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The Role of Herbivores as Dung Seed Dispersing Agent for Encroaching Woody Species in Nech Sar National Park, Ethiopia

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Abstract

The Plains of Nech Sar National Park are a semi-arid savannah, and have been used for cattle grazing since 1960s. This has led to changes in the vegetation, which have been associated with overgrazing and is affecting biodiversity conservation and ecotourism development. To determine if endozoochory could be one explanation for changing vegetation, we investigated the seed dispersing role of herbivores in this ecosystem. We collected a total of 27.5 kg dry weight dung of cattle, goat, sheep, zebra, greater Kudu, lesser kudu and Grant's gazelle from the savannah plains; extracted seeds of *Dichrostachys cinerea*, *Acacia nilotica* and *Solanum incanum* and carried out seedling emergence tests between 2012 and 2014. We found 15926 seeds of which 95.4 % were undamaged. *S. incanum* accounted for 53.4 % of the undamaged seeds, followed by *D. cinerea* (25.7 %) and *A. nilotica* (20.9 %) with seed density of 339.6, 163.8 and 133.1 kg⁻¹ dung, respectively. We found large number of seeds in the dung of greater Kudu (42.2 %), Grant's gazelle (24.9 %) and lesser kudu (20.3 %), whereas small quantity from dung of cattle (1.4 %), zebra (5.3 %) and goat (6 %). However, seeds from dung of lesser kudu showed the highest germination success (14 %) followed by seeds from dung of cattle (11.1 %) and greater kudu (10 %). The germination success of seeds of *D. cinerea* from dung of lesser kudu, cattle and goat was 28.7 %, 19.7 % and 16 %, respectively. The overall germination success for seeds from the dung samples was 9.2 %, being 17.1 %, 6.5 % and 4 % for *D. cinerea*, *A. nilotica* and *S. incanum*, respectively whereas it was 6.4 % for seeds from control groups. Our results show that lesser kudu, cattle, greater kudu, Grant's gazelle and goat facilitated the dispersal of *D. cinerea* and *A. nilotica* but not *S. incanum*. This, leading to change in vegetation structure, may have negative impact on biodiversity conservation and ecotourism development in the region. Hence close monitoring to control expansion of the bush encroachment because of zoochory should be supported by large scale researches.

Keywords: Encroaching species, endozoochory, herbivore, Savannah plains of Nech Sar National Park, seed dispersal