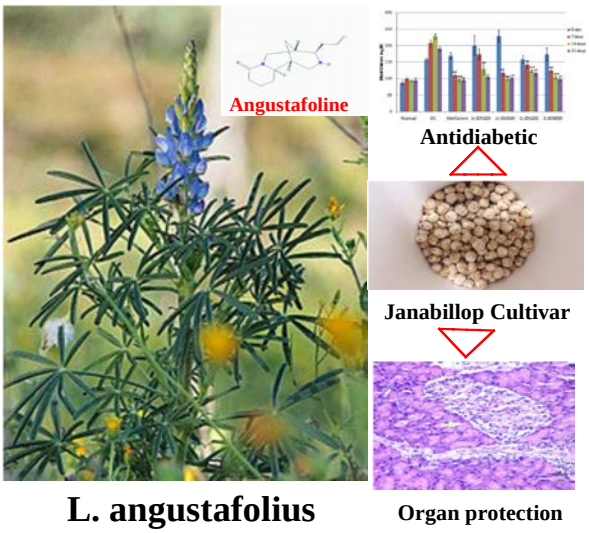
Antidiabetic and Organ Protective Potential of hydroalcoholic extracts of Australian Lupin Cultivars of Unprocessed and Processed Seed Flours: *In vitro, In vivo* and *In silico* Approaches

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Abstract

Australia is the largest producer of Lupin specially sweet lupin (*Lupinus angustifolius*) in the world, typically producing 0.75 million tonnes per year. Due to its unique nutritional value and chemical composition, Australian sweet white lupin is attracting worldwide attention as a new and healthy 'Super Food'. The general aim of this research is to estimate the antidiabetic potential of the Australian Lupin cultivars for processed and unprocessed flours through *in vitro*, *in vivo* and *in silico* bioassays with aims to determine *in vitro* enzyme inhibitions (alpha amylase and alpha glucosidase), evaluate *in vivo* hypoglycemic and organ protective activities through biochemical and histopathlogical studies, *in silico* evaluation of mechanism of action of the selected metabolites of different cultivars isolated by LC-QTOF-MS/MS by exploring the α-amylase, α-glucosidase and DDP-4 inhibition activities through molecular docking analysis and ADME/T property studies also performed to measure the safety of the selected compound as drug of both processed and unprocessed lupin seed flour extracts of 9 cultivars . From *In vitro*, *in vivo* and *in silico* bioassay studies it was observed that all cultivars of *L. angustifolius* are found to be more potent against diabetes than *L. albus* cultivars. All the cultivars of *L. angustifolius* showed promising inhibition of alpha amylase and alpha glucosidase. Among them, extract of Jenabillup cultivar found to be most potent against both the enzymes. Janabillup extract also increase the glucose uptake into the skeletal muscle and played role against diabetes. From *in vivo* study it was observed that both unprocessed and processed (cooked) extracts of Jenabillop at a dose of 500mg/kg played effective role to control blood glucose level in alloxan induced diabetes rats. Both the extracts of Jenabillup also significantly protect alloxan induced organ damage. *In silico* ADME and Molecular docking studies of the some of the isolated metabolites also correlate with the *in vitro* and *in vivo* results. The studies discussed above indicate that the impact of Lupin on carbohydrate or glucose metabolism is extensive. Lupin is not only super food but also have huge therapeutic potential like antidiabetic and organo-protective effects.



Key Words: Lupin seeds, Antidiabetic, Organ protective, Processed and Unprocessed, LC-Q-TOF MS/MS



Biography

Dr. Kishor Mazumder has completed his PhD at the age of 34 years from Osaka University, Japan and postdoctoral studies from Charles Sturt University School of Biomedical Sciences, Australia. He is the Chairman and Associate professor as well as advisor, Research Cell of Jessore University of Science and Technology, Jessore Bangladesh, Bangladesh. In addition he is also an Adjunct Sr. Lecturer, School of Biomedical Sciences, CSU,NSW, Australia. He has published more than 35 papers in reputed journals and has been serving as reviewer of many reputed journals. He research interest in on antidiabetic and anticancer drug development and discovery from natural sources.

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