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HYDROETHANOLIC LEAF EXTRACTS OF *SALVIA OFFICINALIS* AS POTENTIAL A-GLUCOSIDASE INHIBITORS

Background. Type 2 diabetes mellitus is one of the most common metabolic diseases, characterized by chronic hyperglycemia and numerous associated complications. One approach to controlling postprandial hyperglycemia is the inhibition of α -glucosidase. Given the potential side effects of synthetic α -glucosidase inhibitors, particularly acarbose, there is a pressing need to identify natural sources of bioactive compounds with similar activity. *Salvia officinalis* is rich in bioactive compounds and is a promising natural source for treating metabolic disorders associated with diabetes mellitus. **Aim.** To evaluate the inhibitory effects of hydroethanolic extracts obtained from the leaves of *S. officinalis* on α -glucosidase activity in vitro. **Methods.** The effects of 50% and 70% hydroethanolic extracts of *S. officinalis* on α -glucosidase activity were evaluated as described in [1]. To compare the inhibitory potency of the crude extracts, α -glucosidase inhibition was assessed at three extract concentrations corresponding to total polyphenol contents of 50, 100, and 200 μg GAE/mL. Acarbose was used as a reference inhibitor. For kinetic analysis, α -glucosidase activity was measured at varying concentrations of pNPG (0–3 mM) in the absence or presence of acarbose or *S. officinalis* extracts at their respective IC_{50} values. The mode of inhibition was evaluated using Lineweaver-Burk plots [2]. **Results.** A high potential of biologically active compounds present in 50% and 70% extracts of *S. officinalis* to inhibit α -glucosidase activity in vitro has been confirmed. Both extracts effectively inhibited the enzyme, with the 70% extract demonstrating stronger inhibitory activity (IC_{50} of 56.8 $\mu\text{g}/\text{mL}$) than the 50% extract (IC_{50} of 168.0 $\mu\text{g}/\text{mL}$). The higher inhibitory activity of the 70% extract may be attributed to its higher polyphenol content (287.7 ± 2.3 μg GAE/mL), which was 1.7-fold higher than that of the 50% extract (168 ± 1.9 μg GAE/mL). The inhibitory effects of both extracts were markedly stronger than those of the positive control, acarbose (IC_{50} of 6.0 mg/mL). It was found that, the 70% extract of *S. officinalis* exhibited a mixed mode of α -glucosidase inhibition. **Conclusions.** The results indicate the potential of *S. officinalis* leaves as a source of bioactive compounds for the development of herbal medicinal products and functional foods to prevent and correct metabolic disorders associated with hyperglycemia.

Keywords: Diabetes mellitus, *Salvia officinalis* extracts, α -glucosidase.

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