

APPENDICES

APPENDIX A

List of chemical used

Chemical name	Formula	Grade
Acetic acid (glacial)	CH_3COOH	Analar
Acetone	CH_3COCH_3	Analar
Buffer solution	NaHCO_3 NH_4HCO_3	
Chloroform	CHCl_3	Analar
Cetytrimethylammonium bromide(CTAB)	$[\text{CH}_3(\text{CH}_2)_{15}](\text{CH}_3)_3\text{NBr}$	
Copper sulphate	$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	
Decahydrophlene		
Dichloromethane	CH_2Cl_2	Analar
Diethyl ether	$(\text{C}_2\text{H}_5)_2\text{O}$	Analar
Disodium hydrogen phosphate	Na_2HPO_4	
Ethanol	CH_3OH	Analar
Ethylenediaminetetra-acetic acid (EDTA)	$[\text{CH}_2\text{N}(\text{CH}_2\text{COOH})_2]_2$	
2 - ethoxyethanol/ethylglycol	$\text{C}_2\text{H}_5\text{OCH}_2\text{CH}_2\text{OH}$	
Ferric nitrate	$\text{Fe}(\text{NO}_3)_3 \cdot \text{H}_2\text{O}$	
Hydrochloric acid (12N)	HCl	Analar
Methanol	CH_2OH	
2 - Methylpropanol - 2 - ol n - butanol	$(\text{CH}_3)_3\text{COH}$	Analar
Nitric acid	HNO_3	Analar
Oxalic acid dihydrate	$\text{C}_2\text{H}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$	Analar
Petroleum ether		Analar
Potassium hydroxide	KOH	
Potassium nitrate	KNO_3	
Potassium permanganate	KMnO_4	Analar

Chemical name	Formula	Grade
Potassium sulphate	K_2SO_4	
Reduction solution (Sodium sulphite)	NaS	
Silver nitrate	$AgNO_3$	
Sodium borate decahydrate	$Na_2B_4O_7 \cdot 10H_2O$	
Sodium lauryl sulphate	$CH_3(H_2)_{11}OSO_2ONa$	
Sulphuric acid (95% - 97%)	H_2SO_4	
10% vanilin in sulphuric acid (con.)		

APPENDIX B

Preparation of solution

All preparation of solution are for 1 litre unless stated otherwise.

B.1 Neutral detergent solution (NDS)

Ethylenediaminetetra - acetic acid (EDTA) (18.16 g) and 6.81 g of sodium borate decahydrate were placed together in a beaker. Approximately 200 ml distilled water was then added and the mixture heated in a water bath until dissolved (solution A). Sodium lauryl sulphate (30 g) was added to 10 ml 2 - ethoxyethanol/ethglycol in another beaker (solution B). Then, the solution A were poured into solution B. Disodium hydrogen phosphate (4.56 g) were dissolved in 50 ml distilled water and then mixed together with solution A and B. The volume of the mixture was made up to about 50 ml and the pH adjusted to 6.9 - 7.1. Total volume of NDS was then made up to 1 litre in a volumetric flask.

B.2 Acid detergent solution (ADS)

An ADS is made up of cetytrimethylammonium bromide (CTAB) (20.0 g) in 1 L of 0.5 M sulphuric acid (27.7 ml in 1 L cons. sulphuric acid).

B.3 Lignin reagents

i - Saturated potassium permanganate

Potassium permanganate reagent (50.0 g) was dissolved in 1 L of distilled water. The solution was stored in a dark bottle at 4°C.

ii – Lignin buffer solution

A mixture of ferric nitrate (6.0 g) and argentum nitrate (0.15 g) was dissolved in 100 ml distilled water (solution A). Glacial acetic acid (500 ml), potassium nitrate (5.0 g) and tertiary butyl alcohol (400 ml) was added sequentially to solution A and mixed thoroughly.

iii - Combined permanganate solution

Saturated potassium permanganate solution was mixed with lignin buffer solution (2 : 1; v/v) just prior to use and the mixture was stored in a dark bottle.

iv - Demineralising solution

Oxalic acid dehydrate (5.0 g) was dissolved in 700 ml ethanol (95 %) before being mixed with 50 ml nitric acid (12 N) and 250 ml distilled water.

APPENDIX C

Location of deer farms in each state in Malaysia

STATE	LOCATION	SPECIES
Perlis	Titi tinggi (DVS)	<i>Cervus timorensis</i>
Kedah	Pendang (DVS)	<i>Cervus timorensis</i>
	Datai, Langkawi (P)	<i>Cervus timorensis</i>
	Anak Bukit (I)	<i>Cervus timorensis</i>
Perak	Grik (DVS)	<i>Cervus timorensis</i>
	Kg. Beng, Lenggong (S)	<i>Cervus timorensis</i>
	Taiping (Z)	<i>Cervus timorensis</i>
		<i>Axis axis</i>
		<i>Axis kuhli</i>
		<i>Axis porcinus</i>
		<i>Cervus unicolor</i>
	Ulu Kati (DVS)	<i>Cervus timorensis</i>
	Sg Siput (DVS)	<i>Cervus timorensis</i>
	Sungkai (WLNP)	<i>Cervus unicolor</i>
<i>Cervus timorensis</i>		
	Behrang Hulu (DVS)	<i>Cervus timorensis</i>
Kuala Lumpur	Taman Tasik Perdana (DBKL)	<i>Dama dama</i>
	Bang. Parlimen	<i>Cervus timorensis</i>
Negeri Sembilan	Serting (P)	<i>Cervus timorensis</i>
	Juasseh (P)	<i>Cervus timorensis</i>
	Siliau (DVS)	<i>Cervus timorensis</i>
	Gemenchih (P)	<i>Cervus timorensis</i>

STATE	LOCATION	SPECIES
Selangor	Rawang (P)	<i>Cervus timorensis</i>
	Sg. Nilam (DVS)	<i>Cervus timorensis</i>
	Batu Arang (DVS)	<i>Cervus timorensis</i>
	Rasa (P)	<i>Cervus timorensis</i>
	Parit Baru (DVS)	<i>Cervus timorensis</i>
	Sg. Besar (DVS)	<i>Cervus timorensis</i>
	Kpg Jawa, Klang (I)	<i>Cervus timorensis</i>
	Shah Alam (I)	<i>Cervus timorensis</i>
	Ulu Kelang (Z)	<i>Cervus timorensis</i>
Serdang (U)	<i>Cervus timorensis</i>	
Melaka	Air Keroh (Z)	<i>Axis kuhli</i>
		<i>Axis axis</i>
		<i>Cervus timorensis</i>
		<i>Cervus unicolor</i>
Pahang	Bukit Redan (MARDI)	<i>Cervus timorensis</i>
	Rompin (P)	<i>Cervus timorensis</i>
	Taman Negara	<i>Cervus unicolor</i>
	Jenderak (WLNP)	<i>Cervus timorensis</i>
Johor	Ins. Haiwan Kluang (DVS)	<i>Axis axis</i>
		<i>Cervus unicolor</i>
	PORIM, Kluang	<i>Cervus timorensis</i>
	Segamat (P)	<i>Cervus timorensis</i>
	Desaru (SEDC)	<i>Dama dama</i>
	Taman Tunku (Z)	<i>Cervus unicolor</i>
	Johor Bahru	<i>Cervus timorensis</i>

STATE	LOCATION	SPECIES
Terengganu	Cermin Kiri (DVS)	<i>Cervus timorensis</i>
	Jerangau (DVS)	<i>Cervus timorensis</i>
	Pusat Pertanian Sekayu	<i>Axis axis</i>
		<i>Cervus unicolor</i>
	<i>Cervus timorensis</i>	
Kelantan	Gua Musang (WLNP)	<i>Cervus unicolor</i>
		<i>Cervus timorensis</i>
	Jeram Pasu (DVS)	<i>Cervus timorensis</i>
Sarawak	Kuching (P)	<i>Cervus unicolor</i>
	Bintulu (DVS)	<i>Cervus unicolor</i>
Sabah	Keningau (DVS)	<i>Axis axis</i>
		<i>Cervus unicolor</i>
		<i>Cervus timorensis</i>
	Tawau (DVS)	<i>Cervus unicolor</i>

List of deer farm in Malaysia (Adapted from Vidyadaran et al.,1991)

DVS	: Dept. of Veterinary Services
P	: Private
I	: Palace
Z	: Zoological garden
DBKL	: Dewan Bandaraya Kuala Lumpur
WLNP	: Wildlife and National Park
MARDI	: Malaysian Agriculture Research and Development Institute
SEDC	: State Economy Development Corporation

APPENDIX D

Artificial saliva for rumen simulating technique (RUSITEC)

3.92 % NaHCO_3

9.30 % $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$

9.40 % NaCl

11.4 % KCl

12.18 % $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$

6.0 % $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$

* NaHCO_3 and $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$ were freshly prepared

* All chemical were added to make up 1L

* $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$ was added last

* The pH should be maintain around 9.5

APPENDIX E

List of unidentified species of plants eaten by deer

Family	Genus	Vernicular Name
Euporbiaceae	<i>Glochidion sp.</i>	
Zingiberaceae	<i>Zingiber sp.</i>	
Lauraceae	<i>Beilschmiedia sp.</i>	
Myristicaceae	<i>Horsefieldia sp.</i>	
Guttiferae	<i>Calophyllum sp.</i>	
Menispermaceae		
Sterculiaceae		
Verbenaceae	<i>Teijsmanniodendrons sp.</i>	
Sapotaceae	<i>Palaquium rostratum</i>	Nyatoh sidang
Dipterocarpaceae	<i>Dipteracarpus sp.</i>	Keruing buluh
Symplocaceae	<i>Symplocos sp.</i>	
Euphorbiaceae	<i>Glochidion superbum</i>	
Loganiaceae		
Oleaceae		
Celastraceae	<i>Lophopetalum sp.</i>	
Euhorbiaceae	<i>Macaranga henni</i>	
Euphorbiaceae	<i>Macaranga cornifera</i>	
Ulmaceae	<i>Trema angustifolia</i>	
Bombaceae	<i>Durio sp.</i>	
Verbenaceae	<i>Callicarpa sp.</i>	
Ulmaceae	<i>Gironniera sp.</i>	Hampas tebu
Euphorbiaceae	<i>Macaranga sp.</i>	
Euphorbiaceae	<i>Aporusa sp.</i>	
Ulmaceae	<i>Trema sp.</i>	

APPENDIX F

Reagents used in Metabolizable Energy (ME) determination

- * Buffer solution (NaHCO_3 and NH_4HCO_3)
- * Macromineral solution
- * Micromineral solution
- * Reduction solution
- * Resazurine solution

APPENDIX G

Preparation of reagents for Thin Layer Chromatography (TLC)

1 - 10 % vanilin in concentrated H_2SO_4

Concentrated sulphuric acid and ethanol were mixed in the ration 2 : 1 (solution A). Vanilin powder (10 g) was then dissolved in 100 ml of solution A and stirred. The vanilin solution was prepared immediately before use.

2 - Dragendoff's reagent

Solution A : 1.7 g of bismuth nitrate in 100 ml water - acetic acid (80 : 10)

Solution B : 4.0 g of potassium iodide in 70 ml distilled water

Solution C : 20 ml of acetic acid in 70 ml distilled water

* Dragendoff's solution was made by adding 5 ml of Solution A and 5 ml of Solution B were added to Solution C before use.

APPENDIX H

The analysis of varians (ANOVA) on PA for *Sapium baccatum*

Sample : *Sapium baccatum*

Source		F-value								
	df	DM	CP	CF	EE	ASH	NFE	NDF	ADF	ADL
Model	3	190.20**	5.11*	580.73**	56.41	2.33 ^m	85.32**	1.79 ^m	8.22**	2.66 ^m
Error	8									
Total	11									

	DM	CP	CF	EE	ASH	NFE	NDF	ADF	ADL
Mean :	31.58	21.18	18.13	4.71	5.22	51.10	27.81	17.00	8.20
S. E. :	2.12	0.73	3.17	0.51	0.14	2.97	1.07	1.19	0.35
C. V. :	23.27	11.90	60.52	37.67	9.13	20.12	13.39	24.21	14.88

ERRATA

1. For Table in page 15, 46, 47, 53, 55, 59, 60, 62, 64, 68, 72 and 96; the title for each Table should be on top of the table.
2. The title for Figure 5.1 (page 56) and Figure 5.3 (page 70) should be written below the Figure.