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Variation in antioxidant activity and soluble sugars of Wild ginger *(Siphonochilus aethiopicus L.)* in response to water and nitrogen levels

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Tild ginger (Siphonochilus aethiopicus) is rhizomatous herb which belongs to the family Zingiberaceae. The plant is of great importance because the rhizomes and roots possess great medicinal benefits due to the presence of medicinally significant compound siphonochilone. It has been traditionally used for the treatment of coughs, colds, asthma, headaches, pain, inflammation and malaria. The leaves, rhizomes and roots of Wild ginger were screened for their total phenolic content (TPC), total flavonoid content (TFC), antioxidant activity and concentration of soluble sugars in response to irrigation regimes and nitrogen application rates. Common methods of FRAP, Folin-Ciocalteu colorimetric, aluminum chloride (AlCl₂) and high performance liquid chromatography (HPLC) were employed to determine the antioxidant, total phenolic content, total flavonoid content and soluble sugars respectively. The results showed that TPC for leaves varied from 13.92 mg/g GAE under severely stressed conditions with the application of 200N to 82.86 mg/g GAE with application of 100N. The leaves in general recorded much greater TPC content, followed by the roots and rhizomes. It was also found that the total flavonoids content of all plant parts had significant variation, ranging from a low 0.12 mg/g QE for rhizomes under severely stressed (70% ADL) with 0N application rate to 3.60 mg/g QE for leaves under moderately stressed treatments with 150N application amounts. Additionally the results clearly indicate that leaves had greater antioxidant activity than the rhizomes and roots. With soluble sugars however, the roots recorded increased sucrose content followed by fructose and glucose with rhizome and leaves showing the least. Taken together, potent TPC, TFC, antioxidant activity and soluble sugar concentration with the inclusion of cultivation practices could be used as knowledge for conservation purposes of the endangered medicinal species and applied to the industry as natural antioxidants.

Biography

Salmina N Mokgehle is a PhD candidate under the School of Agriculture, Earth and Environmental Sciences, University of KwaZulu-Natal working on Wild ginger (Zingiberaceae) species.

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