

V. CONCLUSION

5.1 Conclusion

Based on this study, we can conclude that:

1. The recent study of crude extract of several Piper genus represent the 11 Piper species were chemically studied and assayed against the plasmodium or protozoa including *Piper aduncum*, *P. auritum*, *P. marginatum*, *P. obrutum*, *P. jericcoense*, *P. betle*, *P. chaba*, *P. heterophyllum*, *P. glabratum*, *P. acutifolium*, *P. cubeba*, *P. demeraranum* and *P. duckeii* with potential secondary metabolites isolates from several Piper genus were 20,60-Dihydroxy-40-methoxydihydro-chalcone, 3-Farnesyl-p-hydroxybenzoic acid, Piperine, Chabamide, Benzoic acid derivatives, Guineensine, Pellitorine, Brachystamide B, Sarmentine, Sermentosine, 5,8-Hydroxy-7-methoxyflavone, Prenylated hydroxybenzoic acid, 4-Nerolidylcatechol, Piperitone, Champor, and Viridiflorol (EO).
2. Callus culture could be the promising method for antimalarial secondary metabolites acquisition and proved to increase the content of metabolites, which has been proved for 7 Piper species such as *Piper betle*, *P. colubrinum*, *P. crocatum*, *P. longum*, *P. nigrum*, *P. permucronatum* and *P. solmsianum* indicated the different suitable concentration of plant growth regulator (PGR) to induce the callus formation even the same species which related to the various amount of endogenous hormone.

5.2 Suggestion

Furthure research and investigation about the Piper as an antimalarial agent should lead to the discovery of Piper species with high content of molecules of interest in case the lack of Piper studies, and callus culture for Piper species can be further improved by the research of optimization processes for easy and cost-effective of callus culture products should receive commensurate attention.

