

# **The intraspecific variation of plant species across environmental gradients on Marion Island**

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Functional traits are indicative of the function and performance of organisms in their environment. Thus, understanding how the environment affects functional trait variation is a crucial step towards predicting the impacts of changes on organisms and their functions. Intraspecific variation is often neglected when studying the response of functional traits to environmental gradients, despite the fact that in some cases intraspecific variation can even have larger explanatory value than interspecific variation. The aim of this investigation was to quantify the direction and extent of functional trait variation within species across environmental gradients and to identify which environmental predictors contribute most to the observed intraspecific variation and filtering of functional traits. Sub-Antarctic Marion Island offers a useful setting for investigating these questions as it is a species-poor system offering minimal biotic complexity, yet offers diverse habitats and climatic conditions that may regulate the functional distribution of species. The intraspecific variation in five functional traits of five indigenous and five invasive vascular plant species on Marion Island were measured. Several site-specific environmental variables such as altitude, vegetation type and substrate were recorded at each plant's position. Here we present what environmental factors are most instrumental in driving trait variation in indigenous and invasive plants, and we provide a view on how ecosystem changes due to climate change may impact the concerned species and their functions under a global change scenario.