

## CERTIFICATE OF ANALYSIS

Name of Customer : DR AHMAD BUKHARY  
 Address : School of Biological Sciences, Universiti Sains Malaysia  
 11800 USM Gelugor, Pulau Pinang.  
 Tel. No. : 012-304 5007  
 Sample Description : One (1) sample described as *INSECT FRASS FERTILIZER SPECIES ACHETA DOMESTICUS*  
 Sample Ref. No : U0493/21

### ANALYSIS RESULTS

(As per sample)

Parameter, Unit	Result		Test Method / Equipment / Technique
Nitrogen, % (w/w)	4.28	4.43	Nitrogen: In-house method no. STP/Chem/A03 based on AOAC 20 <sup>th</sup> Edi. 981.10
Calcium, mg/kg	3012.50	3065.12	Microwave Digestion – AAS
Potassium, mg/kg	16537.84	16498.86	Microwave Digestion - AAS
Magnesium, mg/kg	1906.95	1971.83	Microwave Digestion – AAS
Phosphorus, mg/kg	6634.46	6664.50	Microwave Digestion – MP/AES

**Remarks:**

- a. Opened / balance samples will be discarded two weeks after issuance of Certificate of Analysis.

  
**NOR AIN SYUHADA ZUHAIMI**  
 Laboratory Executive  
 UNIQ SDN BHD (870956-D)

This report refers to the tested sample only. Sampling is not carried out by our organization. All analysis are carried out to the best of our knowledge and ability and our responsibility is limited to the correctness of the result. This report is issued on the understanding that it does not relieve parties concerned from their contractual obligations. This report shall not be reproduced except in full without written approval of the laboratory.

Our Ref : ACL/MIS-OTH 210811

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
 School of Biological Sciences  
 G08 Building, Universiti Sains Malaysia  
 11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as Insect Frass Fertilizer Species  
 Acheta Domesticus

### Results of Analysis

Parameter	Unit	Method	Results
pH	-	In House based on APHA 4500 H <sup>+</sup> B	8.3
Total Organic Carbon	%w/w	MS678:Pt I to IV:1980	29.0
Total Organic Matter	%w/w	In House	90.5
Sulphur as S	mg/kg	ICP-OES	5,575
C/N Ratio	-	By Calculation	7.4

Note:

"<" denote "Less Than"



MOHD BADRULLAH BIN BUANG  
 BSc(Hons), LMIC  
 IKM Registered Chemist : L/2784/8241/18

Allied Chemists Laboratory Sdn Bhd 199801006433 (462560-M)

10, Jalan Bakawali 68, T +607-352 8227  
 Taman Johor Jaya, F +607-352 9227  
 81100 Johor Bahru, E aclsb@alliedchemists.com.my  
 Johor, MALAYSIA. W www.alliedchemists.com.my



### Certificate of Analysis

Lab Ref No.: **UL2107-A00634**

SN: **RS1723334428404556**

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Noor Azinah Maamin  
 Chemist & Food Analyst  
 IKM No. : M/1973/4360/03 Food Analyst No: MJMM 0622  
 AN1: RA1768315829918756

**DR AHMAD BUKHARY BIN AHMAD KHAIR**  
 SCHOOL OF BIOLOGICAL SCIENCE  
 G08 BUILDING  
 UNIVERSITI SAINS MALAYSIA  
 11800 PULAU PINANG  
 MALAYSIA

Sample Marking: **INSECT FRASS FERTILIZER SPECIES ACHETA DOMESTICUS**  
 Sample Description: **FERTILIZER**

*Remarks:*

1. *Opened / balance samples will be discarded two weeks after issuance of Certificate of Analysis.*

Test Description	Unit	Result(s)	Test Method/Equipment/Technique
Total Ash	%w/w	10.4	In-house Method No: STP/Chem/A05 based on AOAC 20th Edition: 923.03

**- END OF REPORT -**

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Our Ref : ACL/MIS-OTH 220308

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Acheta Domesticus**

**Results of Analysis**

Parameter	Unit	Method	Results
Cation Exchange Capacity	meq/100g	MS 678: Pt. I to V :1980	20.0
Conductivity	$\mu$ S/cm	MS 678: Part VI to IX :1980	6,580

Note:

"<" denote "Less Than"



MOHD BADRULLAH BIN BUANG  
BSc(Hons), MMIC  
IKM Registered Chemist : M/5949/8241/18/22

Our Ref : ACL/MIS-OTH 220287

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Insect Frass Fertilizer Species Acheta Domesticus**

**Results of Analysis**

Parameter	Unit	Method	Results
Ammonium	mg/kg	Ion Chromatography	10293.7
Nitrate	mg/kg	Ion Chromatography	0.03
Nitrite	mg/kg	Ion Chromatography	0.01

*Note:**"ND" denotes "Not Detected"**"<" denotes "Less Than"*

MOHD BADRULLAH BIN BUANG  
BSc(Hons), MMIC  
IKM Registered Chemist : M/5949/8241/18/22

Our Ref : ACL/MIS-OTH 220347

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Acheta Domesticus**

**Results of Analysis**

Parameter	Unit	Method	Results
Crude Fiber	% w/w	MS 1414 (1997)	2.8



MOHD BADRULLAH BIN BUANG  
BSc(Hons), MMIC  
IKM Registered Chemist : M/5949/8241/18/22



Our Ref : ACL/MIS-OTH 220366

Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer**  
**Marking: Insect Frass Species Acheta Domesticus**

**Results of Analysis**

Parameter	Unit	Method	Results
Total Iron as Fe	mg/kg	ICP-OES	815.9



MOHD BADRULLAH BIN BUANG  
BSc(Hons), MMIC  
IKM Registered Chemist : M/5949/8241/18/22

Allied Chemists Laboratory Sdn Bhd 199801006433 (462560-M)

1, Jalan Gemilang 7, T +607-288 2088  
Taman Perindustrian Cemerlang, F +607-  
81800 Johor Bahru, E aclsb@alliedchemists.com.my  
Johor, MALAYSIA. W www.alliedchemists.com.my



Our Ref : ACL/MIS-OTH 220381  
Company : **DR AHMAD BUKHARY BIN AHMAD KHAIR**  
School of Biological Sciences  
G08 Building, Universiti Sains Malaysia  
11800 USM Pulau Pinang

Sample description : Received one (1) samples labelled as **Fertilizer Marking:**  
**Insect Frass Fertilizer Species Acheta Domesticus**

**Results of Analysis**

Parameter	Unit	Method	Results
Organic Nitrogen as N	mg/kg	APHA4500Norg-B, NH3-G	2,340
Ferric Iron	mg/kg	APHA3500Fe,3120	312

Note:

"<" denote "Less Than"

  
MOHD BADRULLAH BIN BUANG  
BSc(Hons), MMIC  
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1, Jalan Gemilang 7, T +607-288 2088  
Taman Perindustrian Cemerlang, F +607-  
81800 Johor Bahru, E aclsb@alliedchemists.com.my  
Johor, MALAYSIA. W www.alliedchemists.com.my



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