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Study on 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity in relation to the phenolic and gallic acid content in four medicinal plants used for cancer therapy in Sri Lanka

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Antioxidants have an important role in preventing a variety of diseases including cancer. It has been shown that phenolic substances present in plants have major contribution for their antioxidant activity. The objective of this study was to investigate, the antioxidant activity in relation to the polyphenolic and gallic acid contents in four traditional medicinal plants used by traditional medical practitioners in Sri Lanka for cancer therapy.

The total phenolic content present in water extract of *Smilax glabra* (Cheena Ala; root), *Bombax ceiba* (ela imbul; gum)*, Anacyclus pyrethrum* (Akkarapatta; root) and *Hemidesmus indicus* (Iramusu; root) was determined by Folin-Ciocalteu method. Caffeine and gallic acid were quantified by high performance liquids chromatography (HPLC). Total free radical scavenging activity of each ingredient was investigated by 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging method and the values were compared with phenolic and gallic acid present in each plant.

The polyphenol content of *Bombax ceiba*, *Anacyllus pyrethrum*, *Hemidesmus indicus* and *Smilax glabra*, were 32.57 ± 5.04 %, 30.98 ± 2.97 14.52 ± 1.13 and 19.43 ± 2.89 % w/w gallic acid equivalents respectively. Detectable levels of gallic acid were present only in *Bombax ceiba* (1.46 mg g^{-1}) and *Smilax glabra,* (0.94 mg g^{-1}). The EC_{50} values for DPPH radical scavenging activity for *Bombax ceiba*, *Anacyllus pyrethrum Hemidesmus indicus* and *Smilax glabra* were 15.47±1.80, 15.01±0.82, 46.78±16.03 and 35.67±0.64 µg cm^{-3}. The mean values of EC_{50} (y) for DPPH radical scavenging activity were correlated with total phenolics (x) present in plant extracts ($y = -35.417x + 1428$; $R^2 = 0.9887$), for all plant ingredients used in this study.

The above findings suggest that phenolic substances present in the four plants, contribute to their free radical scavenging activity in the presence or absence of endogenous gallic acid.

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