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(57) Abstract :
The present invention describes an efficient and innovative therapeutic approach to address the challenges of glycemic control and disease management. Recognizing their potential as promising antidiabetic agents, the focus was on establishing a concise and reliable synthetic pathway. The successful synthesis of the target compounds was achieved and confirmed through spectral characterization including FTIR, NMR, and mass spectrometry, which confirmed their structural integrity and composition. In vitro evaluation of the synthesized derivatives revealed notable activity, with compound (6c) exhibiting significant α-amylase inhibitory activity, reflected by an IC50 value of 21.05 ± 0.17 µg/mL. This promising activity underscores the potential of this novel class of quinoline derivatives as lead compounds. These results provide a strong basis for the advancement of novel therapeutic approaches. The development of quinoline-based alpha-amylase inhibitors holds significant potential for next-generation antidiabetic drugs by offering enhanced specificity and efficacy. Future research should focus on optimizing quinoline derivatives for improved bioavailability, reduced side effects, and long-term safety. These advancements could pave the way for more effective and patient-friendly treatments for diabetes management.

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