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Review on Investigation of Antidiabetic Activity in *Coriandrum sativum*

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ABSTRACT

Medicinal plants have been proposed as rich potential sources for anti-diabetic drugs and used since for the treatment of diabetes mellitus (DM). Many of the synthetic drugs were discovered either direct or indirect source from the plants. This present study was performed to investigate the anti-diabetic activity of *Coriandrum sativum* seeds and leaves extraction in *in vivo* assays. *Coriandrum sativum* or coriander, belonging to the family: Apiceae,is well known for its wide range of uses in preparation similarly as ancient drugs during a form of conditions. completely different chemical compounds area unit recognised in every part of the plant as well as roots, leaves, fruits, and seeds, that account for its broad spectrum of use to decision a couple of, such compounds embody acid, thymol, and bornyl acetate, that area unit expected to exert metastatic tumor, medicine, and involuntary relaxation induction effects, severally. Linalool, a hydrocarbon alcohol found in coriander, has been rumored to be the foremost constituent that's to blame for some therapeutic values coriander because it possesses neuroprotective, analgesic and anti-diabetic effects.

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases in which the person has high blood glucose (blood sugar) level either due to inadequate insulin production or because the body's cells do not respond properly to insulin or both. The term "Diabetes mellitus (DM)" describes a metabolic disorder of multiple etiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat (dyslipidaemia) and protein metabolism resulting from defects in insulin secretion, insulin action, or both. symptoms are:

1. Polyuria (frequent urination)

2. Polydipsia (increased thirst)

3. Polyphagia (increased hunger)

2. Types of diabetes mellitus (DM)

2.1 Insulin Dependent Diabetes mellitus (DM) (IDDM, Type 1)

2.2 Non-Insulin Dependent Diabetes mellitus (DM) (NIDDM Type 2)

2.3 Gestational diabetes (Type 3)

2.1 Other types of diabetes include those caused by:

2.1.1 Genetic defects of the beta cells, (the part of the pancreas that makes insulin) such as maturity-onset diabetes of the young (MODY) or neonatal diabetes mellitus (DM) (NDM).

2.1.2 Diseases of the pancreas or conditions that damage the pancreas, such as pancreatitis and cystic fibrosis

2.1.3 Excess amounts of certain hormones resulting from some medical conditions such as cortisol in Cushing's syndrome that work against the action of insulin.

3. Treatment of diabetes mellitus (DM)

3.1 Insulin and oral hypoglycemic drugs

Insulin therapy should aim to mimic nature, which is remarkably successful both in limiting postprandial hyperglycaemia and preventing it between meals. Insulin can be prepared from

humans called human insulin, from cattle called beef insulin and from pigs called pork insulin. Insulin therapy is not free from complications and adverse effects. when there is a mismatch in the insulin injection and meals there is a risk of gain in weight and hypoglycaemia They bind to sulfonylurea receptors on the ß-cell plasma membrane, causing closure to ATP sensitive potassium channels, leading to depolarization of the cell membrane. Administration of sulfonylureas to type 2 DM patient's increases releases from the pancreas and, maybe further increase insulin levels by reducing hepatic clearance of the hormones. It has been shown to increase peripheral uptake of glucose, and to reduce hepatic glucose output by approximately 20-30% when given orally but not intravenously. Impaired absorption of glucose from the gut has also been suggested as a mechanism of action.

3.2 Herbal treatment of diabetes

There are few literature reviews by different authors about anti-diabetics, more than 300 plant species accepted for their hypoglycaemic properties. The review has classified the plants according to their botanical name, country of origin; Parts used and nature of active agents. One such plant is Coriandrum sativum. WHO listed 21,0000 plants, which are used for medicinal purposes throughout the world. Among these 2500 species were found in India, out of which 150 species are used commercially on a large scale. India is the largest producer of medicinal plants and herbs and as called the botanical garden of the world.

4. MATERIALS AND METHODOLOGY

4.1 Identification and authentication of plant material:

The Coriander (Coriandrum sativum L.) leaves we used were obtained from the local vegetable market. Fresh plants were dried at 60-70°C heat and then grinded into small pieces. The plant identification and authentication were performed by botanical department of Guru Ghasidas Central University Bilaspur (C.G).

4.2 Preparation and extraction of Coriandrum sativum leaves and seeds

4.2.1. Extraction of Leaves from Ethanolic Extract

500 grams dried leaves of Coriandrum sativum were macerated with 5 L ethanol, twice by using Soxhlet apparatus. The mixture was filtered using filter paper and the filtrate was concentrated using rotary vacuum evaporator at 60°C.

4.2.2. Extraction of Seeds from Methanol

Seeds were extracted by using methanol and petroleum ether. The coriander seeds were crushed, 10 g seed was weighed and extracted with 100 ml methanol for 8 h at room temperature (24 °C). This process was repeated three times. For PE extract, a 10 g ground sample was weighed. Then 100 ml of PE was added and placed into an ultrasonic bath filled with ice water and treated for 15 min. This process was repeated three times. Afterwards, the extracts were filtered, and evaporated for drying.

4.3 In vivo Studies for anti-diabetic treatment

4.3.1 Diabetes induced animal model

4.3.1.A Alloxan

Diabetogenic action of alloxan is mediated by reactive oxygen species. Alloxan and the product of its reduction, dialuric acid, establish a redox cycle with the formation of superoxide radicals. These radicals undergo dismutation to hydrogen peroxide. Thereafter highly reactive hydroxyl radicals are formed by the fenton reaction. The action of reactive oxygen species with simultaneous massive increases in cytosolic calcium concentration causes cells. The action of alloxan in the pancreas is preceded cells.

4.3.1. B Streptozotocin

Streptozotocin is synthesized by stepto-mycetes achromogenes and is used to induce both type-1 and type-2. Streptozotocin induces diabetes in almost all the species. diabetes dose varies with the species and the optimal dose required to produce diabetes in rat was found to be [50-60mg/kg i.p. or i.v],in mice 9175-200mg/kg i.p. or i.v] and in the dogs [`15 mg/kg for 3 days].Due to its low solubility the rapid i.v ;injection appears to be best route of administration.

4.3.2 Non-insulin dependent diabetes mellitus (DM) [NIDD] resembling animal models

By altering the dose and the dose of the STZ injection, the n- stz models exhibit various stages of type-2 diabetes mellitus (DM), such as impaired glucose tolerance, mild, moderate and severe hyperglycemias neonatal stz-induced rat model of type 2 diabetes mellitus (DM) model is generated by injecting Wister rats on the day of their birth intravenously saphenous vein] or intraperitoneal with 100mg/kg of stz. Antibodies secreted by the injected animal.

ALP, triglycerides and total cholesterol were restored to near normal level in STZ induced diabetic rats.

CONCLUSION

The present review has presented comprehensive details of antidiabetic plants used in the treatment of diabetes mellitus (DM). Plant derived medicines offer potential for cost effective management of diabetes through dietary inventions, nutrient supplementation, and combination therapies with synthetic drugs in the short term and as the sole medication from natural sources over the long term. Some of the plant derived medicines, however offer potential to cost effectiveness. The presences of bioactive chemicals are mainly responsible for this antidiabetic action. However, many other active agents obtained from plants have not been well characterized. More investigations must be carried out to evaluate the mechanism of action of medicinal plants with antidiabetic effect. The research for alternate remedies (from the plant kingdom) for diabetes mellitus (DM) will continue all over the world as the disease poses many challenges not only to the physician but also to the researcher.

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