

# PARTIAL PURIFICATION OF $\alpha$ - AMYLASE INHIBITOR FROM *Syzygium cumini* LEAVES

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Pancreatic  $\alpha$ -amylase and the brush border enzyme glucosidase are essential to break down starch into sugar molecules, in the intestine. Activity of these enzymes is interrelated with post prandial blood glucose level and insulin action.

Inhibition of  $\alpha$ -amylase and  $\alpha$ -glucosidase is useful to reduce post prandial blood glucose level in order to control diabetes and obesity. Therefore finding a new  $\alpha$ -amylase inhibitory drug with minimum side effects is very important with modern lifestyle and eating habits.

Among the medicinal plants in Sri Lanka, *S. cumini* is well known for its medicinal properties. Its seed, bark and leaf are used for anti-diabetic therapy. *C. speciosus* leaf and *M. charantia* fruit and seeds are also known for their antidiabetic effects.

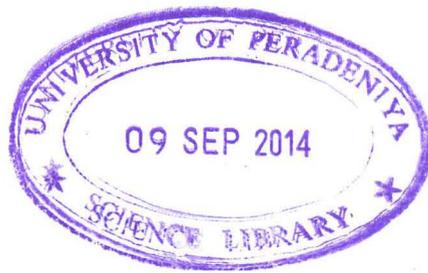
Objectives of the study were to measure amylase inhibitory activity and glucosidase inhibitory activity of *S. cumini* leaf, *C. speciosus* leaf and *M. charantia* fruit and to partially purify amylase inhibitor/s from *S. cumini* leaves and to analyze the phytochemicals present in the active fractions.

Plants were identified and voucher samples were deposited at the Herbarium, Royal Botanical Gardens, Peradeniya. Crude methanol extracts were prepared using *S. cumini* leaf, *C. speciosus* leaf and *M. charantia* fruit.

Inhibitory activity of  $\alpha$ -amylase of the three crude methanol extracts and solvent fractions was analyzed using porcine pancreatic  $\alpha$ -amylase and potato starch.

Very high  $\alpha$ -amylase inhibitory activity (93.66%) was observed in crude methanol extract of *S. cumini* leaf at 1 mg ml<sup>-1</sup>. Inhibitory activities found in crude methanol extracts of *C. speciosus* leaf and *M. charantia* fruit were 13.5% and 8.8% respectively.

Crude methanol extracts of *S. cumini* leaf, *C. speciosus* leaf and *M. charantia* fruit had shown 97.6%, 64.26% and 80.08%  $\alpha$ -glucosidase inhibitory activity respectively.



Mean percentages of amylase inhibitory activities found in hexane, methanol fraction (1), methanol fraction (2), ethyl acetate and water fractions of *S. cumini* leaf were, 11.14%, 92.7%, 97.25%, 36.58% and 93.8% respectively at 1 mg ml<sup>-1</sup>.

IC<sub>50</sub> values for amylase inhibitory activity of crude extract, hexane fraction, methanol fraction (1), methanol fraction (2), ethyl acetate fraction and water fraction were, 27, >2000, 156, 15, 1900 and 60 µg ml<sup>-1</sup> respectively. Very high amylase inhibitory activity was recovered in methanol fraction (1), methanol fraction (2) and water fraction. There was no considerable amylase inhibitory activity recovered in hexane and ethyl acetate fractions.

Phytochemical analysis showed that fractions with high amylase inhibitory activity contain flavanoids and tannins.

Our findings show that *S. cumini* leaves are a good source of amylase inhibitor/s. The inhibitor/s is/ are seem to be polar in nature and most likely to be a flavonoid or a tannin.