Bioactivities study and action malaria mechanisme of derivative xanthone compounds from Wadung 
(*Garcinia tetranda* Pierre)

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Activities and natural products chemistry compounds ITS of researche groups. 
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Summary

The malaria epidemic is one of the tropical diseases, it’s constituted a problem of medical treatment in overcoming the amount of victims. On the other hand, drug pattern of malaria have some insufficiencies that can lead to various side-effects, such as hypertension and vertigo. In a certain conditions, malaria drugs are contained, as Chloroquinendiphosphate and sulfadoxine-pirimethamine, can be experience of resistant. Medical treatment to decrease fever involving the usage of traditional drugs derived from natural compounds or plants in various areas in developing countries, empirically showed to have an ability to heal the disease. This fact presents some information that the plants have bioactive chemical compounds and, can be exploited and developed as a new antimalaria drug.

The first HPTP grant research reported about exploration of chemical compounds and in-vitro antimalaria activity against test using *Plasmodium falciparum* strain 3D7 from two species of *Garcinia tetranda* Pierre and *G. picrorhiza* Miq. obtained seven growth inhibitor parasites of the prenylatedxanthone compounds, as follows; $\alpha$-mangosteen (1) ($IC_{50}$ 0,005 $\mu$g/mL); 1,3,6-trihydroxy-7-methoxy-2(3-methyl-3-methoxy)-8-prenylated xanthone (2) ($IC_{50}$ 0,022 $\mu$g/mL); dulxanthone D (3) ($IC_{50}$ 3,83 $\mu$g/mL); 1,3,4,8-tetrahydroxyxanthone (4) ($IC_{50}$ 0,61 $\mu$g/mL), and $\beta$- mangosteen (5) ($IC_{50}$ 1,33 $\mu$g/mL), and two other are inactives antimalaria againts, 1,3,5-trihydroxy-6,7-chromanoxanthone (6) and 1,3,4,8-tetratahydroxyxanthone (7). Both of them compounds (1 and 2) have highest resistance activity againts compared with chloquinediphosphate as a drug standard, and it exibited the potential importance as a new malaria drug (Fidock, 2004).
Hence several research groups are working to develop new active compounds as an alternative antimalarial drugs. Studied antimalarial activity an two active compounds (1 and 2) were examined aim an in vitro model, against *Plasmodium falciparum* pathway 3D7. Both of active compounds showed same effect within 24 hours of incubation period, parasite was complete growth, compared to the negative control. After incubation time of 48 hours, compounds showed growth inhibition on dipolimerization process of Heme to Homozoin, that indicated by swollen vacoula of parasite. There is interesting moment, after incubation time of 78 hours, the compounds showed complete parasite growth inhibition, it’s indicate that the active compounds (1 and 2) have higher toxicity. More advance study needed to determine optimum concentration of both compounds (IC$_{50}$ and LD$_{50}$ level) against tested animal.

Furthermore, we haved explorated 14 compounds from 5 *Garcinia* species have been examined for their bioactivity. They were devided to three groups, one of them have a higher activity compared with standard, as chloroquine diphosphate (IC$_{50}$ 0.035 µg/ml) are 2″′-methoxymorelloflavone (10) (IC$_{50}$ 0.004 µg/ml), morelloflavone (6) (IC$_{50}$ 0.011 µg/ml), 5,7,4′,5′′,7′′,4′′′-hexadihydroxy-3′′-methoxyflavonone-[3.8′′]-flavone (7) (IC$_{50}$ 0.016 µg/ml), 1,4-dihydroxy-[6,7]-Chromanexanthone (IC$_{50}$ 0.023 µg/ml) and 1,4,thrihydroxy-7-prenylxanthone (IC$_{50}$ 0.031 µg/ml), the second group is a moderate activity are aristophenone B (3), GB-1a (4), morelloflavone (5), 1,6-dihydroxy-5,7-dimethoxy-[3,4]-chromanexanthone (11) and 1,6-dihydroxy-5-metoxy-[7,8]-furan-[3,4]-chromonexanthone (12), and the thirts groups aren’t bioactivity test, as compounds 13-16.

From two years studied has been reported on 13 articles, they were presented at national conferences and contributed too on discussion and letterature, especially on the natural product chemistry. This research have been too nine thesis for master degree program and three thesis for graduate degree program.

Discovering another active compounds, the most potent antimalarial drugs, has led to the further study of plants as antimalarial agent. The pharmacological approach for the search of new antimalarial agent from plant sources of genus *Garcinia*, has led to positive contribution to Indonesian healthy against malaria.