BIOINFO Drug targets
ISSN: 2249-1759 & E-ISSN: 2249-1767, Volume 2, Issue 1, 2014, pp.-011-013.
Available online at http://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BPJ0000197

MEDICINAL PLANTS AND OLD SOURCE OF NEW DRUGS FOR DIABETES

SINGHAL M. AND SHARMA S.*
M.L.B Autonomous College, Bhopal- 462 002, MP, India.
*Corresponding Author: Email- sandhyasharma2411@yahoo.com

Received: November 09, 2013; Accepted: May 08, 2014

Abstract- Medicinal plants are important source of therapeutic agents for diabetes. Many oral synthetic Antidiabetic agents have been developed. Hyperglycemia can be treated initially with oral agents and insulin therapy. However these synthetic agents produce some serious side effects and are relatively expensive for developing countries. Therefore, scientist and researchers investigating crude drugs for diabetes which are effective, low cost and less side effected.

Keywords- medicinal Plant, Crude drugs, diabetes, low cost, side effect, effective

Introduction

Plants have played a significant role in maintaining human health and improving the quality of human life for thousands of years and have served human well as valuable components of medicines, seasonings, beverages, cosmetics and dyes and the most important is stable oxygen and carbon di oxide ratio. Plants, the living Phytochemical factories of nature, which produce (give us) so many drugs for cure diseases. Herbal medicine is based on the premise that plants contain natural Phytochemical that can promote health and alleviate illness. The last decade was sudden comeback of interest in herbal medicine. In recent times, focus on plant research has increased all over the world and large body of evidence has collected to show immense potential of plants used in various traditional system. India is one of the world's 12 biodiversity centers with the presence of over 45000 different plant species. India's diversity is unmatched due to the presence of 16 different agro-climatic zones, 10 vegetation zones, 25 biotic provinces and 426 biomes (habitats of specific species). Of the 2, 50,000 higher plant species on earth, more than 80,000 are medicinal of these, about 15000-20000 plants have good medicinal value. However, only 7000-7500 species are used for their medicinal values by traditional communities. In India, drugs of herbal origin have been used in traditional systems of medicines such as Unani and Ayurveda since ancient times. The Ayurveda system of medicine uses about 700 species, Unani 700, Siddha 600, Amchi 600 and modern medicine around 30 species. It is estimated that 70 to 80% people worldwide rely chiefly on traditional health care system and largely on herbal medicine [1]. The drugs are derived either from the whole plant or from different organs, like leaves, stem, bark, root, flower, seed, etc. Some drugs are prepared from excretory plant product such as gum, resins and latex. Medicinal plants obtain drugs have lesser or no side effect and are less expensive as compared to synthetic drugs. Medicinal plants remain a prolific source for the discovery of new drugs and drugs leads even from Vedic period. Recent data suggests that 80% drug molecules are natural products or natural compound inspired [2]. Even the Allopathic system of medicine has adopted a number of plant-derived drugs which form an important segment of the modern pharmacopoeia. Some important chemical intermediates needed for manufacturing the modern drugs are also obtained from plants (E.g. diosgenin, solasodine, b-ionone). Ethno pharmacological studies on such herbs/medicinally important plants continue to interest investigators throughout the world. Isolated Compounds from plants have also identified for hypoglycemic, antimalarial, anticancer activities, cardiovascular diseases.

Diabetes

Diabetes is widespread metabolic disease that affects around 41 million, In India 60% people are suffering from diabetes. India rightfully making the "Diabetic Capital of the World". Diabetes mellitus is a global problem now. Diabetes mellitus is characterized by group of metabolic disorder. Deficiency or insensitivity of insulin causes glucose to accumulate in the blood, leading to various complications. Diabetes is a syndrome of disordered metabolism usually due to a combination of hereditary and environmental courses. Despite considerable progress in the treatment of diabetes by conventional synthetic drugs, there is a need for effective, safe and better hypoglycemic agents of chemical nature. Medicinal plants would be more effective and safe for this. In Ayurveda various plants are reported for treating and preventing Diabetes.

The researchers proved that some isolated compounds from plants identify as strong medicine for cure diseases. Several workers have already been reported the utility of plants for the treatment of diabetes. Some indigenous plants have reported for antidiabetic activity [Table-1].

Result

The future of antidiabetic herbal drugs depend upon the extensive exploration of tribal pockets of India. The promising crude drug must be analysed in clinically manifested hyperglycaemia in the wake of thorough investigation of ethnomedicinal antidiabetic herbs. A major segment of population in India and use herbal medicines for the treatment of various diseases. These herbal herbal medicines can substitute the toxic and harmful allopathic medicines. Drug development by plant standardize, safe and effective herbal

formulation with proven scientific evidence can also provide an economical alternative several disease areas. Still some pro's and con's need alternation for improvement of traditional medicines. Herbal medicines are very beneficial for all dangerous diseases. medicines are less expensive and have no or very little but harmless side effects.

Table 1- Plants having for Antidiabetic activity

Sr. No.	Plant Name	Plant parts	Mechanism	Ref.
1	*Aegle marmelos*	Leaf	Increases utilization of glucose; either by direct stimulation of glucose uptake or via the mediation of enhanced insulin secretion and has potent antioxidant activity, which may account for the hypoglycemic potential	[1]
2	*Allium cepa*	Bulb	Lowers blood glucose level and has potent antioxidant activity, which may account for the hypoglycemic potential	[2]
3	*Allium sativum*	Whole plant	Increased the insulin like activity of plasma	[3]
4	*Aloe vera*	Whole plant	Maintains glucose homeostasis by controlling the carbohydrate metabolizing enzymes	[4]
5	*Artemisia pallens*	Aerial part	Inhibits glucose re-absorption or increase in peripheral glucose utilization	[5]
6	*Annona squamosal*	Leaf	Lowers blood glucose level	[6]
7	*Andrographis paniculata*	Whole Plant	Prevents glucose absorption	[7]
8	*Azadirachta india*	Leaf	Reduce blood glucose level by regeneration of β cells	[8]
9	*Biophytum sensitivum*	Whole Plant	Stimulates pancreatic beta cells to release insulin.	[9]
10	*Beta vulgaris*	Root	Lowers blood glucose level	[10]
11	*Brassica juncea*	Whole plant	Increases the concentration of hepatic glycogen and glycogenesis and suppressed the activity of glycogen phosphorylase and gluconeogenic enzymes, lead to reduction in glycogenolysis and gluconeogenesis	[11]
12	*Boerhavia diffusa*	Leaf	Increases plasma insulin levels and improves glucose tolerance, produced significant antioxidant activity	[12]
13	*Cassia auriculata*	Flower	Increased utilization of glucose through increased glycolysis	[13]
14	*Caesalpinia bonducella*	Seed	Increases the release of insulin from pancreatic cells	[14]
15	*Catharanthus roseus*	Leaf	Increases metabolism of glucose	[15]
16	*Cajanus cajan*	Leaf & stem twigs	It lowers plasma glucose level	[16]
17	*Citrullus colocynthis*	Seed	The oral administration of plant extract reduced the plasma level of AST and LDH Significantly.	[17]
18	*Coccinia indica*	Leaves	Suppresses glucose synthesis, through depression of the key gluconeogenic enzymes glucose-6-phosphatase and fructose-1,6-bisphosphatase and enhances glucose oxidation by shunt pathway through activation of its principal enzyme glucose-6-phosphate dehydrogenase	[18]
19	*Casearia esculenta*	Root	Exhibits significant reduction in blood glucoselevel, a decrease in the activities of glucose-6-phosphatase and fructose-1,6-bishosphataseand an increase in the activity of liverhexokinase, resulting in potent hypoglycemic activity	[19]
20	*Camellia sinensis*	Leaves	Epigallocatechin gallate, present in tea increases insulin activity and prevent oxidative damages, responsible for the hypoglycemic activity	[20]
21	*Enicostemma littorale*	Leaves	Decrease glycosylated Hb & glucose 6 phosphatase	[21]
22	*Eugenia jambolana*	Seed powder	It exhibits normoglycemia and better glucose Tolerance.	[22]
23	*Eucalyptus globulus*	Leaves	Increase insulin secretion from clonal pancreatic beta line (BRIN-BD 11)	[23]
24	*Ficus bengalensis*	Bark	Inhibits insulin degradative processes	[24]
25	*Gymnema sylvestre*	Leaves	Lowers plasma glucose level	[25]
26	*Hibiscus rosa sinensis*	Whole plant	Stimulates insulin secretion from pancreatic beta cells and increases utilization of glucose, either by direct stimulation of glucose uptake.	[26]
27	*Mangifera indica*	Leaf	Possibly act through the intestinal reduction of glucose as well as pancreatic and extra pancreatic mechanism	[27]
28	*Morus indica*	Leaf	Acts by increasing glucose uptake	[28]
29	*Murraya koeingii*	Leaf	Increases glycogenesis and decreases glycogenolysis and gluconeogenesis	[29]
30	*Momordica charantia*	Fruit	Reduce blood glucose level	[30]
31	*Ocimum sanctum*	Leaf	Its powdered leaf has produced potent hypoglycaemic and hypolipidemic effect in normal and diabetic rats	[31]

Conflicts of Interest: None declared.

References

[1] Upadhyay S. (2004) *Indian Journal of Physiol. Pharmacology*, 48(4), 476-480.

[2] Karawya M.S. & Abde S.M. (1984) *Journal of Natural Product*, 775-780.

[3] Augusti K. & Sheela C.G. (1996) *Planta Medica*, 61, 356-357.

[4] Tanaka M. (2006) *Biological Pharmaceutical Bulletin*, 29, 1418-1422.

[5] Subramonium A. & Pushpangadan P. (1996) *Journal Ethnopharmacol.*, 50, 13-17.

[6] Gupta R.K., Kesari A.N., Watal G. & Murthy P.S. (2005)*Annals of Nutrition and Metabolism*, 49, 404-413.

[7] Nugroho A.E. (2012) *Indian Journal Pharmacology*, 44(3), 377-381.

[8] Prabhakar P.K. & Doble M.A. (2008) *Current Diabetes Reviews*, 4: 291-308.

[9] Puri D. (2001) *Journal of Ethnopharmacol.,* 78(1), 89-93.

[10] Yoshika M. (1996) *Chemical and Pharmaceutical Bulletin*, 44, 1212-1217.

[11] Thirumalai T., Therasa S.V., Elumalai E.K. & David E. (2011) *Asian Pacific Journal of Tropical Biomedicine*, 1(4), 323-325.

[12] Pari L. (2004) *Journal of Ethnopharmacology*, 91, 109-113.

[13] Gupta S., Sharma S.B. & Singh U.R. (2010) *Journal Medical Food*, 13(3), 528-34.

[14] Chakarbarti S. Biswas T.K., Rokeya B. & Ali L. (2005) *Journal Ethnopharmacology*, 97, 117-122.

[15] Don G. (1999) *Medicinal Plants of the World*, Humana Press, Totowa, N.J., 109-118.

[16] Patil R., Patil R., Ahirwar B. & Ahirwar D. (2011) *Asian Pacific Journal of Tropical Biomedicine*, 1(2), S291-S298.

[17] Bnouham M. Ziyyat A. Mekhfi H. & Tahri A. (2006) *International Journal of Diabetes Metabolism*, 14, 1-25.

[18] Kamble S.M., Kamlakar P.L., Vaidya S. & Bambole V.D. (1998) *Indian Journal of Medical Science*., 52, 143-146.

[19] Prakasam A., Sethupathy S. & Pugalendi K.V. (2003) *Polish Journal of Pharmacology*, 55(1), 43-50.

[20] Gomes A., Vedasiromoni J.R., Das M. & Sharma R.M. (1995) *Journal of Ethnopharmacology*, 45, 223-226.

[21] Maroo J., Vasu V.T. & Gupta S. (2003) *Phytomedicine*, 10, 196-199.

[22] Vijayvargia R., Kumar M. & Gupta S. (2000) *Indian Journal of Experimental Biology*, 38, 781-784.

[23] Singh LW. (2011) *Journal of Medicinal Plant Research*, 5(5), 677-687.

[24] Bnouham M., Ziyyat A., Mekhfi H. & Tahri A. (2006) *International Journal of Diabetes Metabolism*, 14, 1-25.

[25] Prabhakar P.K. & Doble M.A. (2008) *Current Diabetes Reviews*, 4, 291-308.

[26] Sachadeva A. & Khemani L.D.A. (1999) *Biomedical Environment. Science*, 12, 222-226.

[27] Srivastava S., Lal V.K. & Pant K.K. (2012) *Phytopharmacology*, 2(1), 1-15

[28] Devi V. & Uroj A. (2008) *Indian Journal of Experimental Biology*, 46, 614-616.

[29] Khan B.A., Abraham A. & Leelamma S. (1995) *Indian Journal Biochemistry Biophysics*, 32, 106-108.

[30] Saxena A. & Vikram N.K. (2004) *Journal of Alternative and Complement Medicine*, 10(2), 369-378.

[31] Vats V., Yadav S.P., Grover J.K. (2004) *J. Ethnopharmacol*., 90, 155-160