

Assessment of plant communities pattern and diversity along a land use gradient in W Biosphere Reserve, Benin Republic

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Abstract

Human disturbance on vegetation is an important concern in biodiversity conservation. In this study we assessed how anthropogenic disturbance affected plant communities pattern, diversity, life form and chorotype composition along a land use gradient. Vegetation relevés were performed along a land use gradient (park-buffer zone-communal land) at W Biosphere Reserve in Benin. Non-metric multidimensional scaling (NMS) was used to assess plant communities patterns. Indicator species were determined for each plant community and land use. Plant community diversity, life forms and chorotypes composition were assessed and compared among land uses using one-way analysis of variance. NMS ordination showed a good separation between relevés of the park and those from the communal land while relevés of buffer zone were mixed within the park and communal land relevés. There was no significant difference between species richness among land uses types ($F = 0.68$; $p = 0.529$, ANOVA test at a level of significance of 5%). The Pielou evenness for the plant communities was higher in the park ($E = 0.69 \pm 0.04$) and buffer zone ($E = 0.61 \pm 0.13$) than in the communal lands ($E = 0.44 \pm 0.02$) while Shannon index showed no clear pattern along land use gradient. Therophytes abundance was significantly higher in the communal land while hemicryptophytes abundance was significantly higher in the park. Wide-distributed species abundance was significantly higher in the communal land whilst Sudanian species showed significantly higher abundance in the park. We concluded that monitoring of the indicator species of the plant communities and their traits are relevant tools for managers to follow-up changes in plant communities.