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Specific diversity of *Vachellia tortilis* subsp. *raddiana* formations in Kilakam and N'Guel kolo in the Diffa region, Niger

Ismael Bio^{1*}, Abdourahimou Amadou Issoufou¹, Boubacar Moussa Mamoudou¹, Idrissa Soumana², Ali Mahamane^{1,3}

1. Faculty of Agronomic Sciences, University of Diffa, BP: 78 Diffa-Niger

2. Institut National de la Recherche Agronomique du Niger, BP: 429 Niamey-Niger

3. Faculty of Science and Technology, Abdou Moumouni University of Niamey, BP: 10662,

Corresponding author: ismaelbio2014@gmail.com

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ABSTRACT

Objective: The objective of the study was to analyse the ecological and floristic indicators of natural formations with *Vachellia tortilis* subsp. *raddiana*.

Methodology and Results: The present study was conducted in the departments of Maine-Soroa and Goudoumaria located in the Diffa region, in the extreme south-east of Niger. Phytosociological data were collected using the Braun-Blanquet sigmatiste method and the Daget and Poissonet quadrat point method. In total, 80 plots were delimited. The data collected are related to the coverage of plant species and environmental variables. The spectra of biological and phytogeographical types were calculated. Hierarchical Ascending Classification (HAC), Canonical Detrended Analysis (CDA) and Canonical Correspondence Analysis (CCA) were used to determine the plant groupings and their ecological and floristic characteristics. The results revealed a total species richness of 72 plant species divided into 34 families and 70 genera. The most represented families are Poaceae (18.06%), Fabaceae- Mimosoideae, and Convolvulaceae (8.33% each). Therophytes are the most represented biological type (50%). Paleotropical species is the dominant phytogeographic type (37.5%). The ascending hierarchical classification (CHA) and the Canonical Correspondence Analysis (CCA) allowed to discriminate three (3) plant groupings with *V. tortilis*. These are the *Vachellia tortilis* and *Dactyloctenium aegyptium* group (G1) and the *Vachellia tortilis* and *Cenchrus biflorus* group (G2) observed on the dune flats and slopes and the *Vachellia tortilis* and *Schoenefeldia gracilis* group (G3) in the lowlands. The analysis of structural parameters showed that the population of *V. tortilis* is characterized by an average density of 102.5±22.10 plants/ha with individuals having an average diameter of 14.68±8.22 cm, an average height of 5.24±1.49 m and an average cover of 25.58±16.47 m².

Conclusion and application of results: This study constitutes a reference state that can serve as a basis for sustainable management of the ecosystems in these areas, whose main uses are essentially pastoral.

Key words: *Vachellia tortilis*, Biological types, Phytogeographical types, Floristic diversity, Niger.