Pengaruh ekstrak akar pasak bumi eurycoma longifolia jack sebagai antimalaria melalui mekanisme aktivitas spesifik enzim antioksidan sod dan katalase pada mencit yang diinfeksi plasmodium berghei = The role of pasak bumi eurycoma longifolia jack extract as an antimalarial agent through the mechanism of antioxidant specific activity superoxide dismutase sod and catalase cat in plasmodium berghei infected mice / Bintang Riris Sitanggang

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Abstrak

[ABSTRAK
Pasak bumi (PB) (Eurycoma longifolia Jack), adalah tanaman herbal Indonesia yang digunakan sebagai antimalaria. Penelitian terdahulu meliputi efek anti ageing dan anti inflamasi, namun belum pernah diteliti tentang efek terhadap aktivitas enzim antioksidan pada penggunaan ekstrak akar PB. Penelitian ini bertujuan untuk mengetahui apakah pengaruh ekstrak akar PB sebagai antimalaria dapat menurunkan aktivitas spesifik antioksidan enzimatik. Penelitian ini menggunakan mencit yang diinfeksi Plasmodium berghei, diterapi dengan ekstrak akar PB, klorokuin 10 mg/kg BB (kontrol positif, KP), kontrol negatif (akuades, KN), kontrol normal (K0), PB 30 (TI), 60 (TII) dan 90 mg/kg BB (TIII). Parameter yang diukur adalah inhibisi parasitemia, kadar karbonil, aktivitas spesifik SOD, katalase (CAT). Inhibisi parasitemia hari ke 7 dari KP, TI, TII dan TIII adalah 69,81%, 39,37%, 41,72% dan 12,92%. Aktivitas spesifik enzim SOD dan CAT plasma tidak ada perbedaan bermakna. Aktivitas spesifik SOD hati menunjukan perbedaan bermakna antara K0-KN (p=0,000), K0-KP (p= 0,025), KN-TI (p=0,001), KP-TI (p=0,042), KN-TII (p=0,002), KN-TIII (0,005). Aktivitas spesifik CAT hati menunjukkan perbedaan bermakna antara KP-TI (p=0,009), KP-TII (p=0,009), KP-TIII (p=0,014), KP-K0 (p=0,009), TI-TIII (p=0,014), KN-TI (p=0,009), KN-TII (p=0,047), K0-KN (p=0,047). Kadar karbonil plasma dan hati tidak menunjukkan perbedaan bermakna antar kelompok. Korelasi positif bermakna (r=0,690, p=0,000) terjadi antara aktivitas spesifik SOD dan CAT hati. Korelasi negatif bermakna terjadi antara aktivitas spesifik SOD, CAT hati dan parasitemia (r= -0,637, p=0,000) (r=-0,557, p=0,002). Kesimpulan: Potensi PB sebagai antimalaria diragukan karena herbal ini juga memiliki efek antioksidan yang menguntungkan bagi parasit.
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ABSTRACT
Pasak bumi (PB)(Eurycoma longifolia Jack), is an Indonesian herb used as antimalarial. Previous studies had been done on its anti-ageing and anti-inflammation properties, but its effect on antioxidant enzyme had not been researched. This study aim to investigate the antimalarial influence of PB extract on the reduction of specific

antioxidant activity of the SOD and CAT enzyme. We used mice infected by Plasmodium berghei treated with: PB 30, 60, and 90 mg/kg BW as (TI, TII, and TIII), positive control (chloroquine 10 mg/kg BW) (KP), negative control (aquadest) (KN), normal mice control (K0). The parameters were: growth inhibition, carbonyl concentration, specific activity of SOD and CAT. Growth inhibition in 7 day groups of KP, TI, TII, and TIII were 69,81%, 39,37%, 41,72%, and 12,92%. Specific activity of plasma SOD and CAT were insignificant between groups. Liver SOD specific activity showed significant different between K0-KN (p=0,000), K0-KP (p= 0,025), KN-TI (p=0,001), KP-TI (p=0,042), KN-TII (p=0,002), KN-TIII (0,005). Specific activity of liver CAT showed significant different between KP-TI (p=0,009), KP-TII (p=0,009), KP-TIII (p=0,014), KP-K0 (p=0,009), TI-TIII (p=0,014), KN-TI (p=0,009), KN-TII (p=0,047), K0-KN (p=0,047). Carbonyl concentrations show insignificant between groups in plasma and liver. Positive correlation (r=0,690, p=0,000) showed between liver SOD and CAT specific activity, negative correlation showed between liver SOD (r= -0,637, p=0,000), CAT (r= -0,557, p=0,002) specific activity and paracytemia. Therefore, The potential use of PB as an antimalarial was of doubtful effectiveness due to its antioxidant effect which could be beneficial to the parasite, Pasak bumi (PB)(Eurycoma longifolia Jack), is an Indonesian herb used as antimalarial. Previous studies had been done on its anti-ageing and anti-inflammation properties, but its effect on antioxidant enzyme had not been researched. This study aim to investigate the antimalarial influence of PB extract on the reduction of specific antioxidant activity of the SOD and CAT enzyme. We used mice infected by Plasmodium berghei treated with: PB 30, 60, and 90 mg/kg BW as (TI, TII, and TIII), positive control (chloroquine 10 mg/kg BW) (KP), negative control (aquadest) (KN), normal mice control (K0). The parameters were: growth inhibition, carbonyl concentration, specific activity of SOD and CAT. Growth inhibition in 7 day groups of KP, TI, TII, and TIII were 69,81%, 39,37%, 41,72%, and 12,92%. Specific activity of plasma SOD and CAT were insignificant between groups. Liver SOD specific activity showed significant different between K0-KN (p=0,000), K0-KP (p= 0,025), KN-TI (p=0,001), KP-TI (p=0,042), KN-TII (p=0,002), KN-TIII (0,005). Specific activity of liver CAT showed significant different between KP-TI (p=0,009), KP-TII (p=0,009), KP-TIII (p=0,014), KP-K0 (p=0,009), TI-TIII (p=0,014), KN-TI (p=0,009), KN-TII (p=0,047), K0-KN (p=0,047). Carbonyl concentrations show insignificant between groups in plasma and liver. Positive correlation (r=0,690, p=0,000) showed between liver SOD and CAT specific activity, negative correlation showed between liver SOD (r= -0,637, p=0,000), CAT (r= -0,557, p=0,002) specific activity and paracytemia. Therefore, The potential use of PB as an antimalarial was of doubtful effectiveness due to its antioxidant effect which could be beneficial to the parasite]