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Indigenous Salvia species - an investigation of the antimicrobial activity, antioxidant activity and chemical composition of leaf extracts

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ABSTRACT

The genus *Salvia*, commonly known as the sages is a member of the mint family (Lamiaceae). In Latin, ‘sage’ means "to save" and the Romans called it "sacred herb". Throughout history it has been used for depression, fever, respiratory infections, women's complaints, sleep inducer, diuretic, gargles and sick room use. The essential oil is reported to have anti-inflammatory, antimicrobial, antioxidant, antiseptic, antispasmodic, astringent, diuretic, antihypertensive and insecticidal properties. Of the 900 species recorded worldwide, 30 are indigenous to South Africa where they are used extensively in traditional healing.

The aerial parts of twelve samples were hydrodistilled and the essential oil analysed by GC-MS. The essential oil composition varied quantitatively and qualitatively within the different *Salvia* species analysed. Linalool was the only compound that was present in all the essential oils. β-caryophyllene and caryophyllene oxide were present in all essential oil with the exception of *S. stenophylla.*

The essential oil as well as methanol and acetone extracts were tested for antimicrobial activity on a number of bacteria and fungi. No species showed activity against *Cryptococcus neoformans, Candida albicans* nor *Alternaria alternata*. All test samples studied demonstrated variable degrees of antibacterial activity with the exception of four test samples; *S. disermas* (methanol and acetone) from the Walter Sisulu Botanical Garden; *S. disermas* (methanol) from Mossel Bay and *S. lanceolata* (methanol). Gram-positive organisms were more sensitive to the test samples than the Gram-negative organisms. In general, the extracts were far more active than the essential oils.

Thin layer chromatography indicated that all methanol extracts possess antioxidant activity. All methanol extracts contain the antioxidant compound, rosmarinic acid. It is evident that, in addition to rosmarinic acid, other polar and non-polar compounds are present in all *Salvia* species that also act as antioxidants.