Pada uji kromatografi lapis tipis ekstrak *actinomyces* mengandung golongan senyawa alkaloid, fenolik, dan terpenoid.

Kata Kunci : *Actinomyces*, Sedimen Laut, Antiplasmodium, *Plasmodium falciparum*, Sitotoksitas.

ABSTRACT

Malaria is a life threatening disease in tropical regions by infection of *Plasmodium* genus which still become a global health problem, especially in developing countries. The emergence of plasmodium strain which was resistant to antimalarial drugs has been reported, so it was needed an Attempts to find the extract of active anti-plasmodium to overcome the resistance of *Plasmodium* problem is required. An alternative source for new antimalarial drugs is active in the actinomycetes of marine sediment.

Actinomycetes was isolated from marine sediments which was a collection of the Biotechnology Research Center, LIPI. Then, it was extracted with ethyl acetate to get the thick extract of ethyl acetate. Furthermore, screening was done by using a method of anti-plasmodium activity test in vitro on *Plasmodium falciparum* culture. *P. falciparum* cultures containing parasites with 0,5-1% parasitemia were included in mikrokultur 96 wells. A solution containing the test material at various concentrations was added to the culture for subsequent incubation for 72 hours.

The result of skirining of 15 extracts of actinomycetes with concentration of 10 µg/mL obtained 5 extract with highest percentage of inhibition extract A 25.69%; extract B 35.55%; extract C 29.18%; extract E 30.66%; and extract N 43.26%. Furthermore, the five extracts of actinomycetes carried out continued research using a series of concentrations of 1.25; 2.5; 5; 10; 20; 40 µg/mL and obtained IC₅₀, where extract A (IC₅₀ = 34.94 µg/mL ± 20.64); extract B (IC₅₀ = 22.87 µg/mL ± 7.73) extract C (IC₅₀ = 33.82 µg/mL ± 11.92); E (IC₅₀ = 29.88 µg/mL ± 22.46); N (IC₅₀ = 15.88 µg/mL ± 1.91) has medium potential antimalarial activity. The results of cytotoxicity test on vero cells showed that acinimycetes extract at 62,5 and 125 µg/mL concentrations could increase vero cell viability, but at concentrations of 250; 500; and 1000 µg/mL can decrease vero cell viability. For the determination of selectivity index, it was found that extract B (10.69) and N (14.71) were classified as active and safe antimalarial extract, C extract (6.93) were partially active, while extracts A and E were not selective antiplasmodium with selectivity index value less than 4. In thin layer chromatography test of actinomycetes extract contains class of alkaloid, phenolic, and terpenoid compounds

Keywords: Actinomycetes, Marine Sediments, Antiplasmodium, Plasmodium falciparum, Cytotoxicity.