

PHYTOCHEMICAL SCREENING AND BIOACTIVITY EVALUATION OF METHANOL BARK EXTRACT OF *Garcinia quaesita*

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Plant-based pharmaceuticals are progressively replacing synthetic treatments due to their fewer adverse effects and improved biocompatibility. Initial investigations revealed that hexane and methanol extracts of *Garcinia quaesita* bark exhibited notable bioactive properties. Garcinol was recognised as the active compound in the hexane extract. This study aimed to identify the phytochemicals responsible for unexpected and unreported bioactivity of the bark methanol extract. The air-dried and ground bark pieces were sequentially extracted with hexane, ethyl acetate, and methanol. The extracts were evaluated for their anti-obesity, antidiabetic, and antioxidant properties using pancreatic lipase, α -amylase, and 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assays, respectively. Ascorbic acid (IC_{50} 7.30 \pm 0.28 mg L⁻¹), acarbose (IC_{50} 11.021 \pm 0.232 mg L⁻¹) and orlistat (IC_{50} 9.869 \pm 0.686 mg L⁻¹) served as positive controls for DPPH, α -amylase, and pancreatic lipase assays, respectively. When compared to positive controls, the methanol extract showed strong antioxidant and antidiabetic activities with IC_{50} values of 9.43 \pm 0.14 mg L⁻¹ for DPPH and 43.65 \pm 2.23 mg L⁻¹ for α -amylase inhibition and exhibited low anti-obesity activity of 357.14 \pm 8.48 mg L⁻¹. The presence of tannins (black precipitate with FeCl₃ and light-yellow precipitate with Pb(CH₃COO)₂, steroids (dark blue colour with Liberman-Burchard test), and saponins (formation of stable emulsion with olive oil) was detected in the methanol extract. The presence of tannins in the methanol extract was supported by the high total phenolic content of 337.80 \pm 21.01 mg GAE g⁻¹. The alkaline ethanol precipitation method was used to extract tannins, yielding brown-coloured tannin salt that tested positive with FeCl₃ and Pb(CH₃COO)₂ tests. This tannin fraction exhibited significant antidiabetic and antioxidant properties, with IC_{50} values of 60.30 \pm 1.58 mg L⁻¹ and 18.41 \pm 0.31 mg L⁻¹ for each, respectively, but low anti-obesity activity (IC_{50} 186.51 \pm 11.60 mg L⁻¹). The non-tannin fraction showed low antidiabetic (IC_{50} 214.76 \pm 5.91 mg L⁻¹), anti-obesity (IC_{50} 117.92 \pm 0.70 mg L⁻¹) and antioxidant (IC_{50} 252.46 \pm 2.65 mg L⁻¹) properties. According to the quantification, tannins accounted for 94.29% of the total mass of methanol extract. These results conclude that the primary contributors to the observed bioactivities of *Garcinia quaesita* bark methanol extract are tannins. Further studies are required to isolate and characterise individual tannin compounds responsible for bioactivity.

Keywords: Antidiabetic, Antioxidant, Bioactivity, *Garcinia quaesita*, Tannins