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**Antioxidant, Cytotoxic and Antibacterial Activities of Methanol Extracts from *Smilax zeylanica* L. Root and Rhizome**

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**Abstract**

Root and rhizomes of *Smilax zeylanica* (Family: Similaceae; Kabarossa in Sinhala; Kumarika in English) is widely used as a traditional remedy to manage cancer. Yet, its ethnomedical usage is not scientifically proven. Present study aimed to evaluate the antioxidant, cytotoxic and antibacterial activities of root and rhizome (RR) of *S. zeylanica*. Dried RR was refluxed with methanol and the phytochemical screening was conducted using standard methods and was confirmed by thin layer chromatography. Total phenols and flavonoids were quantified with Gallic acid and Quercetin as respective standards. Antioxidant activity was evaluated using 2,2-diphenyl-1-picrylhydrazyl free radical scavenging assay, while cytotoxic activity was tested (n=50) with Brine shrimp lethality assay. Antibacterial activity against two gram-positive (*Bacillus subtilis* and *Streptococcus aureus*) and two gram-negative (*Escherichia coli* and *Proteus* sp.) bacteria conducted using disk diffusion method. Phytochemical screening revealed the presence of unsaturated sterols, terpenes, saponins, flavonoids, proanthocyanidines, anthraquinones, tannins, and polyphenols. The free radical scavenging potential of the extract increased with increasing concentration in a linear fashion. Further, the extract found to be a strong free radical scavenger (IC<sub>50</sub>: 6.53±0.02 µg/ml) compared to the standard ascorbic acid (IC<sub>50</sub>: 2.59±0.02 µg/ml). Cytotoxic effect of *S. zeylanica* showed a significant difference with the standard Potassium dichromate (p<0.05). The IC<sub>50</sub> value exhibited by the extract was 90±2.8 µg/ml compared to the standard (32 µg/ml). The extract did not exhibit any antibacterial activity against the tested bacterial strains. The present study confirms ethnomedical use of RR of *S. zeylanica* against cancer. It is suggested that the active compounds of methanol extraction of RR of *S. zeylanica* play a role to inhibit free radical activity and kill *Artemiasalina nauplii*. The substances can be considered as potential antioxidant and cytotoxic agents as well as imminent candidate for cancer therapy. Further investigations on chemical composition and possible isolation of active ingredients are required.

**Keywords:** *Smilax zeylanica*, Methanol extract, Antioxidant activity, Cytotoxicity, Antibacterial activity