ABSTRACT

Effects of 96% Ethanol Extract of Bitter Herbs (Andrographis paniculata Nees) and Andrographolide Compound against Morphological Changes and Heme Detoxification Process in Parasite Plasmodium falciparum in Vitro

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The emergence of resistance of Plasmodium falciparum to existing antimalarial drugs has prompted the discovery of new antimalarial drugs from nature or even synthetic materials. 96% Ethanol extract of bitter herbs (A. paniculata Nees) and andrographolide compound is a drug compound from nature that have been shown to have antimalarial activity by inhibiting the growth of P. falciparum trophozoite stage. This research aimed to describe the antimalarial activity of 96% ethanol extract of bitter herbs and andrographolide compound and morphological changes of P. falciparum strain 3D7 after 24 hours incubated with 96% ethanol extract of bitter herbs and andrographolide compound 10 µg/ml, and also to determine the effect of both of them on the heme detoxification process by measuring the barriers of β-hematin formation. The research was designed as an experimental laboratory research and was conducted in malaria laboratory of Institute of Tropical Disease (ITD). The result showed that the 96% ethanol extract of bitter herbs and andrographolide compounds inhibited parasite growth and induced morphological changes of trophozoite stage of P. falciparum in a form of crisis form. The presence of “crisis form” along with decreasing in parasitemia levels shows that the 96% ethanol extract of bitter herbs and andrographolide compound has induced parasite death. The observation of the barrier of β-hematin formation was found that 96% ethanol extract of bitter herbs inhibits β-hematin formation of 61.07±4.69%, and andrographolide inhibits β-hematin formation of 61.77±3.70% which means that they were able to inhibit heme detoxification process of P. falciparum parasites. 96% ethanol extract of bitter herbs and andrographolide compound induces cell death of P. falciparum parasites by inhibiting heme detoxification process of the parasite where andrographolide compound was more potent to be developed as a new candidate of antimalarial drugs.

Key word: Ethanol extract 96%, Andrographolide, Bitter Hers, Andrographis paniculata Nees, Morphological changes of P. falciparum, Heme Detoxification.