Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Applying *in vitro* Gas Production Technique to Assess the Nutritive Value of *Gmelina arborea* Leaves

Oluwanike Abiola-Olagunju[1], Victor Akinwande[2], Adejoke Mako[2], Aderonke Mosuro[1], Haleemat Ayanwale[1]

[1] *Lead City University, Dept. of Microbiology, Nigeria*
[2] *Tai Solarin University of Education, Agricultural Science, Nigeria*

Abstract

In vitro gas fermentation method was used to evaluate the nutritive value of different forms of *Gmelina arborea* leaves. Two experiments were conducted. Experiment 1 involved the determination of chemical composition of green, yellow and brown leaves. In experiment 2 , the nutritive value of green, yellow and brown leaves of *Gmelina arborea* was assessed by *in vitro* gas production technique for total gas production over a period of 24 hr and to predict organic matter digestibility (OMD), metabolisable energy (ME) and short chain fatty acid (SCFA). Methane volume (CH_4) was measures after incubation at 24 hr. The *in vitro* gas production (IVGP) characteristics (insoluble degradable fraction (b), potential degradability (a+b), rate of degradation (c) and effective degradation (ED)) were also predicted.

Results revealed that the chemical composition of green, yellow and brown leaves varied significantly ($p < 0.05$). Dry matter ranged from 80.15 to 91.24 % in green and brown leaf respectively. Same trend was observed for neutral detergent fibre, it ranged from 60.92 to 63.77 %. The crude protein ranged from 24.84 to 26.44 % in brown and green leaves respectively. The IVGP, ME, SCFA and methane production were not significant ($p > 0.05$), except OMD. Same trend was observed for all the *in vitro* gas fermentation parameters with the green leaf recording the highest value, while the lowest values were obtained in the brown leaf. They ranged between 3.75 and 4.25 ml/200 mg DM; 3.27 and 3.49 MJ kg^{-1} DM; 0.10 and 0.94 μmol; 1.5 and 3.0 ml/200 mg DM in brown and green leaf respectively. OMD ranged significantly from 41.57 to 45.05 % in yellow and green leaf respectively. The a, b, a+b, c and ED also did not vary significantly.

It can be concluded that *Gmeilna arborea* leaf has potential in ruminant nutrition and any of the forms can serve as fodder in the tropics.

Keywords: chemical composition, *Gmelina arborea* leaves, *in vitro* gas production, nutritive value

Contact Address: Oluwanike Abiola-Olagunju, Lead City University, Dept. of Microbiology, Toll Gate Area, Ibadan, Nigeria, e-mail: nikkymakky07@yahoo.com