

OP 09**Bioactivity-guided Isolation of the Antidiabetic Compound Fucosterol from the Leaves of *Coccinia grandis* (L.)**

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Background: *Coccinia grandis* (L.) Voigt (Family: Curcubitaceae) leaves are known to be a promising source for the isolation of antidiabetic compounds. Previous studies confirmed that the ethyl acetate extract of *C. grandis* leaves exerted potent α -amylase, α -glucosidase, and DPP-IV enzymes inhibitory activities *in-vitro*.

Objectives: To isolate and elucidate the structure/s of antidiabetic compound/s from the ethyl acetate leaf extract of *C. grandis* following the bioactivity-guided principle.

Methods: The ethyl acetate leaf extract of *C. grandis* was fractionated by vacuum liquid chromatography (VLC). The resultant sub-fraction with the highest antidiabetic activity was further fractionated subsequently in a stepwise manner using flash chromatography and thin-layer chromatography until a pure compound was isolated. Antidiabetic activity was determined in resulting fractions/sub-fractions and in the isolated compound using α -amylase, α -glucosidase, and DPP-IV enzyme inhibitory assays. The structure of the isolated compound was elucidated using ¹H and ¹³C Nuclear Magnetic Resonance (NMR) data and confirmed using FT-IR spectroscopy. Physical appearance and melting point of the compound were noted.

Results: The ethyl acetate extract of *C. grandis* yielded four VLC sub-fractions; EA₁, EA₂, EA₃, and EA₄. The EA₄ was the most active sub-fraction which showed the highest inhibitory enzyme activities of α -amylase, α -glucosidase, and DPP-IV as IC₅₀ 7.13 (\pm 0.36), 0.40 (\pm 0.02) mg mL⁻¹, and 28 (\pm 2) μ g mL⁻¹, respectively. The subsequent isolation steps on EA₄ yielded a pure pale-yellow compound with a melting point of 134-136°C. On the basis of the spectroscopic data, the pure compound was identified as fucosterol. α -Amylase, α -glucosidase, and DPP-IV inhibitory activities of fucosterol were determined to be IC₅₀ 0.77 (\pm 0.01), 0.03 (\pm 0.00) mg mL⁻¹, and 52.0 (\pm 4.0) μ g mL⁻¹, respectively. α -Glucosidase inhibitory activities of EA₄ and fucosterol were significantly higher than that of acarbose (p <0.05). This is the first report on isolation of fucosterol from *C. grandis* leaves.

Conclusions: The compound, fucosterol was isolated from the leaves of *C. grandis* for the first time and it exerted α -amylase, α -glucosidase, and DPP-IV inhibitory potential *in-vitro*, indicating its potency to act as an antidiabetic agent.

Keywords: Antidiabetic compound, Bioactivity-guided principle, *Coccinia grandis*, Fucosterol

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