LAPORAN AKHIR PROJEK PENYELIDIKAN GERAN PENYELIDIKAN UNIVERSITI

FINAL REPORT OF UNIVERSITY RESEARCH GRANT

Antibacterial Properties of Madu Lebah Tualang: A Laboratory Analysis

Principle Investigator: Dr. Kirnpal Kaur Banga Singh

USM RU Grant

UNIVERSITI SAINS MALAYSIA

UNIVERSITY RESEARCH GRANT FINAL REPORT
Geran Penyelidikan Universiti Laporan Akhir

A.	**TITLE OF RESEARCH:** *Tajuk penyelidikan:* **Antibacterial Properties of Madu Lebah Tualang: A Laboratory Analysis**
B.	**PERSONAL PARTICULARS OF RESEARCHER** / *MAKLUMAT PENYELIDIK:*
(i)	**Name of Research Leader:** *Nama Ketua Penyelidik:* Dr. Kirnpal Kaur Banga Singh
	Name of Co-Researcher *Nama Penyelidik Bersama:* Dr. Siti Asma' binti Hassan Dr. Gan Siew Hua Pn. Rosliza Abd. Rahman
(ii)	**School/Institute/Centre/Unit :** *Pusat Pengajian /Institut/Pusat/Unit :* Pusat Pengajian Sains Perubatan

C. **Research Platform (Please tick (/) the appropriate box):**
Pelantar Penyelidikan (Sila tanda (/) kotak berkenaan):

[ ]	**A. Life Sciences** *Sains Hayat*
[ ]	**B. Fundamental** *Fundamental*
[ ]	**C. Engineering & Technology** *Kejuruteraan & Teknologi*
[ ]	**D. Social Transformation** *Transformasi Sosial*
[ ]	**E. Information & Communications Technology (ICT)** *Teknologi Maklumat & Komunikasi*
[ ]	**F. Clinical Sciences** *Sains Klinikal*
[√]	**G. Biomedical & Health Sciences** *Bioperubatan Sains Kesihatan*

D.	**Duration of this research :** *Tempoh masa penyelidikan ini :* ***Duration :** 3 years *Tempoh :* **From** : October 2007 **To** : September 2010 *Dari:* *Ke :*
E.	**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)

Antibiotic resistance of bacteria is on the rise, thus the discovery of alternative therapeutic agents is urgently needed. Honey possesses therapeutic potential, including wound healing properties and antimicrobial activity. Although the antimicrobial activity of honey has been effectively established against an extensive spectrum of microorganisms, it differs depending on the type of honey. To date, no extensive studies of the antibacterial properties of tualang (*Koompassia excelsa*) honey on wound and enteric microorganisms have been conducted. The objective of this study was to conduct such study and to compare the antibacterial activity of tualang honey with that of manuka honey. Tualang honey was assayed for antibacterial activity against 13 wound & enteric microorganisms in comparison to Manuka honey, using broth dilution method. Different concentrations of honey [6.25-25% (w/v)] were tested against each type of microorganism. Minimum inhibitory concentrations (MICs) against each type of bacteria were determined by visual inspection and spectrophotometric assay at 620 nm. Minimum bactericidal concentration (MBC) was also determined by culturing onto blood agar. The MICs of Tualang honey ranged from 8.75% (w/v) to 25% whereas MICs of Manuka honey ranged from 8.75% to 20%. Spectrophotometric readings of at least 95% inhibition yielded MIC values ranging between 10% and 25% for both types of honey. The lowest MBC for tualang honey was 20%, whereas that for manuka honey was 11.25% for the microorganisms tested. The lowest MIC value (8.75%) for both types of honey was against *Stenotrophomonas maltophilia*. Tualang honey had a lower MIC (11.25%) against *Acinetobacter baumannii* compared to manuka honey (12.5%). This study shows that Tualang honey exhibited variable activities against different microorganisms, but they were within the same range as those for manuka honey. This result suggests that tualang honey could potentially be used as an alternative therapeutic agent against certain microorganisms, particularly *A. baumannii* and *S. maltophilia*. Studies are currently being conducted to determine pytochemicals component in different fractions of tualang honey.

F. **SUMMARY OF RESEARCH FINDINGS**
Ringkasan dapatan Projek Penyelidikan

Introduction:
The fact that honey possesses therapeutic potential including wound healing properties and antimicrobial activity is irrefutable. Its antimicrobial activity has been effectively established against an extensive spectrum of microorganisms, depending on the type of honey, as floral source and bee type give variation in honey's antimicrobial potency. To date, no studies have been carried out regarding the antibacterial properties of Tualang honey on wound and enteric microorganisms.

Objectives:
The objective of this study is to determine the antibacterial activity of Tualang honey on wound and enteric microorganisms.

Materials and methods:
Antibacterial activity was determined against 13 wound and enteric microorganisms in comparison to Manuka honey, using broth dilution method. Different concentrations of honey (25% (w/v) to 6.25%) were tested against each type of bacteria. Minimum inhibitory concentrations (MICs) were determined by visual inspection and spectrophotometric assay at 620 nm. Minimum bactericidal concentration (MBC) was also determined by culturing onto blood agar plates.

Results:
The MICs of Tualang honey ranged from 8.75% to 25% whereas MICs of Manuka honey ranged from 8.75% to 20%. The lowest MBC for Tualang honey was 15% whereas for Manuka it was 11.25% for the range of organisms tested. *Stenotrophomonas maltophilia* gave the lowest MIC value (8.75%) for both honeys tested. Tualang honey had lower MIC (11.25%) against *Acinetobacter baumannii* compared to Manuka honey (12.5%).

Conclusions:
Tualang honey has variable activity against different microorganisms. The potency of this activity in Tualang honey suggests its potential use as an alternative therapeutic agent against certain microorganisms.

G. **COMPREHENSIVE TECHNICAL REPORT**
Laporan Teknikal Lengkap
Applicants are required to prepare a comprehensive technical report explaining the project.
(This report must be attached separately)
Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.
[Laporan ini mesti dikepilkan]

List the key words that reflectour research:
Senaraikan kata kunci yang mencerminkan penyelidikan anda:

English	Bahasa Malaysia
Honey	Madu Lebah
Antibacterial	Antibakteria