ISSN NO. 1410-8313

THE 2nd INTERNATIONAL CONFERENCE ON CHEMICAL SCIENCES (2nd ICCS-2010)

Yogyakarta, 14-16 October, 2010

PROCEEDING

Chemistry Goes Green

The 2nd ICCS 2010
Chemistry Goes Green

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MESSAGE
FROM THE CHAIRPERSON OF CHEMISTRY DEPARTMENT FACULTY OF MATHEMATICS AND NATURAL SCIENCES UNIVERSITAS GADJAH MADA

Assalamualaikum Wr. Wb.

Dear guests,

Welcome to the 2nd ICCS 2010, Yogyakarta, the second International conference organized by Chemistry Department, Universitas Gadjah Mada.

The 2nd ICCS-2010, which is held form October 14-16th, 2010 in Yogyakarta-Indonesia, conducted following the success of 1st ICCS 2007 is a truly good opportunity for academicians, researchers and industrial practices to present their frontier works leading to innovation in chemical sciences for a better life. Wishing you for a great success in this conference, it is our sincere hope that in this scientific occasion you will actively take part in the discussion and be exposed to advance science and technology, which is expected to comply to the world sustainable-green chemistry paradigm.

On behalf of the Chemistry Department we would like to give our warmest welcome again to you all here in Yogyakarta.

Wassalamu'alaikum Wr.Wb.

Chairperson of Chemistry Dept.,

Prof. Drs. Mudasir, M.Eng, Ph.D.

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MESSAGE FROM THE DEAN FACULTY OF MATHEMATICS AND NATURAL SCIENCES UNIVERSITAS GADJAH MADA

Assalamualaikum Wr.Wb

Dear Distinguished Guests and Conference Participants,

Welcome to the second International Conference on Chemical Sciences (ICCS) 2010, Yogyakarta-Indonesia. On Behalf of the Faculty of Mathematics and Natural Sciences, Universitas Gadjah Mada, Yogyakarta-Indonesia, I am very pleased to welcome you all the participants to this high scientific gathering. It is a great honour that our faculty is, once again, hosting an international conference on Chemical Sciences. I am deeply thankful for your tremendous effort to be able to take part in this scientific meeting. I would also like to express my gratitude to the organizing committee in making the conference successful. Congratulation!

As you know very well, Chemical Sciences have been evolving together with other fields of Sciences to become front runner and keep contributing enormously to the progress of Sciences and Technology. Many novel innovations in chemical sciences are developed and perfected in order to catch up with the late issues and to formulate the future directions in chemical knowledge, research and education, as well as to help industrial users and community apply various advancements in chemical sciences. The main theme: "Chemistry Goes Green" which has been selected by the organizing committee, in my opinion, is very appropriate with the big role of Chemical Sciences nowadays in many sectors such as ICT, smart material, environmental protection, life sciences and many others.

We believe that this conference will succeed in bringing together researches, academicians and industrial practices to have scientific exchange of information and networking.

Finally, we wish you a great conference and this ICCS-2010, be highly beneficial to the teaching and research in Chemistry Sciences as well as to welfare of the community.

Wassalamualaikum Wr. Wb.

Dean,

Dr. Chairil Anwar

The 2nd ICCS 2010
Chemistry Goes Green

MESSAGE
FROM THE RECTOR UNIVERSITAS GADJAH MADA

Bismillahirrahmaanirraahiim.

Assalamualaikum Wr. Wb.

Dear Distinguished Guests and all the Conference Participants,

I am honoured to be able to welcome all participants to the International Conference of Chemical Sciences (The 2nd ICCS 2010) to Universitas Gadjah Mada (UGM) here in Yogyakarta. I am please to see many of you have come to this event, not only from Indonesia but also neighbouring countries such as Malaysia and Philippines.

Allow me to describe a little bit about our university. As the bigest and oldest state-run university, Universitas Gadjah Mada is committed to excelent research and theaching as well as community service. UGM has been recognized in the world for quality in social and cultural sciences. UGM's committed encompasses many dicipkines, including chemistry.

In today's world, chemistry is an area of study that is very important for human beings as human beings make use much of chemical products in their daily life. Demands are increasing for the application of science of chemistry and they bring with them greater challenges as well. The contributions made by experts who are gathering here are, therefore, required to be able to meet those demands and challenges.

With many scientists, academicians and industrial players from around the globe participating in the conference. I am confident great things will be achieved as you will collectively turn your throughts to the comprehensive issues facing chemistryin today's world to improve the better quality of our live. I hope you can also meet the target of achieving green sustaineble chemistry.

Finally, I wish you enjoy this converence and have a pleasant stay in Yogyakarta. In addition, you are very welcomed to have a closer look at our campus by visiting each faculty and unit in person. Thank you.

Wassalamu'alaikum Wr.Wb.

Rector,

The 2nd ICCS 2010
Chemistry Goes Green

Prof. Ir. Sudjarwadi, M.Eng., Ph.D.

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IN VIVO ANTIMALARIAL ACTIVITY IN WHITE MICE OF THE ETHANOL ISOLATES *GARCINIA DULCIS ROOT*

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ABSTRACT

The purpose of this study was to examine the antimalarial activity *in vivo* in white mice of the ethanol isolates root *Garcinia dulcis*. The results of research using modification methods Peter tests showed that ethanol isolates of the root Garcinia dulcis can inhibit parasite growth by 90%.

Keywords: *antimalarial activity, ethanol isolate, The root of Garcinia dulcis*

INTRODUCTION

Malaria remains a global health problem, both in developed and developing country, which threaten the world population. It is indicated by the increase of current incident in whole endemic areas. World health organization (2003) reported that 41% of world population or approximately 2.3 billion people who live in endemic area were threatened by this disease. In addition, 300-500 million people were infected and 1.5-2.7 million people, particularly children under five and pregnant women in Africa, were died annually.

The malaria status in Indonesia is not quite different to that of global status. In Java and Bali, the level of Annual Parasite Incidence (API) decreased in 1995 from 0.19 per mil (in 1993) to 0.06 per mil). However, in various areas in Java, there still happened unexpected incidence such as in Jepara (in 1996-1997), Purworejo and Kulon Progo (in 2000).

Malaria is caused by infection of blood red cells with protozoan parasites of the genus *Plasmodium*. The parasites are inoculated into human host by a feeding female *Anopheles* mosquito. Four species that commonly infect humans are *P. falciparum, P. vivax, P. ovale,* and *P. malariae. Plasmodium falciparum* is responsible for most malaria deaths.

The current efforts of eliminating malaria are:

1. Malaria parasite, i.e. by providing medication to patient which suffer from malaria.
2. Malaria mosquito, by conducting fogging in the house using insecticide.

There are many problems in efforts of to solve this problem. For instance, some strains of *Anopheles* mosquito developed resistance to insecticide and Plasmodium parasite become resistant to antimalaria drug, such as chloroquine. In addition, the malaria case happened rapidly and widely in the world endemic area. Therefore, those forced the researchers to find the new antimalaria drug against the resistant parasites.

The patent or synthetic medicines are not secure at all and may emerge threats in the case of overdose. The consideration of health domain currently started to be directed to the use of traditional medicine, which gained from the herbs. The use of traditional medicine in Indonesia has been exist since the time of our ancestor and inherited from generation by generation. However, some herbs have not been tested clinically and pharmacologically.

The purpose of this study was to examine the antimalarial activity *in vivo* in white mice of the ethanol isolates *Garcinia dulcis*. root

EXPERIMENTAL SECTION

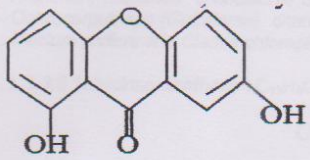
Procedure

Modification of the Peter test ("4 days suppressive test"), treatments performed on 3 test groups (with a dose of 100.10 and 1 mg / kg mice) and 1 negative control group, each group consisted of 3 mice. The test materials were administered orally in the form of suspense with CMC-Na 0.5%. Treatment

carried out for 4 days (D0-D3). On the first day treatments (D0) and one day after the treatments end (D4) of blood taken from the tail and made a thin blood smear stained with Giemsa to calculate the level of parasitemia. Then the data is calculated as% inhibition of parasite growth in the treatments compared to negative control group (no drug).

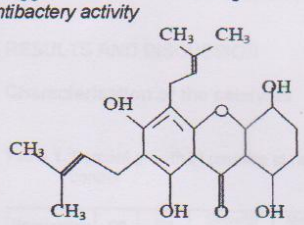
Some compounds derived xanthone

a. Euxanthone = 1,7-dihydroxy xanthone

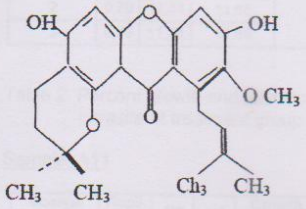


Found in Calophyllum, Bonnettia, Garcinia, and Haploclatera Spp, in Mammea americana and in the heartwood and Platonia insignis (all Guttiferae), has a function as an anti-inflammatory activity

b. *Gartanin = 1,3,5,8-tertra hydroxy - 2,4diprenylxanton* in *Garcinia manggostana* as *antifungal* and *antibactery activity*

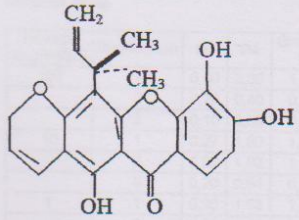


c.l. *Isomangostin* : $C_{24}H_{26}O_6$

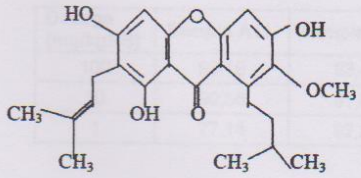


in *Garcinia mangostana*, as anti bacterial and *anti fungal.*

d. *acluna xanthone* : $C_{23}H_{22}O_6$

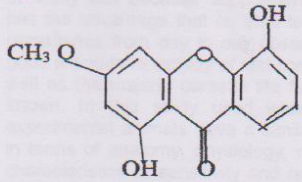


In *Garcinia ovalifolia* and in *Rhudia brasiliensis* (*Guttiferae*) and *Maclura ponifera.*



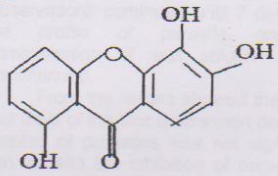
in *Garcinia mangostana (Guttiferae)* as *anti inflammatory* and *anti microbial activities*

f. Mesua xanthone A : 1,5-Dihydroxy-3-methokxy xanthone



Mesuaferrea, Keilmeyera specrosa, Garcinia xanthochymus, Haplo clathra and Vismia Spp has *anti inflammatory activity.*

g.Mesua xanthone B : 1,5,6 trihydroxy xanthone



in *Mesuaferrea, Mammea africana, Galopgyllum mophyllum, C. fragraus, Garcinia* and *Symphonia Spp (Guttiferae)* as *anti inflammatory activity*

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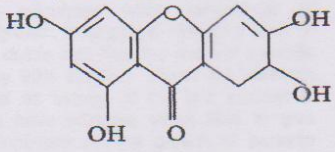
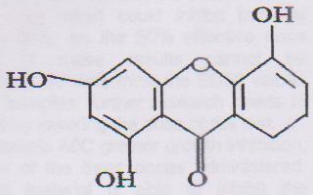
h. Norathyrial ; $C_{13}H_8O_6$



In *Gratoxylum prumiflorum, Garcinia mangostana, Hyperricum androsaemun* dan *H.ancheri, Mammea allanblachia Symphonia, Ochrocarpus spp (Gutteferae)* ditemukan juga *Maclura pnifera* and *Clarisa chlorophora spp*

i. 1,3,5 Trihydroxy xanthone : $C_{13}H_8O_5$



In *allanblachia floribunda (Guttiferae)* as *Tuberculostatic activity*

RESULTS AND DISCUSSION

Characterisation of the catalysts

Table 1. Percent growth of parasite at negative control

Replication	D0	D4	Growth %	Mean growth %
1	0,80	12,11	11,32	11,27
2	0,79	12,44	11,65	
3	0,49	11,34	10,85	

Table 2. Percent growth and inhibition of parasite at treatment group

Sample A11

Dosage (mg/ kgBB)	Repli-cation	D0	D4	Growth %	Inhibit %
100	1	0,17	0,93	0,76	93,26
	2	0,10	1,36	1,26	88,82
	3	0,29	0,57	0,28	97,51
10	1	0,20	1,34	1,14	89,88
	2	0,92	2,09	1,17	89,62
	3	0,91	1,79	0,88	92,19
1	1	0,40	3,23	2,83	74,89
	2	0,20	1,40	1,20	89,35
	3	0,30	4,0	3,70	67,17

Sample A6C

Dosage (mg/kgBB)	Replication	D0	D4	Growth %	Inhibit %
100	1	0,80	2,30	1,50	86,69
	2	0,20	0,40	0,20	98,22
	3	0,10	0,60	0,50	95,56
10	1	0,27	1,60	1,33	88,20
	2	0,92	1,92	1,00	91,13
	3	0,20	0,64	0,44	96,10
1	1	0,30	1,53	1,23	89,09
	2	0,29	0,84	0,55	96,12
	3	0,39	1,26	0,96	91,48

% Mean growth

Dosage (mg/kgBB)	Sample A11	Sample A6C
100	93,19	93,49
10	90,56	91,81
1	77,14	92,23

Test of antimalarial activity *in vivo* growth of *Plasmodium berghei* infected mice in the body white. This test is performed *in vivo* in the hope that proceeds will be able to better describe the actual condition of the parasite in the host body. In this study using the method of *4-day test* because suppressive *Peter'test* has the advantage that is, able to monitor % parasitemia from day to day observations, so good antimalarial activity of test compounds as well as the malaria parasite life force can be known. In this study used white mice as experimental animals have a similar structure in terms of anatomy, physiology, metabolism, characteristics of sensitivity and resistance to the drug compound in humans.

In this research the implementation of anti-malarial activity assay using isolated of the ethanol extract of *Garcinia dulcis* root made in the form of suspension in certain doses equivalent to the price ED_{50} BB. Observations continued until 7 days to obtain the profile of parasite growth after administration of test solution suspension discontinued.

From the results showed that during the four days of the test suspension decreased the number of parasites was not significant. But can we see the inhibition of parasite growth. On day five where granting the suspension has been terminated, it can be seen a significant increase in parasite growth. This could indicate that isolates the ethanol extract of *Garcinia dulcis* root cannot be deadly malaria parasite but can be inhibited parasite growth. This could be the basis of therapy in malaria by using isolated of *Garcinia dulcis*

root. From the calculation of percent growth inhibition calculated what percentage of parasite growth, isolates the ethanol extract of *Garcinia dulcis root* has the percent parasite growth by 90% (table)... Based on research performed an extract of the test solution is stated to have effective when able to give percent inhibition on the growth of parasite more than 30% (Carvalho, 1991). By looking at the results of this research need a further study on pharmacokinetic studies in experimental animals.

CONCLUSION

1. Both samples showed a strong barrier activity (very active), until the smallest dose (1 mg / kg mice) could inhibit parasite growth> 50%, so the 50% effective dose (ED50) of these results cannot be determined. To determine the ED50 values of both samples, further research needs to be done by lowering the dose of the test.
2. In the sample A6C greater growth inhibition, because of the three doses administered, the test material is able to inhibit the parasite by 90%. There was no significant difference in activity at doses that are used to sample A6C, although the dose of the test material was derived tenth time.

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