Abstract

Aim: Antihyperglycemic effect of Musa species and effect of co-administration of herbal drugs in treatment of diabetes and its complication.

Method: Plant materials were collected from Nanded, Satara, Goa and Kerala, authentication of plant material done at BSI, Pune and Science College, Nanded. Extraction of various Musa species carried out using ethanol as a solvent. Preliminary phytochemical evaluation performed by qualitative analysis of extract for presence of alkaloids, glycoside, flavonoids, tannins, saponins and phenolic compounds. In-vitro antioxidant activity of ethanolic extract of Musa species for scavenging free radicals carried out using DPPH radical scavenging assay, H2O2 scavenging assay and ferric reducing power assay. Preliminary antidiabetic activity of various Musa species was assessed using hypoglycemic and oral glucose tolerance test in normoglycemic rats. Assessment of antidiabetic potential of Musa species was carried out using alloxan-induced diabetes in rats for 21 days. In alloxan-induced diabetes ethanolic extract of Musa cavendish (EMC) and Musa acuminata (EMA) alone and in co-administration with Madhunil Amrut Churna (herbal formulation) were evaluated by assessing various biochemical, physiological parameters such as plasma glucose, serum lipid profile, kidney function test, liver glycogen content, body weight and histopathological study of kidney. HPTLC finger printing was performed for identification of phyto-constituents present in EMA. Different fractions of EMA such as PEMA, EAMA, CMA, AMA and EtMA were investigated for its antihyperglycemic and lipid lowering effect on alloxan-induced diabetic rats.

Result: Phytochemical investigation of ethanolic extract of Musa species confirmed the presence of flavonoids, tannins, alkaloids and phenolic compounds. In-vitro antioxidant activity revealed that Musa acuminata possess promising antioxidant property compared to other Musa species. In hypoglycemic study only EMS showed marginal hypoglycemia. Assessment of antihyperglycemic activity (OGTT) EMC and EMA demonstrated promising antihyperglycemic effect in non-diabetic animals (p<0.01). Further EMC & EMA evaluated for its antidiabetic property using alloxan-induced diabetes in rats. EMA demonstrated significant reduction in plasma glucose, serum triglyceride, total cholesterol, LDL cholesterol, serum creatinin and improvement in serum HDL cholesterol, total protein, albumin and liver glycogen content with improved body weight. MAC alone and in coadministration with EMC and EMA demonstrated significant nephroprotective action owing to its antidiabetic effect. Further EMA assessed for HPTLC finger printing which confirmed the
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presence of catechin, quercetin, rutin and flavonoid. Various fractions of EMA viz. CMA and EtMA demonstrated significant reduction in plasma glucose and alteration in lipid profile in alloxan induced diabetic rats.

Conclusion: Significant glucose lowering action of peels of Musa acuminata along with enhancement of glycogen content and improvement in body weight is suggestive of its antidiabetic potential. HPTLC finger printing confirmed the presence of catechin, quercetin and rutin which may be responsible its antihyperglycemic effect. Its protective role in diabetic complications such as peripheral neuropathy, nephropathy and hyperlipidemia supports its claim as a possible alternative or as an adjuvant for the treatment of diabetes and therefore, peels of banana further deserves to be explored for its use in DM.

“Antihyperglycemic Effect of Musa Species and Effect of Co-administration of Herbal Drugs in Treatment of Diabetes and its Complication.”