CHAPTER V

Conclusion

Thirty six *P. falciparum* isolates were collected from malaria patients from Mae-Sariang district area, Mae Hong Son province and tested for their antimalarial drug sensitivity and mutations of enzymes (*Pf*CRT and *Pf*DHFR) responsible for Chloroquine (CQ) and Pyrimethamine (PYR) drug resistance respectively. In this study, three groups of antimalarial drugs were used. The first group is antimalarial drugs that were used in the past such as PYR and CQ. The second group is the drugs which were routinely used as single-drug or sometimes used as combination; Mefloquine (MQ) and Dihydroartemisinin (DHA). Lastly, the new antimalarial drug candidate 'P218', developed at BIOTEC, NSTDA, was also tested for its efficacy to field isolates in order to predict its use in the field. The results showed that all the tested isolates were resistant to PYR and CQ. Some isolates were resistant to MQ and almost all our isolates were still sensitive to DHA. The tested parasite isolates showed good efficacy to P218 when compared with PYR. When checked for the reported mutations in *Pfdhfr* and *Pfcrt* genes that cause resistance to PYR and CQ respectively, most of all of the tested isolates have quadruple mutations (N51I, C59R, S108N, and I164L), 3 isolates contain triple mutations (C59R, S108N, and I164L), and 1 isolate contains double mutations (C59R and S108N) in *Pf*DHFR, while all of the CQ-resistant isolates contain the reported K76T mutation in *Pf*CRT. The obtained information of drug resistance and resistance genes suggested that, although PYR and CQ have not been used in the area for a long time, the parasite isolates in the field are still resistant to these drugs. Furthermore, despite the reports of artemisinin resistant parasites, the tested parasite isolates are still sensitive to DHA. In the case of MQ and DHA resistance, it is postulated that other drug resistance genes; *Pfmdr1*, *Pfmrp1*, and *Pfatp6* might be involved. This study gave us information of the current situation of drug resistance in the field, thus allows us to plan effective treatment and monitor against the spread of resistance parasite in the endemic areas.