



# LAPORAN AKHIR

## GERAN PENYELIDIKAN UNIVERSITI

### PENYELIDIKAN (RU)

**TAJUK PROJEK:**

**EFFECTS OF EURYCOMA LONGIFOLIA JACK  
SUPPLEMENTATION ON RECREATIONAL ATHLETES'  
RUNNING PERFORMANCE AND PHYSIOLOGICAL  
RESPONSES IN THE HEAT**

**NO AKAUN:**

**1001/PPSP/812028**

**TEMPOH:**

**01/03/2009-31/08/2011**

**NAMA KETUA PENYELIDIK:**

**DR OOI FOONG KIEW**

**NAMA PENYELIDIK BERSAMA:**

**PROFESOR MADYA MOHD ROSLI ABDULLAH**

**DR CHEN CHEE KEONG**





Tarikh: 27 Sept, 2011

Kepada:

Ketua Penolong Pendaftar,  
Pejabat Pengurusan & Kreativiti Penyelidikan,  
Bahagian Penyelidikan dan Inovasi,  
Universiti Sains Malaysia,  
11800 USM Pulau Pinang,  
Pulau Pinang.

**Kampus Kesihatan**  
Universiti Sains Malaysia,  
16150 Kubang Kerian  
Kelantan, Malaysia.  
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Ext: 6926  
Fax: 609 764 1945  
Website: www.medic.usm.my

Tuan,

**LAPORAN AKHIR GERAN PENYELIDIKAN UNIVERSITI PENYELIDIKAN (RU)**

**TAJUK PROJEK : EFFECTS OF EURYCOMA LONGIFILIA JACK SUPPLEMENTATION ON RECREATIONAL ATHLETES' RUNNING PERFORMANCE AND PHYSIOLOGICAL RESPONSES IN THE HEAT**

**NO. AKAUN : 1001/PPSP/812028**  
**TEMPOH : 01/03/2009 – 31/08/2011**

Dengan segala hormatnya, perkara di atas dirujuk.

2. Sepertimana yang telah dinyatakan di dalam surat tuan yang bertarikh 10 Februari 2011, di sini saya sertakan laporan akhir bagi geran saya yang telah tamat tempohnya pada 31 August 2011. Untuk makluman tuan, saya telah mendapatkan kelulusan dari pihak USM untuk melanjutkan tempoh penyelidikan hingga ke 31 August 2011. Surat kelulusan telah dilampirkan bersama dengan surat ini untuk rujukan tuan.


3. Sehubungan dengan ini, saya juga telah mengambil perhatian dan tindakan yang sewajarnya terhadap setiap perkara yang telah dinyatakan di dalam surat tuan yang terdahulu.

Sekian, untuk tindakan dan perhatian pihak tuan.

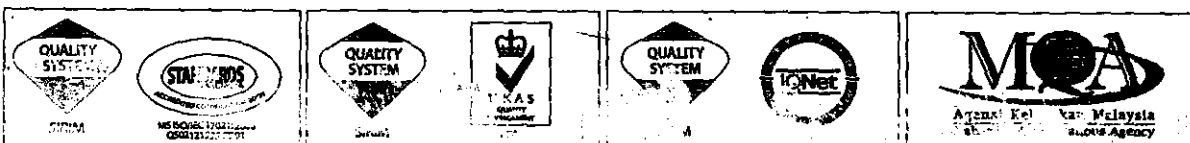
Terima kasih.

**"BERKHIDMAT UNTUK NEGARA"**

Saya yang menurut perintah,

  
.....

Dr Ooi Foong Kiew  
Pensyarah,  
Unit Sains Sukan, PPSP



Canselori,

Universiti Sains Malaysia  
Aras 6, Bangunan Canselori  
11800, USM Pulau Pinang  
T : (6)04-653 3108/3178/3988/5019  
F : (6)04-656 6466/8470  
: (6)04-653 2350  
L : www.research.usm.my

Ruj Kami : 2009/117 (U0422)  
Tarikh : 20 April 2011

Dr. Ooi Foong Kiew  
Pusat Pengajian Sains Perubatan  
USM Kampus Kesihatan  
16150 Kubang Kerian  
PULAU PINANG

Tuan,

**PERMOHONAN UNTUK MELANJUTKAN TEMPOH GERAN PENYELIDIKAN UNIVERSITI PENYELIDIKAN (RU)  
TAJUK : "EFFECTS OF EURYCOMA LONGIFOLIA JACK SUPPLEMENTATION ON RECREATIONAL ATHLETES'  
RUNNING PERFORMANCE AND PHYSIOLOGICAL RESPONSES IN THE HEAT"  
NO. AKAUN : 1001 / PPSP / 812028**

Dengan hormatnya perkara di atas dirujuk. Borang HEPG tuan yang telah diterima Bahagian ini pada 15 April 2011 adalah berkaitan.

2. Sukacita dimaklumkan bahawa Universiti telah meluluskan pelanjutan tempoh geran penyelidikan tuan selama 6 bulan mulai 1 Mac 2011 hingga 31 Ogos 2011.
3. Bersama-sama ini disertakan kelulusan TNC (Penyelidikan & Inovasi) untuk rujukan dan tindakan lanjut tuan.

Sekian, terima kasih.

**"BERKHIDMAT UNTUK NEGARA"**  
**'Memastikan Kelestarian Hari Esok'**

Yang menjalankan tugas

  
(HAZLAN ABDUL HAMID)  
Ketua Penolong Pendaftar  
Pejabat Pengurusan & Kreativiti Penyelidikan  
Bahagian Penyelidikan & Inovasi

s.k. Dekan Penyelidikan  
Pelantar Sains Klinikal  
Pejabat Pelantar Penyelidikan  
USM Kampus Kesihatan

Dekan  
Pusat Pengajian Sains Perubatan  
USM Kampus Kesihatan

Timbalan Bendahari  
Jabatan Bendahari  
USM Kampus Kesihatan

Pegawai Sains  
Pelantar Kejuruteraan & Teknologi  
Pejabat Pelantar Penyelidikan  
USM Kampus Kesihatan

<b>A.</b>	<b>PARTICULARS OF RESEARCH / MAKLUMAT PENYELIDIKAN:</b>
(i)	<b>Title of Research:</b> <i>Tajuk Penyelidikan:</i> <b>Effects of Eurycoma Longifolia Jack Supplementation On Recreational Athletes' Running Performance and Physiological Responses In The Heat</b>
(ii)	<b>Account Number:1001/PPSP/812028</b> <i>Nombor Akaun:</i>
<b>B.</b>	<b>PERSONAL PARTICULARS OF RESEARCHER / MAKLUMAT PENYELIDIK:</b>
(i)	<b>Name of Research Leader:</b> <i>Nama Ketua Penyelidik:</i> <b>Dr Ooi Foong Kiew</b>
	<b>Name of Co-Researcher</b> <i>Nama Penyelidik Bersama:</i> <b>Assoc. Prof. Mohd Rosli Abdullah</b> <b>Dr Chen Chee Keong</b>
(ii)	<b>School/Institute/Centre/Unit :Sports Science Unit, School of Medical Sciences</b> <i>Pusat Pengajian /Institut/Pusat/Unit :</i>
<b>C.</b>	<b>Research Platform (Please tick (/) the appropriate box):</b> <i>Pelantar Penyelidikan (Sila tanda (/) kotak berkenaan):</i>
	<input type="checkbox"/> <b>A. Life Sciences</b> <i>Sains Hayat</i>
	<input type="checkbox"/> <b>B. Fundamental</b> <i>Fundamental</i>
	<input type="checkbox"/> <b>C. Engineering &amp; Technology</b> <i>Kejuruteraan &amp; Teknologi</i>
	<input type="checkbox"/> <b>D. Social Transformation</b> <i>Transformasi Sosial</i>
	<input type="checkbox"/> <b>E. Information &amp; Communications Technology (ICT)</b> <i>Teknologi Maklumat &amp; Komunikasi</i>
	<input checked="" type="checkbox"/> <b>F. Clinical Sciences</b> <i>Sains Klinikal</i>
	<input type="checkbox"/> <b>G. Biomedical &amp; Health Sciences</b> <i>Bioperubatan Sains Kesihatan</i>

**D.** **Duration of this research :**  
*Tempoh masa penyelidikan ini :*

**\*Duration : 2 years**  
*Tempoh :*

**From : 1 March 2009**  
*Dari:*

**To : 31 August 2011**  
*Ke :*

H. a) Results/Benefits of this research  
 Hasil Penyelidikan

No. Bil:	Category/Number: Kategori/ Bilangan:	Promised	Achieved
1.	<b>Research Publications</b> (Specify target journals) <i>Penerbitan Penyelidikan</i> (Nyatakan sasaran jurnal)		<p><b><u>Journal Paper Publication</u></b></p> <p>1. Ayu, S.M., Chen, C.K., Ooi, F.K., Mohamed, R.A. &amp; Chan, K.L. (2010). Effects of Eurycoma longifolia Jack supplementation on recreational athletes' endurance running capacity and physiological responses in the heat. <i>International Journal of Applied Sports Sciences</i>. 2010 Volume 22, No 2, pg 1-19</p> <p>2. Ayu Suzailiana Muhamad, Chen Chee Keong, Ooi Foong Kiew and Mohd Rusli Abdullah (2009) Eurycoma longifolia Jack: Medicinal properties and its effects on endurance exercise performance . <i>Asian Journal of Exercise and Sports Science</i>. 2009 Vol. 6 (No.1) pg 39-43</p> <p><b><u>Conference Proceeding</u></b></p> <p>1. Ayu, S.M., Chen, C.K., Ooi, F.K. &amp; Mohamed, R.A. (2010). Effects of Eurycoma longifolia Jack on endurance running performance and exercise metabolism in the heat in recreational athletes. <i>Proceedings of 4<sup>th</sup> Asia Pacific Conference on Exercise and Sports Science &amp; 8<sup>th</sup> International Sports Science Conference</i>. Kota Bharu, Kelantan: Sports Science Unit, School of Medical Sciences, Universiti Sains Malaysia, pg 123-132</p> <p><b><u>Oral Presentation</u></b></p> <p>1. Chen Chee Keong, Ayu Suzailiana Muhamad, Ooi Foong Kiew, Mohd Rusli Abdullah (2010). Effects of Eurycoma longifolia Jack supplementation on endurance running performance and selected physiological parameters in the heat. 6th Annual International Conference on Kinesiology and Exercise Sciences, Athens, Greece on 28-30 June 2010 &amp; 1 July 2010.</p> <p>2. Ayu Suzailiana Muhamad, Chen Chee Keong, Ooi Foong Kiew, Mohd Rusli Abdullah (2009). Effects of Eurycoma Longifolia Jack Supplementation on recreational athletes' endurance running performance and physiological responses in the heat. Abstract book of Joint Conference: 4th Asia Pacific Conference on Exercise and Sports Science &amp; 8th International Sports Science Conference. Universiti Sains Malaysia, Kota Bharu, Malaysia (July 15 – July 17, 2009).</p>

			<p>3. Ayu Suzailiana Muhamad, Chen Chee Keong, Ooi Foong Kiew, Mohd Rusli Abdullah (2009). Effects of Eurycoma Longifolia Jack Supplementation on endurance running performance in the heat in recreational athletes. Abstract Book of 14th National Conference on Medical and Health Sciences (NCMHS), Universiti Sains Malaysia, Kota Bharu,, Malaysia (May 21 – May 22, 2009)</p> <p>4. Ayu Suzailiana Muhamad, Chen Chee Keong, Ooi Foong Kiew, Mohd Rusli Abdullah (2009). Effects of consuming Eurycoma Longifolia Jack on endurance running performance and exercise metabolism in the heat in recreational athletes. Abstract Book of 23rd Scientific Meeting of the Malaysian Society of Pharmacology and Physiology, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia (May 12 - May13, 2009)</p>
2.	<b>Human Capital Development</b>		
	a. Ph. D Students		
	b. Masters Students	1	1
	c. Undergraduates (Final Year Project)		
	d. Research Officers	1	1
	e. Research Assisstants		
	f. Other: Please specify		
3.	<b>Patents</b> <i>Paten</i>		
4.	<b>Specific / Potential Applications</b> <i>Spesifik/Potensi aplikasin</i>		
5.	<b>Networking &amp; Linkages</b> <i>Jaringan &amp; Jalinan</i>		
6.	<b>Possible External Research Grants to be Acquired</b> <i>Jangkaan Geran Penyelidikan Luar Diperoleh</i>		

- Kindly provide copies/evidence for Category 1 to 6.

**b) Equipment used for this research.**

*Peralatan yang telah digunakan dalam penyelidikan ini.*

<b>Items Perkara</b>	<b>Approved Equipment</b>	<b>Approved Requested Equipment</b>	<b>Location</b>
<b>Specialized Equipment Peralatan khusus</b>	<ul style="list-style-type: none"><li>• Motorized treadmill (Quinton 18-60, USA)</li><li>• Height and weight machine (Sega @ body meter 208)</li><li>• Heart rate monitor (Casio HS-30, Japan)</li><li>• Gas analyser (V-Max, Spectra, USA)</li><li>• 1500 YSI sport lactate analyzer.</li><li>• Temperature monitor (Libra medical ET 300R)</li><li>• Rectal and skin temperature probes</li><li>• Tanita BioImpedance body composition analyzer</li><li>• Whirling Hygrometer (Brannan, England)</li></ul>	Motorized treadmill (Quinton 18-60, USA)	Sports Science Unit, PPSP
<b>Facility Kemudahan</b>	<ul style="list-style-type: none"><li>• Centrifuge (Rotting 46 RS, Hetteich, Zentrifugen)</li><li>• Spectrophotometer (Spekol 1200, German)</li></ul>		Sports Science Unit, PPSP
<b>Infrastructure Infrastruktur</b>	Sports Science laboratory		Sports Science Unit, PPSP

- Please attach appendix if necessary.



I. BUDGET / BAJET

Total Approved Budget : RM 99, 834.00  
Total Additional Budget : RM 0  
Grand Total of Approved Budget : RM 99, 834.00

Yearly Budget Distributed

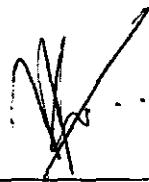
Year 1 : RM 79, 254.00  
Year 2 : RM 20, 580.00  
Year 3 : RM 0

Additional Budget Approved

Year 1 : RM 0  
Year 2 : RM 0  
Year 3 : RM 0

Total Expenditure : RM 99, 775.02  
Balance : RM 58.98

- Please attach final account statement from Treasury



Signature of Researcher  
Tandatangan Penyelidik

25/9/2011

Date  
Tarikh

Dr. Ooi Feong Kiew  
Lecturer  
Sports Sciences Unit  
School of Medical Sciences  
Health Campus  
Universiti Sains Malaysia  
16150 Kubang Kerian, Kelantan.

H.

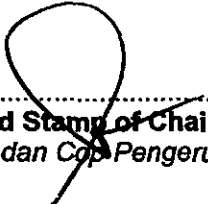
**COMMENTS OF PTJ'S RESEARCH COMMITTEE**  
**KOMEN JAWATANKUASA PENYELIDIKAN PERINGKAT PTJ**

**General Comments:**

*Ulasan Umum:*

Project completed successfully and all objectives achieved. Output include 2 published manuscripts, one poster conference proceeding and 4 oral presentations.

**PROFESOR AHMAD SUKARI HALIM**  
Timbatan Dekan (Penyelidikan)  
Pusat Pengajian Sains Perubatan  
Kampus Kesihatan  
Universiti Sains Malaysia  
16150 Kubang Kerian, Kelantan.



**Signature and Stamp of Chairperson of PTJ's Evaluation Committee**  
*Tandatangan dan Cop Pengerusi Jawatankuasa Penilaian PTJ*

Date : .....

Tarikh : .....

29/10/11

**Signature and Stamp of Dean/ Director of PTJ**  
*Tandatangan dan Cop Dekan/ Pengarah PTJ*

Date : .....

Tarikh : .....

24/10/11  
**PROFESOR ABDUL AZIZ BABA**  
Dekan  
Pusat Pengajian Sains Perubatan  
Kampus Kesihatan  
Universiti Sains Malaysia  
16150 Kubang Kerian, Kelantan.

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# **TECHNICAL REPORT OF THE STUDY**

## **Effects of *Eurycoma longifolia* Jack Supplementation on Recreational Athletes' Endurance Running Capacity and Physiological Responses in the Heat.**

### **Abstract**

This study investigated the effects of *Eurycoma longifolia* Jack supplementation on recreational athletes' endurance running capacity and physiological responses in the heat. Twelve healthy male recreational athletes (Age: 23.3 (3.7) years old;  $VO_{2max}$ : 45.1 (8.1) mL.kg<sup>-1</sup>.min<sup>-1</sup>) were recruited in this double blind, placebo-controlled, cross-over study. Subjects completed two endurance running trials in the heat (31°C, 70% relative humidity), performed on separate days, after consuming either 2 capsules of *Eurycoma longifolia* Jack (75 mg per capsule) or placebo per day for 7 days before and one hour prior to the experimental trial. On the trial day, after 5 minutes warm-up at 50%  $VO_{2max}$ , subjects were requested to run on the treadmill at 60%  $VO_{2max}$  for 60 minutes. This was immediately followed by a 20 minutes time trial for determining endurance running capacity. Blood samples were taken before warm-up, after warm-up, and every 20 minutes during the trial. Statistical analysis was performed using two-way ANOVA with repeated measures. Results show that endurance running capacity was not significantly different ( $P<0.05$ ) between *Eurycoma longifolia* Jack (EL) and placebo (P) trials. Similarly, oxygen uptake, heart rate, skin temperature, tympanic temperature, ratings of perceived exertion, haemoglobin concentration, haematocrit level, plasma glucose concentration, and plasma free fatty acid concentration were not significantly different between the trials. These findings suggest that supplementation of *Eurycoma longifolia* Jack with a dosage of 150 mg.day<sup>-1</sup> for 7 days did not elicit beneficial effects on endurance running capacity and physiological responses of recreational athletes in the heat. Higher dosage and longer duration of supplementation of *Eurycoma longifolia* jack is warranted to elicit the positive effects during endurance exercise.

**KEY WORDS:** Ergogenic aids, time trial, herbs.