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Phytochemical screening and antibacterial investigations of crude methanol extracts of *Senna didymobotrya* (Fresen.) H. S. Irwin & Barneby

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ABSTRACT

Objective: Senna didymobotrya (African senna, African wild sensitive plant, peanut butter cassia, peanut butter tree, popcorn cassia, popcorn senna or wild senna) is native to East Africa and is widely used as a medicinal plant among many communities in Kenya. The objective of this research was to evaluate the presence of phytochemicals present in the different plant parts and their antibacterial activity.

Methodology and results: Leaves, flowers, stem bark, immature pods and root barks were collected from Siaya, Nandi and Nakuru Counties. These were dried and ground. Methanolic crude extracts were in cooperated in nutrient media at 2.5 %, 5 %, 7.5 % and 10 %. Test organisms *Staphylococcus aureus* and *Escherichia coli* were inoculated on impregnated media, incubated and observed for colony development. Observation on growth of cultures was made at an interval of 2 days for 8 days. The area under disease progress stairs (AUDPS) was calculated using the derived colony surface areas. Results indicated that all plant parts contained terpenoids, phenols and steroids. The presence of alkaloids and flavonoids varied with the location the plant was collected and the plant part. Growth of *S. aureus* cultures grown on media impregnated with 2.5% root bark extract and that with 7.5% stem bark extract were completely inhibited (no growth). Media with 10% flower, pods and leaves extract had average reduction of colony sizes from AUDPS 10102 (control) to AUDPS 2475. Growth of *E. coli* was completely inhibited on media impregnated with 5% root bark extract and 7.5% stem bark extracts. At 10% concentration, the flowers, pods and leaves extract did not result in complete inhibition of colony growth.

Conclusions and applications: The present research suggests that *S. didymobotrya* extracts possessed antibacterial activity against bacterial pathogens thus supporting their folkloric usage, promising a future scope for its use against microbial populations. Methanolic extracts possessing high antibacterial effects should be further investigated for their therapeutic utility. This would be related to the presence of bioactive metabolites, which are soluble in methanol. There is need to explore further the quantities of

phytochemicals in the root and stem barks that make them more potent than the other plant parts. The structures of the bioactive metabolites should be examined in future.

Key words: Antibacterial activity, Methanolic extract, *Senna didymobotrya, Escherichia coli, Staphylococcus aureus*