

# AN ETHNOBOTANICAL STUDY OF PLANTS USED FOR THE TREATMENT OF DIABETES IN THE WARANGAL DISTRICT, ANDHRA PRADESH, INDIA

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## 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 Warangal district, Andhra Pradesh by traditional healers. Information was obtained through structured questionnaire administered to traditional healers and herbalists in the region. The study revealed 15 species of plants belonging to 13 families. The decoction of the roots leaves and barks of these plants are the most commonly used while the extracts are taken orally for long period of time usually between 6 and 12 months, depending on the severity of the ailments. *Chloroxylon swietenia* and *Costus speciosus* of the families Rutaceae and Zingiberaceae 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:** Ethnomedicine, Diabetes, Medicinal Plants, Warangal

## INTRODUCTION

Diabetes mellitus is a group of metabolism disorder resulting from defects in insulin secretion or 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. 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. 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. 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. Plant derivatives with antidiabetic potentials have been used in traditional healing systems around the world (Yeh et al., 2003; Soma Manjula and Estari Mamidala, 2012). 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; Lingaiah and Nagarajarao, 2013). 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

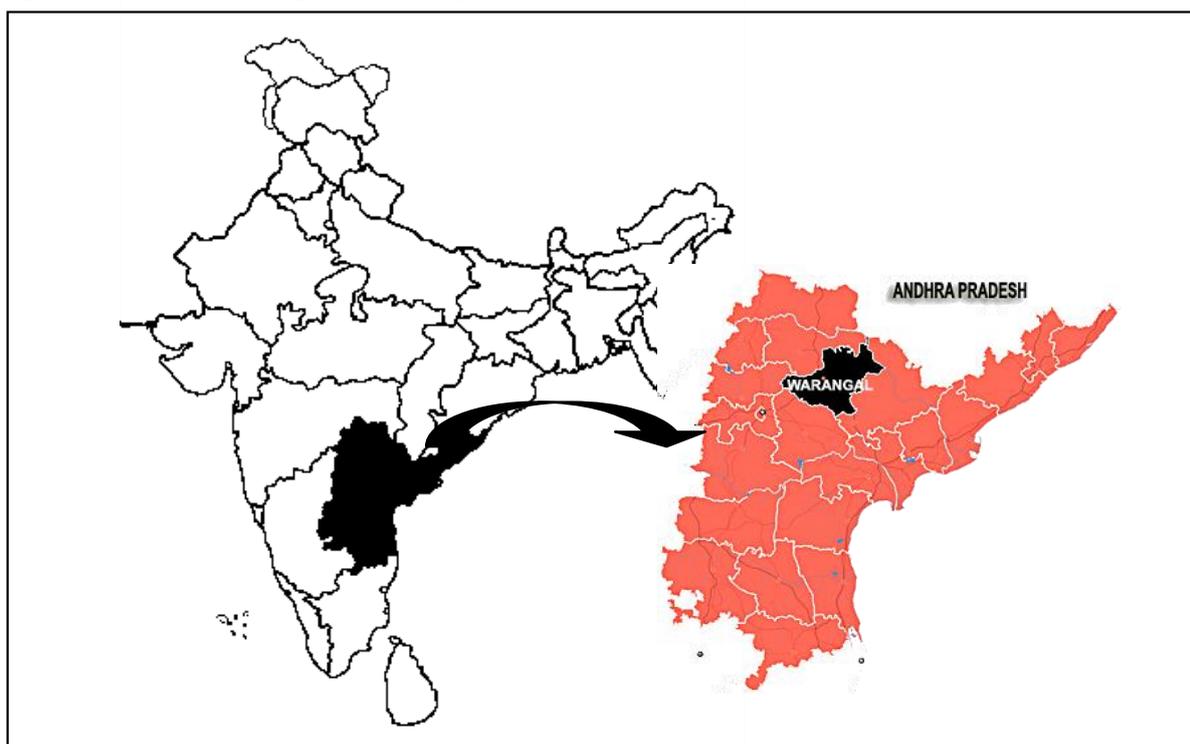
they have an impact on both World health and international trade. Interest in herbal drugs is growing due to their efficiency, low toxicity and absence of side effects (Momin, 1987). However up to few decades back the herbal medicines were replaced by synthetic medicines due to their quick effect. But 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 Eturnagaram, Warangal district, Andhra Pradesh in order to document the knowledge of the antidiabetic plants used by traditional healers in the study area.

## MATERIALS AND METHODS

### Study Area

Warangal is a city and a municipal corporation in Warangal district in Indian state of Andhra Pradesh. Warangal is located 148 kilometers northeast of the state capital of Hyderabad and is the administrative headquarters of Warangal District. Warangal is located at 18.0°N 79.58°E.

**Figure 1. Location map of Warangal district of Andhra Pradesh, India**



It has an average elevation of 302 meters (990 feet). As of 2011 India census, Warangal had a population of 759,594. Males constitute 51% of the population and females 49%. Warangal has an average literacy rate of 84.16%, higher than the national average of 74.04%: male literacy is 91.54%, and female literacy is 76.79%.

### Methodology

This study was carried out from May 2012 to January 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 V.S. Raju of Botany Department, Kakatiya University.

## RESULT AND DISCUSSION

As our present report is confined to plants with antidiabetic potentials so here we have presented ethnomedicinal information on antidiabetic 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 15 antidiabetic 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 15 species of plants belonging to 14 families that are commonly

**Table 1 : Medicinal plants used for the treatment of different ailment by traditional healers of Warangal district**

S.N.	PLANT SCIENTIFIC NAME	VERNACULAR NAME	FAMILY	PARTS USED
1.	<i>Acassia auriculata</i>	Thangedu	Caesapinaceae	Leaves
2.	<i>Andrographis Parculata</i>	Nelavemu	Acanthaceae	Whole Parts
3.	<i>Vigna mungo</i>	Urad	Fabaceae	Seeds
4.	<i>Ceriscoides turgida</i>	Tellavelaga Kaya	Rubiaceae	Bark
5.	<i>Chloroxylon swietenia</i>	Bhirra, Satinwood	Rutaceae	Leaves
6.	<i>Costus speciosus</i>	Malay Ginger	Costaceae	Leaves
7.	<i>Eugenia jambolana</i>	Neredu	Myrtaceae	Seeds
8.	<i>Euphorbia antiquorum</i>	Bramhajemudu	Euphorbiaceae	Leaves
9.	<i>Ficus recemosa</i>	Medi	Moraceae	Bark
10.	<i>Hemedesmus indicus</i>	Suganda Paala	Apocynaceae	Roots
11.	<i>Litseasebifera</i>	Narre Mamedi	Lauraceae	Bark
12.	<i>Phyllanthus niruri</i>	Nela Usiri	Phyllanthaceae	Leaves
13.	<i>Tinospora Cordifalia</i>	Thippa Teega	Menispermaceae	Leaves
14.	<i>Conscinium fenestratum</i>	Maramaneal	Menispermaceae	Stem
15.	<i>Xanthium strumarium</i>	Maruloo Mathangi	Asteraceae	Roots & Seeds

used by the herbalists, traditional healers and people of Eturnagaram, Warangal district for the management of diabetes mellitus (Table 1). Out of these, 11 species (73.33%) have not been reported before in the study area for the treatment of diabetes mellitus. The root of the plants was mostly used (13.3%) followed by the whole plants (6.6%), stem (13.3%), bark (20%), seeds (20%) and leaves (40%). Two of the plant species, *Chloroxylon swietenia* and *Costus speciosus* of the families Rutaceae and Zingiberaceae 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 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 antidiabetic 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 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 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.

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