

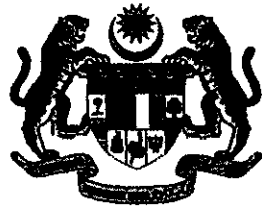
UNIVERSITI SAINS MALAYSIA
GERAN PENYELIDIKAN UNIVERSITI PENYELIDIKAN
LAPORAN AKHIR

EFFECTS OF CONSUMING A MALAYSIAN ACACIA HONEY
DRINK PRIOR TO, DURING AND POST EXERCISE ON
PHYSIOLOGICAL RESPONSES, BLOOD GLUCOSE
METABOLISM, URINE OSMOLALITY AND RUNNING TIME-
TRIAL PERFORMANCE IN THE HEAT

PENYELIDIK

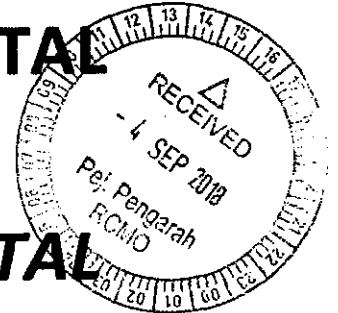
PROFESOR MADYA DR. OOI FOONG KIEW

2019



**KEMENTERIAN
PENDIDIKAN
MALAYSIA**

**LAPORAN AKHIR SKIM GERAN
PENYELIDIKAN FUNDAMENTAL
(FRGS)
FINAL REPORT FUNDAMENTAL
RESEARCH GRANT SCHEME (FRGS)**



Title of Research:	EFFECTS OF CONSUMING A MALAYSIAN ACACIA HONEY DRINK PRIOR TO, DURING AND POST EXERCISE ON PHYSIOLOGICAL RESPONSES, BLOOD GLUCOSE METABOLISM, URINE OSMOLALITY AND RUNNING TIME-TRIAL PERFORMANCE IN THE HEAT
Account No:	203/PPSP/6171176
Research Leader:	ASSOC. PROF. DR. OOI FOONG KIEW
Co-Researcher:	ASSOC. PROF. DR. CHEN CHEE KEONG ASSOC. PROF. DR. MOHAMED SAAT HJ. ISMAIL PROF. DR. K.N.S SIRAJUDEEN
Duration:	15 DEC 2014 - 31 MAY 2018



KEMENTERIAN
PENDIDIKAN
MALAYSIA

FINAL REPORT
FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS)
Laporan Akhir Skim Geran Penyelidikan Fundamental (FRGS)
Pindaan 1/2014

RESEARCH TITLE: *Effects of Consuming a Malaysian Acacia Honey Drink Prior to, During and Post Exercise on Physiological Responses, Blood Glucose Metabolism, Urine Osmolality and Running Time-Trial Performance in The Heat*

PHASE & YEAR: *Phase 2 & Year 2018*

START DATE: 1.12.2014

END DATE: 31.12.2017

EXTENSION PERIOD (DATE): 1.1.2018-31.5.2018

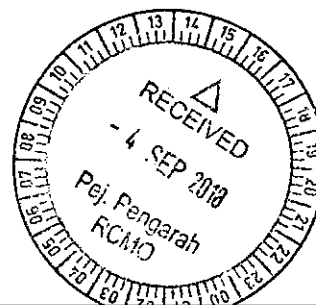
PROJECT LEADER: Assoc. Prof. Dr. Ooi Foong Kiew

PROJECT MEMBERS: 1. Assoc. Prof. Dr. Chen Chee Keong

(Including Gra)

2. Assoc. Prof. Dr. Mohamed Saat Bin Hj Ismail

3. Prof. Dr. Kuttulebbai Nainamohamed Salam Sirajudeen



ACHIEVEMENT PERCENTAGE

Project progress according to milestones achieved up to this period	0 - 50%	51 - 75%	76 - 100%
Percentage (please state #%)			100%

RESEARCH OUTPUT

	Indexed Journal	Non-Indexed Journal
Number of articles/ manuscripts/ books (Please attach the First Page of Publication)	<p>Nursyuhada Mohd Sukri, Foong Kiew Ooi, Chee Keong Chen, K.N.S. Sirajudeen (2018) Effects of Acacia Honey Drink Ingestion Pre and During Exercise Compared To Sports Drink on Glucose Metabolism and Running Performance in the Heat among Male Recreational Athletes. Applied Physiology, Nutrition and Metabolisme. <i>Under Review.</i></p> <p>Chee Keong Chen, Aidi-Naim Bin Mohamad Samsani, Foong Kiew Ooi, Mohamed Saat Ismail (2018) Effects of Acacia Honey Drink Ingestion During Rehydration After Exercise Compared to Sports Drink on Subsequent Running Performance, Selected Physiological Parameters and Urine Osmolality in the Heat. Asia Pacific Journal of Clinical Nutrition. <i>Under Review.</i></p>	

	International	National
Conference Proceeding (Please attach the First Page of Publication)	Foong Kiew Ooi, Aidi Naim Mohamad Samsani, Chen Chee Keong, Mohamed Saat Ismail. (2017) Effects of Acacia Honey Drink Ingestion during Rehydration after Exercise Compared to Sports Drink on Physiological Parameters and Subsequent Running Performance in the Heat. <i>Conference proceeding of International Conference on Sport Science and Physical Health (ICSSPH 2017)</i> Oct 05-06, 2017, New York, USA. Page 94 (<i>World Academy of Science, Engineering and Technology International Journal of Sport and Exercise Sciences</i> Vol:4, No:10, 2017)	

Intellectual Property
(Please specify)

HUMAN CAPITAL DEVELOPMENT

Human Capital	Number				Others (please specify)
	On-going		Graduated		
Citizen	Malaysian	Non Malaysian	Malaysian	Non Malaysian	Four Research Assistant (Bayaran Honorarium) Muhammad Alif Ridzuan Bin Hamzah (Okt,Nov,Dis, 2015) 920513-03-5113 Noor Aini Sahrir (Mac, Apr, Mei 2016) 900117-07-5676 Muhammad Amrun Haziq Abidin (Julai 2016) Nurul Ain Fathma Abdullah (Apr, Mei, June 2018) 850607-03-5148
PhD Student					
Master Student			2		
Undergraduate Student					
Total			2		

C **Budget Approved (Peruntukan diluluskan)** : **RM 95800.00**
Amount Spent (Jumlah Perbelanjaan) : **RM 88403.67**
Balance (Baki) : **RM 7396.33**
Percentage of Amount Spent (Peratusan Belanja) : **92.3%**

MAMPU MELAKSANAKAN TRANSFORMASI MELALUI PENYELIAAN BERKUALITI DAN BERKEMAMUKAN

International	Activity	Date (Month, Year)	Organizer
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(e.g : Course/ Seminar/ Symposium/
Conference/ Workshop/ Site
Visit)

Oral Presentations (International)
(One award was won)

**Foong Kiew Ooi, Aidi Naim
Mohamad Samsani, Chen Chee
Keong, Mohamed Saat Ismail. (2017)**
Effects of Acacia Honey Drink
Ingestion during Rehydration after
Exercise Compared to Sports Drink
on Physiological Parameters and
Subsequent Running Performance in
the Heat. Conference proceeding of
International Conference on Sport
Science and Physical Health
(ICSSPH 2017). **(This paper was
awarded Best Presentation in the
19th International Conference on
Sport Science and Physical Health,
New York,US).**

Oct 05-06, 2017

World Academy of Science,
Engineering and Technology
International Journal of Sport and
Exercise Sciences.

National

Activity

Date (Month, Year)

Organizer

(e.g : Course/ Seminar/ Symposium/
Conference/ Workshop/ Site
Visit)

**Poster Presentation (Two awards
were won)**

1. **Chen Chee Keong, Aidi-Naim
Mohamad Samsani, Foong
Kiew Ooi, Mohamed Saat
Ismail (2016)** Effects of honey
supplementation during
recovery on subsequent running
performance and selected
physiological parameters in the
heat. Abstract book of 21st
National Medical and Health
Sciences Conference, Universiti
Sains Malaysia, Kubang Kerian,
Kelantan, Malaysia. **(This
paper was awarded 1st prize
in the Best Poster
Presentation in the National
Medical and Health Sciences
Conference. National level,
Universiti Sains Malaysia,
Malaysia).**

17-18th October, 2016.

21st National Medical and Health
Sciences Conference, Universiti
Sains Malaysia, Kubang Kerian,
Kelantan, Malaysia.

2. **Foong Kiew Ooi, Nursyuhada**

20th National Medical and Health

Mohd Sukri, Chee Keong Chen, K.N.S. Sirajudeen (2015) Effects of Acacia Honey Drink Ingested Pre and During Exercise on Physiological Responses and Running Performance in the Heat. Abstract book of 20th National Medical and Health Sciences Conference, Universiti Sains Malaysia, Kubang Kerian, Kelantan,. (This paper was awarded 2nd prize in the Best Poster Presentation in the 20th National Conference on Medical and Health Science, 2015)

12-14th September, 2015

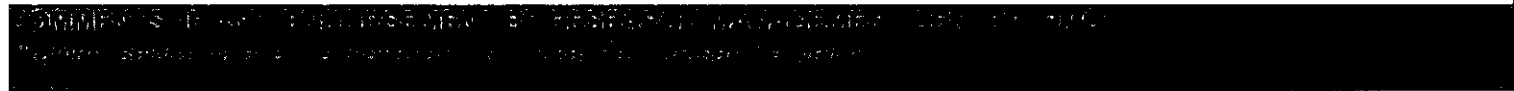
Sciences Conference, Universiti Sains Malaysia, Kubang Kerian, Kelantan,.

E The project has been carried out smoothly.

G This study investigated the effectiveness of Malaysian Acacia honey drink ingested before, during and post exercise on physiological responses, blood glucose metabolism, urine osmolality and running time-trial performance in the heat. The first phase of this study found that honey drink and sports drink ingestion before and during exercise elicited similar effects on physiological responses, blood parameters and running performance in the heat. The second phase of the study found that honey drink during dehydration after exercise elicited beneficial effect on running performance and selected physiological parameters. Therefore, Acacia honey drink, a local Malaysian product, can be proposed to be used as an alternative ergogenic aid before, during and post exercise for athletes who train and compete in hot environment.

Date : 20/8/2018
Tarikh

Project Leader's Signature:
Tandatangan Ketua Projek



H

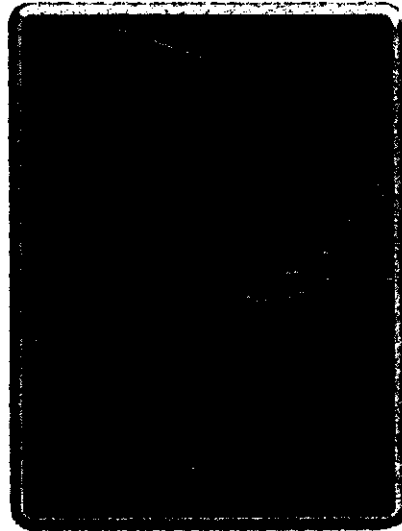
Name:
Nama:

PROF. DR LEE KEAT TEONG
Director
Research Creativity & Management Office
Universiti Sains Malaysia

Signature:
Tandatangan:

Date:
Tarikh:

**BUKU PROFIL PENYELIDIKAN SKIM GERAN PENYELIDIKAN
FUNDAMENTAL (FRGS) TAHUN 2018**



**Effects of Consuming a Malaysian Acacia Honey Drink prior to,
during and post exercise on Physiological Responses, Blood
Glucose Metabolism, Urine Osmolality and Running Time-Trial
Performance in The Heat**

Name of Project Leader

Assoc. Prof. Dr. Ooi Foong Kiew

Name of co-researchers

**Assoc. Prof. Dr. Chen Chee Keong
Assoc. Prof. Dr. Mohamed Saat Bin Hj Ismail
Prof. Dr. Kuttulebbai Nainamohamed Salam Sirajudeen**

**Sports Science Unit, School of Medical Sciences, Universiti Sains
Malaysia**

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**FRGS Field:
Clinical and Health Science**

ABSTRACT

This study investigated the effectiveness of Malaysian Acacia honey drink ingested before, during and post exercise on physiological responses, blood glucose metabolism, urine osmolality and running time-trial performance in the heat. The first phase of this study found that honey drink and sports drink ingestion before and during exercise elicited similar effects on physiological responses, blood parameters and running performance in the heat. The second phase of the study found that honey drink during dehydration after exercise elicited beneficial effect on running performance and selected physiological parameters. Therefore, Acacia honey drink, a local Malaysian product, can be proposed to be used as an alternative ergogenic aid before, during and post exercise for athletes who train and compete in hot environment.

1. INTRODUCTION

To date, the sports drinks available in the market are mostly carbonated drinks which may cause gastric discomfort. Acacia honey drink which was prescribed to the subjects in the present study was not a carbonated drink. It is believed that ingestion of this non-carbonated honey drink might not cause gastric discomfort. Since the efficacy of a non-carbonated drink i.e. Malaysian Acacia honey drink ingested prior to, during and post exercise on physiological responses, blood glucose metabolism and running time-trial performance in the heat has not been attempted before, therefore the present study was proposed.

2. RESEARCH METHODOLOGY

2.1 TEST PROCEDURE OF PHASE 1 AND PHASE 2 STUDIES

The present study was carried out in 2 phases, i.e. phase 1 study which aimed to investigate the effects of acacia honey drink supplementation before and during exercise on physiological responses, blood glucose metabolism, urine osmolality and running time-trial performance in the heat, and phase 2 which aimed to investigate the effect of honey drink supplementation during rehydration after exercise on physiological parameters, blood glucose metabolism, urine osmolality and subsequent running time trial performance in the heat.

2.2 EXPERIMENTAL DESIGN

2.2.1 PHASE 1 STUDY

Subjects reported to the laboratory following a 10-hour overnight fast. The following procedures were carried out before each trial: (i) a standardised breakfast; (ii) determination of nude body weight; (iii) fitting of temperature probes and (iv) cannulation for drawing blood samples. Patency of the cannula was maintained with heparinised saline. For each blood withdrawing, 8 ml of blood was collected in a 10ml sterile syringe. Approximately 0.8 ml of heparinised saline was injected into the extension tube after each blood withdrawal.

One hour before the warm up, blood was collected from the subjects, and subjects were required to consume either 500ml of Acacia honey drink or sport drink 30 minutes before warm-up. Immediately before warm up, blood samples was collected; resting heart rate, core body temperature and expired gas were measured. After which, the subject were asked to warm-up for 5 minutes by running at 50% VO_{2max} . Blood sample, heart rate, core body temperature and expired air were collected during the last minute of the warm-up. Immediately after the completion of the warm-up, the intensity of running was increased to 60% VO_{2max} . At intervals of 20