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DOCKBOU BURAT: *PLASMODIUM FALCIPARUM* : MITOCHONDRIAL OXYGEN UPTAKE IN ASEXUAL AND SEXUAL BLOOD STAGES. THESIS ADVISORS: PAKPIMOL MAHANNOP, Ph.D. JERAPAN KRUNGKRAI, Ph.D. ADISAK BHUMIRATANA, M. Sc. 101 p. ISBN 974-662-099-1

Mitochondrion is an important organelle and necessary for growth and survival of malarial parasites. It is a molecular target for some antimalarial drugs. In this study, the components of respiratory system of both asexual and sexual blood stages of *Plasmodium falciparum* from *in vitro* cultures were analyzed by using the mitochondrial inhibitors rotenone, TTFA, antimycin A and KCN which specifically act on each component of the electron transport system in the measurement of the rate of oxygen uptake.

The findings are summarized as follow. The mitochondrial electron transport system of asexual and sexual blood stages of *P.falciparum* contains NADH-CoQ oxidoreductase, succinate dehydrogenase, ubiquinol, cytochrome c reductase and cytochrome c oxidase. Their activities were associated with respiratory complexes I, II, III and IV. The highest oxygen uptake of asexual stages was found in schizonts, lower in trophozoites and lowest in ring forms. Comparison of the oxygen uptake of *P. falciparum* asexual and sexual blood stages show no difference. The rate of oxygen uptake of both asexual and sexual blood stages was inhibited by 4 and 3 mM KCN, respectively. In addition, the mitochondrial electron transport components of asexual and sexual blood stages were not different. Our result, together with evidence from other investigators, may support a rational approach to develop new antimalarial drugs.