

Seasonal variation in the nitrogen nutrition and carbon assimilation in wild and cultivated *Aspalathus linearis* (rooibos tea)

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Abstract

The Fynbos Biome of southern Africa is a Mediterranean-climate ecosystem with highly infertile soil. It is home to the endemic leguminous shrub *Aspalathus linearis* (rooibos tea), which is both an invaluable wild resource and commercially cultivated plant. Wild rooibos has a narrow geographic range and is confined to mountain ranges of the Cederberg Region. Under projected climate change, warmer and more arid conditions may place additional pressure on these range-restricted plants to survive in an already resource-limited environment. To understand the adaptive strategies that may allow rooibos to persist in its habitat under future climate change, the present study evaluated changes in the photosynthetic activity and nutrient cycling of wild and cultivated *A. linearis*, at the temperature and rainfall extremes of summer and winter. Wild and cultivated rooibos tea had different methods of adapting to nitrogen (N) nutrition and carbon (C) assimilation during wet and dry seasons. In particular, the wild plants were better able to tolerate summer drought by increased water use efficiency and maintaining higher levels of biological N₂ fixation than was the cultivated tea.