

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

**ANTIMICROBIAL PROPERTIES OF KELULUT  
(TRIGONA SPP) HONEY**

**PENYELIDIK**

**DR. NOOR IZANI NOOR JAMIL**

**PENYELIDIK BERSAMA**

**DR. MOHD SHAHJAHAN**

**2012**

DITERIMA  
03 APR 2012  
Pejabat Penyelidikan  
Pusat Pengajian Sains Kesihatan

1. Nama Ketua Penyelidik:

Dr. Noor Izani Noor Janil

Profesor Madya/  
Assoc. Prof.

Dr./  
Dr.

Encik/Puan/Cik  
Mr/Mrs/Ms

2. Pusat Tanggungjawab (PTJ):

Pusat Pengajian Sains Kesihatan

School/Department

3. Nama Penyelidik Bersama:

Dr. Mohd Shahjahan

4. Tajuk Projek:

Title of Project

Antimicrobial Properties of Kelulut (*Trigona spp*) Honey.

5. Ringkasan Penilaian/Summary of Assessment:

Tidak Mencukupi Inadequate		Boleh Diterima Acceptable	Sangat Baik Very Good	
1	2	3	4	5

i) Pencapaian objektif projek:  
Achievement of project objectives

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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ii) Kualiti output:  
Quality of outputs

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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iii) Kualiti impak:  
Quality of impacts

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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iv) Pemindahan teknologi/potensi pengkomersialan:  
Technology transfer/commercialization potential

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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v) Kualiti dan usahasama :  
Quality and intensity of collaboration

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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vi) Penilaian kepentingan secara keseluruhan:  
Overall assessment of benefits

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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**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.

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**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

Madu lebah kelulut (*Trigona spp*)  
Aktiviti antibakteria

Aktiviti antifungi

Bahasa Inggeris

Kelulut (*Trigona spp*) honey  
Antibacterial activity

Antifungal activity

**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)

Abstract on oral presentation in the 1<sup>st</sup> International Conference On The Medical Uses Of Honey. 26-28 August , 2006, Kelantan.

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- (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 sourcee 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)*

- ii) **Lain-lain:**  
*Others* Dua tesis projek tahun akhir.

9. **Peralatan yang Telah Dibeli: Tiada**  
*Equipment that has been purchased*



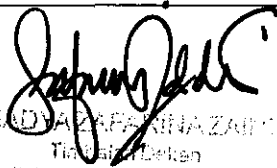
**Tandatangan Penyelidik**  
*Signature of Researcher*

28 Mac 2012

**Tarikh**  
*Date*

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

The finding from this research is interesting and need further investigation to identify the <sup>ant</sup> microbial ~~properties~~ <sup>agents</sup> of Kelulut honey. The output from this research is however inadequate. Only 1 abstract was presented in an international conference and 2 final year projects were completed.



PROF MADYA ZAFARINA ZAIDI UDIN  
Tid. Usah. Bekan  
Penyelidikan & Pengajian Sivik & Jd  
Pusat Pengajian Bina Negara  
Kampus Kepong  
Universiti Selangor

8/4/2012

**TANDATANGAN PENERUSI**  
**JAWATANKUASA PENYELIDIKAN**  
**PUSAT PENGAJIAN/PUSAT**  
*Signature of Chairman*  
*[Research Committee of School/Centre]*

**Tarikh**  
*Date*

## LAPORAN AKHIR PROJEK PENYELIDIKAN GERAN JANGKA PENDEK

### “ANTIMICROBIAL PROPERTIES OF KELULUT (*TRIGONA SPP*) HONEY”

Noor Izani Noor Jamil<sup>1</sup> & Mohd Shahjahan<sup>2</sup>

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<sup>2</sup>Department of Biochemistry and Molecular Biology, University of Rajshahi, Rajshahi-6205, Bangladesh.

#### ABSTRAK

Aktiviti antimikrob oleh madu lebah “Kelulut” (*Trigona spp*) yang diperolehi daripada pembekal di Kota Bharu, Kelantan telahpun dikaji. Madu “Kelulut” diuji untuk aktiviti antimikrob melalui pengasaian disk difusi, pengasaian telaga difusi dan kepekatan perencatan minimum (MIC) ditentukan menggunakan prosedur pengasaian standard. Berdasarkan kepada sifat fisikokimia, ianya berupa ambar gelap dengan pH 2.50, graviti spesifik 1.26, kandungan lembapan 20.6%, kandungan kering 79.4% dan kandungan lipid 1% (w/w). Madu “Kelulut” mempamerkan aktiviti antibakteria yang baik terhadap bakteria Gram positif dan Gram negatif yang dikaji pada kepekatan madu antara 20-80 (% v/v) dan madu tanpa pencairan (100%, v/v) memberikan kesan aktiviti antibakteria paling baik. Dalam penentuan kepekatan perencatan minimum, kesemua strain bakteria mempamerkan kesan sensitif dalam julat (35-70 µg/ml). Namun, ekstrak beberapa pelarut organik madu “Kelulut” tidak mempamerkan kesan antibakteria yang signifikan. Walaubagaimanapun, madu “Kelulut” tidak menunjukkan sebarang aktiviti antifungi walaupun pada kepekatan madu yang tinggi. Madu “Kelulut” juga didapati mempunyai aktiviti antioksidan yang rendah.

#### ABSTRACT

The antibacterial activities of Kelulut (*Trigona spp*) honey obtained from the local honey supplier in Kota Bharu, Kelantan was investigated. “Kelulut” honey was tested for its antimicrobial activity by disc diffusion and well diffusion assays and the minimum inhibitory concentration (MIC) was determined using the standard assay procedures. In terms of physicochemical properties, it has a dark amber appearance with a pH of 2.50, specific gravity of 1.26, moisture content was 20.6%, dry matter content was 79.4% and lipid content of 1% (w/w). The “Kelulut” honey exhibited significant antibacterial activities towards the Gram positive and Gram negative bacteria at the concentration of 20-80 (% v/v) and the neat honey (100%, v/v) produced the best antibacterial activity compared to other dilutions. In the minimum inhibitory concentration determination, all the strains were most sensitive in the range of (35-70 µg/ml). The honey organic solvent extract did not exhibit significance antibacterial effect. However, the “Kelulut” honey did not show antifungal activity even at very high concentration. The “kelulut” honey was found to have low anti-oxidant activity.