

Abstract

Title of the thesis-“The medicinal implication of a Himalayan herb *Gymnadenia orchidis* Lindl against type 2 diabetes mellitus”

Diabetes Mellitus (DM) is a syndrome characterized by abnormal insulin secretion, action or both with derangement in carbohydrate, lipid and protein metabolism and is characterised by hyperglycaemia. It is a major worldwide health problem predisposing to markedly increased atherosclerosis, coronary heart disease and mortality related to development of nephropathy, neuropathy and retinopathy. Nowadays prolonged uses of synthetic drugs are causing many adverse side-effects. To achieve complications free treatment without any side effects, our study has been designed to explore the medicinal efficiency of root extracts of *Gymnadenia orchidis* Lindl on type-2 diabetes mellitus. Experimental diabetes was induced by subcutaneous injection of Streptozotocin (60 mg/ kg body wt.) to Wistar rats and were treated with root Salep (200mg/kg body wt.) twice a day at an interval of 8 hrs for 10 days. Fasting blood sugar level and body weight of the treated animals were found to be normal. After treatment period, the animals were sacrificed and liver function enzymes, kidney function, lipid profiles, antioxidant enzymes levels, etc. were determined and all were found to be normal. Phytochemical analysis of the root sample by HPTLC showed the presence of significant amount of terpenoids. Separation, characterization and confirmation of active phytoconstituents of root extracts (terpenoid) of *Gymnadenia orchidis* Lindl were done by TLC), UV-VIS spectroscopy, FTIR, Mass spectroscopy. Terpenoids extracted from the root sample were supplemented orally (4mg/kg/body weight) to the STZ-induced diabetic animals (mice). Fasting blood glucose levels, liver functions, kidney functions, antioxidants activities, lipid profile, glycosylated haemoglobin, haemoglobin concentrations etc. were all found to be normal in the terpenoid supplemented mice. Significant ($P < 0.001$) decrement of glycosylated haemoglobin percentage, increment of body weights, increased activities of G6PD, improvement of insulin production were noted in terpenoid treated diabetic animals. Terpenoid plays the key role for improving the condition in diabetic induced animals. Thus we can conclude that the root Salep of *Gymnadenia orchidis* Lindl or its terpenoids may be used as potentially herbal therapeutic agent for long term and effective solution against type-2 diabetes mellitus.

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