

Amylase inhibition activity and essence preparation by *Pandanus amurillifolus*

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1. Aim of Project

Herbal medicines are extensively used in treatment of *diabetes mellitus* throughout the world. In last decades more than 800 plants are reported for antidiabetic activity. Spices are common dietary adjunct that contribute to taste and flavor of foods. To study their mechanism, mode of action is also a major goal. Most of plant cultivation is restricted only to certain regions. So it's important to prepare food remedies so medicinal plants can daily used in different regions.

In view of increasing number of diabetes in the world over and drawbacks of current available therapies, there is strong need to develop safe, cheap and better therapies. It is very essential to combine the traditional knowledge with current modern medical understanding of disease and research into the precise mechanism of plant components.

Pandanus amurillifolus(PA) is commonly known as *Annapurna* or pulav patti in konkan region. It is famous in many Indian regions as Poor man's basmati as it gives a typical smell of basmati. It is wild plant mostly cultivate as ornamental plant.

2. Procedural

2.1 All chemicals used were analytical grade. Pancreatic amylase was purchased from Himedia.

2.2 The annapurna leaves collected from the Dist. Ratnagiri, Maharashtra state, India and identified from botany department.

2.3 Extraction method : The α -amylase inhibiting action was studied in the methanol extract of the dried powdered leaves. 5 g dried leaves extracted in 100 ml methanol for 2 days. After that extracted solvent weighed and evaporated the remaining residue is dissolved in Dimethyl sulphoxide (DMSO) and used for further investigation.

2.4 Inhibition study of alpha amylase-
0.4 mg/ml of α -amylase was incubated with different extracts at 37°C for 2 min. Optimum pH was maintained for maximum activity of enzyme by adding Sodium phosphate buffer of pH 6.6. 1% starch was used as substrate. Whole reaction mixture was incubated for 10 min at

37°C and reaction was stopped by the addition of strong alkali (1ml 2M NaOH). The α -amylase without any extract used as control. Amount of reducing sugars formed are estimated by the DNSA method.

Assays were performed in quadruplicate. The inhibitory activity was calculated by using following formula.

$$\% \text{ Inhibition} = \frac{\text{Absorbance of Control} - \text{Absorbance of Test}}{\text{Absorbance of Control}} \times 100$$

2.5 Temperature effect

In boiling water bath, extract of fraction having highest inhibition action on α -amylase activity was placed for time interval (20min.). After cooling enzyme assay performed to detect effect on the inhibitory activity of the component.

2.6 Kinetic Studies

For kinetic studies, different concentrations of 1% starch were incubated with α -amylase in the presence and absence of the inhibitory component (12 μ g/ml). The amount of reducing sugar formed was determined. Data obtained was used to plot the Michael- Mentens Plot to identify the nature of the inhibition.

2.7 essence preparation

0.12 mg of plant extract was diluted in 20ml of distill water which contain 1% vinegar.

3. Inferences

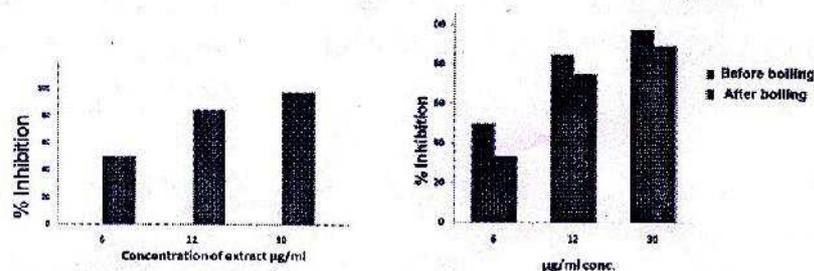


Fig. 1 Percentage inhibition of α -amylase.

Fig 2 Effect of temperature on enzyme activity

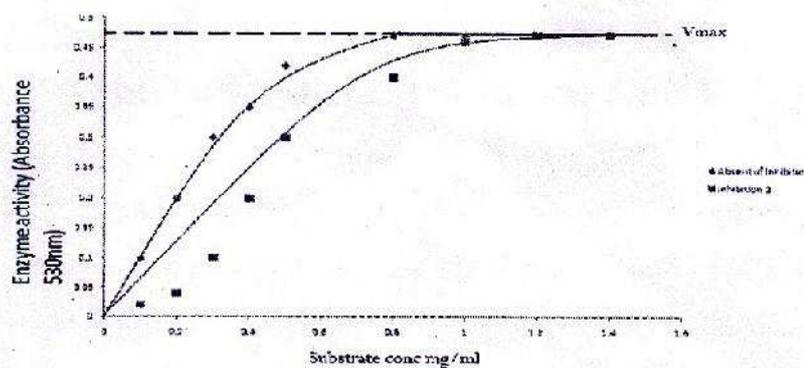


Fig. 3 kinetic studies using MM plot

4. Conclusion

In present study it is found that PA shows maximum inhibition at 30 $\mu\text{g/ml}$ 97.33%. Due to temperature effect 89% activity is sustained. It is also reported that its antioxidant activity sustain. It reflects that both aroma and inhibitory activity sustain at higher temperature. Rice is favorite food in Indian population. Rapidly digested and absorbed dietary carbohydrates result in a sharp increase in postprandial glucose. The STOP-NIDDM Trial has shown that amylase treatment in subjects with impaired glucose tolerance is associated with a significant risk reduction in the development of diabetes, hypertension and cardiovascular complications. Dietitians strictly prohibited eating rice to diabetic and obese patients in diet management. The amylase inhibitor responsible for slow digestion of carbohydrates. As normal blood glucose and satiety feeling for prolong time are important aspect for weight and glucose management. It is Well said that 'let food be thy medicine and medicine be thy food.' *Pandanus amaryllifolius* essence showed no microbial contamination its aroma and amylase inhibitor property sustained even after three months. So the major problem with old rice and unpolished rice is smell. Addition of this essence beneficial to give aroma and slow digestion property.

References

- Abesundra K., Mastsui, Matsumoto K.[2004],alpha glucosidase inhibitory activity of cassia auriculata in rats. Journal of agriculture & food chemistry [52:2541:2545].
- Ahmed, Iakhani M.S., Gillet [2001]. Effect of antidiabetic Monordica charantia [karela] fruit extract in streptococcus induced diabetic rats. Diabetes research & clinical practice 51[3]:155-161.
- Nor F.M., Mohamed S.Idris N, Ismail R. [2008]. Antioxidative properties of *Pandanus amaryllifolius* leaf extracts in accelerated oxidation and deep frying studies. Food Chemistry110[2]319-327