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Determination of Antimicrobial, Cytotoxic and Antioxidant Activity in Extracts of *Hemidesmus indicus* (L.) R. Br.

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Abstract

There is a growing interest in use of natural antioxidants instead of synthetic antioxidants due to its versatile health benefits. *Hemidesmus indicus* (L.) R. Br. is one of the most commonly used medicinal plants in traditional medicine due to its phytochemicals. The present study was conducted to evaluate antimicrobial, cytotoxic and antioxidant activities in 85% ethanol and hot water extracts of root and leaves of *H. indicus*. Total phenolic content, total flavonoid content and radical scavenging activity of both crude extracts were determined using Folin-Ciocalteu method, Aluminium chloride method and 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay respectively. Anti-microbial properties of crude extracts were studied against *Escherichia coli* and *Staphylococcus aureus* using agar disk diffusion method. The cytotoxicity level of crude extracts against *E. coli* and *S. aureus* was evaluated using 3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. Ethanol extracts of both root and leaves of *H. indicus* exhibited a higher phytochemical content than hot water extracts. Between ethanol extracts, *H. indicus* roots showed higher total phenolic content and total flavonoid content than *H. indicus* leaves, which were 309.0 ± 2.6 mg gallic acid equivalent (GAE) per 100 g of dry weight of sample and 34.4 ± 0.2 mg rutin equivalent (RT) per 100 g of dry weight of sample respectively. The highest radical scavenging activity was detected in *H. indicus* roots with IC_{50} at 0.26 mg/ml. The disk diffusion assay revealed an antimicrobial activity only for ethanol extracts, where *H. indicus* leaves showed a significant activity only against *S. aureus*. Moreover, ethanol extracts of *H. indicus* roots showed a significant cytotoxic activity against *E. coli* with the IC_{50} value of 4.4 ± 0.2 mg/ml. This study revealed antimicrobial, cytotoxic and antioxidant properties of crude extracts of *H. indicus* exhibiting a new hope for a natural source of antioxidants and antimicrobial compounds for food and pharmaceutical industries.

Keywords: *Hemidesmus indicus* (L.) R. Br., Antioxidants, Cytotoxicity