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Ethnobotanical Survey of using Anti-Diabetic Medicinal Plants of Dindigul District, Tamil Nadu, India

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Abstract

An ethnobotanical survey of medicinal plants used for the treatment of diabetes in local people of Dindigul District, TamilNadu, India was conducted between January, 2013 - June, 2014. From the survey, a total of 37 plant species belonging to 34 genus and 26 families were found to be useful in the treatment of diabetes. Recipes used in the treatment of this disease were documented. Prominent among them are *Enicostemma littorale, Azadirachta indica, Moringa oleifera, Phyllanthus emblica, Allium cepa, Coccinia grandis.* These species were found to be very important and useful in the treatment of diabetes based on their frequency of occurrence in the recipes obtained. Herbal remedies were either prepared from dried or freshly collected plants while traditional solvent of choice included water, lime and aqueous extract from fermented maize. Decoction and pulverization were the main methods of preparation while mode of administration varies within 2 to 3 times daily. Survey revealed that leaves form the major part of plants for herbal preparations. Residents in the study area find traditional medicine cheaper as compared to orthodox medicine. A need for further scientific research based on the findings of this work is needed.

Key words: Traditional Medicinal Plant, Anti-Diabetic, Rural Peoples, Dindigul district.

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1. Introduction

Diabetes is a common and very prevalent disease affecting the citizens of both developed and developing countries. The World Health Organization estimated the disease in adults to be around 173 million in year 2000, two-thirds of which live in developing countries (Wild *et al.,* 2004). The prevalence of diabetes mellitus is on the increase worldwide and it is still expected to increase by 5.4% in 2025 (Moller and Flier, 1991). Increase in sedentary lifestyle, consumption of energy-rich diet and obesity are some of the factor causing the rise in the number of diabetics. According to American Diabetes Association, Asia, and Africa are regions with greatest potential where diabetics could rise to two or threefold above the present level (WHO, 1994). In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects (Modak *et al.*, 2007).

Herbal medicines continue to play an important role in diabetic therapy, particularly in the developing countries where most people have limited resources and do not have access to modern treatment (Ajaiyeoba *et al.*, 2006). The use of herbal remedies for the treatment of diabetes has also been authenticated by WHO (Bailey and Day, 1989). The increase in demand for the use of plant based medicines to treat diabetes may be due to the side effects associated with the use of orthodox drugs such as insulin and oral hypoglycemic agents (Marles and Farnsworth, 1994). Another important factor that strengthens the use of plant materials as anti diabetics could be attributed to the belief that herbs do provide some benefits over and above allopathic medicine and allow the users to feel that they have some control in their choice of medication (Johshi and Kaul, 2001). Right from its beginning the documentation of traditional knowledge especially on use of medicinal plants has provided important information for modern drugs and even today this area holds much more hidden thesaurus. The present study focuses the traditional medicinal plant wealth that is being used by the rural people of Dindigul district for the treatment of Diabetes. Thus, the aim of this study was to document the medicinal plants used for the treatment of diabetes from the study region.

2. Materials and Methods

2.1 The study area

The present study was conducted in several villages of Dindigul district in Tamil Nadu, India. Geographically, the entire area of Dindigul district is lies between 10º 21'N- 77º 57' E / 10. 35º N 77.95^{0}E at the elevation of 265M (869 ft), Dindigul district receives rainfall with an average of 812mm (32.0) annually. The field survey was conducted in different localities of Dindigul district, during 2013-2014. In the interview survey with herbalist healers and households, the authors used a structured questionnaire. The senior citizens, local medicine men, vaidus and especially diabetic persons were taken to collect the information about the important plants used to cure diabetes.

2.2 Data collection

The survey of medicinal flora includes the investigation of species treating diabetes, their genera and families possessing medicinal properties. In the present study, the methods suggested by Jain and Goel (1995) were adopted to survey the ethno botanical uses of medicinal plants, specimen collection, field Notes, processing of the material was followed according to the Standard protocol suggested by BSI. Traditional botanical knowledge on plants and their therapeutic application to respective ailments were collected from ethnic group of local people. The data including local name, part used were collected interview, questionnaire, collecting sample and discussion were carried out in the field visit. Identification and Nomenclature of the specimen were made by the local flora such as " An Excursion flora of Central Tamil Nadu" (Matthew, 1982), "Further Illustration on the flora of Tamil Nadu Carnatic" (Matthew, 1988), "Flora of Presidency of Madras" (Gamble & Fischer, 1915-1935, Vol 1-3). The Voucher specimens were also prepared and deposited in the Department of Botany, Saraswathi Narayanan College, Madurai.

3. Results and Discussion

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Table1: Anti-diabetic medicinal plants of Dindigul District, Tamil Nadu, India

Sl. No.	Plants name	Family	Vernacular names	Uses
1.	*Adhathoda zeylanica* Medicus.	Acanthaceae	Adhatoda	Leaf juice of this Plant used for diabetes
2.	*Aegle marmelos* (L.) corr.serr.	Rutaceae	Vilvam	The dried and powdered leaves Used for diabetes
3.	*Allium cepa* L.	Liliaceae	Venkaayam	Bulb of the Onion used for diabetes
4.	*Allium sativum* L.	Liliaceae	Vellaipoondu	Juices of leaves used for diabetes
5.	*Aloe vera* L.	Liliaceae	Sotrukatrazhai	Leaf gel are taken orally to control diabetes
6.	*Andrographis paniculata (*Burm.f) wallich ex Nees	Acanthaceae	Sirianangai	The juices of leaves used for diabetes
7.	*Aristalochia bracteolata* Retz	Aristalochiaceae	Perumarunthu	Leaf juices is taken orally to cure diabetes
8.	*Azadiracta indica* Adr. Juss	Meliaceae	Veembu	Powdered leaves used for diabetes
9.	*Brassica juncea* (L.) Cosson	Brassicaceae	Kadugu	Seed decoction taken orally to control diabetes
10.	*Cajanus cajan* (L.) Millsp.	Fabaceae	Thuvarai	Seeds boiled and taken along With food items
11.	*Cassia auriculata* L.	Caesalpinaceae	Avaram	Daily three or four flower are taken regularly
12.	*Catharanthus roseus* Linn.	Apocynaceae	Nithiyakalyani	Leaf juice is taken orally to treat diabetes.
13.	*Coccinia grandis* (L.) J. Voigt.	Cucurbitaceae	Kovai	Fruits are used for the treatment of diabetes.
14.	*Colocasia esculenta* (L.) Schott.	Araceae	Shaeppam kizhangu	Powdered leaves are used to treat diabetes
15.	*Cuminum cyminum* L.	Apiaceae	Cheerakam	Seeds are used for diabetes
16.	*Curcuma longa* auct.non L.	Zingiberaceae	Manjal	Rhizome is used for diabetes
17.	*Eclipta alba* (L.)Hassk.	Asteraceae	Karsilam kanni	The leaves are used for treatment of diabetes.
18.	*Enicostemma littorale* auct.non Blume.	Gentianaceae	Vellaruku	Powdered leaves are used to cure diabetes.
19.	*Euphorbia hirta* L.	Euphorbiaceae	Amman pacharisi	Leaf juices taken orally to cure diabetes
20.	*Ficus benghalensis* L.	Moraceae	Aalamaram	Bark decoction is used for diabetes
21.	*Ficus religiosa* L.	Moraceae	Arasamaram	Root decoction taken orally to cure diabetes.
22.	*Gymnema sylvestre* (Retz.) R.Br.ex Roemer & Scultes.	Apocyanaceae	Sakkaraikolli	Leaf juice is taken regularly to cure diabetes.
23.	*Hibiscus rosa-sinensis* L.	Malvaceae	Semparuthy	Leaf juice is taken to treat diabetes
24.	*Mangifera indica* L.	Anacardiaceae	Maa	The powered leaves are mixed with cow milk and taken orally to cure diabetes
25.	*Marsilea quadrifolia* L.	Marsileaceae	Arakkerai	Leaf juice is used for diabetes.
26.	*Momordica charantia* L.	Cucurbitaceae	Pavakai	Seed powder is mixed with water and taken orally to treat diabetes.
27.	*Moringa oleifera* L.	Moringaceae	Murungai	Early morning leaf juice is taken orally to cure diabetes
28.	*Murrya koeingii* (L.) Sprengel	Rutaceae	Karuvepalai	Leaf juice taken orally to cure diabetes.
29.	*Ocimum bacilicum* L.	Lamiaceae	Tulasi	Early morning a pinch of leaf is taken to treat diabetes
30.	*Phyllanthus amarus* Schum &Thonn.	Euphorbiaceae	Kilanelli	Leaf juice is taken orally to treat diabetes.
31.	*Phyllanthus emblica L.*	Euphorbiaceae	Nellikkaai	Fruits are very good anti diabetes properties.
32.	*Psidium guajava* L.	Myrtaceae	Koiyaa	Daily one fruits is taken to cure diabetes.
33.	*Punica granatum* L.	Lythraceae	Madulai	Flower is very good anti-diabetic properties.
34.	*Solanum nigrum* L.	Solanaceae	Manathakkali	Leaf juice is taken orally.
35.	*Spermacoce hispida* L.	Rubiaceae	Nathachuri	The powered leaves are taken twice daily.
36.	*Syzygium jambolanum (*Lam) Dc	Myrtaceae	Naval	Early morning seeded powder is taken to cure diabetes.
37.	*Withinia somnifera* (L.) Dunal.	Solanaceae	Amukkuran	The juice of the leaves used for diabetes.

There are several plants which are used as traditional medicines for various disease but for treating diabetes there is a limited number of species, which have been identified and used either directly or with the combination of other species, for the treatment of diabetes (Table- 1). In this study 37 Plant species belonging to 34 genus of 26 families have been recorded. Among all the species, *Enicostemma littorale, Azadirachta indica, Moringa oleifera, Phyllanthus emblica, Allium cepa, Coccinia grandis, Ocimum bacilicum, Psidium guajava,* are used in daily life. Most of the plants utilized in day today life of human life, in the form of single or mixed with any other plant parts and other natural derivatives. The local peoples use locally available plant species for the treatment of diabetes. Some of wild edible Plants have anti-diabetic property in the study regions. These rural practitioners use specific plant parts and specific dosages for the treatment of diabetes.

The plant parts such as seed, rhizome, leaves and root were used by the local people. The plant materials prepared as decoction, infusion, aqueous extracts in milk or honey were used for the treatment of diabetes. The knowledge of the use of medicinal plants and their properties was transmitted from generation to generation (Subodh, 2010). But this knowledge transmission is in danger because of older and younger generation is not always assured (Anyinam, 1995). Apart from ethnobotanical property and primary health care system, medicinal plants were also the alternate source of income for the underprivileged communities (Bussmann *et al*., 2007). Hence critical understanding and rebuilding of such communities has become imperative to strengthen their livelihood. It is interesting to note that such a way of life, particular with respect to healthcare practices has hardly undergone any change even in the present day.

3.1 Conclusion

Folklore medicinal plants are mostly used for rural areas; because the availability of lavish amount of medicinal plants those areas of Dindigul district. Therefore, treating diabetes mellitus with plant derived compounds which are accessible and do not require laborious pharmaceutical synthesis seems highly attractive. In the present an attempt has been made to investigate the anti-diabetic medicinal plants and may be useful to the health professionals, scientists and scholars working in the field of pharmacology. For many classes of drugs widely employed in humans, synthesis of novel structures have neither yielded entities with novel mechanisms of action nor with fewer side effects and activities improved over those of drugs currently available. Traditional plants or herbal formulations might offer a natural key to unlock diabetic complications. Now a time traditional plants or herbal products had been recommended for treatment of diabetes. The potency of herbal drugs is significant and they have negligible side effects than the synthetic anti-diabetic drugs. There is an increasing demand by patients to use the natural products with anti-diabetic activity. In recent time there has been renewed interest in the plant remedies. Plants hold definite promises in the management of diabetes.

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