

POLYPHENOLIC COMPOUNDS IN COMMON TREE FODDERS AND ITS EFFECT ON NUTRIENT UTILIZATION

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Tannin in forage plants plays an important role in ruminant nutrition. They cause both beneficial and detrimental effects in intake, digestibility and nutrient utilization. Plant tannins are of many kinds and their effect depends on the type and the quantity ingested. Therefore, proper understanding and finding methods to mitigate them becomes very important.

The objective of this study was to identify and quantify the tannin types present in tree forages and its effects on nutrient utilization. The tree fodder species used were *Acacia mangium*, *Artocarpus heterophyllus*, *Bahunia recemosa*, *Calliandra calothyrsus*, *Ceiba petendra*, *Enterolobium saman*, *Erythrina verigeta*, *Flemingia macrophylla*, *Gliricidia sepium*, *Pterocarpus indica* and *Tithonia diversifolia*. Follin – Ciocalteu assay, Rhodanin assay, Protein precipitable phenol assay, Filter paper assay, Butanol / HCl assay and Radial diffusion assay were used as extraction and analytical techniques. A metabolism trial was conducted to estimate the intake, digestibility and to evaluate the rumen parameters, using goats as the test animals.

Total phenols were high in *B. recemosa* and lowest in *T. Diversifolia* (26.2 vs 1.1%). Tannin was high in *B. recemosa* (20.3%), *A. mangium* (19.4) and lowest in *T. Diversifolia* (0.7%). Free Gallo Tannins, Bound Gallo Tannin, Tannic acids and Bovine Serum Albumin Bound Tannin is very negligible in all tree forage species tested. There was no difference in condensed tannins except for *A. heterophyllus*. These different tannin levels depict that these tree forage species can be successfully used as a ruminant feed with minimum interference to nutrient utilization.

The highest dry matter(DM) intake was observed with *T. diversifolia* (3.8 kg/100kg BW) and the lowest was with *B. recemosa* (1.8 kg/100kg BW). The mean intake of all tree forage tested was 2.8 kg/100kgBW). The highest dry matter and organic digestibilities were observed with *T. diversifolia* (62 and 50 g/100gDM, respectively). The lowest was with *F. macrophylla* (45 and 36 g/100g). With all tree forage the rumen pH was similar and normal (mean = 7.6). The rumen ammonia nitrogen with all forages were within the acceptable levels (mean 213 mg/l). This result suggests that these tree forage species can be successfully used in ruminant feeding, and better results can be obtained if fed as a mixture as a “cocktail feed”.

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