

Progress Seminar

Seminar Title	: Effect of gastrointestinal motility on starch digestion supplemented with dietary polyphenol as an antidiabetic agent for diabetes management
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Venue	: BM-140, Seminar Hall (BM)
Date and Time	: 28 Jul 2025 (3:30 pm)
Abstract	<p>: According to the recent statistics of 2021, diabetes has become more prevalent among the urban population, with more than 400 million people across the globe suffering from the disease and more than 100 million from the Indian subcontinent. Two major reasons are attributed to insulin resistance and high postprandial blood glucose levels. Existing medications have side effects that may further deteriorate the health. There is a necessity for developing natural medications for controlling plasma glucose levels. Sometimes, patients are susceptible to the rapid rate of digestion (in vivo) of starch, leading to a sharp increase in postprandial blood glucose level, which may further lead to the development of diabetes. Despite numerous studies involving in vitro starch digestion, the details of the kinetics of multienzyme hydrolysis in in vivo conditions remain a mystery. The current study explores starch digestion under in vivo conditions and further estimates the plasma glucose. Since antidiabetic agents such as polyphenols obtained from plant-based sources have shown inhibitory effects on the key enzymes for starch digestion, the kinetics of polyphenols' inhibitory action may be a better solution for patient management. Using a mathematical model, we have performed preliminary studies on the rate kinetics of the formation of these metabolites and the competitive inhibition of the enzymes by the polyphenols. The results of the kinetic assay are analyzed graphically and interpreted. Comparing the control and inhibition kinetic graphs, we can deduce that polyphenols, when in higher concentration, bind strongly to the enzymes in a competitive inhibition manner and thus reduce the rate of reaction drastically. This comparative analysis will provide valuable insights into the potential mechanisms by which polyphenols may modulate the kinetics of starch digestion. These findings may contribute to developing dietary strategies for managing postprandial glucose response and improving metabolic health in controlling diabetes.</p> <p>Keywords &ndash Diabetes, Starch digestion, Kinetic models, Polyphenols, Inhibition studies</p>