ETHNOMEDICINAL VALIDATION AND LOOM FOR THE TREATMENT OF DIABETES: AN OVERVIEW OF THE MEDICINAL PLANTS

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ABSTRACT

Diabetes is a metabolic disorder, which is characterized by abnormally high glucose level in blood and urine. According to World Health Organization (WHO), 9% of world's adult population suffer from diabetes and this percentage is accelerating. Many medicinal plants have been used for the treatment of diabetes amongst the people of Chhattisgarh since ages. The study deals with the documentation of the plants species with their parts used for the preparation of herbal formulations. Literature survey and ethnomedicinal analysis of the data revealed that many medicinal plant species belonging to different plant families are being used for curing diabetes. Most of these plant species belonged to Fabaceae family followed by Meliaceae, Rutaceae, Apocynaceae, Combretaceae, Solanaceae and others. Leaves were the most used plant part followed by root, fruit, bark and others for the treatment and cure of Diabetes. The work is promising and might help in the discovery of potential therapeutic molecule(s) for the control and cure of diabetes.

KEYWORDS: Medicinal plants, Diabetes, Ethnomedicine, Traditional knowledge, Herbal formulations.

INTRODUCTION

In order to preserve the traditional medicinal knowledge, documentation ofplants with therapeutic value needs to be carried out, along with the knowledge related to their use. These efforts might prove helpful to society besides the preservation oftraditional knowledge. Furthermore, Ethnomedicinal surveys gives the basis for selection and thereafter conducting scientific investigationof medicinal plants, as these indigenous herbal formulations have successfully beenused by significant numbers of people overextended periods of time as reported by traditional healers.[1]

Diabetes is a metabolic disease, which is characterized by abnormally high glucose level in blood and urine.[2] According to World Health Organization (WHO), 9% of world's adult population have diabetes and the percentage is accelerating.[3-4] The global increase in the prevalence of diabetes is due to the growth in population, ageing, increase in urbanisation that has lead to obesity and physical inactivity. The primary indicators are the rapid epidemiological transition which is associatedwith changes in dietary patterns and decreased physical activity.Unlike in the West, where older populations are most affected, the burden of diabetes in Asian countries is disproportionately high in young to middle-aged adults.[5,6] It is estimated that the total number of people with diabetes will be 87.0 million by 2030.1According to the World Health Organization (WHO) criteria, theprevalence of known diabetes was 5.6% and 2.7% among urbanand rural areas, respectively.[7]

In 2000, Ramachandran et al. reported that age-standardised prevalence of diabetes and impairedglucose tolerance (IGT) in urban India was 12.1% and 14.0%, respectively with no gender difference.[8] Diabetes has shown positive and independent associations with parameters like age, body mass index (BMI), waist-to-hip ratio, family history of diabetes, monthlyincome and sedentary physical activity. When taken in to consideration. Age, BMI and a familyhistory of diabetes have shown associations with IGT.

Recent research has indicated further increases in diabetes prevalence in urban areas.[9] Moreover, the prevalence of diabetes was also found to beincreasing rapidly in rural areas, as a result of the recent socioeconomic transitions.[10-12] The objective of the present paper is to prepare a database on the health care usages against Diabetes adopted by indigenous communities.

Potential medicinal plants

The medicinal plant species belonging to different plant families used for curing diabetes has been mentioned in Table 1.

Table 1: Medicinal plants used for curing diabetes[13-23]

S. No.	Botanical name	Plant part used	Family
1	*Acacia arabica*	Exudation	Fabaceae
2	*Aegle marmelose*	Leaves and Fruits	Rutaceae
3	*Alysicarpus monolifer*	Leaves and Root	Fabaceae
4	*Ampelocissus latifolia*	Tuber	Vitaceae
5	*Andrographis paniculata*	Whole Plant	Acanthaceae
6	*Azadiracta indica*	Leaves	Meliaceae
7	*Croton roxburghii*	Bark	Euphorbiaceae
8	*Cyperus rotundus*	Tuber	Cyperaceae
9	*Gymnema sylvestre*	Leaves	Asclepiadaceae
10	*Holarrhena antidysentrica*	Bark	Apocynaceae
11	*Meila azedarach*	Leaves	Meliaceae
12	*Momordia charantia*	Leaves	Cucurbitaceae
13	*Piper nigrum*	Fruit	Piperaceae
14	*Pongamia pinnata*	Seed	Palilionaceae
15	*Psidium guajava*	Leaves	Myrtaceae
16	*Pterocarpus marsupium*	Bark	Fabaceae
17	*Saraca indica*	Leaves	Caesalpiniaceae
18	*Solanum nigrum*	Leaves	Solanaceae
19	*Syzigium cumini*	Fruit and seed	Myrtaceae
20	*Terminalia bellirica*	Fruit	Combretaceae
21	*Trigonella foenum-graecum*	Fruit	Fabaceae
22	*Vitex lencoxyon*	Bark	Lamiaceae
23	*Withania somnifera*	Root	Solanaceae
24	*Woodfordia fructicosa*	Leaves	Lythraceae
25	*Zanthoxylum alatum*	Seed	Rutaceae
26	*Zingiber officinale*	Rhizome	Zingiberceae

Ethnomedicinal tools have been applied to the information obtained from the literature survey.[24] Most of these plant species belonged to Fabaceae family (18.18%)for curing diabetes followed by Meliaceae, Rutaceae (9.09%), Apocynaceae, Combretaceae, Solanaceae, Acanthaceae (6.06%) and others 3.03% (Figure 2).
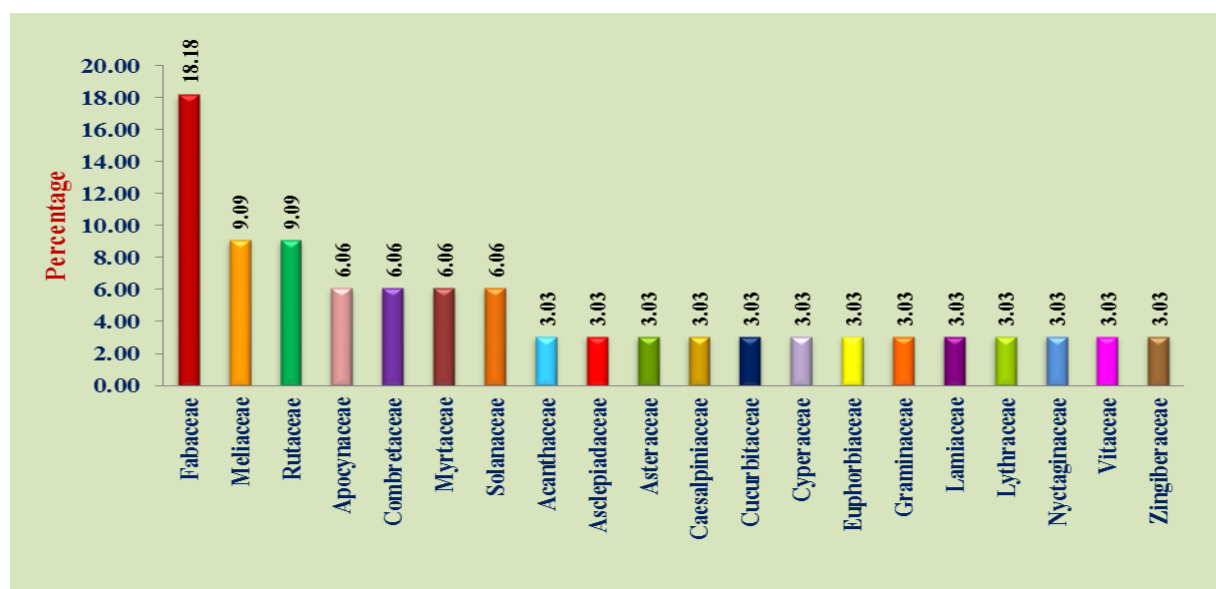

Figure 2: Frequency of Plant family used for curing of diabetes.

Leaves were the most used plant part in the herbal formulations followed by root, fruit, bark and others for curing diabetes (Figure 2).
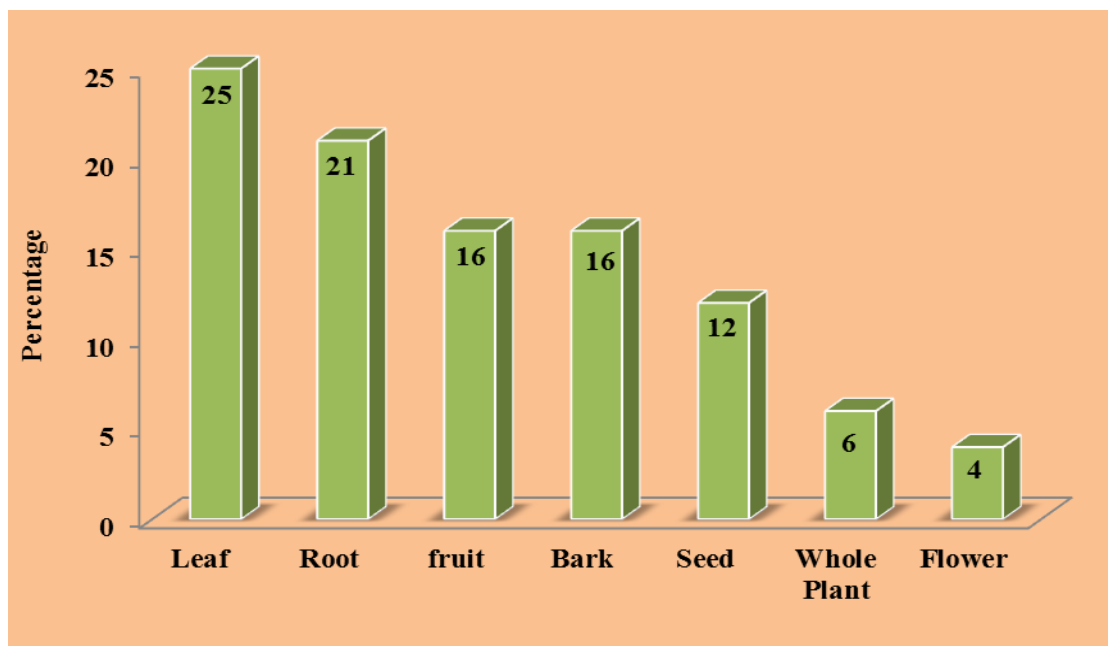
Figure 3: Plant parts used in herbal formulations.

The growth form of the investigated taxa revealed, Trees are used for curative purpose followed by herbs, climber and shrubs (Figure 3).
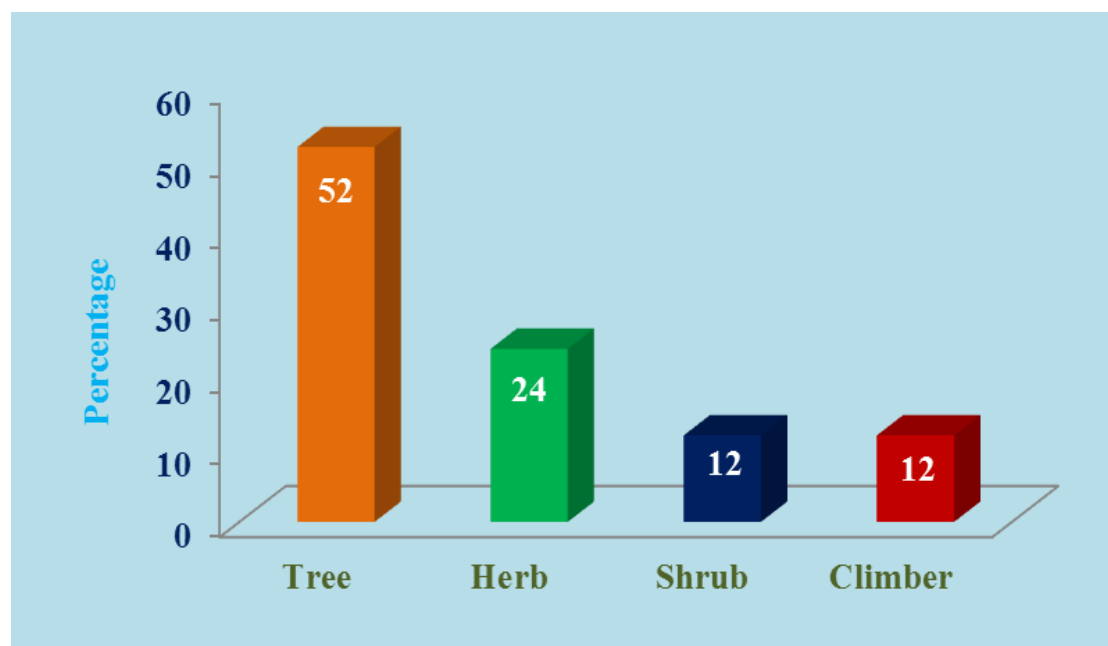

Figure 4: Growth form of the investigated taxa.

Most frequently used plant species in the herbal formulations were *Gymnema sylvestre*, *Syzygium cumuni*, *Psidium guajava*, *Andrographis paniculata* and others.

Powder was the most preferred dosage form by the traditional healers for curing diabetes followed by syrup and paste and pills (Figure 4).
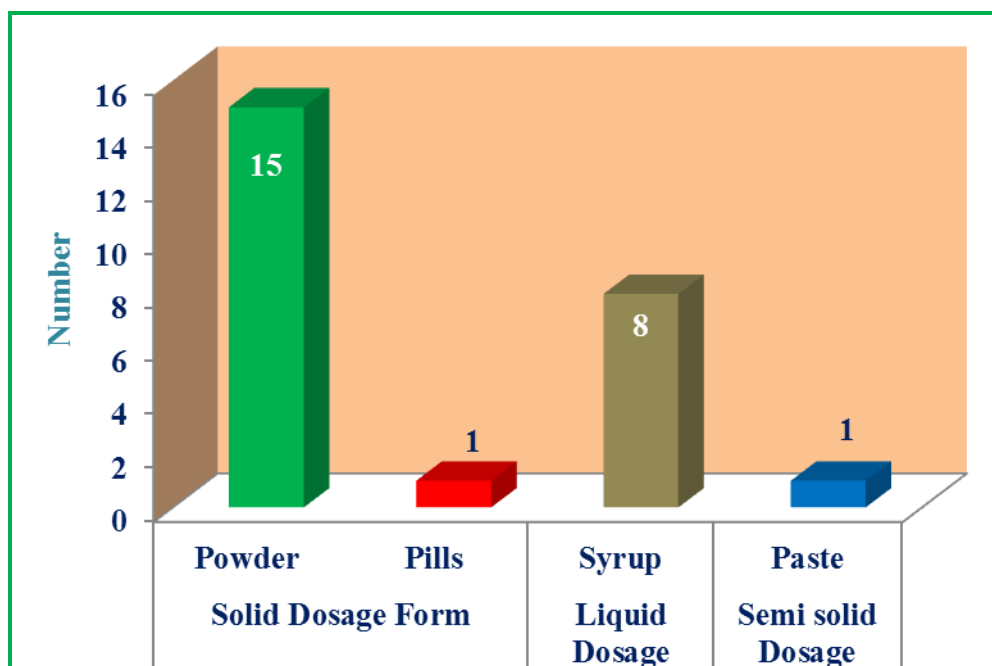
Figure 5: Dosage form classification of herbal formulations.

The study revealed thattribal community still prefer traditional medicine for curing various ailments due to lack of modern healthcare facilities in villages and due to inadequate transportation facility. Resource persons, traditional healers were invariably elderly people of the village.

The younger generation remains reluctant to take up the practice of herbal healing which implied for the documentation of traditional knowledge to preserve the knowledge base which in turn will conserve the plant resources endemic to the area. This will also contribute in narrowing the gap in the literature. This comprehensive information will be helpful in great extent to the students, local people, traditional healers, researchers, academicians, conservation professionals etc.

CONCLUSION
In conclusion, the past decades have witnessed arapid rise in the prevalence of diabetes, especially inthe urban areas owing to change in lifestyle related factors. The fact is there has been a shift in ageof onset to younger age groups which could be an alarming situation as this may adversely affect on the nation's economy.

Hence, the early identification of at risk individuals and appropriate intervention in the form of weightreduction, changes in dietary habits and increasedphysical activity could greatly help to prevent, or atleast delay, the onset of diabetes and thus reduce theburden due to non communicable diseases in India.

This work is promising and might help in the discovery of potential novel therapeutic molecule(s) for the control and cure of Diabetes.

Conflict of Interest
There is no conflict of interest in this article.

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