

Effects of Nitrogen, Phosphorus and Potassium Nutrition on Total Antioxidant Contents of Bush Tea (*Athrixia phylicoides* DC.) Leaves

By

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DECLARATION

I hereby declare without reservation that the data recorded herein were originated and compiled by myself and that the data have never been published at the University of Limpopo or elsewhere. Work by other authors that formed part of literature review has been duly acknowledged by the citation and reference list of authors.

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ABSTRACT

Bush tea (*Athrixia phyllicoides* DC) has been used for many years by the people of South Africa for medicinal purposes. The herbs was only harvested from the wild, therefore data on the effects of mineral nutrition on total antioxidant activity had not been established. The objective of this study was to determine the seasonal effect of nitrogen (N), phosphorus (P) and potassium (K) nutrition on total antioxidant activity (TAA) in cultivated bush tea leaves. Treatments consisted of 0, 100, 200, 300, 400 or 500 kg·ha⁻¹ N, P or K in a randomized complete block design with four replications under 50 % shade nets. Three (N, P and K) parallel trials were conducted per season (autumn, winter, spring and summer). TAA was determined using 2,2-diphenyl-1-picrylhydrazyl-hydrate (DPPH) method and analyzed in a spectrophotometer. Results of this study demonstrated that regardless of season, the application of N, P and K fertilizers increased quadratically levels of TAA in bush tea with most of the increase occurring between 0 and 300 N, 300 P and 200 K kg·ha⁻¹. Therefore, for improved total antioxidant content in bush tea leaves, 300 N, 300 P and 200 K kg·ha⁻¹ N are recommended.