

Insulin Secretory Actions of *Spirulina platensis* in Perfused Rat Pancreas, Isolated Mouse Islets, and Clonal Pancreatic B-Cells

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Abstract : *Spirulina platensis* (SP, Blue-green algae) have been accepted as a supplement for the treatment of pre and post-diabetes. The present study investigated the effects of butanol fraction from ethanol extract of *S. platensis* on insulin release from BRIN BD11 cells, isolated mouse islets, and perfused rat pancreas, as well as glucose homeostasis in type 2 diabetic rats and their molecular pathways. In a dose-dependent manner, *S. platensis* increased insulin release from mouse islets and pancreatic β -cells. The extract also elevated insulin release in perfused rat pancreas. Glucose, isobutylmethylxanthine, tolbutamide, and a depolarizing concentration of KCl significantly potentiated insulin release from BRIN BD11 cells. The effect of diazoxide and verapamil, as well as the absence of extracellular Ca^{2+} showed a reduction in insulin secretion. When administered orally together with glucose (2.5g/kg bw), *S. platensis* extract improved fasting and postprandial blood glucose in type 2 diabetes. These data suggest that the anti-diabetic activity of *S. platensis* is partly mediated by insulin secretion via the KATP channel-dependent pathway/the intracellular cAMP pathway.

Keywords : Insulin, glucose, *S. platensis*, type 2 diabetes, medicinal plants

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