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Analysis of edible fruits against glycolytic enzymes and glycation: *In vitro* approaches with *in silico* validation

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Diabetes is the most quotidian endocrine disorder and one of the fastest growing non-communicable diseases around the globe.Commonly consumed six fruits were investigated to determine their therapeutic potential to inhibitoxidation, key glycolytic enzymes and glycation activity which has relevance in the management of hyperglycemia and type II diabetes. The *in vitro* analysis revealed that amla fruit showed maximum total phenols and total antioxidant capacity among all the six fruits. Amla fruit exhibited potent inhibition for both alpha amylase and alpha glucosidase enzyme activity than the positive control acarbose. The IC_{50} value of alpha amylase inhibition and alpha glucosidase inhibition in amla was found to be high among all the fruits. Further, amla fruit phenolic compound (gallic acid) confirmed better *in silico* enzyme inhibitory action with alpha glucosidase with a binding energy of -6.21kcal/mol than alpha amylase. In antiglycation activity amla and mango fruits showed potent inhibition. Pearson correlation results showed a strong correlation ($p \leq 0.01$) between total phenol with flavonoids, total antioxidant capacity and antiglycation activities.The results obtained in this study showed that amla and mango had potent potential for the management of hyperglycemia, diabetes and the related condition of oxidative stress. Hence, these fruits can be prescribed to treat diabetes in safest way by incorporating them in natural medications.

Key Words : Fruits, Alpha amylase, Alpha glucosidase, Antiglycation, Antioxidant, *In silico*

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