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Bioactive constituents, antibacterial, antioxidant and cytotoxicity properties of the flower and leaves essential oils of *Bauhinia galpinii* (N.E. Br) grown in South Africa

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Statement of the Problem: Reactive oxygen species (ROS) and infectious diseases, particularly those due to multi-drug resistant bacterial strains are almost impossible to combat globally. Besides challenges posed by microbial resistance to synthetic antibiotics, these drugs are known to exhibit side effects. There is paucity of information of the composition and bioactivity of most indigenous plants such as *Bauhinia galpinii* claimed potent in folk medicine for management of diseases including diabetes, cancers, cardiovascular in Africa. This study aimed to investigate the bioactive compounds, in vitro antioxidant, antibacterial and cytotoxicity properties of *B. galpinii* essential oils (EOs).

Methodology & Theoretical Orientation: The EOs obtained using modified Clevenger apparatus were characterized by high resolution GC-MS, while the radicals scavenging and antibacterial effects were examined spectrophotometric, micro-dilution and haemolytic techniques respectively.

Findings: Phytol (25.61%), azulene (12.63%), and α -ionone (10.38%) were the dominant compounds found in the leaf EO (LEO), while α -guaiene (13.23%), α -ionone (5.81%) and azulene (11.46%) were the prominent compounds in the flower EO (FEO). The EOs exhibited strong antibacterial activity against five reference bacterial strains and one laboratory confirmed multi-drug resistant bacterial strain. The FEO exhibited more activity than LEO against the test bacteria with MIC value of 0.125-0.25 mg/mL and 0.20-0.35 mg/mL for the LEO. The IC₅₀ value for FEO (0.52 mg/mL) showed higher antiradical property than LEO (3.30 mg/mL) and the reference compounds in reducing lipid peroxy radical to neutral molecule. The FEO demonstrated some haemolytic activity at 0.850 mg/mL, while LEO showed no haemolytic effects on human red blood cells.

Conclusion & Significance: The study indicates that the EO has potent bioactive compounds, noteworthy antioxidant strength, significant antibacterial property and the EO could be used as natural medicine and food preservative upon further investigation.

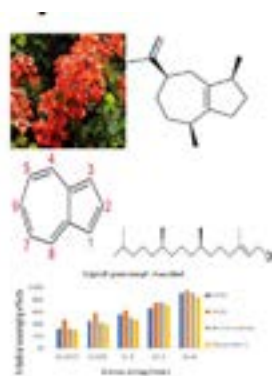


Figure 1: Major bioactive constituents of *Bauhinia galpinii*'s essential oil and antioxidant effects of the oils and reference compounds on lipid peroxide radicals.

Biography

S O Okoh is currently a Postdoctoral Research Fellow at the University of Fort Hare Alice, South Africa. His niche area is Phytochemistry and natural product chemist and he has explored different natural resources to produce various cosmetics and soap products including neem herbal antiseptic soap, cream, lotion and hand sanitizers. He has conducted ethno-botanical survey of over fifty medicinal plants used in management of infectious and degenerative diseases such as malaria, cancers, skin diseases, diabetes, cardiovascular, dementia, arteriosclerosis in major villages in Nigeria and eastern Cape South Africa. Prior to joining University of Fort Hare, he has acquired valuable teaching and research skills at University of Lagos and Nigerian foremost Research Institute – Federal Institute for Industrial Research Institute, Lagos.

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