Spirulina platensis extracts stimulate insulin secretion from perfused rat pancreas

The hypoglycemic effect of Spirulina has previously been reported in rats and humans. In this study, the effects of the plant extracts were evaluated on insulin secretion together with exploration of their mechanisms of action in isolated perfused rat pancreas. Extrapancreatic action of the plant extract was also evaluated in nondiabetic and diabetic rats. The ethanolic extract was fractionated using hexane, chloroform, ethylacetate and butanol. Extract and fractions were dissolved in KRB solution and perfused, via a cannula into the aorta, to the celiac and mesenteric arteries of pancreas. Insulin in the effluent (collected from the portal vein at 1ml/min) was measured by ELISA. For the studies on the mechanism underlying the insulin secretory activity, the extract and fractions with or without 11 mM glucose, 50 µM verapamil, 300 µM diazoxide were used. Effects of the extract on glucose absorption were evaluated by using an intestinal perfusion technique and measurement of unabsorbed sucrose in the gut. The extract showed significant hypoglycemic activity in fasting as well as postprandial state in the glucose-fed type 2 rats. The extract produced 10 fold increase in insulin secretion from perfused pancreas (p<0.01). Three fractions (ethylacetate, butanol and aqueous) stimulated insulin secretion 7-10 fold. Inhibition of extract/fraction-induced insulin release was observed with diazoxide and verapamil. Extract also showed significant effect in the inhibition of glucose absorption in the gut (p<0.01). These findings reveal that extract and fractions of S. platensis exert stimulatory effects on insulin secretion mediated through physiological insulinotropic pathways. It also shows effective in the inhibition of carbohydrate absorption in the gut.

Biography
J M A Hannan is a Professor and founding Chairman of the Department of Pharmaceutical Sciences at North South University, Dhaka, Bangladesh. He is also a visiting Professor of Department of Pharmacy, Jahangirnagar University, Dhaka and Department of Public Health, NSU. Formerly he was Senior Research Officer in the Department of Pharmacology, BIRDEM, and Dhaka. He was awarded PhD in Pharmacology from University of Ulster, UK. He has published over hundred scientific articles in reputed local and international journals and presented his research findings at various international seminars.