

ID: ECBC2021243

Primary Contact:

Ruan van Mazijk, Department of Biological Sciences, University of Cape Town
Cape Town, South Africa

All Authors:

Ruan van Mazijk, Department of Biological Sciences, University of Cape Town (**Primary Presenter**)

Michael Cramer, Department of Biological Sciences, University of Cape Town

George Anthony Verboom, Department of Biological Sciences, University of Cape Town

Title:

Environmental heterogeneity explains contrasting plant species richness between the South African Cape and southwestern Australia

Abstract:

Given the importance of environmental heterogeneity as a driver of species richness through its effects on species diversification and coexistence, we aimed to account for the dramatic difference in vascular plant species richness per unit area between two similar Mediterranean-type biodiversity hotspots (the Greater Cape Floristic Region (GCFR) and Southwest Australian Floristic Region (SWAFR)) and whether this difference is explained by differences in heterogeneity. Comparable, geospatially explicit environmental and species occurrence data were obtained for both regions and used to generate heterogeneity and richness raster layers. Heterogeneity in multiple environmental variables and richness per unit area were compared between the two regions at a range of spatial scales. At each scale, richness was also regressed against these individual axes and against a major axis of heterogeneity, derived by principal component analysis. The GCFR is generally more environmentally heterogeneous and species-rich than the SWAFR. Richness per unit area is significantly related to the major axis of heterogeneity (PC1) across both regions, the latter describing ca. 38-50% of overall heterogeneity, the slope of this relationship differing between the two regions only at the finest scale. Multivariate regressions and regressions against PC1 revealed variations in the dependence of richness on heterogeneity between the two regions. Notwithstanding some region-specific effects, we present evidence of a common positive relationship between richness and heterogeneity across the GCFR and SWAFR. This is dependent on spatial scale, being strongest at the coarsest level of sampling. The generally greater richness per unit area of the GCFR is thus explained by the former's generally greater environmental heterogeneity.

Preferred Presentation Type:

Talk

Country of presenting author:

South Africa

Gender identity:

male (pronouns: he/they)