

Plants used by Hmar, Manipuri and Barman community of Hailakandi District of Assam (India) for the treatment of Diabetes

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Abstract

The paper deals with the plant based on folk practices of the Hmar, Manipuri and Barman communities of Hailakandi District of Assam for the treatment of diabetes. Altogether 52 plant species were recorded belonging to 35 families of which Euphorbiaceae and Fabaceae tops the list followed by Poaceae, Cucurbitaceae, Phyllanthaceae, Moraceae, Rutaceae, Cannabaceae, etc.

Key words: Diabetes, Herbal remedies, Hmar, Manipuri and Barman communities, Hailakandi, Assam

INTRODUCTION

Hailakandi district is in the southernmost part of Assam. It is located between longitude 92°25' to 92.46° East and latitude 24°8' to 24.53° North. It has an average elevation of 21 meters. The total geographical area of the district is 1327 sq km situated in the middle of Barak Valley and bounded by Cachar district in the north and east, Mizoram state in the south and Karimganj district in the west. The district consists of both plain and hilly areas. The district is mainly inhabited by Bengali, Manipuri (Bishnupuriya and Meitei), Hmar, Barman and Rajbongshi communities. The Hmar, Barman and Manipuri people are habituated to use many plant species for their ethnic traditional medicinal practices to treat the disease diabetes. They collect a good number of plants from wild habitats and grow them in their homestead areas for the treatment of various diseases like diabetes, hypertension etc. Diabetes mellitus, which is considered as a lifelong disorder in modern medical science, is becoming a common disease in all parts of the world. Today, about 200 million people worldwide have diabetes, and this number is increasing by more than 20 million each year (Walker & Rodgers 2004). It is characterized by hyperglycemia (high level of serum glucose) due to insulin deficiency. There are two types of diabetes - *Type I* (insulin dependent diabetes mellitus) and *Type II* (non-insulin dependent diabetes mellitus), the latter being the most common. The problems related to the drugs in tolerance, hypersensitivity and resistance to insulin makes it all the most important to search for safe, effective and cheaper remedies. In the Indian system of Ayurvedic medicines many plants are used as antidiabetic. In practice, it is being increasingly recognized to be alternative form of modern medicine. World Health Organization (WHO) has also recommended that this practice should be encouraged, especially in countries where access to modern treatment of diabetes mellitus is not adequate (WHO 1980). Some traditional used anti-diabetic plants are: *Murraya koenigii* Linnaeus (Curry plant); *Momordica charantia* Linnaeus (Bitter gourd); *Galega officinalis* (Galega).

People of Hmar, Manipuri and Barman communities have been using various plant species for different purposes. Kanjilal *et al* (1934 – 1940) had reported the Flora of Assam. Reports on the status of medicinal plants of Barak valley, Assam have been contributed by Saha *et al* (2001), Sharma *et al* (2002), Das (2007), Das *et al.* (2008), Baruah *et al.* (2010, 2011). Several workers have already conducted ethnobotanical studies on northeast Indian tribes in relation to the medicinal plants including Borthakur (1976, 1981, 1992, 1996), Bhattacharjee *et al.* (1980), Dutta & Dutta (2001), and Khan *et al.* (2010, 2011). The present paper reports some of the plant species used by these three communities for the treatment of diabetes in the Hailakandi district of Assam.

MATERIALS AND METHODS

Survey for the anti-diabetic plants in the Hailakandi district of Assam was conducted during August 2012 – August 2013. Detailed information regarding the plant, parts of the plant used etc. were recorded through direct consultation with the local informants. During this survey, detailed ethno-medico-botanical information on different plants, types of medication, diseases treated were recorded from the local people of the tribal communities, elderly women and the 'Vaidyas'. Direct observation and structured questionnaire were adopted to collect valid information from the herbal practitioners. This is again confirmed by direct interaction with diabetic patients using these plants. Voucher specimens were also collected from the vegetation taking help of the informants. The collected plant specimens were identified by consulting literatures *viz.* Hooker (1872 – 1897) Kanjilal *et al.* (1934 – 1940), Deb (1981 – 1983) Bor (1940) Sinha (1987) and Joshi (2000). Herbarium specimens were prepared by standard methods (Jain & Rao, 1977). Specimens were identified and confirmed with the help of literatures and matched at GUBH. Voucher specimens have been cited for all the species enumerated in the Table-1 and are now kept under the first author's possession for future studies and will be deposited in the GUBH.

RESULTS AND DISCUSSION

Altogether 52 species of plants were collected from different villages of Hailakandi District like Gharmura, Lalpani, Jamira, Kukital, Hussaincherra, Ratacherra, Katlicherra, Amala, Bashbari, etc. these plants were found to be commonly used by the people of Hmar, Manipuri and Barman communities for the treatment of diabetes in their own traditional method. As there were no sufficient scientific record of occurrences of diabetes among the above mentioned communities. Scientific name, family, vernacular name/local name, habit and the plant-part used for every species are enumerated in Table 1. These plants were distributed across 35 families of which Euphorbiaceae and Fabaceae tops the list followed by Poaceae, Cucurbitaceae, Phyllanthaceae, Moraceae, Rutaceae, Cannabaceae, etc.

Among the plant-parts used, leaves ranked the first, followed by bark, seeds, root, whole plant, flowers, twigs, rhizomes, stem, bulbs, resin and fruits. They are using these plants as an alternative to modern medicine for the treatment of diabetes. Local informers possess rich traditional knowledge based on locally available resources/ plants for the management of many diseases or disorders including diabetes. Documentation of this indigenous traditional knowledge is needed for future generations.

Table 1. Plants used in treatment of diabetes by the people of Hmar, Manipuri and Barman communities in the Hailakandi district of Assam.

Scientific name [Family]; Exsiccatae	Vernacular/local name (tribes)	Habit	Parts used
<i>Aegle marmelous</i> (Linnaeus) Correa [Rutaceae]; TUK-714	<i>Heirikhagok</i> (M,B)	Tree	Leaf
<i>Allium sativum</i> Linnaeus [Alliaceae]; RKA-098	<i>Chanam</i> (H,M,B)	Herb	Bulb
<i>Alocasia indica</i> Roxburgh [Araceae]; TUK-018	<i>Hong-ngoo</i> (M)	Herb	Rhizome
<i>Annanas comosus</i> Linnaeus [Bromeliaceae]; RKA-015	<i>Keehom</i> (M,B)	Herb	Whole plant
<i>Andrographis paniculata</i> (Burman f.) Wallich ex Nees [Acanthaceae]; BC-681	<i>Kalmegh</i> (B)	Herb	Whole plant
<i>Angiopteris evecta</i> (G. Froster) Hoffmann [Angiopteridaceae]; RKA088	<i>Gokur</i> (M,H)	Shrub	Leaf
<i>Annona squamosa</i> Linnaeus [Annonaceae]; RKA146	<i>Sitaphalam, Gandhagatra, Subha</i> (H,M,B)	Shrub	Leaf
<i>Areca catechu</i> Linnaeus [Arecaceae]; BC-106	<i>Kwa</i> (B)	Tree	Nut
<i>Azadiracta indica</i> A. Jussieu [Meiliaceae]; RKA-209	<i>Neem</i> (H,M,B)	Tree	Leaf, seed
<i>Benincasa hispida</i> (Thunberg) Cogniaux [Cucurbitaceae]; RKA-215	<i>Torbot</i> (B)	Climber	Fruit
<i>Bombax ceiba</i> Linnaeus [Malvaceae]; BC-162	<i>Terapambee</i> (M,H)	Tree	Flower, Fruit, bud
<i>Borussia javanica</i> Linnaeus [Simaroubaceae]; TUK-352	<i>Heining</i> (H)	Tree	Fruit, seed
<i>Canna indica</i> Linnaeus [Cannaceae]; TUK-388	<i>Laphurit</i> (M,B)	Herb	Leaf, aerial parts
<i>Cannabis sativa</i> Linnaeus [Cannabaceae]; RKA-206	<i>Gunja</i> (H)	Shrub	Leaf, flower, resins
<i>Carica papaya</i> Linnaeus [Caricaceae]; BC-121	<i>Awathabi</i> (B)	Shrub	Seed
<i>Cassia fistula</i> Linnaeus [Fabaceae]; RKA-535	<i>Aragvadha, Suvarnaka</i> (M,B)	Shrub	Flower, seed, stem-bark
<i>Cinnamomum tamala</i> (Buchanan –Hamilton) T. Ness & C.H. Ebermaier [Lauraceae]; TUK-393	<i>Tezpata</i> (H,M,B)	Tree	Stem, bark, root
<i>Citrullus lanatus</i> (Thunberg) Matsumura & Nakai [Cucurbitaceae]; RKA-207	<i>Turbuz</i> (B)	Climber	Fruit
<i>Citrus reticulata</i> Blanco [Rutaceae]; TUK-720	<i>Komla</i> (H,M,B)	Tree	Fruit, root
<i>Cocos nucifera</i> Linnaeus [Arecaceae]; RKA-019	<i>Daab, Narikel</i> (M,B)	Tree	Fruit, flower
<i>Cordia dichotoma</i> Forsskål [Boraginaceae]; RKA-108	<i>Bahubara</i> (B)	Tree	Leaf, fruit
<i>Coix lacrymajobi</i> Linnaeus [Poaceae]; TUK-382	<i>Chaning, Angouba</i> (H,M)	Herb	Root
<i>Curcuma longa</i> Linnaeus [Zingiberaceae]; TUK-878	<i>Karma, Haridra, Haldi</i> (H,M,B)	Herb	Leaf, rhizome
<i>Cynodon dactylon</i> (Linnaeus) Persoon [Poaceae]; TUK-378	<i>Durba, Dubh</i> (H,M,B)	Herb	Whole plant
<i>Cyperus rotundus</i> Linnaeus [Cyperaceae]; BC-190	<i>Sembang kaotha</i> (M)	Herb	Whole plant with rhizome
<i>Dioscorea alata</i> Linnaeus [Dioscoreaceae]; RKA-152	<i>Guraniaalu, Katalu, Chupri alu</i> (B)	Climber	Rhizome

Scientific name [Family]; Exsiccatae	Vernacular/local name (tribes)	Habit	Parts used
<i>Equisetum debile</i> Roxburgh [Equisetaceae]; BC-123	<i>Lai utong</i> (H)	Herb	Whole plant
<i>Euphorbia hirta</i> Linnaeus [Euphorbiaceae]; BC-899	<i>Baro-kheurie</i> (M,B)	Herb	Whole plant
<i>Ficus benghalensis</i> Linnaeus [Moraceae]; TUK-599	<i>Bar, Bot, Languli, Karihari</i> (H,M,B)	Tree	Whole plant
<i>Ficus religiosa</i> Linnaeus [Moraceae];TUK-749	<i>Aswatha, Aswat</i> (M,B)	Tree	Root-bark, root
<i>Gloriosa superba</i> Linnaeus [Colchicaceae]; RKA-125	<i>Langali, Agnisikha, Bishalanguli, Ulat</i> (H,M,B)	Climber	Whole plant
<i>Gmelia arborea</i> Roxburgh [Verbenaceae]; RKA-063	<i>Gamari</i> (M)	Tree	Leaf, stem, fruit
<i>Hydrolea zeylanica</i> Linnaeus [Hydrophyllaceae]; RKA-126	<i>Isha-langula, Kasschra</i> (H,M)	Herb	Leaf, twig
<i>Imperata cylindrica</i> Linnaeus [Poaceae]; RKA-057	<i>Oolo, Ulu</i> (M,B)	Herb	Root
<i>Ipomoea aquatica</i> Forsskål [Convolvulaceae]; BC-240	<i>Kalmisak</i> (B)	Herb	Leaf, twig
<i>Jatropha curcas</i> Linnaeus [Euphorbiaceae]; BC-891	<i>Lalbherendha, Nikumba, Verenda</i> (H,M,B)	Shrub	Leaf, twig
<i>Justicia adhatoda</i> Linnaeus [Acanthaceae]; BC-690	<i>Nongmangkha</i> (H,B)	Shrub	Leaf, flower, root
<i>Kalanchoe pinnata</i> Persoon [Crassulaceae]; BC-923	<i>Kophpata or patharkuchi</i> (M,B)	Herb	Whole plant
<i>Mangifera indica</i> Linnaeus [Anacardiaceae]; BC-473	<i>Aam</i> (H,M,B)	Tree	Leaf
<i>Mimosa pudica</i> Linnaeus [Fabaceae]; BC-913	<i>Lajjabati</i> (H,B)	Herb	Whole plant
<i>Mimordica charantia</i> Linnaeus [Cucurbitaceae]; RKA-052	<i>Korola</i> (H,B)	Herb	Leaf
<i>Nyctanthes arbortristis</i> Linnaeus [Oleaceae]; RKA-049	<i>Shiwli</i> (H)	Shrub	Leaf
<i>Oxalis corniculata</i> Linnaeus [Oxalidaceae]; BC-473	<i>Amrul, Yensil</i> (M)	Herb	Leaf
<i>Phyllanthus acidus</i> Linnaeus [phyllanthaceae]; BC-893	<i>Harboroi, Laboir</i> (M)	Tree	Leaf
<i>Phyllanthus emblica</i> Linnaeus [phyllanthaceae]; RKA-038	<i>Amlok, Amla, Amlika</i> (H,M,B)	Tree	Seeds
<i>Plumbago rosea</i> Linnaeus [Plumbaginaceae]; BC-419	<i>Kengol</i> (M)	Shrub	Stem
<i>Senna auriculata</i> Linnaeus [Fabaceae]; RKA-536	<i>Chahui</i> (H,M,B)	Tree	Flower
<i>Streblus asper</i> Loureiro [Moraceae]; TUK-849	<i>Doi-Shang, Reang, Rupashi, Sheora</i> (H,M,B)	Tree	Bark
<i>Syzygium cumini</i> Linnaeus [Myrtaceae]; RKA-021	<i>Kala jam</i> (M)	Tree	Bark, fruit, seeds
<i>Terminalia chebula</i> Retzius [Combretaceae]; RKA-119	<i>Hortoki</i> (H,B)	Tree	Seeds

Scientific name [Family]; Exsiccatae	Vernacular/local name (tribes)	Habit	Parts used
<i>Tinospora cordifolia</i> Willdenow [Menispermaceae]; BC-973	<i>Vanrui, Chorei, Golancha</i> (H,M,B)	Climber	Leaf, bark
<i>Trigonella foenum-graecum</i> Linnaeus [Fabaceae]; TUK-862	<i>Methee</i> (M)	Herb	Leaf, seed

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LITERATURE CITED

- Baruah, M.K.; Chakraborty, G. & Dutta Choudhury, M. 2010. Status of Floristic study in Barak Valley in Assam, India: need for future research. *Pleione* 4(1): 17 – 32.
- Baruah, M.K.; Chakraborty, G. & Dutta Choudhury, M. 2011. Use of Ethnomedicinal plants by the kuki Tribe of Cachar District of Assam, India. *Pleione* 5(2): 231 – 237.
- Bor. N. L. 1940. *Flora of Assam*. Vol-5, Govt. of Assam, Shillong.
- Borthakur, S.K. 1976. Less known medicinal plants among the tribes of Karbi Anglong (Mikir Hills) Assam, *Bull Bot Surv India*, 18 (1-4): 166 – 171.
- Borthakur, S.K. 1981. Certain plants in the folklore and folk life of Karbis (Mikirs) of Assam. In (Ed.) S.K. Jain, *Glimpses of Indian Ethnobotany*. New Delhi. Pp170- 181.
- Borthakur, S.K. 1992. Native phytotherapy of child and women diseases in Assam, North-Eastern India. *Pitoterpia* 63(6): 486 – 488
- Borthakur, S.K. 1996. Postnatal care of women in traditional system in Assam, *Ethnobotany* 8: 51 – 53.
- Bhattacharjee, S. 1980. Folklore medicine from district Kamrup (Assam). *Bull. Medico. Ethno. Botany Res.* I: 447 – 460.
- Das, A.K.; Dutta, B.K. & Sharma, G.D. 2008. Medicinal plants used by the different tribes of Cachar district, Assam. *Indian J. Trad. Knowl.* 7(3): 446 – 454.
- Das, B. 2007. *Fern Flora and Fern allies of Southern Assam with reference to ethno-medicobotanical studies and certain conservation aspects*. Ph. D. thesis, Assam University, Silchar.
- Deb, D.B. 1981-1983. *Flora of Tripura State*. Vol. - 1 & 2. Today & Tomorrow's Printer and Publisher, New Delhi.
- Dutta, P.K. & Dutta, B.K. 2001. *Medico Ethno botanical studies of some North east tribe/Ethnic community settled in Barak valley*. Proceed. Nat. Sem. "On traditional knowledge on Herbal medicine & Plant Resources of North east India, protection utilization and conservation", March 13 to 15, Guwahati Assam. Pp. 129 – 153pp
- Hooker, J.D. 1872 – 1898. *The flora of British India*, vol. 1 – 7. L. Reeve & Co., London.
- Jain, S.K. & Rao, R.R. 1977. *A Handbook of Field and Herbarium methods*. Today & Tomorrow's printers & publishers, New Delhi.

- Joshi, S.G. 2000. *Medicinal plants*. Oxford and IBH publishing Co.pvt. Ltd. New Delhi.
- Kanjilal, U.N.; Kanjilal, P.C; Das. A. & Purkaystha, C. 1934. *Flora of Assam*, Vol. 1, Assam Govt. Press, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C. & Das, A. 1938. *Flora of Assam*, Vol. 2, Assam Govt. Press, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C.; Das. A. & Dey, R.N. 1939. *Flora of Assam*, Vol. 3, Assam Govt. Govt. Press, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C; Das, A, & Dey, R.N. 1940. *Flora of Assam*, Vol. 4, Assam Govt. Govt. Press, Shillong
- Khan, T. U.; Borthakur, S. K. & Hore, D.K. 2010. Sugandhmantri [*Homalomena aromatica* (Roxb.) Schott – An important Medicinal and Aromatic Plant of N. E. India. *Pleoine* 4(1): 1 – 5.
- Khan, T.U.; Chowdhury, B. & Borthakur, S.K. 2011. Traditional Conservation Practices in Hailakandi District, Barak Valley of Assam. *Pleoine* 5(1): 142 – 147.
- Myers, N.; Mittermeier. R.A.; Mittermeier, C.G.; da Fonseca, G.A. & Kent, J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403: 853 – 856.
- Saha, D. & Dutta, B.K. 2001. *Some observations on the status of medicinal plants of Barak Valley, Assam Ethno medicine of North East India* Proceed. Nat. Sem. “On traditional knowledge on Herbal medicine & Plant Resources of North east India, protection utilization and conservation”, March 13 to 15, Guwahati Assam. Pp. 98 – 128.
- Sharma, G. D.; Bhattacharjee, S.; Sinha, M. & Das, A. K. 2002. Status of plant Bio-diversity of Cachar district and its conservations. *J. Econ.Taxon. Bot.* 25(1): 94-101.
- Sinha, S.C.1987. *Ethnobotanical study of Manipur*. Ph. D. Thesis, Manipur University.
- Walker, R. & Rodgers, J. 2004. *Diabetes-A practical guide to managing your health*. Dorling Kindersley Ltd., London.
- WHO 1980. *The WHO Expert Committee on Diabetes mellitus. Second Report, Technical Report Series*. WHO, Geneva. pp.646.