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Phytochemical screening, GCxGC TOF-MS analysis of crude *Rhoicissus tomentosa* rhizome extract

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Globally, medicinal plants play a very significant role in health-promotion and the reduction of disease burden in our communities. Over 80,000 species of such plants and their secondary metabolites such as tannins, terpenoids, alkaloids, terpenes, phenolic compounds, glycosides and flavonoids have demonstrated excellent antimicrobial properties *in vitro*. Our main interest is on *Rhoicissus tomentosa* with high medicinal potentials whose phytochemistry has not been fully investigated. *Rhoicissus tomentosa* is a plant used in South African traditional medicine to treat ailments mainly related to fertility and reproduction and pains. Phytochemical screening of the rhizomes of *R. tomentosa* was investigated for the first time to ascertain their possible pharmaceutical potential. The results showed that the rhizomes of the plant contain alkaloids, flavonoids, saponins, steroids, reducing sugars and tannins. These phytochemicals have been discovered to have several biological activities. 2 Dimensional gas chromatography coupled to time of flight mass spectra (GCxGC TOF-MS) analysis of the crude extracts displayed the presence of over 100 known bioactive compounds. These compounds belong to different groups of compounds most of which are amino acids and fatty acids and its esters. These compounds are known and have been previously reported to have anti-abortifacient, analgesic, anti-inflammatory, antifungal and antibacterial properties. In general, this study gave some level of validity to the ethnobotanical uses of *R. tomentosa* with consideration to the known biological activities of the compounds identified therein. In the light of the increasing problem of antibiotic resistance to existing antibiotics, these bioactive compounds identified in this plant are to be isolated and tested for antimicrobial properties and other biological activities in anticipation for a possible drug lead for microbial infections and fertility treatment.

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Phytochemical analysis and antibacterial testing of *Crinum macowanii* bulbs

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Crinum macowanii Baker is a medicinal plant native to southern Africa. It is commonly known as the Cape coast lily. The chemical makeup of the plant was investigated by phytochemical analysis using chromatography techniques such as Thin Layer Chromatography (TLC), Gravity Column Chromatography (GCC) and 2D Gas Chromatography (GCxGC TOF-MS). Phytochemical screening of plant crude extract showed the presence of tannins, reducing sugars, flavonoids, steroids, alkaloids, saponins and cardiac glycosides. The results showed slight differences with a general trend that more phytochemicals were detected in autumn. The bulbs showed a strong result in the test for alkaloids, confirming that the plant is rich in this specific group of compounds. Antibacterial activity was noted for crude extracts against *Mycobacterium smegmatis*, *Bacillus cereus* and *Staphylococcus epidermidis* at a concentration of 1 mg/mL. In the disc diffusion experiments *C. macowanii* showed the highest antibacterial activity against *Bacillus subtilis* with a 12.67 mm zone of inhibition. The plant crude extract displayed no activity against *Klebsiella pneumoniae*, *Proteus mirabilis* and *Proteus vulgaris* for both disc diffusion and MIC, which are all Gram-negative bacteria. The only Gram-negative species that showed susceptibility to the bulb extract was *Pseudomonas aeruginosa*. From the GCxGC TOF-MS results, a number of compounds were detected such as oleic acid, 9,19-cycloergost-24(28)-en-3-ol, 4,14-dimethyl-,acetate (3á, 4à, 5à)-, trisphaeridine, dihydronormorphinone, xanthosine, flexinine and α -sitosterol. These compounds have been reported to have biological applications such as anti-inflammatory, anti-microbial, anti-tumor, anti-proliferative, antidiabetic, analgesic and lactation properties. These results imply that the active compounds found in bulbs are pharmaceutically useful for the production of drugs and this provides a basis for the justification of the traditional medicinal uses of the plant against the treatment of itchy rashes, boils, acne, backache and venereal disease.

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