

The effects of associated pod quality on seed recovery and germination of *Dichrostachys cinerea* and *Acacia tortilis* fed ruminants

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Keywords: Associated diet quality, Germination percentage, Seed dispersal, Seed viability, Woody plant encroachment

Introduction

Pods of different plant species form an important part of the diet of livestock during the dry season due to their high nutritional value compared to grasses. Therefore, herbivores browsing pods of certain woody plants may disperse intact seeds that can potentially germinate. The quality of associated diet such as pod chemistry (*i.e.* protein and tannin concentration) is one of the most important determinants of success of livestock faecal seed dispersal (Tjelele *et al.*, 2012; Tjelele *et al.*, 2014). The objective of this study was to determine the effects of associated pods quality (*i.e.* nutrients and tannins composition of *Dichrostachys cinerea* and *Acacia tortilis* pods) on seed recovery and germination of *Dichrostachys cinerea* and *Acacia tortilis* fed to goats and sheep.

Materials and Methods

Seed recovery and germination: Goats and sheep were offered *D. cinerea* and *A. tortilis* pods at 2.5% of their body mass, pending germination trial. Germination potential was subjected to the following treatments: 1) *Dichrostachys cinerea* seeds recovered from goats and control (untreated *D. cinerea*), 2) *Acacia tortilis* seeds recovered from goats and control (untreated *A. tortilis*), 3) *D. cinerea* seeds recovered from sheep and control (untreated *D. cinerea* seeds), 4) *Acacia tortilis* seeds recovered from sheep and control (untreated *A. tortilis* seeds). Untreated seeds were used as control. Each treatment consisted of three replicates of 25 seeds per replicate.

Results and Discussion

Both animal species were offered *D. cinerea* and *A. tortilis* pods at 2.5% of their body mass. Seed recovery for *A. tortilis* (38.37 % \pm 1.79) was significantly higher than for *D. cinerea* (12.37 % \pm 1.02). There was no significant difference found between animal species ($P > 0.189$). There was no significant difference in germination found between the seeds that passed through the gut of animals ($P > 0.227$). *Acacia tortilis* and *D. cinerea* seeds that passed through the gut of goats and sheep had a significantly higher germination percentage than the seeds that had not passed through the gastrointestinal tract of animals.

Conclusion

The results suggest that passage through the gut and associated pod quality may facilitate seed dispersal and thereby germination of woody plant species.

References

- Tjelele, T. J., L. E. Dziba and H. T. Pule. 2012. Recovery and germination of *Dichrostachys cinerea* seeds fed to goats (*Capra hircus*). *Rangeland Ecology and Management* 65:105-108.
- Tjelele, T. J., D. Ward and L. Dziba. 2014. Diet quality modifies germination of *Dichrostachys cinerea* and *Acacia nilotica* seeds fed to ruminants. *Rangeland Ecology Management* 67:423-428.

Acknowledgement

The Agricultural Research Council (ARC) provided financial support for this project.