ABSTRACT

ANTIMALARIAL ACTIVITY *Melicope triphylla* LEAF EXTRACT IN *Plasmodium falciparum In vitro* AND MECHANISM OF ACTION ON ENZYMES *Mallate Quinone Oxidoreductase* (MQO) AND *Dihydro-orotate Dehidrogenase* (DHODH)

Lia Ahyuni Mulya

Malaria is one of the health problem caused by parasite *Plasmodium*. Eastern Indonesia has the highest Annual Parasite Incidence (API). That condition is getting worse with resistance to antimalarial drugs such as quinine, chloroquine, and artemisin. The development of science, especially *P. falciparum* provides an opportunity to discover new malaria drugs with the mechanism of action at the new target site that is mitochondria. An example for the new antimalarial target sites in mitochondria are *mallate quinone oxidoreductase* (MQO) and *dihydro-orootate dehydrogenase* (DHODH). This study aims to find an active extract of *M. triphylla* which inhibit the growth of *Plasmodium falciparum* by MQO and DHODH assay. This study carried out the antimalarial activity test of five *Melicope triphylla* leaf extracts. The extracts were *n*-Hexane, dichloromethane, and methanol extract were extracted by gradually, alkaloid rich-extract with acid-base extraction procces from simplicia (alkaloid fraction). Those extracts were tested for their antimarial activity by three methods (microscopic method , MQO, and DHODH). Antimalarial activity with microscopic method showed that three extracts had a very active category, namely n-hexane extract (Inhibitory Concentration 50%, IC_{50}: 0.02 µg/ml); methanol extract (IC_{50}: 0.02 µg/ml); and dichloromethane extract (IC_{50}: 0.08 µg/ml). Alkaloid fraction had a moderate category (IC_{50}: 1.35 µg/ml). Antimalarial activity by MQO method showed that n-hexane extract was the most potent extract (IC_{50}: 7.49 µg/ml). Meanwhile, antimalarial activity by DHODH method showed that methanol extract was the most potent extract (IC_{50}: 16.37 µg/ml), and the other extract had IC_{50} > 100 µg/ml. The *n*-hexane extract inhibits MQO, but less active in inhibiting the DHODH enzyme. Therefore, all extracts need to be followed up with toxicity test (MTT) to determine the safety of the extract.

Keywords: *Melicope triphylla*, antimalarial, microscopic, mitochondria, MQO, DHODH