

**Variation in rhizosphere nutrient cycling affects the source of nitrogen acquisition in wild and cultivated *Aspalathus linearis* (N.L.Burm.) R.Dahlgren plants**

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**ABSTRACT:**

We investigated the different functional strategies of N nutrition of cultivated and wild varieties of the legume *Aspalathus linearis* (N.L.Burm.) R.Dahlgren during wet and dry seasons in the Cape Floristic Region. The study addressed differences in soil and plant N cycling in cultivated and wild varieties of *A. linearis*. The seasonal variation in biological N<sub>2</sub> fixation (BNF), soil microbial activity, as well as N cycling strategies, were investigated in wild and cultivated varieties of the legume of *A. linearis*. Fresh leaf samples, leaf litter samples and soil samples were collected during dry and wet seasons for both cultivated and wild-growing *A. linearis*. Plant samples were analysed for  $\delta^{15}\text{N}$  and total N content. Percentage N resorption was calculated. Soil N, C, P, urease and  $\beta$ -glucosidase were determined directly at the rhizosphere and in bulk soil. During the wet seasons, wild plants had an increased reliance on biological N<sub>2</sub> fixation (BNF). This was attributed to an increase in soil microbial activity, which can lead to competition between roots and soil microbes for mineralized soil N. No trade-off between N sources in plants was found and plants tend not to rely more on BNF when microbial activity is low. Wild and cultivated *A. linearis* plants use different N cycling strategies, where wild plants are more reliant on biological N<sub>2</sub> fixation (BNF) whilst cultivated plants tend to retain N.