



Medicinal Plants: Novel Therapeutic Solutions for Diabetes

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Editorial

The Global Report on Diabetes issued by the World Health Organisation draws the attention of the global community on the steady increase in the prevalence of diabetes almost in every country [1]. Diabetes, specially, non-insulin dependent diabetes, termed as “the epidemic of modern age”, affects approximately 422 million individuals worldwide [1,2]. Unrelenting drivers of health care cost associated to diabetes include micro and macro vascular complications that affect multiple organs, such as the eyes and kidneys. The total cost related to diagnosed diabetes hit US \$1.31 trillion in 2015, two third of the amount was directly linked to medical charges and one third was due to lost in productivity [3]. Elevated post prandial glucose level, the main character of diabetes is the main focus of diabetes management. Nowadays, from a patient perspective, natural products, namely plants, are considered as interesting alternatives for the management of diabetes. Besides, a strong body of evidence generated *via* ethnobotanical investigations praise the use of medicinal plants for the management of diabetes in various cultures cross the world. Indeed, medicinal plants have been found to act upon diabetes by modulating different pathways involved in the pathogenesis of the disease.

Oxidative stress has an important role in the onset and/or progression of diabetes. Excessive reactive oxygen species generation can induce the development of diabetes by contributing to insulin resistance [4]. On the other hand, hyperglycaemic conditions are favourable to the production of reactive oxygen species and this is known as “hyperglycaemia-induced oxidative stress” [5]. Plant secondary metabolites possessing strong antioxidant properties have attracted much interest as complementary therapy for the management of diabetes.

Secondary metabolites naturally occurring in plants have versatile therapeutic actions and have been shown to exert inhibitory action on numerous enzymes. The ability of plant secondary metabolites to mitigate postprandial glucose peaks by inhibiting digestive enzymes responsible for the hydrolysis of starch, namely α -amylase and α -glucosidase, has been claimed as an anti-diabetic treatment [6]. However, side effects associated to this therapeutic approach have been reported to affect the quality of life of the diabetic patient. Hence, new methods to normalise glycaemia are desirable. Liver glycogen phosphorylase, a key enzyme involved in glycogen metabolism, has been proposed as a valid therapeutic target for the development of novel anti-diabetic agents [7].

The prevalence of certain conditions, such as Alzheimer’s disease, obesity, and hypertension, in diabetic patients requires a multiple therapeutic approach that might be tailored by medicinal plants. Previous studies have demonstrated that several medicinal plants possess both hypoglycaemic and hypolipidemic effects, thereby addressing the problem of obesity and diabetes [8-10].

Nature has gifted mankind with natural keys to unlock the diabetologist’s pharmacy. A large body of evidence from the literature attest of the increasing interest of scientists in naturally-derived compounds from medicinal plants. However, one should keep in mind that the use of plants for therapeutic applications necessitates judicious knowledge of the possible toxicity and appropriate dosage.

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