

# Pengaruh Pemberian secara Subkutan dari Kombinasi Ekstrak Akar Pasak Bumi (*Eurycoma longifolia* Jack) dan Artemisinin-Based Combination Therapy terhadap Parasitemia Mencit Terinfeksi *Plasmodium berghei* = The Effect of Subcutaneously Given Combination of *Eurycoma longifolia* Jack Root Extract and Artemisinin-Based Combination Therapy (ACT) on Parasitemia in Mice Infected with *Plasmodium berghei*

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## Abstrak

[Malaria masih menjadi beban kesehatan bagi Indonesia, terlebih lagi dengan perkembangan resistensi parasit terhadap pengobatan saat ini. Untuk itu, diperlukan penemuan terapi baru dengan segera. Pasak Bumi (*Eurycoma longifolia*) adalah tanaman asli Kalimantan yang terbukti secara *in vitro* dan *in vivo* memiliki aktivitas antiplasmodium. Penelitian ini ingin menguji efektivitas kombinasi ekstrak akar Pasak Bumi dosis 10 mg/kgBB (PB10) dan 20 mg/kgBB (PB20) dengan Artemisinin-based Combination Therapy (ACT) dosis 1,7 mg/kgBB pada mencit Swiss yang terinfeksi *Plasmodium berghei*. Pemberian obat dilakukan secara subkutan untuk meningkatkan bioavailabilitasnya, sehingga didapatkan hasil yang maksimal. Dengan menggunakan metode 4-day suppressive test, didapatkan pertumbuhan densitas parasitemia dan persentase inhibisi pertumbuhan secara berturut-turut: kontrol positif 22,08% dan 50,92%, PB10+ACT 5,22% dan 88,4%, PB20+ACT 3,5% dan 92,22%. Pemberian kombinasi meningkatkan efektivitas secara signifikan terhadap PB tunggal, tetapi tidak signifikan terhadap ACT tunggal. Meskipun demikian, peningkatan tersebut mengindikasikan adanya efek sinergis dari kedua zat dan membutuhkan penelitian lebih lanjut. Dari semua perlakuan, PB20+ACT memiliki efek antimalaria yang paling baik.;

Malaria is still considered as a burden disease for Indonesia, especially with the fast developing resistance of parasite against current medication. Hence, the invention of novel therapy is needed immediately. Pasak Bumi (*Eurycoma longifolia*), a native plant in Kalimantan, has been proven to have *in vivo* and *in vitro* antiplasmodial activity. This study aims to test the effect of combination of *E. longifolia* and Artemisinin-based Combination Therapy (ACT) both given subcutaneously on parasitemia in mice infected with *Plasmodium berghei*. The doses of the extract tested in this experimental study were 10 (PB10) and 20 mg/kg BW (PB20). Using the 4-day suppressive test, the growth of parasite and growth inhibition percentage of each groups are as following: positive control 22,08% and 50,92%, PB10+ACT 5,22% and 88,4%, PB20+ACT 3,5% and 92,22%. The combination therapy showed significant increase in effectiveness compared to PB monotherapy but insignificant increase compared to ACT monotherapy. Despite the insignificance, this indicates synergistic effect of the two substances that needs further investigation. Among all groups, PB20+ACT showed the best antimalarial activity, Malaria is still considered as a burden disease for Indonesia, especially with the fast developing resistance of parasite against current medication. Hence, the invention of novel therapy is needed immediately. Pasak Bumi (*Eurycoma longifolia*), a native plant in Kalimantan, has been proven to have *in vivo* and *in vitro* antiplasmodial activity. This study aims to test the effect of combination of *E. longifolia* and Artemisinin-based Combination Therapy (ACT) both given subcutaneously on parasitemia in mice infected with *Plasmodium berghei*. The doses of the extract tested in

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