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Phytochemical Analysis and Anti–Oxidant Activity of *Plumbago Indica* L. Root Bark

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Abstract

Root and root bark of *Plumbago indica* (family: Plumbaginaceae, common name: Rath nithul/nitol in Sinhala) is used in traditional medicine in treating numerous ailments including rheumatism, bronchitis and cancers. The previous work has focused mainly on *P. zeylanica* and therefore limited scientific literature is available on *P. indica* species. As a preliminary study, phytochemical constituents of the powdered root bark (RB) extracted with four different solvents (chloroform, n-hexane, methanol and aqueous) were examined according to standard methods. Furthermore the extracts rich with numerous phytochemicals; aqueous and methanol were subjected to further investigations. Therefore, the methanol RB extract was subjected to gas chromatography/mass spectrometry (GC/MS) analysis (Gas Chromatograph: Agilent-7890/ Mass Spectrometer: Agilent-5975; Capillary column-HP-5MS (30x0.25 mm); Oven temperature:50° C for 5 min, raised from 50 to 250° C at a rate of 2 °C/min; NIST 08 library Database).Anti-oxidant activity in both aqueous and methanol RB extracts was tested using diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay. Phytochemical screening of the aqueous RB extract revealed the presence of saponins, tannins, phenols and anthraquinones. Chloroform extract only had anthraquinones, unsaturated sterols and triterpenes. Similarly the methanol extract gave positive results for tannins, phenols, anthraquinones, unsaturated sterols and triterpenes while the hexane extract revealed the presence of anthraquinones, unsaturated sterols and triterpenes. GC/MS analysis confirmed the presence of fatty acids (Hexadecanoic acid methyl ester and 9-Octadecenoic acid methyl ester) as major constituents. Both extracts produced dose dependent antioxidant activity for the tested concentration series (31.25, 62.5, 125, 250, 500, and 1000 µg/ml). The IC_{50} values for aqueous and methanol extractions were 186.92±1.76 µg/ml and 458.01±1.57 µg/ml respectively and the positive control (ascorbic acid) was 146.07±1.09 µg/ml. According to the results, the aqueous RB extract showed high potential towards anti-oxidant activity than the methanol RB extract. Therefore, isolating and identifying the therapeutic potential of the active compounds would make a significant value to the economy of Sri Lanka.

Keywords: *Plumbago indica*, Phytochemical screening, GC/MS analysis, Antioxidant activity

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