

Full Length Research Paper

Ethno-medicinal Plants used as Phytotherapy for Curing Diabetes

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The present study deals with 24 species of ethno-medicinal plants which are traditionally used to cure diabetes by the people in the vicinity of Nahargarh Wildlife Sanctuary, Jaipur (India). The bases of information are observations, interviews, discussion with local people and cross checked with other folk practitioners. In the availability of modern medical facilities, the documentation and preservation of these practices are essential.

Key words: Ethnomedicinal, Diabetes, Nahargarh Wildlife Sanctuary, traditional medicines.

INTRODUCTION

The third world nations of Asia are rich in biodiversity and indigenous knowledge particularly ethnomedicinal practices (Pushpangadan and George, 2010). Among them, India is endowed with a rich biological heritage and possesses more than 53 million tribal people belonging to 300 tribal communities, constituting about 8% of the total population of the country (Anonymous, 1998). The tribal knowledge regarding the use of plant species for various purposes depend on the surrounding plants (Reddy *et al.*, 2010). Plants and other living organism have great potential to treat human diseases (Subbu and Prabha, 2009). *Diabetes mellitus* is a disease common to all parts of the world (Anonymous, 2007). It is a common and very prevalent disease affecting the citizen of both developed and developing countries. It is also estimated that 25% of the world population is affected by this disease (Erasto *et al.*, 2005). Currently India has got the largest number of diabetics and is being called as diabetic capital of the world. Diabetes has significant health consequences for individual and communities, serious diabetes-related complications including heart disease, stroke and kidney failure kills people every day. The use of insulin and control achieved over the disease are of comparatively recent origin when one takes in to account the long history of this disease. The problem of drug intolerance, hypersensitivity and resistant to insulin makes it all the

more important to search for safe, effective and cheaper remedies. Even before the advent of modern medicine, man has been using various forms of plants therapy to fight this disease (Jayakumar *et al.*, 2010).

Nahargarh Wildlife Sanctuary has great wealth of ethno-medicinal plants. Medicinal values of these plants are largely based on folk practitioners. Sanctuary is surrounded by more than 10 villages and percentage of the population still prefers to use herbal medicines along with modern medicines. The study stated that either the whole plant or different parts like leaves, stem, bark, roots, etc. are used to cure diabetes. Therefore, the present investigation seeks to explore indigenous knowledge of people in the vicinity of the sanctuary. Earlier work in the sanctuary has been carried out by Khan *et al.* (2009), Mohammed *et al.* (2008), Sharma and Kshetrapal (1999) and Sharma (1990).

MATERIALS AND METHODS

The present data is an outcome of extensive investigation of ethno-medicinal plants in the Nahargarh Wildlife Sanctuary, Jaipur (India) during the period of January 2008 to January 2010. This sanctuary is one of the 23 sanctuaries of Rajasthan State, lies between 26°15' Northern to 28°45' Northern latitude and 75°45' Eastern to 77°05' Eastern longitude. The oldest hills (Aravalli ranges) make hilly ecosystem and *Anogeissus pendula* (dhaunk) is a dominant plant in the sanctuary. (Table 1)

Table 1: List of Ethno-medicinal plants for Diabetes cure

S.N.	Plant Name	Family	Local Name	Uses
1.	<i>Acacia catechu</i>	Febaceae	Khair	Decoction of hard wood is used regularly and water extract of hard wood to be taken in the morning.
2.	<i>Aegle marmelos</i>	Rutaceae	Bel	Leaves are soaked in water overnight and water is taken next morning.
3.	<i>Allium cepa</i>	Liliaceae	Pyaj/Kanda	Regular use of bulb decreases the sugar in blood.
4.	<i>Andrographis paniculata</i>	Acanthaceae	Kalmegh	Leaf powder is taken with cow's or goat milk.
5.	<i>Azadirachta indica</i>	Meliaceae	Neem	Bark decoction is used for drinking.
6.	<i>Butea monosperma</i>	Fabaceae	Palash/Dhak	Flowers are soaked in water overnight and water is drunk in morning.
7.	<i>Casia fistula</i>	Fabaceae	Amaltash	Decoction of flower buds taken in morning.
8.	<i>Catharanthus roseus</i>	Apocynaceae	Sadabahar	Leaf juice is taken twice a day.
9.	<i>Centella asiatica</i>	Lamiaceae	Brahmibuti	Paste of whole plant is taken with cow's milk.
10.	<i>Citrulluscolocynthis</i>	Cucurbitaceae	Gartumba	Patients are advised to crush the fruits by legs in morning and roasted seeds are eaten in empty stomach.
11.	<i>Cocciniacordifolia</i>	Cucurbitaceae	Gulkakri	Plant juice is taken in morning and evening.
12.	<i>Cynodondactylon</i>	Poaceae	Doobghas	Juice of whole plant is taken in morning.
13.	<i>Echinopsechinatus</i>	Asteraceae	Gokaru	Water extract of whole plant and leaf paste is taken twice a day. Leaf powder is also taken with cow's milk.
14.	<i>Emblica officinalis</i>	Euphorbiaceae	Anwla	Bark juice is taken with turmeric powder in morning in empty stomach.
15.	<i>Ficus benghalensis</i>	Moraceae	Bargad	Fruits are taken to treat diabetes.
16.	<i>Ficus racemosa</i>	Moraceae	Gooler	Root powder is taken with water twice a day.
17.	<i>Mangifera indica</i>	Anacardiaceae	Aam	Dry kernel powder is taking with cow's milk twice daily.
18.	<i>Momordica balsamina</i>	Cucurbitaceae	Baad-karela	Fruit juice is taken in morning and evening in empty stomach.
19.	<i>Moringa oleifera</i>	Moringaceae	Sahinjana	Leaves are boiled in water and taken every morning in empty stomach.
20.	<i>Pedaliium murex</i>	Pedaliaceae	Bada-gokru	Powder of fruits and seeds are taken three times a day.
21.	<i>Phyllanthus niruri</i>	Euphorbiaceae	Bhui-anwla	Juice of whole plant is taken twice a day.
22.	<i>Plumbago zeylanica</i>	Plumbagenaceae	Chitrak	Stem decoction is taken thrice a day.
23.	<i>Tinosporacordifolia</i>	Menispermaceae	Neem-giloe	Decoction of bark is taken with turmeric powder two times a day.
24.	<i>Tribulusterrestris</i>	Zygophyllaceae	Chota-gokru	Decoction of dried fruits is drunk twice daily.

For the present investigation, data was collected by direct interaction with aged ethnic people, folk healers and vaidyas, whose empirical knowledge was respected by everyone in the study area. Data on local name of folk drug plants, parts used, methods of preparations, dosage

were recorded. The samples collected from one place were shown to other places for confirmation. The information was also discussed with different medicine men to validate the claim. Traditional medical practitioners were the main informants in the survey.

Their ages range from 32 to 75 years with more of them in the older side of the range and most of the informants were men. The collected ethno-medicinal plants were identified and confirmed with the help of herbarium of Botany Department, University of Rajasthan, Jaipur (Rajasthan). Authentications of these collected data were made in the light of existing literatures (Jain, 1963; 1991; Nadkarni, 1992) and plant species were identified taxonomically with the floras (Duthie, 1903-1929; Shamra and Tyagi, 1979 and Bhandari, 1990).

Enumeration

The information gathered on ethno-medicinal uses of diabetes in the vicinity of Nahargarh Wildlife Sanctuary by local inhabitants and traditional medical practitioners are enumerated with scientific names of plant species, family name, local name and their ethnomedicinal uses.

RESULTS AND DISCUSSION

The study revealed that 24 plant species belonging to 18 families distributed in 23 genera were generally used for treatment of diabetes disorder by the people (local tribes, folk healers, and traditional medical practitioners) in the vicinity of Nahargarh Wildlife Sanctuary. Among them, 10 were trees (41%), 9 were herbs (37%), 4 were climbers (16%), and 1 was shrub (4%). The leaves were most commonly used plant parts and other parts (root, stem, bark, flower buds, fruits and whole plant in case of herbs) were also useful for curing. Decoctions were common method for preparation of drug and recommended orally. One most interesting thing observed during the study that diabetic patients were advised to crush the fruits of *C. colocynthis* by their legs in the morning without taking any food or liquids. It was very surprising that fruits crushing were used for treating diabetes and patients were feeling better (low sugar level) after regular crushing. This is further to be investigated. The study analyzed that most of the people use modern allopathic medicines and diet control for fighting this disease but some were (30%) totally dependent on herbal medicines and some were observed to use different type of herbal drugs along with modern medicines.

The present investigation shows that indigenous people maintain their health through the use of various plants as medicine and have developed a close relationship to the plants world. But the fact that many plants have other uses lead to their over exploitation, threatening their continuous survival in the study area. Nahargarh Wildlife Sanctuary has heavy biotic pressure because it is situated between N. H. no. 8 and 11 and more than 10 villages are surrounded by the sanctuary. The knowledge of the use of plants to treat diabetes has been with the people for generations but has not been recorded. This knowledge remains mostly with the older people. The

local population should be educated on sustainable methods to use plants for disease treatment. The young generation should also be encouraged to learn the traditional medicinal knowledge to preserve it from being lost with the older generations. Similar related observations have been recorded at different areas by Devenkumar and Mukharjee (1983), Jain and Chauhan (2009), Lans (2006), Kapoor *et al.* (2008), Erasto *et al.* (2005) and Khan *et al.* (2009).

CONCLUSION

Rajasthan state offers a big promise for sustainable utilization of its herbal diversity for economic development of our country. Top priority should be given to the protection and conservation of existing germplasm. Various conservation methods were mentioned in the past by many authors for protection. These methods include *in-situ* protection, *ex-situ* cultivation, herbal gardens, germplasm collection, etc. Nahargarh Wildlife Sanctuary has heavy biotic pressure due to its situation at very near to metropolitan city, Jaipur. Sanctuary has affected mostly by grazing, cutting of trees by local inhabitant, firewood and also increase in pollution. Therefore, conservation of these ethnomedicinal plants should be viewed seriously and Government should also take severe action to protect the forest and its wealth.

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