

## An ethnobotanical survey of medicinal plants extracts used for the treatment of diabetes mellitus in the Utnoor Mandal of Adilabad Dist, Telangana, India

Lingaiah<sup>1</sup>, Estari Mamidala<sup>2</sup> and P. Nagaraja Rao<sup>3\*</sup>

<sup>1,3</sup> Department of Zoology, Osmania University, Hyderabad-500007, Telangana State, India

<sup>2</sup> Department of Zoology, Kakatiya University, Warangal-506009, Telangana State, India

\*Email: [lingaiahzoology@gmail.com](mailto:lingaiahzoology@gmail.com)

### ABSTRACT

Herbal medicine is gaining popularity both in developing and developed countries because of their natural origin. The herbal drugs with antidiabetic activity are yet to be commercially formulated as modern medicines, even though they have been acclaimed for their therapeutic properties in the traditional systems of medicine. Ethnobotanical documentation is one way of capturing this body of knowledge. An Ethnobotanical survey was conducted on the medicinal plants frequently used for the management of diabetes mellitus in Utnoor mandal of Adilabad district, Telangana by traditional healers. Information was obtained through structured questionnaire administered to traditional healers and herbalists in the tribal areas. The study revealed 13 species of plants belonging to 13 families. The Decoctions, Paste, powders, Juice etc. of the roots, leaves, seeds and bark. These plants are the most commonly used while the extracts are taken orally with combination of Water, milk, Honey etc for long period of time usually between 6 and 10 months depending on the severity of the ailments. *Acalypha indica* and *Terminalia chebula* of the families Euphorbiaceae and Combretaceae respectively, were repeatedly mentioned by the traditional healers as the two mostly used for the management of diabetes mellitus in the study area. There is urgent need of recording all ethnobotanical information before they are lost and continuous efforts should be made to collect the information which will provide avenue for future generation

**Key words:** Medicinal plants, Diabetes mellitus, Utnoor mandal, traditional healers, Ethnobotanical survey

### INTRODUCTION

Diabetes mellitus is a group of metabolism disorder (A. J. Boulton., 2005) resulting from defects in insulin secretion or synthesis reduced sensitivity of the tissues to insulin action or both (Lanza *et al.*, 1999). It is characterized by chronic high blood glucose that causes glycation of body protein which could lead to severe complications (Rang *et al.*, 1991). These complications are classified into acute, sub-acute and chronic.

#### How to Site This Article:

Lingaiah, Estari Mamidala and P. Nagaraja Rao (2015). An ethnobotanical survey of medicinal plants extracts used for the treatment of Diabetes mellitus in the Utnoor Mandal of Adilabad dist, Telangana, India. *Biolife*. 3(4), pp 937-939. DOI: 10.17812/blj.2015.3429

Published online: 28 December, 2015

On the basis of aetiology and clinical presentation, diabetes mellitus can be grouped into type -1 known as insulin-dependent diabetes mellitus (IDDM) and type 2 diabetes mellitus also known as non-insulin- dependent diabetes mellitus (NIDDM). Type 1 diabetes mellitus is caused by immunological destruction of pancreatic beta cells leading to insulin deficiency (Notkins, 2002), whereas type 2 diabetes is characterized with insulin resistance and is the most common type of diabetes, afflicting 85 - 95% of all diabetic individuals.

Diabetes is a rapidly emerging medical problem in well off society and significantly attack on metabolic activity of patient (Meigs JB.,2003). India has a Diabetic population of approx 18 million. The WHO has estimated that more than 80% of the world's population use Botanical medicine (Rahim M.A., 2007). A variety of plant preparations have been mentioned in ayurveda and other indigenous systems of medicine, which are claimed to be useful in treatment of Diabetes mellitus (Lingaiah M and Nagaraja Rao P, 2013). Plant derivatives with antidiabetic potentials have been used

in traditional healing systems around the world (Yeh 2003). There are lots of chemical agents available to control and to treat diabetic patients, but total recovery from diabetes has not been reported up to this date.

Despite advances in understanding the disorder and management, the mortality and morbidity of the disease is ever increasing (Dhanbal, 2004). Alternative to these synthetic agents, plants provide a potential source of hypoglycemic drugs and are widely used in several traditional systems of medicine to prevent diabetes. Traditional medicines derived mainly from plants play major role in the management of diabetes mellitus (Shokeen *et al.*, 2008). Over the past decade, herbal medicines have been accepted universally, and they have an impact on both World health and international trade. Interest in herbal drugs is growing due to their efficiency, low toxicity and absence of side effects (Momin, 1987). However up to few decades back the herbal medicines were replaced by synthetic medicines (Dhanbal SP., 2004) due to their quick effect. But it is interesting to know that global trend is now going back to natural way of living and necessity of herbal medicine is now being realized, due to side effects of allopathic medicines. However there is lack of information and documentation of application of different medicinal plants as antidiabetic in certain areas. Hence the present survey was undertaken in forest area of Uttoor mandal of Adilabad district, Telangana state.

## MATERIAL AND METHODS

### Study Area

Utnoor is a mandal head quarter and rural area in Adilabad district in Indian state of Telangana. Adilabad dist is lies between 77° 47' and 80° 0' of the eastern longitudes and 18° 40' and 19° 56' of northern latitudes. The district is bounded on north by Yeotmol, on the East by Chanda district of Maharastra and on the south by Karimnagar and Nizamabad and on the west by Nanded district of Maharastra state. These harbor mainly dry deciduous forest and aborigines. These forest occupy about 44.5 percent of the total geographical area of the Adilabad district. The total forest area in the district is 7218.86 sq.km. The total population of the Adilabad district is 27, 37,738 out of which the tribal population is 5, 12,602 (census of India 2011).

### Methodology

This study was carried out from November 2011 to April 2013 using a well-structured questionnaire. The set questions contained the diagnosis of diabetes mellitus, the names of plants, methods of preparation, duration of treatment, adverse effects and mode of administration of the plant materials. Traditional healers and herbalists interviewed consisted of women and men between 40 and 60 years of age with low education qualification. Vouchers of the reported

antidiabetic plants were identified by Prof A.V. Raju, Department of Botany, Kakatiya University Warangal.

## RESULTS AND DISCUSSION

As our Present report is confined to plants with anti-diabetic potentials so here we have presented Ethno medicinal information on anti-diabetic plants (Table-1). The list includes various types of preparations used to cure diabetes. Herbal medicines prescribed by tribal healers are either preparation based on single plant part or a combination of several plant parts. During the course of the study, a total of 13 anti-diabetic plants species were documented, of which some were herbs, some trees, some shrubs and others climbers. The collected information's are arranged in the alphabetic order of the plant Botanical name with the local (or) common name, family name and therapeutic use for each plant. Collection of medicinal plants is a source of livelihood for the local herbal healers.

The study revealed 13 species of plants belonging to 13 families that are commonly used by the herbalists, traditional healers and people of Uttoor mandal, Adilabad district for the management of diabetes mellitus (Table-1). Out of these, 13 species have not been reported before in the study area for the treatment of diabetes mellitus. The root of the plants was mostly used followed by the whole plants), stem, bark, seeds and leaves. Two of the plant species. *Acalypha indica* and *Terminaria chebulla* of the families Euphorbiaceae and Combretaceae respectively, were repeatedly mentioned by the traditional healers as the two mostly used for the management of diabetes mellitus in the study area. It is observed that the traditional healers are usually unwilling to disclose their knowledge about the uses of different plant species, keeping in mind, improper use of the medicine, fear of over exploitation of plant species and fear of losing their status in the local community. However, they did mention that most formulations were either powder, decoctions, pastes or extracted juices from crushed or macerated whole plant or plant part(s), which depending on extent was administered. The information recorded from herbal healers indicates that they possess good knowledge of anti-diabetic herbal drugs. Documentation of traditional knowledge of local traditional healers is very useful for future generation.

## CONCLUSION

Thus many different plants have been used individually or in formulations for treatment of diabetes mellitus and its complications. One of the major problems with this herbal formulation is that the active ingredients are not well defined. It is important to know the active component and their molecular interaction, which will help to analyze therapeutic efficacy of the

**Table-1. Ethno medicinal information on anti-diabetic plants**

S.No	Scientific name	Common name	Family	Part used
1	<i>Acassia auriculata</i>	Thangedu	<i>Caesapinaceae</i>	Leaves
2	<i>Cassia occidentalis(L)</i>	Kassitha	<i>Leguminaceae</i>	Fruits
3	<i>Momordica charatia</i>	Bittergourd	<i>Cucurbitaceae</i>	Leavas
4	<i>Tinospora cordfiolica</i>	Tippatheega	<i>Menispermaceae</i>	Stem bark
5	<i>Euphorbia antiquorum</i>	Brahmajemudu	<i>Euphorbiaceae</i>	Leaves
6	<i>Ceriscoides turgida</i>	Tellavelugakayalu	<i>Rubiaceae</i>	Bark
7	<i>Eugenia jambolana</i>	Nerudu	<i>Myrtaceae</i>	Seeds
8	<i>Ficus recemosa</i>	Medi	<i>Moraceae</i>	Bark
9	<i>Phyllanthus niruri</i>	Nela usiri	<i>Phyllanthaceae</i>	Leaves
10	<i>Hemedesmus indicus</i>	Suganda paala	<i>Apocynaceae</i>	Roots
11	<i>Andrographis parculata</i>	Nela vemu	<i>Acanthaceae</i>	Whole plant
12	<i>Acalypa indica</i>	Muripinda	<i>Euphorbiaceae</i>	Leaves
13	<i>Terminalia chebula</i>	Myrobalan/karakkaya	<i>Combretaceae</i>	Fruits

product and also to standardize the product. Efforts are now being made to investigate mechanism of action of some of these plants using animal models. The collective efforts of ethno botanists, phytochemists, pharmacognostists and pharmacologists are needed to document and evaluate the usefulness and safety of the claim.

## ACKNOWLEDGEMENT

I wish to express my profound appreciation and sincere thanks to all the traditional healers Utloor mandal of Adilabad district who gave us these data's. I extend my thanks to my Research Supervisors for their Continues support.

## Conflict of Interests

Authors declare that there is no conflict of interests regarding the publication of this paper.

## REFERENCES

- [1]. Dhanbal SP. Evaluation of therapeutic activity and development of quality control profiles for some antidiabetic herbal drugs. *Ind. J. Pharm.Edu.* 2004;8:163-165.
- [2]. Lanza RP, Ecker DM, Kuhnreiber, WM, Marsh JP, Ringelling J and Chink WL. Transplantation of islets using micro encapsulation: studies in diabetic rodents and dogs. *J. Mol Med.*1999. 77: 206-210.
- [3]. Momin A. Role of indigenous medicine in primary health care. *Proceedings of 1<sup>st</sup> International Seminar on Unani Medicine (ISUM'87), New Delhi, India.* 1987;pp: 54-54.
- [4]. Notkins AL . Immunologic and genetic factors in type 1 diabetes. *J. Biol. Chem.* 2002; 277: 43545-43548.
- [5]. Rang HP, Dale MM, Ritters JM. The endocrine pancreas and the control of blood glucose: In Barbara Simmons, Susan Beasley. Eds. *Pharmacology*, U.K Longman group Ltd. 1991. 403-410.
- [6]. Shokeen P, Anand P, Murali YK, Tandon V. antidiabetic activity of 50% ethanolic extract of *Ricinus communis* and its purified fractions. *Food Chem. Toxicol.*2008; 46: 3458-3466.
- [7]. Soma Manjula and Estari Mamidala. 2012. Ethnobotanical Survey Of Medicinal Plants Used By Traditional Healers Of Thadvai, Warangal District, Andhra Pradesh, India. *International Journal of Medical Research & Health Sciences*, 2(1), 40-46.
- [8]. Yeh,GY, Eisenberg DM, Kaptchuk TJ and Phillips RS. Systematic Review of Herbs and Dietary Supplements for Glycemic Control in Diabetes. *Diabetes Care* 2003; 26: 1277 – 1294.
- [9]. A. J. Boulton, L. Vileikyte, G. Ragnarson-Tennvall, and J. Apelqvist, "The global burden of diabetic foot disease," *The Lancet*, vol. 366, no. 9498, pp. 1719–1724, 2005.
- [10]. Meigs JB. Epidemiology of cardiovascular complications in type 2 diabetes mellitus. *Acta Diabetol.*2003;40(Suppl 2):S358–S361.
- [11]. Rahim M.A., Hussain A., Khan A.K.A., Sayeed M.A., Ali S.M.K., Vaaler S. Rising prevalence of type 2 diabetes in rural Bangladesh: A population based study. *Diabetes Research and Clinical Practice* 2007; 77(2):300-305.
- [12]. Dhanbal SP. Evaluation of therapeutic activity and development of quality control profiles for some antidiabetic herbal drugs. *Ind. J. Pharm.Edu.* 2004;8:163-165.
- [13]. Lingaiah M and Nagaraja Rao P. (2013). An ethnobotanical survey of medicinal plants used by traditional healers of Adilabad district, Andhra Pradesh, India. *Biolife.* 1(1); 17-23.