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“Development on the margin”

Rumen Degradation Characteristics and Tannin Biological Effects of Brazilian Tanniniferous Tropical Plants Based on *in vitro* Gas Production Technique.

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Abstract

Four tanniniferous tropical plants, Aroeira (*Astronion urundeuva*), Catingueira (*Caesalpinia bracteosa*), Jureminha (*Desmanthus virgatus*) and Leucaena (*Leucaena leucocephala*) collected from four sites of Brazilian Northeast during three seasons (August 2008, March 2009 and August 2009) (total 48 sample per plant) were evaluated individually for their ruminal methanogenic potential, degradability and tannin bioactivity based on 24h *in vitro* semi-automatic system for gas production (GP) (2 inoculum per sample plant). Lucerne (*Medicago sativa*) hay was used as control. The plants showed crude protein content of 143, 119, 169 and 212 g kg⁻¹ DM for Aroeira, Catingueira, Jureminha and Leucaena, respectively. Methane (CH₄) parameters were calculated based on the truly degraded organic matter (TDOM), tannin bioassay was calculated as % increase in GP in the presence of polyethylene glycol (PEG addition). All data were statistically corrected for season effect (dew point as covariate). The results indicated that the experimental plants decreased ($p < 0.0001$) the GP and CH₄ compared to the control. Aroeira showed the least CH₄ and TDOM either with or without PEG addition and showed the highest values for the % increase in GP and CH₄ production therefore Aroeira presented the highest value for the methane inhibition potential (48.12%) compared with the control; probably due to its high tannin content (22.6 g condensed tannins per kg DM) whereas both Leucaena and Catingueira reduced ($p < 0.0001$) the CH₄ by 26.2 and 25.2% without adverse effect on the TDOM as compared to the control. It could be concluded that these plants are potentially promising to reduce the methane production in the rumen and to overcome nutrients limitation in these tropical regions.

Keywords: Degradation and tannin bioassay, gas production, methane, native pasture, polyethylene glycol