

**ACTIVITY- DIRECTED PHYTOCHEMICAL INVESTIGATION OF *SPATHODEA*
CAMPANULATA (P. BEAUV)**

BY

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ABSTRACT

This study investigated the crude extracts of the leaf, stem bark and flower of *Spathodea campanulata* for antitrichomonal, antimicrobial, molluscicidal and radical scavenging activities and the chemical composition of the polar fractions of the plant. The constituents with antioxidant property were isolated and characterized with a view to validating the ethno-medicinal uses of the plant.

The plant parts were separately extracted with methanol and screened for these biological activities using standard protocol. The extracts were respectively subjected to medium pressure liquid chromatographic procedures using normal and reverse phase techniques with the stable free radical 1,1-diphenyl-2-picrylhydrazyl radical (DPPH) bioautography for monitoring to isolate pure compounds. The pure compounds obtained were characterized using spectroscopic methods including NMR, evaluated for biological properties and their EC₅₀ values determined.

The results showed that there were marked differences in the TLC profiles of the fresh, oven-dried and air-dried plant extracts. This indicated loss of components during drying, hence fresh materials were studied. Two iridoids: Ajugol and Verminoside were isolated from the fresh stem bark. Four compounds: Verminoside, Kaempferol diglucoside, Phytol and Caffeic acid were isolated from the fresh leaf. The fresh flower gave two iridoids, Verminoside and Specioside. Caffeic acid demonstrated immediate reaction in the DPPH bioautography model consistent with its known anti-oxidant property. Verminoside demonstrated a very strong antioxidant property in the DPPH spectrophotometric assay. It gave an EC₅₀ value of 2.04 µg/ml. Kaempferol diglucoside and Specioside had EC₅₀ values of 8.86 µg/ml and 17.43 µg/ml respectively in comparison with ascorbic acid (the positive control) which gave an EC₅₀ value of 2.18 µg/ml. None of the compounds showed any antimicrobial property in the antimicrobial bioautographic test against type organisms of *Bacillus subtilis* and *Escherichia coli*. All the compounds exhibited moderate antitrichomonal activity against the local strain of *Trichomonas gallinae*. The minimum lethal concentrations (MLC)

of the compounds after 48 hr exposure were: Verminoside (250 µg/ml), Kaempferol diglucoside (1000 µg/ml), Caffeic acid (500 µg/ml), while the standard drug Metronidazole was the most active (3.91 µg/ml). In the molluscicidal test, the leaf extract had an MLC of 1000 µg/ml while Verminoside showed only a weak activity of 20% mortality at 100 µg/ml. The other compounds were non- active against the tested snails *Biomphalaria glabrata*.

In conclusion, this study established a wide distribution of verminoside in the various parts of the plant which shows a strong antioxidant property. In combination with other antioxidant compounds such as Specioside, Kaempferol diglucoside and Caffeic acid isolated, they act to confirm the use of the plant in overcoming oxidative stress in users of the traditional plant preparation. The presence of Verminoside and Specioside in various parts of the plant was also significant in rationalising the traditional use of the plant in amoebic dysentery as both compounds were only recently reported to be potent anti-amoebic agents.