

Antimalarial Activity of *Bambusa vulgaris* Leaf Extract and Artemisinin Combination

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Resistance to antimalarial drugs has increased the mortality rate in malaria cases globally. Artemisinin-based Combination Therapies (ACTs) are the first-line malaria treatment worldwide by combining artemisinin with other antimalarial drugs. According to the literature, *Bambusa vulgaris* leaf has been shown to have antimalarial potential. This study was intended to determine the compatibility of *B. vulgaris* leaf extract when combined with artemisinin in malaria control. In this study, donor animals were prepared by intra-peritoneal injection of *Plasmodium berghei*-infected red blood cells (IRBC) into albino BALB/c strain mice. When the quantity of parasitemia reached 2-3%, the entire infected blood was taken through the heart of the mice and treated by centrifugation to obtain IRBC. The IRBC was then treated with *B. vulgaris* leaf extract combined with artemisinin, and the results indicate that the treatment can inhibit the growth phase of *P. berghei*. Microscopic observation and calculation of percent parasitemia were carried out to analyze the inhibition of each group. Inhibition value was used to determine the IC₅₀. The combined *B. vulgaris* leaf extract and artemisinin treatment exhibited 356 μ L of IC₅₀ whereas the *B. vulgaris* leaf extract treatment only exhibited 1196 μ L of IC₅₀. This means the compatibility of the combination contributes to higher antimalarial efficacy depicted by the smaller IC₅₀. Complementary GC-MS and reverse molecular docking were utilized to elucidate the substance in *B. vulgaris* leaf extract. The 3-[4-(Pivaloyloxy)butyl]cyclohexanone was found to be responsible for the antimalarial activity based on the lowest binding affinity value and the best ligand-receptor interaction visualization.

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