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Canberra, Australia

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Chemical Composition and *In Vitro* Rumen Fermentation Kinetics of Selected Tropical Forages from Mauritius

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Smallholder dairy farmers in Mauritius generally collect fodder to give to their animals, which are reared in a cut and carry system. Tree and browse species are an important component of ruminant diets and are rich in most essential nutrients, particularly proteins and minerals. Although they are important sources of forage throughout the year for smallholder farms, little information is available on their nutritional value. The objective of this study was to investigate the chemical composition and *in vitro* rumen fermentation kinetics of some tropical forages from Mauritius.

Samples of eight tropical forages, including two grasses and six shrub and bush plant species, were collected. The plant species sampled were herbefatak (*Panicum maximum*), sugar cane tops (*Saccharum officinarum*), bois d'oiseaux gros feuilles (*Litsea monopetala*), bois d'oiseaux ti feuilles (*Litsea glutinosa*), lilas (*Melia azedarach*), poivre marron (*Schinus terebenthifolius*), bois noir (*Albizia lebbeck*) and Leucaena (*Leucaena leucocephala*).The samples were analyzed to determine their chemical composition (organic matter (OM), crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF) and lignin contents; Association of Official Analytical Chemists 1999; Van Soest *et al* 1991). Batch cultures of mixed rumen micro-organisms were used to determine the *in vitro* degradability and volatile fatty acid (VFA) production after 24 h of incubation and gas production kinetic parameters of forages.Samples of 400 mg dry matter (DM) of each forage were accurately weighed into 120-mL serum bottles and incubated with 40 mL of buffered rumen fluid from cattle. Gas production was measured at regular intervals up to 120 h, and the data used to calculate parameters of gas production kinetics (France *et al* 2000): A (asymptotic gas production, mL/g), c (fractional rate of gas production, %/h) and average gas production rate (AGPR; mL gas/h).

Content of CP varied between 6.3 and 22.9 g/100 g DM for *S. officinarum* and *A. lebbeck*, respectively. All forages showed a NDF content above 50 g/100 g DM. Sugar cane tops presented the lowest protein and the highest NDF content, and there was a negative correlation (*P = 0.01*) between the CP and the NDF content of forages. Lignin contents were lowest for the two grasses and highest for *L. monopetala* and *S. terebenthifolius.*

Table 1. Chemical composition of eight forages from Mauritius (g/100 g DM), total VFA production (µmol), true *in vitro* DM degradability (TDMD; %) and gas production kinetics parameters (A, c, and AGPR) of forages from Mauritius incubated in batch cultures of rumen micro-organisms

	OM	CP	NDF	ADF	LIG	VFA	TDMD	A	c	AGPR
P. maximum	88.1	8.1	82.9	46.5	6.2	1460^{d}	39.2^{b}	76.4^{d}	0.027^{b}	1.52^{d}
S. officinarum	92.4	6.3	85.8	48.7	7.5	1478^{d}	34.9^{bc}	57.1^{f}	0.067^{ab}	3.30^{a}
L. monopetala	93.0	11.1	72.8	55.9	29.1	1491^{d}	24.7^{de}	51.9^{f}	0.078^{ab}	2.93^{ab}
L. glutinosa	93.5	11.6	62.8	40.9	13.1	1591^{c}	19.3^{e}	88.3^{c}	0.025^{b}	1.61^{cd}
M. azedarach	88.5	18.1	51.9	40.0	15.4	1901^{a}	45.2^{a}	112.6^{a}	0.026^{b}	2.12^{cd}
S. terebenthifolius	92.8	11.5	56.9	46.8	27.5	1509^{d}	29.8^{cd}	50.3^{f}	0.083^{ab}	2.99^{a}
A. lebbeck	92.5	22.9	56.1	34.8	11.9	1738^{b}	49.8^{a}	91.1^{c}	0.108^{a}	2.11^{cd}
L. leucocephala	92.0	21.8	52.6	37.1	15.8	1475^{d}	32.2^{c}	66.4^{e}	0.047^{ab}	2.29^{bc}
s.e.m.	-	-	-	-	-	23.2	1.88	2.66	0.0245	0.236

a, b, c, d, e, f: within a column, means without a common superscript letter differ (P<0.05)

Type of forage had a significant effect (*P < 0.001*) on all parameters of gas production. *A. lebbeck* presented the quickest and *L. glutinosa* the slowest gas production rate, whereas *M. Azedarach* and *A. Lebbeck* had the greatest (*P < 0.05*) values of TDMD and VFA production. Knowledge of nutritive value of these potential ingredients would allow formulating balanced diets for cattle feeding in Mauritius.

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