

**UNIVERSITI SAINS MALAYSIA
GERAN PENYELIDIKAN UNIVERSITI
PENYELIDIKAN
LAPORAN AKHIR**

**ANTIMICROBIAL EFFECT OF COMMONLY USED HERBS
IN MALAYSIA**

PENYELIDIK

DR. SARLIZA YASMIN SANUSI

PENYELIDIK BERSAMA

DR. SITI ASMA' HASSAN

2013



ORANG PENAMBAHBAIKAN DAN PEMBETULAN GERAN PENYELIDIKAN JANGKA PENDEK
IMPROVEMENT AND AMENDMENT FORM FOR SHORT TERM RESEARCH GRANT



Permohonan baru
New Application

Laporan Kemajuan
Progress Report



Nama Ketua Projek
Name of Project Leader

Dr. Sarliza Yasmin Sanusi

Tajuk Projek Penyelidikan

Antimicrobial Effect of Commonly used Herbs in Malaysia

Title of Research Project

i. RINGKASAN PENAMBAHBAIKAN DAN PEMBETULAN
Improvement and Amendment Summary

NO.	REVISIONS	REMARKS
1	Financial Statement & Journal Publication	Ditampirkan penyata perbelanjaan terakhir (Baki projek RM 10,373.80)

II. AKUAN PEMOHON
Applicant Declaration

Saya dengan ini mengaku telah membuat penambahbaikan dan pembetulan sepertimana yang dicadangkan oleh panel penilai seperti di atas.

I declare to have made improvements and corrections proposed by the panel as above.

Saya akui bahawa jika terdapat penambahbaikan dan pembetulan ini tidak menepati dan memenuhi sepertimana yang dikomen oleh panel penilai, pihak Universiti berhak untuk tidak meluluskan/ meneruskan geran ini.

I understand if there is any improvement and correction which does not meet or satisfy as commented by panel, the University reserves the right to disapprove / discontinue the grant.

Saya juga bertanggungjawab mendapatkan kelulusan etika manusia atau haiwan sekiranya berkaitan.

I am also responsible for obtaining human or animal ethics approval if applicable.

Sarliza
Tandatangan Penyelidik
Signature of Researcher

20/8/13
Tarikh
Date

III. KELULUSAN OLEH PENGARAH RCMO
Approval by Director of RCMO

Lulus
Approved

Tidak Lulus
Not Approved

Catatan Pengarah RCMO
RCMO Director Comments:

Tandatangan & Cop Pengarah RCMO:
Signature & Stamp Director of RCMO

Tarikh
Date

UNIVERSITI SAINS MALAYSIA
JABATAN BENDAHARI
KUMPULAN WANG PENYELIDIKAN GERAN USM(304)
PENYATA PERBELANJAAN SEHINGGA 30 NOV 2012

Jumlah Geran:	RM	30,373.00	Ketua Projek:	Rabia Sultana Siddiqui, Prof/Dr. Sarfiza Yasmin Samusi
Peruntukan 2009 (Tahun 1)	RM	19,478.00	Tajuk Projek:	Antimicrobial Effect of Commonly used Herbs in Malaysia
Peruntukan 2010 (Tahun 2)	RM	0.00		
			Tempoh:	15 Mei 2009- 14 Mei 2012
			No. Akaun:	304/PPSC/6139044

Kwg	Akaun	PTJ	Projek	Donor	Peruntukan Projek	Perbelanjaan Tikumpul Hingga Tahun Lalu	Peruntukan Semasa	Tanggungjawab Semasa	Bayaran Tahun Semasa	Belanja Tahun Semasa	Baki Projek
304	11000	PPSG	6139044		7,500.00	-	7,500.00	-	-	-	7,500.00
304	14000	PPSG	6139044		500.00	-	500.00	-	-	-	500.00
304	15000	PPSG	6139044		-	-	-	-	-	-	-
304	21000	PPSC	6139044		-	1,102.00	(1,102.00)	-	926.40	926.40	(2,028.40)
304	22000	PPSC	6139044		-	-	-	-	-	-	-
304	23000	PPSG	6139044		150.00	-	150.00	-	-	-	150.00
304	24000	PPSG	6139044		-	-	-	-	-	-	-
304	25000	PPSG	6139044		-	75.90	(75.90)	-	-	-	(75.90)
304	26000	PPSG	6139044		-	-	-	-	-	-	-
304	27000	PPSC	6139044		11,328.00	2,326.20	9,001.80	1,661.00	-	1,661.00	7,340.80
304	28000	PPSC	6139044		-	-	-	-	-	-	-
304	29000	PPSG	6139044		-	1,662.70	(1,662.70)	-	1,350.00	1,150.00	(3,012.70)
304	32000	PPSG	6139044		-	-	-	-	-	-	-
304	35000	PPSG	6139044		-	-	-	-	-	-	-
304	A11559	PPSC	6139044		-	-	-	-	-	-	-
304	A11102	PPSC	6139044		-	-	-	-	-	-	-
					19,478.00	5,166.80	14,311.20	1,661.00	2,276.40	3,937.40	10,373.80



Ruj. Kami : PPSG/015/034

Tarikh : 17 Julai 2013

Pejabat Pengurusan & Kreativiti Penyelidikan (RCMO)
Bahagian Penyelidikan & Inovasi
Universiti Sains Malaysia
11800 Pulau Pinang.
u/p : Pn. Anis Idayu Mohd. Tahir



Tuan/Puan,

**LAPORAN AKHIR GERAN JANGKA PENDEK
DR. SARLIZA YASMIN BINTI SANUSI GERAN NO - 304/PPSG/6139044**

Dengan hormatnya perkara di atas adalah dirujuk .

2. Bersama ini disertakan 2 salinan laporan geran jangka pendek Dr. Sarliza Yasmin binti Sanusi daripada Pusat Pengajian Sains Pergigian, Kampus Kesihatan untuk tindakan tuan/puan selanjutnya.
3. Kerjasama tuan/puan dalam hal ini amat dihargai dan diucapkan ribuan terima kasih.

"BERKHIDMAT UNTUK NEGARA"

"Memastikan Kelestarian Hari Esok"

he

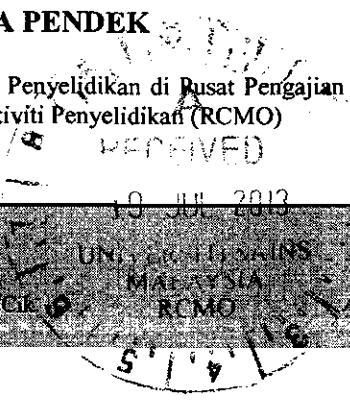
(MAT LUDIN BIN CHE MAT)

Ketua Pegawai Sains
Pusat Pengajian Sains Pergigian
Kampus Kesihatan



LAPORAN AKHIR PROJEK PENYELIDIKAN JANGKA PENDEK
FINAL REPORT OF SHORT TERM RESEARCH PROJECT

Sila kemukakan dua (2) salinan laporan akhir ini melalui Jawatankuasa Penyelidikan di Pusat Pengajian dan Dekan/ Pengarah/ Ketua Jabatan kepada Pejabat Pengurusan dan Kreativiti Penyelidikan (RCMO)



1. Nama Ketua Penyelidik: SARLIZA JASMIN SANUSI
Name of Research Leader

Profesor Madya/Asoc. Prof. *Dr.* Encik/Puan/Cik/Mp/Mrs/Ms

2. Pusat Tanggungjawab (PTJ):
School/Department

PUSAT PENGAJIAN SAINS PERGIGIAN

3. Nama Penyelidik Bersama:
Name of Co-Researcher

DR. SITI ASMA HASSAN

4. Tajuk Projek:
Title of Project

ANTIMICROBIAL EFFECT OF COMMONLY USED HERBS IN MALAYSIA.

5. Ringkasan Penilaian/Summary of Assessment	Tidak Memukap/Inadequate		Boleh Diterima/Acceptable	Sangat Baik/Very Good	
	1	2		3	4
i) Pencapaian objektif projek: <i>Achievement of project objectives</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Kualiti output: <i>Quality of outputs</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Kualiti impak: <i>Quality of impacts</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Pemindahan teknologi/potensi pengkomersialan: <i>Technology transfer/commercialization potential</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v) Kualiti dan usahasama : <i>Quality and intensity of collaboration</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi) Penilaian kepentingan secara keseluruhan: <i>Overall assessment of benefits</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Abstrak Penyelidikan

(Perlu disediakan di antara 100 - 200 perkataan di dalam Bahasa Malaysia dan juga Bahasa Inggeris. Abstrak ini akan dimuatkan dalam Laporan Tahunan Bahagian Penyelidikan & Inovasi sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti & masyarakat luar).

Abstract of Research

(An abstract of between 100 and 200 words must be prepared in Bahasa Malaysia and in English). This abstract will be included in the Annual Report of the Research and Innovation Section at a later date as a means of presenting the project findings of the researcher/s to the University and the community at large)

SILA LIHAT LAMPIRAN

7. Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.

[Sila gunakan kertas berasingan]

Applicant are required to prepare a Comprehensive Technical Report explaining the project. (This report must be appended separately)

Senaraikan kata kunci yang mencerminkan penyelidikan anda:

List the key words that reflects your research:

Bahasa Malaysia

Bahasa Inggeris

Curcuma xanthorrhiza Roxb

Curcuma xanthorrhiza Roxb

anti - mikrobial

antimicrobial

bakteria oral

oral bacteria

8. Output dan Faedah Projek

Output and Benefits of Project

(a) Penerbitan Jurnal

Publication of Journals

(Sila nyatakan jenis, tajuk, pengarang/editor, tahun terbitan dan di mana telah diterbitkan/diserahkan)

(State type, title, author/editor, publication year and where it has been published/submitted)

TIADA

(b) **Faedah-faedah lain seperti perkembangan produk, pengkomersialan produk/pendaftaran paten atau impak kepada dasar dan masyarakat.**
State other benefits such as product development, product commercialisation/patent registration or impact on source and society.

TIADA

* Sila berikan salinan/Kindly provide copies

(c) **Latihan Sumber Manusia**
Training in Human Resources

i) **Pelajar Sarjana**
Graduates Students
(Perincikan nama, ijazah dan status)
(Provide names, degrees and status)

Tiada

ii) **Lain-lain**
Others

PELAKSI KERTIFIKAT TAJARAN 5 KURSUS
DOKUMEN PROGRAM - Student presented at
ATA NATUREL PRODUCT STUDENTS SCIENTIFIC CONFERENCE
2012 (1st runner up); 9th students Scientific Conference
(1st place). main supervisor presented
in Kuching + international conference on
Natural Product

9. **Peralatan yang Telah Dibeli:**

- Equipment that has been purchased
1. S. MUTANS ATCC
 2. S. SANGUIS ATCC
 3. S. ORALIS ATCC
 4. S. AUREUS ATCC
 5. MYELLER HINTON + HORSE BLOOD PLATES
 6. MYELLER HINTON AGAR PLATES
 7. ETHANOL

Barliqa

Tandatangan Penyelidik
Signature of Researcher

09-07-13

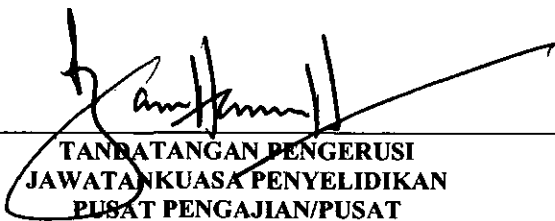
Tarikh
Date

Komen Jawatankuasa Penyelidikan Pusat Pengajian/Pusat
Comments by the Research Committees of Schools/Centres

Satisfactory output: as grant was
utilised for Mundergraduate Final
year studies (yr5) and had
presented to conferences mentioned

Output Geran yg lemah.
Tutup Geran.

Dipin
7/2/13


TANDATANGAN PENERUSI
JAWATANKUASA PENYELIDIKAN
PUSAT PENGAJIAN/PUSAT

Signature of Chairman
[Research Committee of School/Centre]
ASSOC. PROF. DR. ZAINUL AHMAD RAJION
Deputy Dean (Research)
School Of Dental Sciences
USM Health Campus

16150 Kubang Kerian, Kelantan,

16/7/2013
Tarikh
Date

6. Abstrak Penyelidikan

(Perlu disediakan di antara 100 - 200 perkataan di dalam Bahasa Malaysia dan juga Bahasa Inggeris. Abstrak ini akan dimuatkan dalam Laporan Tahunan Bahagian Penyelidikan & Inovasi sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti & masyarakat luar).

Bahasa Malaysia

Rhizome daripada *Curcuma xanthorrhiza* Roxb. (keluarga Zingiberaceae), juga dikenali sebagai temulawak, adalah sejenis herba yang digunakan dalam terapeutik selama beratus-ratus tahun. Walau bagaimanapun, kesannya terhadap bakteria oral kurang mendapat perhatian. Kajian ini bertujuan untuk menentukan kesan antimikrob dan kepekatan perencatan minima (minimal inhibitory concentration) daripada Rhizoma *Curcuma Xanthorrhizae* terhadap bakteria oral. Kesan antimikrob ditentukan dengan menggunakan kaedah "agar agar well diffusion" manakala kepekatan perencatan minima (minimal inhibitory concentration (MIC)) ditentukan dengan menggunakan pencairan broth (Trypticase Soy Broth). Sembilan jenis bakteria oral iaitu *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Streptococcus sobrinus*, *Staphylococcus aureus*, *Lactobacillus Salivarius*, *Enterococcus faecalis*, *Pseudomonas aeruginosa* dan *Eschericia coli* telah digunakan dalam kajian ini. Keputusan menunjukkan bahawa ekstrak air Rhizome *Curcuma Xanthorrhizae* tidak menunjukkan apa-apa kesan antibakteria terhadap bakteria oral. Ekstrak etanol temulawak menunjukkan kesan antibakteria terhadap *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Staphylococcus aureus* and *Enterococcus faecalis*. Nilai kepekatan perencatan minima adalah 1g/ml. Nilai kepekatan perencatan minima boleh digunakan sebagai data asas untuk membuat agen antimikrob seperti ubat atau ubat kumur. Kajian lanjutan perlu dijalankan untuk meneroka komponen aktif tumbuhan ini yang mempunyai kesan antibakteria.

Bahasa Inggeris

The rhizome of *Curcuma xanthorrhiza* Roxb. (Zingiberaceae family, commonly known as temulawak) is a type of herb that has been used in therapeutics for hundreds of years. However, little attention has been paid to its effects on oral bacteria. The aims of this study were to determine the antimicrobial effects and the minimal inhibitory concentration (MIC) of *Rhizoma Curcuma Xanthorrhizae* against oral bacteria. The former was determined using agar well diffusion method whereas the latter was determined using broth dilution (Trypticase Soy Broth) method. Nine types of oral bacteria namely *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Streptococcus sobrinus*, *Staphylococcus aureus*, *Lactobacillus Salivarius*, *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Eschericia coli* were used in this study. Results showed that water extract of Rhizome *Curcuma Xanthorrhizae* did not exhibit any antibacterial effects against oral bacteria. Temulawak ethanol extract demonstrated antibacterial effects against *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Staphylococcus aureus* and *Enterococcus faecalis*: The MIC value was 1g/ml. The MIC value could be utilised as baseline data for contrivance of potential antimicrobial agents such as drugs or mouthwash. Further research should be carried out to deduce the active components of this plant that are responsible for its antibacterial activities.

7. Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.

[Sila gunakan kertas berasingan]

*Applicant are required to prepare a Comprehensive Technical Report explaining the project.
(This report must be appended separately)*



UNIVERSITI
TEKNOLOGI
MARA



Certificate of Award

is presented to

DR SARLIZA YASMIN SANUSI

as

SUPERVISOR

1st RUNNER-UP OF POSTER PRESENTATION

*4th National Dental Students'
Scientific Conference 2012*

held at the
Dewan Agong Tuanku Canselor,
UiTM Shah Alam

on
15 -16 June 2012

Prof. Dr Mohamed Ibrahim Abu Hassan
Dean
Faculty of Dentistry
Universiti Teknologi MARA

Dr Nik Mohd Mazuan Nik Mohd Rosdy
Chairperson
4th National Dental Students'
Scientific Conference 2012



Certificate of Participation

PRESENTED TO

DR SARLIZA YASMIN BT SANUSI

FOR HAVING PARTICIPATED IN THE
POSTER PRESENTATION

**2012 COMMONWEALTH DENTAL ASSOCIATION /
MALAYSIAN DENTAL ASSOCIATION joint
INTERNATIONAL SCIENTIFIC CONVENTION & TRADE EXHIBITION
CUM 69TH MDA AGM**

**1 DENTISTRY – BRIDGING TECHNOLOGIES:
PAST, PRESENT & THE FUTURE**

**BORNEO CONVENTION CENTRE KUCHING
SARAWAK, MALAYSIA**

**FROM
24TH TO 28TH MAY**

DR MOHAMAD MUZAFAR HANIFFA
President
Malaysian Dental Association

DR JOHNTIN
Organizing Chair
2012 CDA/MDA
Scientific Group
cum



Certificate of **APPRECIATION**

This is to certify that

**Dr Sarliza Yasmin Sanusi
Dr Siti Asma' Hassan**

being the supervisor(s) of

Chang Hui Qi

has been awarded

First Place (Poster Presentation)

**9th STUDENT SCIENTIFIC
CONFERENCE**

Blooming Science for Excellence in Health

on

1st December 2011

Dr. Asilah Yusof
Chairperson
Elective Programme
School of Dental Sciences
Universiti Sains Malaysia

Dr. Adam Husein
Dean
School of Dental Sciences
Universiti Sains Malaysia



Malaysian
Natural
Products
Society



UPM
UNIVERSITI PUTRA MALAYSIA



Certificate of Appreciation

This is to certify that

SARLIZA YASMIN SANUSI

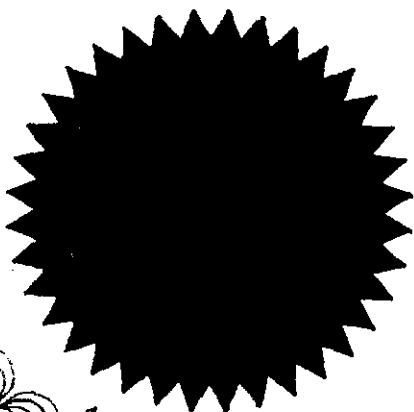
has participated in the

INTERNATIONAL CONFERENCE ON NATURAL PRODUCTS 2011
METABOLOMICS: A NEW FRONTIER IN NATURAL PRODUCTS SCIENCE

14-16 November 2011
Palm Garden Hotel, IOI Resort, Putrajaya, Malaysia

as

POSTER PRESENTER



Naved Hays

PROF. DR. MD NORDIN HJ. LAJIS

Chairman

International Conference on Natural Products 2011
(ICNP2011)

Universiti Putra Malaysia



**THE ANTIMICROBIAL EFFECTS OF
RHIZOMA CURCUMA XANTHORRIZAE
(TEMULAWAK) AGAINST ORAL BACTERIA
– AN *IN-VITRO* STUDY**

ABSTRACT

The Antimicrobial Effects of *Rhizoma Curcuma Xanthorrhizae* (Temulawak) against Oral Bacteria – an *in-vitro* study

Chang Hui Qi^a, Sarliza Yasmin Sanusi^a, Siti Asma' Hassan^b

^aSchool of Dental Sciences, ^bSchool of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia.

The rhizome of *Curcuma xanthorrhiza* Roxb. (Zingiberaceae family, commonly known as temulawak) is a type of herb that has been used in therapeutics for hundreds of years. However, little attention has been paid to its effects on oral bacteria. The aims of this study were to determine the antimicrobial effects and the minimal inhibitory concentration (MIC) of *Rhizoma Curcuma Xanthorrhizae* against oral bacteria. The former was determined using agar well diffusion method whereas the latter was determined using broth dilution (Trypticase Soy Broth) method. Nine types of oral bacteria namely *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Streptococcus sobrinus*, *Staphylococcus aureus*, *Lactobacillus Salivarius*, *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Eschericia coli* were used in this study. Results showed that water extract of Rhizome Curcuma Xanthorrhizae did not exhibit any antibacterial effects against oral bacteria. Temulawak ethanol extract demonstrated antibacterial effects against *Streptococcus mutans*, *Streptococcus sanguis*, *Streptococcus oralis*, *Staphylococcus aureus* and *Enterococcus faecalis*. The MIC value was 1g/ml. The MIC value could be utilised as baseline data for contrivance of potential antimicrobial agents

such as drugs or mouthwash. Further research should be carried out to deduce the active components of this plant that are responsible for its antibacterial activities.