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“Filling gaps and removing traps
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Do Transhumance and/or Vegetation Types Affect the Productivity of Natural Rangelands in Benin?

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Abstract

Transhumance is a way of life and a livestock rearing strategy that greatly contributes to animal production and the livelihood of pastoralists. Although, this production system contributes to livelihoods, it is increasingly being considered as a threat to rangelands. To evaluate this claim and derive recommendation for the sustainable use of rangelands, we investigated the effects of bovine transhumance and of vegetation types on the biomass production and species diversity of plant communities on natural rangelands in Benin. Three distinct agro-ecological zones (AEZ) were studied in north-east, centre and south Benin. Two zones of different intensity of transhumance (ST: strong and WT: weak animal frequentation) and three vegetation types (VT) per site (open forest/woodland savannah, wooded savannah/shrubland savannah and crop field mosaic) were considered. A four-month floristic survey of herbaceous plants was carried out in the three AEZ with a total of 130 phytosociological surveys including 90 surveys in ST and 40 in WT. Total species richness in north-east was 77 in ST compared to 44 herbs in WT. Likewise, in central Benin, 135 herbaceous species were identified in ST against 80 in WT, whereas in south a total of 33 herbaceous species were found in ST compared to 16 species in WT. In all AEZ, forbs dominated as compared to grasses. The diversity of herbaceous species was not significantly affected by transhumance ($p > 0.05$), but by VT and site, with significant interaction ($p < 0.05$). Despite the species richness observed in ST zone, the total plant biomass was neither affected by transhumance nor by vegetation type, but a site (AEZ) effect and a combination of AEZ, VT, and site was determined ($p < 0.05$).

The results reveal that AEZ and VT play a key role in species richness and biomass production, whereas plant diversity and biomass production were not per se affected by the intensity of grazing, most probably due to the combined effect of AEZ and VT. This suggests that pastoral transhumance alone has no direct effect on the floristic composition of the studied natural rangelands and is thus no major driving force of plant biodiversity loss across different AEZ of Benin.

Keywords: Benin, cattle, land degradation, pastoral mobility, plant biodiversity