

Linking ecosystem processes and soil microbial diversity in Rooibos and Honeybush

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The diverse fynbos biome of the Western Cape provides an ideal environment for the discovery of novel species, particularly those in the microbial kingdom. Despite this, little is known about the microbial diversity in this region. The fynbos is also an ideal system for investigating ecological questions, such as those regarding the interactions between plants and microbes. The high degree of endemism of the plant community despite the low nutrient status of the soils suggests that positive symbiotic interactions play a critical role in maintaining diversity. Disturbances in this ecosystem can have a profound effect on the species inhabiting the niche as well as the ecosystem services they drive. This project aims to use wild and cultivated Rooibos and Honeybush as model systems to investigate the influence of soil communities on ecosystem processes. These plants are ideal for such a study as little is known about their mycorrhizal associations, and their interactions with the soil communities. In addition, there are different morphotypes of Rooibos, and several species known as Honeybush, which show distinct spatial distribution patterns. This study aims to establish whether there are also distinct distribution patterns for the soil biotic communities (in the rhizosphere and above ground), amongst ecotypes of Rooibos and species of Honeybush, respectively. Lastly, these species play an important role in providing an income to rural industries in this area. The native range of Rooibos and Honeybush is well suited for the commercial cultivation of these plants. This encourages the conversion of large tracts of land into monoculture, which is currently a key threat to biodiversity in the Fynbos biome. The effects of commercial cultivation will be used to investigate the probable decrease in diversity of nematode and microbial species, with a subsequent disruption in ecosystem function over time; and the possible increased risk of attack by pathogens.