

## ABSTRACT

*Punica granatum L. var. nana* is a dwarf variety of *Punica granatum* popularly planted as an ornamental plant in gardens. This study was aimed at determining the potential of the methanolic extract of this plant leaves as source of botanical nematicides, fungicides, antioxidant and hepatoprotective agent alongside the isolation and structure elucidation of the biologically active metabolites responsible for the antioxidant activity.

The methanolic extract exhibited free radical scavenging activity against DPPH radicals ( $IC_{50}=25.97\mu\text{g/ml}^{-1}$ ). Activity guided separation resulted in isolation of three active compounds namely; Cyanidin 3,5-diglucoside ( $IC_{50}=5.2\mu\text{g/ml}^{-1}$ ), Galloyl glucoside ( $IC_{50}=4.1\mu\text{g/ml}^{-1}$ ) and 2-methyl-pyran-4-one-3-*O*- $\beta$ -D-glucopyranoside ( $IC_{50}=5.5\mu\text{g/ml}^{-1}$ ).

The methanolic extract exhibited hepatoprotective effects against  $\text{CCl}_4$  induced hepatotoxicity in rats and the effects were both preventive and curative. The histopathological studies support the protective effects by restoring the normal tissue architecture.

The methanolic extract exhibited nematicidal against the three root-knot nematodes species; *M. incognita*, *R. reniformis* and *P. penetrans* and fungicidal activity against the three phytopathogenic fungi; *F. oxysporum*, *R. solani* and *S. rolfsii* which causes root rot diseases. The efficacy of this extract was increased with increasing concentration.

This extract was found to be safe using experimental albino rats suggesting that it may be utilized as a potential source of some beneficial bioactive compounds.

**Key words:** *Punica granatum L. var. nana* – *Lythraceae* – Secondary metabolites – Phenolic compounds – Anthocyanins – Antioxidant activity – Hepatoprotective activity – Nematicidal activity – Fungicidal activity – Rats.