

ORIGINAL ARTICLE

PHYTODIVERSITY, PRODUCTIVITY AND CARRYING CAPACITY OF HERBAGES PLANTS COMMUNITIES INVADDED BY *SIDA CORDIFOLIA* L.

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ABSTRACT

Rangelands are vast natural ecosystems composed of grasslands, shrubs, woody vegetation, and arid lands that support both wild and domestic grazing animals. They are vital for livestock production, wildlife conservation, and ecosystem services. However, livelihoods dependent on extensive livestock keeping are increasingly threatened by invasive species. These species disrupt grazing practices, reduce forage yield and quality, increase management costs, slow animal growth, lower meat, milk, wool, and hide quality, and may even poison livestock.

In Niger Republic, *Sida cordifolia* (Malvaceae) poses a major threat to rangeland biodiversity and productivity. Its spread reduces the presence of key forage grasses such as *Andropogon gayanus*, *Pennisetum pedicellatum*, *Alysicarpus ovalifolius*, and *Diheteropogon hagerupii*. To assess the impact, 126 phytosociological plots were established using the Braun-Blanquet method, with vegetation characterized by the Point-Intercept Method. Biomass productivity was measured in five subplots (1 m²) for each plot. The study recorded 114 herbaceous species across 25 families and 74 genera. Poaceae dominated (31 species, 27.43%), followed by Fabaceae (14 species, 12.39%) and Malvaceae (10 species, 9%). Fodder production ranged from 424.83 to 730.98 kg/ha. However, *Sida cordifolia* contributed disproportionately high biomass (246.97–392.6 kg/ha, 40.4–70.2% of total), reducing the productivity of palatable forage species. Consequently, carrying capacity and pastoral value were significantly lower compared to other studies.

The findings highlight that *Sida cordifolia* invasion decreases biomass productivity, pastoral value, and availability of nutritious forage species. Sustainable management requires introducing high-quality fodder species through reseeding and involving breeders in rangeland management to restore productivity and ensure livestock development in Niger Republic.

Keywords: *Sida cordifolia* L., Invasive plant, Phytosociology, herbaceous biomass, species diversity, Rangeland management.