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# Traditional Herbal Medicine Used For the Treatment of Diabetes in Manipur, India

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## ABSTRACT

Traditional medicine plays a crucial role in health care and serves the health needs of a vast majority of people in developing countries access to modern health care services and medicines may be limited in developing countries. 80% of the world population relies on traditional medicine, encouraging the use of indigenous forms of medicine rather than expensive imported drugs. The present study revealed that totally 73 plant species belonging to 46 families were reported by local practitioners for the treatment of diabetes. The profiles presented include information about the scientific name, vernicular name, family, used of plants and parts. The large number of plants described in this paper clearly demonstrated the importance of herbal plants in the treatment of diabetes. These data may be consider and provide a base to start the search of new compounds related to phytochemistry, pharmacology and Pharmacognosy. Mention has also been made on the proper exploitation and utilization of the medicinal plants.

**Key words:** Traditional Medicine, Medicinal Plants, Diabetes, Manipur, India.

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## INTRODUCTION

Manipur is a state in northeastern India making its capital in the city of Imphal. Manipur is situated between 23.83°N and 25.68°N latitude and 93.03°E and 94.78°E longitude. It comprises 1820 sq.km of flat plateau of alluvial valley and 20507sq.km of hill territory and forms a part of the Himalayan mountain system which carries this cup-shaped wonderland inside its series of hill ranges. Manipur is bounded by Nagaland in the north, Mizoram in the south, upper Myanmar in the east and Cachar district of Assam in the west. The valley portion of the state is surrounded by hill ranges from all sides. The plant resources of Manipur with a forest cover with more than sixty percent of the total area lies unexplored among different types of climatic zones ranging from tropical to Mountain Temperature forests, including the elements of adjoining Myanmar flora in the eastern boundary inaccessible drainage forests of the western Manipur. Temperature forests in the high altitudes like Siroy hill, Dzuko valley and other lofty mountains of the state.

In recent few years, there has been exponential growth of interest in the treatment against different diseases using herbal drugs as they are generally non-toxic and World Health Organization (WHO) has recommended the evaluation of effectiveness of plants in condition where we lack modern safe modern drugs [1]. Medicinal plants have also been reported to be useful in diabetic worldwide and used empirically as antidiabetic and hyperlipidemic remedies [2, 3]. Diabetes mellitus is the most common metabolic disorder in the endrocrine disorder. The rapidly increasing incidence of diabetes mellitus is becoming a serious threat to mankind's health in all parts of the world. World Health Organization(WHO) reported that diabetes mellitus is fast becoming pandemic [5] and estimated that about 30 million people suffered from diabetic in 1985 and number increased to more than 171 millions in 2000. It is estimated that the number will increase to over 366 millions in 2030 and that large increase will occur in countries like India, China and United States of America, especially in people aged between 45 to 64 years [5-7]. By definition, diabetes mellitus is categorized as a metabolic disease characterized by hyperglycemia resulting from the defects in insulin secretion, insulin action, or both. The vast majority of cases of diabetes fall into two broad etiopathogenetic categories. In one category, type 1 diabetes, the cause is an absolute deficiency of insulin secretion. In the other, much more prevalent category type 2 diabetes, the cause is a combination of resistance to insulin action and an inadequate compensatory insulin-secretory response [8]. Moreover, the management of diabetes is a global problem until now and successful treatment is not yet discovered. There are many synthetic medicines has been developed for patients. However, the traditional medicines have demonstrated a bright future in therapy of diabetes and to understand the importance of traditional herbs. Several medicinal plants have been used as dietary adjuncts in the treatment of numerous diseases without proper knowledge of their function and properties.

In traditional medicine, diabetes mellitus is treated with diet, physical exercise and medicinal plants, even though, more than 1200 plants are used around the world in the control of diabetes mellitus and approximately 30% of the traditionally used antidiabetic plants were

pharmacologically and chemically investigated [9]. On the other hand, more than 100 medicinal plants of potential hypoglycemic agents were mentioned in the Indian system of medicines including folk medicines for the management of diabetes which are effective separately or in combination [10]. In such a way, the present work was carried out to explore the medicinal remedies of some medicinal plants used by the Manipuries for the treatment of diabetes [11]. The present study was performed with the aim of producing an inventory of the plants used by the traditional healers in Manipur to treat diabetes.

## MATERIALS AND METHODS

This paper is based on the field research carried out by the first author in different districts in Manipur during 2009-2010. Data were collected through general considerations with traditional healers and questionnaires were used to obtain the plants used by them. Details of medicinal plants used, mode of treatment, methods of preparation, types of administrations and dosage were documented by interacting with them as well as through direct observations. It was again confirmed by direct interactions with diabetic patients who used these plants. The collected plant specimens were identified based on published literature [12-17] and corrected nomenclatures were given to the specimens.

The collected plant materials used were ethnomedicinally identified by the ethenic communities [18-19]. After identification the correct nomenclature were given in the specimens and kept in the herbarium centre of Manipur University, Canchipur, India

## RESULTS

During the field survey, ethnobotanical information of 73 species of medicinal plants belonging to 46 families was compiled from various habitats of the study areas. Data obtained from the present investigation were compiled in Table 1. And the plant species are arranged in alphabetical order. Botanical/scientific name followed by family, local name, uses of plants and their parts are reported by the local inhabitants and habitat with the information of collected areas.

These plants were distributed across 46 families of which Rutaceae (6 spp) tops the list followed by Moraceae (5 spp), Cucurbitaceae (4 spp), Fabaceae (4 spp), Poaceae (4 spp), Euphorbiaceae (4 spp), Caesalpinaceae (3 spp), Anacardiaceae (2 spp), Acanthaceae (2 spp), Myrtaceae (2 spp), Zingiberaceae (2 spp) etc. These plants were used either separately or in combination with some of other plants. Most of these plants are commonly available in natural sources in the state and a few are obtained from local dealers.

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**Table 1: Plants used for the treatments of Diabetes**

| Sl. no. | Botanical/Scientific name | Family | Local name | Habit of plant | Parts used |
|---|---|---|---|---|---|
| 1. | Adhatoda vasica Nees. | Acanthaceae | Nongmangkha angouba | Shrub | Leaf, flower, root |
| 2 | Aegle marmelos Correa ex. Roxb. | Rutaceae | Heirikhagok | Tree | Leaf |
| 3. | Allium sativum Linn. | Liliaceae | Chanam | Herb | Bulb |
| 4. | Alocasia indica Roxb. | Araceae | Hong-ngoo | Herb | Rhizome |
| 5. | Annanas comosus Linn. | Bromeliaceae | Keehom | Under shrub | Whole plant |
| 6. | Andrographis paniculata Wall ex. Nees. | Acanthaceae | Bhubati | Herb | Whole plant |
| 7. | Antidesma acidum Retz. | Euphorbiaceae | Chingyensin | Shrub | Leaf, seed |
| 8. | Ardisia colorata Roxb. | Myrsinaceae | Uthum | Tree | Leaf |
| 9. | Passiflora edulis Sims. | Passifloraceae | Sitaphal | Climber | Leaf |
| 10. | Artemisia maritema Linn. | Asteraceae | Ching laibakngou | Under shrub | Whole plant |
| 11. | Areca catechu Linn. | Arecaceae | Kwa | Tree | Nut |
| 12. | Artocarpus heterophylus. Lank. | Moraceae | Theibong | Tree | Leaf |
| 13. | Artocarpus lakoocha Roxb. | Moraceae | Heirikokthong | Tree | Bark and fruit |
| 14. | Auricularia delicata (Fr.) P. Henn. | Auriculariaceae | Uchina | Saprophytic jelly like fungus | Whole plant |
| 15. | Azadiracta indica A. Juss. | Meliaceae | Neem | Tree | Leaf and seeds |
| 16. | Benincasa hispida (Thunb.) Cogn. | Cucurbitaceae | Torbot | Climber | Fruit |
| 17. | Bombax ceiba Linn. | Bombacaceae | Terapambee | Tree | Flower, fruit, bark |
| 18. | Butea monosperma (Lam.) Taub | Fabaceae | Pang-gong | Tree | Whole plant |
| 19 | Canna indica Linn. | Cannaceae | Laphurit | Rhizomatous herb | Leaf, aerial parts |
| 20. | Cannabis sativa Linn. | Cannabinaceae | Ganja | Shrub | Leaf, flower resins |
| 21. | Carica papaya Linn. | Caricaceae | Awathabi | Tree | Fruit |
| 22. | Cassia alata Linn. | Caesalpinaceae | Daopata | Shrub | Leaf, Flower |
| 23 | Cassia bicapsularis Linn. | Caesalpinaceae | Thaonam nashangbi | Undershrub | Tender shoot |

| | | | | | |
|---|---|---|---|---|---|
| 24. | Catharanthus resues(Linn.)G. Don. | Apocynaceae | Saheb lei | Undreshrub | Tender leaf |
| 25. | Celosia argentea Linn. | Amaranthaceae | Haolei angouba | Undershrub | Tender shoot |
| 26. | Cinnamomum tamala Nees & Ebern | Caesalpinaceae | Tejpata | Tree | Bark, Seed |
| 27. | Citrus limon Linn. | Rutaceae | Champra | Tree | Stem, Fruit |
| 28. | Cinnamomum zeylanicum Breyn. | Lauraceae | Ushingsa | Tree | Bark, Root |
| 29. | Citrullus vulgaris Schrad. | Cucurbitaceae | Turbuz | Climber | Fruit |
| 30. | Citrus reticulata Blanco. | Rutaceae | Komla | Tree | Fruit, Root, |
| 31. | Clerodendrum viscosum Vent. | Poaceae | Kuthap ukabi | Shrub | Tender leaf |
| 32. | Coix lacrymajobi Linn. | Rutaceae | Chaning angouba | Shrub | Flower, Fruit |
| 33. | Curcuma longa Linn. | Zingiberaceae | Yaingang | Rhizomatous Herb | Rhizome |
| 34. | Cyanotis cristita D. Don. | Commelinaceae | Wangdeng khoibi macha | Delicate herb | Leaf |
| 35. | Cynodon dactylon (Linn.) Pers. | Poaceae | Tingthou | Herb | Whole plant |
| 36. | Cyperus esculentus Linn. | Cyperaceae | Kaothum | Herb | Fruit and Root |
| 37. | Cyperus rotundus Linn. | Poaceae | Sembang kaothum | Herb | Root |
| 38. | Dioscorea alata Linn. | Dioscoreaceae | Haa | Climber | Tuber |
| 39. | Equisetum debile Roxb. | Equisetaceae | Lai utong | Herb | Leaf, rhizome |
| 40. | Euryale ferox salisb. | Nymphaeceae | Thangjing | Aquatic rooted spiny herb | Raw fruit |
| 41. | Flacourtia jangomas (Lour.) Raeusch. | Flacourtiaceae | Heitroi | Tree | Raw fruit |
| 42. | Ficus bengalensis Linn. | Moraceae | Khongnang taru | Tree | Bark |
| 43. | Ficus glomerata Roxb. | Moraceae | Heibong | Tree | Root |
| 44. | Ficus hispida Linn. | Moraceae | Ashiheibong | Tree | Whole plant |
| 45. | Glycine max Merrill. | Fabaceae | Nunghawai | Undershrub | Fruit bean |
| 46. | Glycosmis pentaphyla(Ritz) corea. | Rutaceae | Yong komla | Shrub | Leaf |
| 47 | Heliotropium indicum Linn. | Boraginaceae | Sabal sadu/Lei henbi | Herb | Leaf |
| 48. | Imperata cylindrical Linn. | Poaceae | Ee nakuppi | Grass | Rhizome |
| 49. | Ipomoea aquatica Forsk. | Convolvulceae | Kolamni | Aquatic herb | Whole plant |
| 50. | Jatropha curcas Linn. | Euphorbiaceae | Awa-kege | Shrub | Whole plant |
| 51. | Kaempferia galangal Linn. | Zingiberaceae | Yai thamna manbi | Herb | Rhizome |

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|---|---|---|---|---|---|
| 52. | Lagenaria siceraria (Mol.) Standley | Cucurbitaceae | Khongdrum | Climber | Fruit, seed |
| 53. | Lemanea australis Alkins | Rhodophyceae | Nungsham | Fresh water alga | Whole plant Whole plant |
| 54. | Lysimachia ovovata Z.D.H. | Primulaceae | Kengoi | Herb | Fruit |
| 55. | Mangifera indica Linn. | Anacardiaceae | Heinou | Tree | Fruit |
| 56. | Momordica charantia Linn. | Cucurbitaceae | Karot akhabi | Climber | Bark, seed, leaf |
| 57. | Nyctanthes arbortristis Linn. | Oleaceae | Singarei | Tree | Flower |
| 58 | Musa paradisiaca Linn. | Musaceae | Laphu | Herb | Leaf |
| 59. | Oreocnede integrifolia Miq. | Ulmaceae | U-khajing | Large shrub | Whole plant |
| 60. | Oxalis corniculata Linn. | Oxalidaceae | Yensil | Herb | Fruit, |
| 61. | Parkia roxburghii G. Don. | Mimosaceae | Yongchak | Tree | inflorescence |
| 62. | Phyllanthus niruri Linn. | Euphorbiaceae | Chakpa heikru maan | Herb | Whole plant |
| 63. | Phylantus simplex Retz. | Euphorbiaceae | Nongkhrang | Undershrub | Leaf, fruit |
| 64. | Punica granalum Linn. | Onagraceae | Kaphoi | Tree | Seed |
| 65. | Schizophyllum commune Fr. | Agaricaceae | Kanglayen | Small saprophyte | Whole plant |
| 66. | Sesbania sesban Linn. | Fabaceae | Chuchurangmei | Shrub | Fresh bark, seed |
| 67. | Solanum nigrum Linn. | Solanaceae | Morokman | Herb | Fruit, leaf |
| 68. | Spondias pinnata (Linn.f.)Kurz. | Anacardiaceae | Heining | Tree | Bark, seed |
| 69. | Syzygium cumini Linn. Skeel. | Myrtaceae | Jam | Tree | Fruit |
| 70. | Syzigium fruticosum DC. | Myrtaceae | Heinouman | Undershrub | Leaf |
| 71. | Tinospora cordifolia Willd. | Menispermaceae | Ninghoukhongli | Climber | Stem, leaf |
| 72. | Trigonella foenum gracum Linn. | Fabaceae | Methee | Herb | Leaf, seed |
| 73. | Zanthoxylum alatum Roxb. | Rutaceae | Mukthrubi | Tree | Leaf |

## DISCUSSION

In the present investigation, 73 medicinal plant species used to treat diabetes were reported and documented. The use of these plants to treat various illness is still needed by the communities, because of poor socio-economic conditions, the high cost and difficult to access the allopathic medicines. The majority of the reported species are wild and rare. These demands have made an urgent attention to conserve such vital resources so as to optimize their use in the primary health care system [20]. These demand

an urgent attention to conserve such vital resources so as to optimize their use in the primary health care system. Now a day, conservation of traditional knowledge is greatly menaced by a lot of factors related to modernization of the region and lack of interest in traditional healers, in transferring it to next generation. This suggests that the long term plan use of herbal drugs may be advantageous over chemical drugs in alleviating some chronic diseases and complications caused by diabetes, while adverse effects of these herbal are minimal [21]. Documentation of this traditional medicinal knowledge is needed for future generation. It is therefore, urgent to save the cultural heritage of the natives, by confirming the therapeutically used plants with scientific criteria.

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