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The effect of polyethylene glycol on in vitro digestibility of tanniferous browses by goat microbial consortia**Fon Fabian Nde and Msimango Nokwethemba Nqobile Philile**
University of Zululand, South Africa

Tannin content in browse species exerts a significant negative effect on ruminant feed intake and digestion. Polyethylene glycol 4000 (PEG 4000) can help to alleviate the adverse effects of tannin rich feed on ruminant nutrition. This study evaluated the effect of PEG 4000 on goat microbial consortia in vitro degradability of tanniferous feeds. Microbial consortia were created by mixing fecal inoculum from goat, impala, giraffe and kudu as follows; N1 (goat+impala, 1:1), N2 (goat+kudu, 1:1), N3 (goat+giraffe+kudu, 1:1:1) and N4 (goat+giraffe+kudu+impala, 1:1:1:1). For microbial consortia cellulase and hemicellulase activities, crude protein enzyme extracts (CPZ) were precipitated from fresh fecal inocula by 60% ammonium sulfate and assayed for hemicellulase, endocellulase and exocellulase activities by incubating with xylan, carboxymethyl cellulose and crystalline cellulose containing 100 µL of 10% condense tannin and 50 µL of 5% (PEG 4000) respectively. In vitro degradability was carried out by transferring 33 ml of fecal consortia inoculum into 67 ml salivary buffer containing 1 g of *Acacia sieberiana*, 10% tannin and 5% PEG4000 before incubating for 72 hours at 38 °C. Apparent degradability (APD), true degradability (TD), neutral detergent fiber degradability (NDFdeg), acid detergent fiber degradability (ADFdeg), cellulose digestibility (CELLdeg), hemicellulose degradability (HEMdeg) and microbial yield (MY) were measured. An increase ($P < 0.05$) in enzyme activities was observed with the addition of PEG. The highest ($P < 0.05$) endocellulase, hemicellulase and exocellulase activities influenced by PEG were observed in N1 followed by N4. The results showed that PEG generally increased ($P < 0.05$) in vitro degradability of *Acacia sieberiana*. Microbial consortium N1 showed the highest increment in degradability when PEG was added for TD, NDFdeg, ADFdeg and CELLdeg. The second highest for the same parameters was observed in N2, followed by N4 while the lowest was observed in N3. For HEMdeg PEG effect was not significant ($P > 0.05$) among ecosystems but were classified as N3, N2, N4 and N1 based on the relative increment observed. Improvement in fiber and *Acacia sieberiana* digestibility after inclusion of PEG clearly emphasized the negative effect of tannins on browses. Therefore, there is a need for constantly researching on novel technologies that will decrease its effect and improve energy harnessing from tanniferous browsed species by domestic browsers.

Biography

Fon Fabian Nde is a PhD in Ruminant Nutrition, graduated from the University of KwaZulu-Natal, South Africa and currently working as a Lecturer at the University of Zululand after serving as a Post-Doctorate Researcher at UNIZULU and UZ. He is a Member of the South African Society of Animal Science, Golden Key International Honor Society and EAAP. His research focuses on improving forage digestion in ruminants especially with potential fibrolytic microbes from wild herbivores.

FonF@unizulu.ac.za
fabiannde@yahoo.co.uk**Notes:**