

Abstract

Context: Rangeland grasses native to Africa constitute the main diet for free-ranging livestock and wild herbivores. Leaf:stem ratio is a key characteristic used for assessing quality of forages. However, studies to determine the allocation of biomass to leaves and stems as well as chemical components and nutritive value, especially of grasses in African rangelands, are rare.

Aim: This study was conducted to establish biomass allocation and chemical and mineral components in leaf and stem fractions of three grasses, *Eragrostis superba*, *Enteropogon macrostachyus* and *Cenchrus ciliaris*, all indigenous to African rangelands.

Methods: Plant height, plant densities, plant tiller densities and biomass yields were estimated at the elongation stage, before inflorescence. Chemical and mineral components were determined from biomass harvested at the vegetative phase for all three grass species. Dry matter, ash content, organic matter, crude protein, neutral detergent fibre, acid detergent fibre, acid detergent lignin, and calcium, phosphorus and potassium contents were determined.

Key results: *Enteropogon macrostachyus* displayed significantly greater plant and tiller densities and plant height than the other two species. Leaf and stem biomass fractions varied significantly ($P < 0.05$) among grasses. Leaf:stem ratio of *E. superba* was double that of *E. macrostachyus* and *C. ciliaris*. Crude protein and organic matter yields and net energy for lactation were highest ($P < 0.05$) in *E. superba* leaf biomass, as was Ca content.

Conclusions: *Eragrostis superba* demonstrated greater potential as a forage species for ruminant animal production than *E. macrostachyus* and *C. ciliaris*.

Implications: *Eragrostis superba* is a key forage species that warrants promotion in pasture establishment programs in its native environments.