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ANTIDIABETIC AND ANTIOBESITIY POTENTIALS OF EXTRACTS OF SPENT COFFEE GROUNDS (SCGs) WASTE

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ABSTRACT

ANTIDIABETIC AND ANTIOBESITY POTENTIALS OF EXTRACT OF SPENT COFFEE GROUNDS (SCGs) WASTE

Diabetes and obesity are major global public health problems worldwide that are associated with severe complications and ever rising costs of health care. This study addressed the urgent need for safer, naturally and useful, alternative drugs in view of the common adverse effects of synthetic drugs in current use. To exploit waste valorization strategy for environmental sustainability, commercially available spent coffee grounds (SCGs) waste was evaluated for the possible antidiabetic and antiobesity activities. Extraction was performed using a microwave-assisted extraction (MAE) technique with a 70:30 ethanol-water (v/v) mixture as the solvent. Total phenolic content (TPC) was estimated using Folin-Ciocalteu method. Inhibitory activities of pancreatic lipase and α-amylase were determined by in vitro enzyme assays. The highest extract yield was 6.5% at sample-to-solvent ratio of 1:40 and the maximum TPC was 977 mg GAE/g extract at 30 ppm concentration, from the results. Meanwhile, in vitro enzyme inhibition assays were performed to assess α-amylase and pancreatic lipase inhibitory activities. The IC_{50} values for SCGs extracts were 344.78 µg/mL for α-amylase compared to 325.58 µg/mL for the standard drug (acarbose) and the IC_{50} for pancreatic lipase was 466.14 µg/mL. Finally, the current work underlines that discarded coffee grounds can be used as a source of bioactive chemicals to develop functional food ingredients or nutraceuticals, indicating them as a prospective, natural and sustainable source of bioactive chemicals with moderate bioactivity against diabetes and obesity as evaluated in enzyme assays in vitro.