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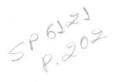
The use of *Tithonia diversifolia* (Hemsl.) Gray as forage to contribute to reduction on the enteric methane emission

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The aim of this study was to evaluate the potential of Tithonia diversifolia to mitigate greenhouse gases originated from enteric fermentation in the rumen. The experiment was conducted in the city of São João del-Rei (Latitude: 21 ° 05 '11 "S, Longitude: 044 ° 13' 33" W and altitude of 950 m), Minas Gerais state, Brazil. This region belongs to the transition zone of the Cerrado - Atlantic Forest, and it is classified as tropical of altitude. The material was obtained from eight locations where the plants T. diversifolia occur naturally. The material which presented higher yield (69,101.8 kg DM ha⁻¹) was statistically selected. Evaluations were conducted using plants of T. diversifolia collected at two developmental stages (booting and preflowering) polled with five levels of inclusion of *Brachiaria brizantha* (0, 25, 50, 75 and 100%). The material was submitted to chemical analysis (crude protein - CP, neutral detergent fiber -NDF, acid detergent fiber - ADF and hemicellulose) and was subsequently fermented using the in vitro gas production technique to quantify methane and volatile fatty acids (VFA) at six and 12h of incubation. The experimental design was a completely randomized and comparison of means was done using the SNK test (Student Newman Keuls) with a significance level of 5%. T. diversifolia collected during the booting stage showed higher CP content (166.1 g kg-1 DM) compared to the period of pre-flowering (117.2 g kg-1 DM). B. Brizantha, used as control treatment, showed high CP content (126.6 g kg-1 DM). This is due to the fact that material was obtained from a rotational grazing system with application of high doses of nitrogen. In contrast to T. diversifolia cultivated in unfavorable soil conditions (acidic pH and low levels of P and Ca), as was the case of plants collected for this experiment, showed equal levels of CP (preflowering) or higher (booting) to that observed for B. Brizantha. There was no influence of the stage of development of T. diversifolia on NDF (446.5 - 450.1 g kg⁻¹ DM) and hemicellulose (63.1 - 63.8 g kg⁻¹ DM). However, these values were lower compared to *B. Brizantha* which showed higher NDF content of 6436 g kg⁻¹ DM and hemicellulose 286.3 g kg⁻¹ DM. There were no significant differences between the levels of the FDA of T. diversifolia (386.3 to 383.5 g kg⁻¹ DM) collected at different stages of development or between T. diversifolia and B. Brizantha (357.9 g kg⁻¹ DM). The VFA production, for both incubation time (six and 12 hours), the acetate concentrations were not different. However, it was verified higher concentrations of propionate in the treatments of 50% of T. diversifolia. The acetate: propionate ratio was not different; however there was a trend of reduction in the treatments including 50% of T. diversifolia. The same patron was observed for the methane production. The congruence between acetate: propionate ratio and methane production level indicates that the inclusion of 50% of T. Diversifolia was able to provide adequate VFA profile and a consequently reduction in the enteric methane. T. diversifolia due to your high nutritive value preserved during long period is a strategically important for forage management. However, according to the growing age, it was verified a reduction on the CP level. The inclusion of T. diversifolia with B. Brizantha (50%), demonstrated the potential of this forage for reduction on the enteric methane production for ruminants.

Keywords: Tithonia diversifolia, methane, rumen, VFA.

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