

Background: Floodplain wetlands feature high plant biodiversity, comprising variability in several organisation levels and at different scales.

Aims: In a large river floodplain, we aimed to answer whether taxonomic, phylogenetic and functional β -diversity of herbaceous assemblages responded to hydrogeomorphic features conditioning the local flood pulse and/or to soil features; and to determine the relationship between β -diversity and geographic and environmental distances.

Methods: Taxonomic, phylogenetic and functional β -diversity indices were computed in 82 sites in the Lower Paraná River floodplain. Relationships between β -diversity and environment were explored by generalised linear models. Spatial structure was assessed by semi-variograms. Responses of partitions of β -diversity to geographic or environmental distances were tested through multiple regressions in distance matrices.

Results: Taxonomic and phylogenetic β -diversity showed a similar pattern in relation to environment, especially to hydrogeomorphic features. The regression model fitted to species richness had the highest explanatory power. Regarding functional β -diversity, only the number of plant functional types responded to environmental features. Partitions of β -diversity, particularly the replacement of functional strategies, were better explained by environmental than by geographic distances.

Conclusions: The diversity patterns of plant assemblages in a large river floodplain highlight the importance of heterogeneity conditioning the local effect of flood pulse regimes.