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On Some Pharmaceutical Angiosperms Having Hypoglycemic Properties

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Abstract

The paper describes for the first time an illustrated documentation of some diverse potential herbal plants having hypoglycemic properties. A total of about 33 species of various such plants, having hypoglycemic activity has been enumerated and these belong to 24 families and 32 genera. Their taxonomy, ecology and means of their conservation have been discussed in great details.

Key words: Hypoglycemic, vernacular name(Vn), Plant parts used(PPU), Phytochemicals(PC)

Introduction

The plants are known as one of the most important sources for the medicines since ages (Agharkar 1954, Chopra 1982, Jain 1996, Mishra *et al.*, 2016). In recent years due to sedentary lifestyles, stress, and unhealthy food habits, diabetes is an emerging serious health problem. It is characterized by increase blood glucose concentration resulting from insufficient insulin secretion and resistance, which leads to metabolic abnormalities in functioning of important biomacromolecules like carbohydrates ,lipids and proteins. It is a chronic disease and is highly fatal for the the survival of the human race which leads to multi organ failure,if not treated properly and timely. A very sporadic work has been done on the phytochemistry of medicinal plants which help in treating diabetes in recent years (Sheela *et al.*, 1992).

Material and methods

The medicinal plants were collected from the diverse localities viz. Gyanpur, Baraut, Handia,& Allahabad. Collected plants were processed and herbarium specimens were prepared following customary methods (Lawrence, 1951) with slight modifications. Plants were properly dried up by changing a number of newspapers and poisoned with mercuric chloride solution in alcohol. Later on the dried specimens were mounted on standard size herbarium sheets, labelled properly and arranged alphabetically according to their botanical names. The voucher specimens were deposited at Botany Deptt of KNPG College Gyanpur.

Observation

In the present study, some medicinal plants showing Hypoglycemic properties having about 33 species, belonging to 24 families and 32 genera. Among them, 18 are trees,3 are shrubs, 8 are herbs and 4 are climbers. These grow in diverse ecological habitats ranging from aquatic, terrestrial, xerophytic places. Table 1 and Plate 1, Figs 1 -9, showing the documentation of some Hypoglycemic plants ,(which helps in lowering the blood sugar levels in man) with its botanical name, vernacular name, habit, family, plant parts used, flowering/ fruiting period and their phytochemicals.

Table.1. Showing the Listing of some Hypoglycemic Plants

S.N	Botanical name	Vernacular name	Habit	Family	Plant parts used	Flowers/ fruits	Phytochemicals
1.	*Abutilon indicum*(L.)	Kanghi	Shrub	Malvaceae	Root bark, leaves, seeds	Throughout the year	Glucose, galactose, glutamic acid
2.	*Acacia catechu*(L.f.) Willd.	Katha, khair	Tree	Mimosaceae	Heartwood axtract	April-Aug	Catechin, Catechu, Tannic acid
3.	*Aegle marmelos*(L.)Correa	Bel	Tree	Rutaceae	Root, Fruit, Leaves	April-May	Marmelosin
4.	*Alangium salvifolium*(L.)	Akola	Tree	Alangiaceae	Roots, Fruits	March-July	Alangic acid
5.	*Terminalia Chebula* Retz	H-Harar	Tree	Combretaceae	Fruits	Mar-June, Nov-Feb	Chebulinic acid
6.	*Andrographis paniculata*(Nees)	Kalmegh	Herb	Acanthaceae	Root	Oct- May	Flavones, Lactones
7.	*Benincasa hispida* (Thunb.)cogn	Petha	climber	Cucurbitaceae	Fruit	Aug- Nov	Glycosides
8.	*Barleria lupunina* Lindl.	Spiny yellow	Shrub	Acanthaceae	All parts	Oct- Jun	Tannins, Diterpinoides
9.	*Catharanthus roseus*(L.)	Sadabahar	Herb	Apocyanaceae	Flower, Leaves, Stem, Root	Almost the year	Catharanthine, Lochnerine, Vindoline
10.	*Centratherum anthelminticum*(Willd.)	Somraj	Herb	Asteraceae	Seed	June - Sept	Alkaloids
11.	*Capparis sepiaria* L.	Thoratti	Shrub	Capparaceae	Leaves	Feb- March	Stachydrine, Glucocapparin, Flavinoides
12.	L.	Amaltas	Tree	Caesalpinaceae	Seeds	April- May Nov- Feb	Sennoside mixture
13.	*Casuarinas equisetifolia* L.	Jhau	Tree	Casuarinaceae	Leaves , Fruit	Mar- May, Jun- July	Pentadecane,1-8-cineole,a-Pinene
14.	*Cynodon dactylon*(L.) Pers.	Doob	Herb	Poaceae	Whole plant	Most part of the year	Mucilage,Aarabinose, Xylose, Uronic acid
15.	*Diospyros malabarica*(desr.) kostel	Kavikattai	Tree	Ebenaceae	Leaves, Bark, Roots	June- Aug, April- May	Betulin ,B-Sitosterol, Oleanolic acid
16.	*Euphorbia hirta* L.	Dudhi	Herb	Euphorbiaceae	Whole plant	Most part of the year	Euphol, Euphorbol
17.	*Ficus bengalensis* L.	Bargad	Tree	Moraceae	Root, Bark,	Jan -March	Bengalinoside, Phytosterolin, Flavonoid, Glycoside
18.	*Ficus racemosa* L.	Gular	Tree	Moraceae	Bark	April- July	Flavonoid
19.	*Gymnema sylvestre* RBr	Gurmar, Madhunashini,	Woody climber	Asclepiadaceae	Whole plant	Aug- March, oct	Gymnemic acid, Saponin, Anthraquinon, Quercitol
20.	*Lagerstroemia reinae* Roxb.	Jarul	Tree	Lythraceae	Bark, Root, Seed, Fruit	March- Sep	Alkaloids, Triterpenes ,Ellagic acid, ursolic acid
21.	*Morus alba* L.	Shahtoot	Tree	Moraceae	Leaf, root, bark	Feb- May	Moran A

22	*Momordica charantia*	Karela	climber	Cucurbitaceae	Fruit	May- Sept	Momordin, Momordicin, Charantin
23.	*Murraya koienigi*i Jack	Karipatta	Tree	Rutaceae	Leaves	Feb- May, Nov- Jan	Bis- indole Alkaloid
24.	*Moringa oleifera* Lamk.	Sahjan	Tree	Moringaceae	Root, Bark, Flowers	Jan- April, May- June	Moringine, Alkaloids, Glucose
25.	*Opuntia sterptacanthas Lem*	Prickly pear	Succulent	Cactaceae	Sap	June- Aug	Isoquinoline alkaloid, cyanogenetic alkaloids
26.	*Oryza sativa L.*	Chawal	Herb	Poaceae	Roots	July- Nov	Glycan
27.	*Pterocarpus marsupium* Roxb.	Beeja	Tree	Fabaceae	Heart Wood, wood	July- Oct, Dec- March	Pterostilbine, Flavonoid
28.	*Psidium gujava* Linn	Amrood	Tree	Myrtaceae	Juice	Feb- Oct	Triterpenoid, Saponins
29.	*Pongamia pinnata* Pierre Linn.	Karanja	Tree	Leguminoseae	Bark	March - Apr	Oil
30.	*Prunus persica* Batsch.	Aru, Peach	Tree	Rosaceae	Leaves	Jan- March, June	Amygdalin
31.	*Rauwolfia serpentine* Benth,exkurz	Sarpagandha	Shrub	Apocynaceae	Leaves, Root	Most part of the year	Ajmaline
32.	*Ricinus communis* L.	Arandi	Shrub	Euphorbiaceae	Oil, Root, Seed	Most part of the year	Ricinine, Oil, Glycerides
33.	*Syzygium cumini*(L.) Skeels	Jamun	Tree	Myrtaceae	Fruit, Seed	Mar- May, Jun- July	Ellagic acid,, Citric acid, Glucose, Sitosterol

Result and discussion

Medicinal plants have always been a fundamental bioresource for mankind since time immemorial. The landmark voluminous writings of Charak, Susruta, Jeevak proved to be the *Magnum Opus* work in the world of herbal traditional medicines(see Kirtikar & Basu 1935). Inspite of enormous revolution in modern health care practices, about 80% of the world population still depends on the phytomedicines for health care. In India also, about 70% of modern medicines are derived from herbal products, due to its easy accessibility, effectiveness, multicultural acceptability, fewer side effects and relatively low cost. Medicines in contemporary India is a unique fusion of traditional system with conventional one and often been used .Even though the rate of medicinal plant utility is ever increasing, very little is known about its use patterns. Therefore it is very important to document, analyze and evaluate this knowledge, not only for there multicultural reasons, but also for their commercial value.

In India, diabetes is a emerging as a serious disorder. It is a group of metabolic disease in which there are high blood sugar levels over a prolonged work. It is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced .The present work has presented an illustrated comprehensive details of hypoglycemic plants used in the treatment of diabetes (see Table 1). It shows that the plants documented above, have potent hypoglycemic properties. The hypoglycemic effects of these plants is due to the presence of various phytochemicals like alkaloids, flavonoids, glycans, aegelin, glycosides, glycosamine, protein bound polysaccharides, nimbidin etc. that produce a definite physiological action by reducing the blood sugar level in the human body.

Due to globalization, urbanization, rising rates of diabetes, lack of interest, unscientific over exploitation of natural plant resources, are creating new health and ecological challenges throughout the world. Therefore it is necessary to collect, document and conserve the valuable medicinal plants from complete depletion and also increase awareness, among the people for sustainable use of herbal plant wealth, for the future generation.

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References

Agharkar S.P. (1954). Medicinal Plants of Bombay. Gazetteer of Bombay, Government of Maharastra.

Chopra, R.N. (1982) Indigenous drugs of India. Kolkata, Academic Press.

Jain, S.K. (1996). Medicinal Plants,National Book Trust,New Delhi, p 1-216.

Kirtikar, K.R. & Basu, B.D. (1933).Indian medicinal plants. Allahabad:Lalit Mohan Basu. Vols. -21

Lawrence, G.H.M. (1951) Taxonomy of Vascular Plants, Publ. The Macmillan Company, New York, p 1-823.

Mishra, S., Mishra S., Tiwari S.,& Misra D.R. (2016) Phytomedicodiversity of some plants of Gyanpur region.Publ. Conservation of Medicinal Plants:Conventional and modern. approaches. Publ. Omega, edited H.K.Chaurasia, Bhagalpur. p 174-180.

Sheela, C.G. & Augusti T.K. (1992). *Indian Journal of Experimental Biology,* **30**: 523-526.