The impact of extraction methods on chemical composition and phytochemical constituents of common browse plants and selected tree species

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Abstract

This study investigated the effects of different extraction process on chemical composition, in-vitro and methane gas production of selected browse plants and tree species (Albizzia lebbeck, Enterolobium cyplocarpum, Millettia grifoniana, Moringa oleifera and Pterocarpus santalinoides) which were collected from the vicinity of Federal University of Agriculture, Abeokuta (FUNAAB), Ogun State, Nigeria during late dry season. Samples collected were air-dried for 14 days after which they were milled, ground and packaged for further analysis. Phytochemical constituents, In vitro gas production, fibre fractions and crude protein content were assessed using standard procedures. Data collected were subjected to ANOVA using SAS. Results revealed that Millettia grifoniana recorded the lowest gas production value while Moringa oleifera produced the highest value throughout 72 hours of incubation. Albizzia lebbeck had highest DM (891.7 g/kg) while Moringa oleifera had highest CP (161.7 g/kg), ash (81.7 g/kg) and EE (165.6 g/kg) contents. Diethyl-extracted Pterocarpus santalinoides had highest NDF (680.0 g/kg) and hemicellulose content (360.0 g/kg) while water-extracted Pterocarpus santalinoides had highest ADF (5520.0 g/kg) and cellulose content (366.7 g/kg). Highest ($p<0.05$) tannin contents were observed in Diethyl-extracted Albizzia lebbeck (0.08%) and Millettia grifoniana (0.08%) while water-extracted Moringa oleifera produced highest phenols. It was concluded that Moringa oleifera proves to be the best due to its high in vitro gas production, reduced methane production, high protein content and reduced fibre fraction. Furthermore, all plants investigated, except Pterocarpus santalinoides, can serve as supplement in ruminants feeding.

Keywords: Browse plants, Gas production, Albizia, Anti-nutrients, Fibre fractions

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Target audience: Animal scientists; animal nutritionists; livestock farmers