Inhibition of Salivary ALPHA-Amylase by a Bistorta major (S. F. Gray) Extract as a Therapeutic Strategy for the Treatment of Diabetes Mellitus

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Diabetes mellitus (DM) is a very common disease affecting millions of people worldwide. In light of its widespread prevalence, researchers are looking for therapeutic targets they can influence in order to improve the patient's condition. Salivary a-amylase (SAA) plays an important role in carbohydrate metabolism, as it breaks down polysaccharides into oligosaccharides, that can get further hydrolyzed and absorbed into the bloodstream, which leads to postprandial hyperglycemia. Acarbose, a a-glucosidase inhibitor (AGI), though effective, often causes undesirable gastrointestinal side effects. This is why it is of great importance for researchers to identify natural alternatives. This project investigates the potential of Bistorta major (S. F. Gray) rhizome hydroalcoholic extracts as natural SAA inhibitors. Hydroalcoholic extracts of B. major rhizomes demonstrated significant inhibitory activity against SAA, with an IC50 value of 148 µg/mL, suggesting moderate inhibition that balances efficacy and safety. For the development of this project we got delivered medicinal plants, determined moisture content in fresh herbs, prepared aqueous and hydroalcoholic herbal extracts, performed partial phytochemical characterization of the obtained extracts, determined in vitro inhibitory activity of the extracts on human SAA and finally we performed a LC-ESI-MS/MS analysis of phenolic compounds. Further research, including in vivo studies and structural docking analysis, is recommended to elucidate the molecular interactions and optimize the therapeutic potential of B. major extracts. This research underscores the importance of exploring traditional medicinal plants for developing novel antidiabetic therapies.

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