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Ethnomedicinal Documentation of Some Antidiabetic Plants used by Tribal's of Amravati District, Maharashtra

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ABSTRACT: An ethnobotanical survey was conducted to collect information about medicinal plants used for the treatment of diabetics and associated complications by tribals in Amravati district. The indigenous knowledge of local traditional healers and native plants used for the treatment of diabetics related health disorders were collected through questionnaire and personal interviews. Extensive field survey of different parts of the district was made along with the local tribal villagers and ethnomedicinal/ayurvedic drug practitioner's perusal of published literature and herbarium specimen of different herbaria of the district was done. The investigation revealed that, the traditional healers and the inhabitants use 13 species of plants distributed in 12 genera belonging to 11 families to treat diabetes and related complications. Results depict that fresh plant materials were invariably preferred for the treatment of long term complications associated with diabetics. Anti-diabetic medicinal plants used by tribals of Amravati district have been listed along with plant parts used.

Keywords: Amravati, Ethnomedicine, Traditional Knowledge, Anti diabetic.

INTRODUCTION

Modern therapies are for too costly and also they are beyond the reacted of tribal people to be practice for the majority of diabetes refers, so the ethno-pharmacological use of herbal remedies for the treatment of diabetes is an area of study, which ripe with potential as a starting point in the development alternative, inexpensive therapies ,medicinal plant used to treat hypoglycaemic and hypoglycaemic condition are of considerable interest to ethno botanical community as they are recognized to contained valuable medicinal properties in different part of the plant (Ayyanar *et al*., 2008).

Diabetes mellitus is one of the most common metabolic diseases in the world. It is a group of disorder that are associated with high blood sugar level which often leads to complications such as blindness, kidney failure ,coronary heart disease, circulatory problem and premature death. Medicinal plants used to treat diabetic condition are of considerable interest and a number of plants have shown varying degree of antidiabetes activity (Ayyanar *et al*., 2008).

Traditional antidiabetic plants might provide a useful source of new oral hypoglycemic compounds for development as pharmaceutical entities, or as simple dietary adjuncts to existing therapies. Sulfonylureas and metformin are valuable treatments for hyperglycemia in non-insulin-dependent diabetes mellitus (NIDDM), but they are often unable to lower glucose concentrations to within the normal range, or to reinstate a normal pattern of glucose homeostasis (Bailey and Nattrass, 1988; Melander, 1988). Use of these therapies is restricted by their pharmacokinetic properties, secondary failure rates, and accompanying side effects (Bailey and Nattrass, 1988; Bailey *et al*., 1988). Whereas their modes of action partially compensate for the metabolic disturbances in diabetic states, they do not necessarily correct the fundamental biochemical lesions. Even insulin therapy does not reinstate a normal pattern of glucose homeostasis in most NIDDM patients, and overvigorous insulin treatment may carry an increased risk of atherogenesis and hypoglycemia (Bailey *et al*., 1988; Ginsberg and Rayfield, 1981; Peacock and TattersalI, 1984; Stout, 1987). Although an orally active botanical substitute for insulin seems unlikely, new molecules to stimulate endogenous insulin biosynthesis and secretion (and to promote insulin action) are realistic possibilities. This survey considers the current status of scientific and medical research in the use of traditional plant treatments for diabetes mellitus. Melghat sub-division of Amravati district (Maharashtra, India) comes under tribal sub-plan area.

Entire area comes under category – I. i.e. where tribal population is over 50% Tribal sub-plan area extends over an area of 4212 sq.km out of which 77% area is under forest. There are 314 villages having about 80% population of tribals (Indurkar, 1993). Tribal population mainly includes tribal castes such as *Korku, Bhil, Nihal, Gond, Balai, Gawali, Halbi* and *Wanjari*. This tribal population of the area has been using various plants and their parts as medicine for the diabetes regulation. Unfortunately, the ethanobotanical enumerations for antidiabetes regulation was not recorded or documented for this region. Therefore, the present study is small effort to gain insight in the knowledge of traditional medicine of this region and also focus on the screening of some meaningful medicinal plants from this region and establishing their anti diabetes potentials.

METHODS AND MATERIALS

The Melghat region is entirely different from the rest of the districts with respect to climatology, agronomical and floristic point view. The northwestern compact blocks of forest, extending over 3,075 square km in the Amravati district of Barer (now a part of the Maharashtra state) is known as "Melghat". It extends for about 65 km from North to South between latitudes 21° 46′ and 20° 11′ North and about 95 km from east to West between longitude 77° 34′ and 76° 38′ east. Melghat is situated in the mountainous region, the Gavilgarh hills of Satpuda from Chikhaldara and Dharni tahsils of Amravati district of Maharashtra state. This part of the Satpura is known as Melghat (Ingole and Kakade, 2011). Documentation of antidiabetic ethnomedicinal plants was carried out during the period from January 2013 to July 2014. Ethnomedicinal information of Melghat region was collected from tribal villagers and many ayurvedic or ethnomedicinal drugs practitioner. For a proper and orderly study, the study sites were selected considering the population and density of flora. The local informants selected were old persons from tribal villages, hakims, vaidhayas, gunias and ojhas, people working on field, experts in the field of herbal medicine and village formers who interacted for the study and documentation of their traditional knowledge of the plants used as antidiabetic agent.

Extensive field survey of different parts of the Melghat region was made along with the local tribal villagers and ethnomedicinal / ayurvedic drug practitioners. Perusal of published literature and herbarium specimen of different herbaria of the district was done to document information following the methodology of Jain (1964, 1981); Chadwick and Marsh (1994); Martin (1995). Specimen were identified with the help of relevant scientific literature of Dhore and Joshi (1988).

RESULTS AND DISCUSSION

The Melghat region of Amravati district has been widely acknowledged for its herbal treasure trove. The medicinal plants are used, as cheap and safe remedies for various ailments by tribals and aborigines. It is very essential to have a proper documentation of medicinal plants and to know their potential for the improvement of the health and hygiene through an eco friendly system. Thus importance should be given to the potentiality of ethnomedicinal studies as these can provide a very effective strategy for the discovery of useful medicinally active identity. A detailed and systemic study is required for identification, cataloging and documentation of plants, which may provide a meaningful way for the promotion of traditional knowledge of herbal medicinal plants. The present study revealed that the tribal aborigines of Amravati forest range have adequate ethanobotanical knowledge which has been transmitted from one generation to another. This study may focus researcher's attention for phytochemical and pharmacological investigation of the above documented diabetic regulating plants and to know their efficacy on modern scientific lines for the validity of ethnobotanical claims and thus would be of great scientific contribution to the society. In the present study, information of medicinal plants with botanical name, local name, family, parts used, medicinal use and formulation is tabulated (Table 1). The present investigation revealed that 13 diabetes regulatory ethnomedicinal plants being commonly used by the tribals. Different plant parts such as the leaf, root, bark, tuber fruits and in some cases whole plants were freshly collected and used for making antidiabetic herbal formulations. It is reported that these were administered internally in the form of infusion, decoction, paste or powder. Plants and there parts were collected at any time of the year, depending on their seasonal availability and preferably in the morning. Informations gathered during this study are in agreement with the previous reports (Jain and Patole, 2001; Ignacimuthu *et al*., 2006; Modak *et al*, 2007; Ramya *et al*., 2008).

Table 1: Systematic enumeration of plants used as antidiabetic ethnomedicine by tribals of Melghat region of Amravati district.

Sr. No	Botanical Name	Family	Local Name/ Common Name	Plant parts used
1	*Aegle marmelos* (L)	Rutaceae	Bel	Leaves
2	*Annona squamosa* (L)	Annonaceae	Sitaphal	Leaves
3	*Aloe barbadensis* (L)	Liliaceae	Gheequar	Leaves
4	*Catharanthus roseus* (L)	Apocyaceae	Sadafully	Whole plant
5	*Syzyguim cumini (L)*	Myrtaceae	Jamun	Fruit, Seed, Bark
6	*Murraya koenigii* (L)	Rutaceae	Curry patta	Leaves
7	*Azadirachta indica* (L)	Meliaceae	Neem	Leaves
8	*Momordica charantia* (L)	Cucurbitaceae	Karela	Leaves, fruit, seeds
9	*Tribulus terrestris* (L)	Zygophyllaceae	Gokshura	Seed
10	*Ficus bengalensis* (L)	Moraceae	Banyan	Leaves, Bark
11	*Ficus recemosa* (L)	Moraceae	Umbar	Fruit pulp
12	*Curcuma longa* (L)	Zingiberaceae	Haldi	Rhizome
13	*Bougainvillea spectabilis Willd.*	Nyctaginaceae	Bougainvilla	Leaves

Phytochemical analysis done in some of the surveyed plants indicated that the high content of total polyphenols in the test leaves might be related to the antidiabetic and antiperoxides effects of the experimental plants leaves (Parmar and Kar, 2007).

The various plants show antidiabetic activity. The pharmacological active ingredients are present in seeds, leaves and aerial parts of the plant *Annona squamosa* (Teonard *et al*., 2006). Some of the plants included in the present survey studies were phytochemically analysed and exponentially studied from the other areas (hypoglycemic and antidiabetic: Watt, 1992; antidiabetic and antiperoxide effects: Parmar and Kar 2007; increase uptake of glucose and enhanced glycogenesis: Purohit and Sharma, 2006).

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