



Some Anti-Diabetic Plants of Southern Assam

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Abstract

Survey to explore anti-diabetes plants of Southern Assam was undertaken during the period of 2006-2008 and altogether 58 anti-diabetes plants have been recorded on the basis of information collected from medicine man. Of the collected plants dicotyledons showed higher percentage of use as compared to monocot and pteridophytes. Among the plant parts used, leaf is highly used followed by bark, root, whole plant, fruit, seeds, roots, flowers, rhizome, sap and nuts

Key Words: Anti-diabetes plants, Southern Assam.

Introduction

Diabetes is characterized by dangerously high level of serum glucose known as hyperglycemia or elevated blood glucose. There are two major types of diabetes diseases designated as Type-I & Type-II.

Type-I is Insulin dependent Diabetes Mellitus (IDDM) or Juvenile on set diabetes accounts for about 10% of diabetes. The only treatment of this type available is insulin injections.

Type-II is Non insulin dependent Mellitus (NIDDM) occurs in 90% of all diabetes. The major chronic complications of Type-II diabetes mellitus include retinopathy, accelerated macro vascular disease, renal diseases; neuropathy etc. Type-II diabetes affects approximately 150 million diabetes around the world. There are four classes of oral glucose lowering agents other than insulin and use to treat Type-II diabetes. They are sulfonylurea, biguanides, glucosidase inhibitors and thiazolidinediones. There are many drawbacks related to each of these treatments mainly developing of resistance and adverse effects to lack of responsiveness in large segments of patient population.

Some herbal alternatives assist prevention of the secondary complications of the disease. Some herbs have been also proven to help in the regeneration of beta cells. To date over 600 traditional plants treatments for diabetes have been reported but only a small number of these have scientific and clinical evaluation to assess their efficacy.

Southern Assam comprising of the districts of Cachar, North Cachar, Hailakandi & Karimganj is inhabited by a number of tribes of various ethnic groups each with unique cultural heritage. It is now believed that these ethnic groups are also rich with medicinal plant lore. Their habitat in remote forest areas without modern medical facilities has compelled them to depend upon plants for their primary health care and by doing so generations after generation they preserve this rich lore of medicinal plants. Keeping in view the facts stated above proposed study has been taken with great interest.

Considering the significance of the study a good number of researchers are now engaged in this field and consequently a number of publications

are available viz.in Assam Borthakur (1976) worked on lesser known medicinal uses of plants among the tribes of Mikir Hills; Hazra (1977) worked on some important medicinal plants from Kaneng district of Arunachal Pradesh; Jain and Shampru (1977) worked on wild edible plants in bazar of Meghalaya; Mazumder *et al.*, (1978) worked on folk-lore medicinal plants of Assam Meghalaya; Tiwary *et al.*, (1978) worked on some medicinal plants from district Tirap of Arunachal Pradesh; Tiwary *et al.*, (1979) worked on folk-lore medicine of Assam & Arunachal Pradesh; Jain & Dam (1979) worked on some Ethno botanical notes from North Eastern India; Bhattacharjee *et al.*, (1980) worked on folk lore medicine from Kamrup District; Kumar Y *et al.* (1980) worked on certain medicinal plants among some Garo people around Balphakrah Sanctuary in Meghalaya; Jain & Barthakur (1980) worked on Mikirs; Rao (1981) worked on medicinal plants used by Khasi and Garo Tribes of Meghalaya; Rao & Jamir (1982) worked on Ethno Botanical plants of Nagaland; Baruah & Sharma (1984) worked on Boro; Gogoi & Boissya (1984) worked on Herbal medicines used by the people of Assam against Jaundice; Dutta Choudhury (1999) has carried out Ethno Medico Botanical aspects of Reang tribe of Assam; Dutta Choudhury & Chowdhury (2002) published some new Ethno Medicinal plants from Rieng tribes of Assam.

Materials and Methods

Collection of Anti-Diabetic Medicinal Plants

In order to collect information on anti-diabetes medicinal plants of Southern Assam, intensive field work has been undertaken over a period of two years (2005 – 2007) covering different seasons so as to gather information on each and every species found useful in herbal medicine by conducting field survey among the Choreis, Hmar and Rieng villages of Southern Assam. Plants have been collected in its flowering and fruiting stages as far as possible from its natural habitat and serially tagged with collection numbers. Thorough observations have been made on spot of collection of the individual plant species and recorded field data as regards location, natural habitat, distribution

pattern, nature of roots, rhizome, bulbs, etc. The color of flowers and fruits and other relevant characteristics that cannot be observed after drying of the specimen are also recorded. Smaller herbaceous plants were collected as a whole and in case of trees, shrubs, under shrubs, woody herbs and climbers, respective twigs were collected. Data on each plant have been collected as follows: (a) vernacular name, (b) parts used, (c) process of preparation of medicine and (d) doses and mode of application.

Instant pressing of the specimen as far as possible was done. Rainy season's collections were pressed by spraying 10% formaldehyde. Succulent plants, bulbous and rhizomatous were boiled till the plant turned yellow and pressed properly. Dried specimens were poisoned with saturated solution of mercuric chloride (HgCl₂) dissolved in absolute alcohol and mounted with fish glue on standard herbarium sheet (42 x 28 cm). Field data with collection number, date of collection, locality, short description, vernacular name, collector's name, etc. were transferred from the field book to the printed side on the right hand corner of the herbarium sheet for ready identification.

A number of Flora and Monographs were consulted specially of Flora of British India Vol. 1 – 7 (Hooker 1872 – 1887); Flora of Assam, Vol. 1-4 (Kanjilal *et al.*, 1934-40), Flora of Nongoph (Joseph, 1982); Flora of Tripura State, Vol. 1 and 2 (Deb, 1981 and 1983), etc. Collected specimen were identified and finally confirmed by consulting herbaria viz., Herbarium of Department of Life Science, Assam University, Silchar and Kanjilal Herbarium, Shillong (Assam). One set each of identified herbarium sheets has been deposited in Herbarium of Department of Life Science, Assam University, Silchar for future reference. Alphabetic arrangement of all the medicinal plants has been made providing correct nomenclature followed names of families of Angiosperms based on Bentham and Hooker (1862 – 1883) system of classification and Fern Allies and Ferns are those of Panigrahi (1994), given in parenthesis and invariably mentioned the vernacular name along with names found if any in Hindi (H), English (Eng) and Bengali (Beng).

Result and Discussion

Table 1. Anti-Diabetes Plants Used By Various Tribes of Southern Assam

Sl. No.	Botanical Name of the Ethnomedicinal Plant	Family	Vernacular Name	The plants used by the Tribes	Parts Used
1	<i>Adhatoda vasica</i> Ness.	ACANTHACEAE	Vasak Pata" (C & B(	C, B, Hm	Root, leaf, flower
2	<i>Albizia procera</i> (Roxb.(	MIMOSACEAE	Koroi"(B(, "Gurar, Kurha, Safed Siris"(H(	C, R	Leaf, Flower, Bark
3	<i>Alocasia indica</i> (Roxb.(	ARACEAE	"Mankachu." (B(, "Mankanda." (H(, "Hastikarni." (S(	C, Hm, R	Rhizome
4	<i>Alstonia scholaris</i> (Linn.(	APOCYNACEAE	"Saptaparnah"(S(, "Chattim, Chatwan"(B(, "Catium, Saitan-Ka-jhad" (H(	R, C	Whole plant
5	<i>Ananas comosus</i> (L(	BROMELIACEAE	"Amatoi"(R(, "Ananash"(B(, "Ananas"(H(, "Anamnasam, Bahunetrphalam"(S(	R, C, Hm	Whole plant
6	<i>Andrographis paniculata</i> (Burun.f(Wall,ex Ness, Syn <i>Justica paniculata</i> (Burm.f(	ACANTHACEAE	Kalmegh (B(	R, C, Hm.	Whole plant
7	<i>Angiopteris evecta</i> (Forst.(Hoffm	ANGIOPTERIDACEAE	Tree fern (E(	C	Petiole
8	<i>Annona squamosa</i> Linn.,	ANNONACEAE	"Sitaphalam, Gandhagathra, Shubha"(S(, "Ata, Seethaphal"(B(, "Seethaphal, Sharifa"(H(	R	Leaf
9	<i>Areca catechu</i> Linn.	ARECACEAE	"Supari"(B(, "Tumul"(A(	C	Nuts
10	<i>Artocarpus heterophyllus</i> Lamk.	MORACEAE	"Kathal"(B&H(	C	Leafs
11	<i>Azadirachta indica</i> Juss.	MELIACEAE	Inkbow (C(, Neem (B&H(	B, C, Hm	Leaf, seeds
12	<i>Bombax ceiba</i> .L., <i>Bombax malabaricum</i> D.C.	BOMBACACEAE	Shimul (B(	C, R	Flowers & steam bark
13	<i>Canna indica</i> Linn.,	CANNACEAE	"Devakuli"(S(, "Sarbajaya"(B(, "Sabbajaya"(H(	C, Hm	Leaf, aerial parts
14	<i>Cannabis sativa</i> L.	CANNABINACEAE	Bhang (B,H(Ganja (B(	Hm, R, C	Flowers, Leaves, resins
15	<i>Caric papaya</i> L.	CARICACEAE	Papaya (B(	R, C	Seeds
16	<i>Cassia fistula</i> Linn.,	CAESALPINIACEAE	"Aragvadha, Suvarnaka"(S(, "Amultas, Bandarlathi"(B(, "Amaltas, Bandarlauri, girimalah"(H(	C, R, Hm	Flower, seed, stem bark
17	<i>Cassia occidentalis</i> L. Syn- <i>Senna occidentalis</i> Roxb.	CAESALPINIACEAE	Kalkashundu (B(	C, R	Leaves, seeds
18	<i>Cassia sophera</i> L.	CAESALPINIACEAE	Kalkasunda (B(	C	Seeds & stem bark
19	<i>Cassia tora</i> L.	CAESALPINIACEAE	Panevar (B(	C	Seeds
20	<i>Catharanthus roseus</i> G.Don.	APOCYNACEAE	Nayantara (B(	C	Leaf
21	<i>Centella asiatica</i> (L.(Urban. Syn- <i>Hydrocotyle asiatica</i> L.	APIACEAE/UMBELLIFERAE	Thunkuni, Tholkuri (B(	Hm, C	Whole plant.
22	<i>Cicca acida</i> (Linn(Meer	EUPHORBIACEAE	Harboroi/Laboir /B/	Hm, C	Leafs
23	<i>Cinnamomum tamala</i> . (Buch-Ham.(Nees	LaurACEAE	Tezpata (B(Tejpat (H(	Hm, C	Stem, bark & root
24	<i>Citrus aurantium</i> Linn.,	RUTACEAE	"Khatta" (H(C, Hm	Fruit
25	<i>Citrous reticulate</i>	RUTACEAE	"Kamala" (R(R, C	Roots, fruits

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26	<i>Clerodendrum viscosum</i> Vent.	VERBENACEAE	"Bhandirah"(S. "Basavanapada,Ibbane" (B & H)	R,C	Whole plant
27	<i>Cocos nucifera</i> L.	ARECACEAE/PALMAE	Dab, Narikel (B)	Hm, C	Fruit & flower
28	<i>Cordia dichotoma</i> Forst	BORAGINACEAE	Bahubara (B)	C, Hm	Leaf and fruits
29	<i>Curcuma domestica</i> Valetton	ZINGIBERACEAE	"Karma"(R. "Haridra" (S. "Haldi"(H. and (B.	C,R	Leaf, rhizome
30	<i>Cynodon dactylon</i> (Linn.)	POACEAE	"Durba, Dubh" (B, "Dub, Durba"(H. "Durva, Niladurva"(S)	C,R	Whole plant
31	<i>Cyperus iria</i> Linn	CYPERACEAE		C,R	Whole plant
32	<i>Dioscorea alata</i> Linn	DIOSCOREACEAE	"Guranialu, Katalu"(A, "Chupri alu"(B.	C,R	Rhizome
33	<i>Dioscorea bulbifera</i> Linn	DIOSCOREACEAE	Banalu, Kukulalu, Gaichaalu" (B, "Ratalu, Suaralu, Pitaalu" (H.	C,R	Leaves and twigs
34	<i>Euphorbia hirta</i> L. Syn:- <i>E. pilulifera</i> sensu Hook.f. non L.	EUPHORBIACEAE	Baro-kheruie	C, Hm	Whole plant
35	<i>Ficus benghalensis</i> Linn	MORACEAE	"Bar, Bot". (B. ("Bar, Barged Bhor"(H, "Vata, Bahupada"(S)	C, Hm, R	Stem bark, sap
36	<i>Ficus hispida</i> L.f.	MORACEAE	Dumur (B)	C	Hypanthodium (fruits)
37	<i>Ficus racemosa</i> Linn	MORACEAE	Thaikat (Chorei(Jagna dumur (B)	C, Hm	Fruit
38	<i>Ficus religiosa</i> L.	MORACEAE	Aswatha, Aswat (B)	C	Rootbark and root
39	<i>Gloriosa superba</i> Linn.,	LILIACEAE	"Langali, Agnisikha." (S("Bishalanguli, Ulatchandal." (B. "Languli, Karihari, Karadhikanninagadde, Nangulika". (H.	C	Whole plant
40	<i>Gmelia arborea</i> Roxb.	VERBENACEAE	Gamari (B)	C	Leaf stem and fruit
41	<i>Heliotropium indicum</i> Linn.,	BORAGINACEAE	"Hatishur" (B)	C	Aerial parts
42	<i>Holarrhena pubescens</i> (Buch-Ham.)	APOCYNACEAE	"Khurchi" (H, "Kutaja, Indra"(S. "Dudh-Khiri"(A)	C	Bark and fruits
43	<i>Hydrolea zeylanica</i> (Linn.)	HYDROPHYLLACEAE	"Isha-langula, Kasschra"(B, "Langali"(S.	C	Leaf and twigs
44	<i>Imperata cylindrica</i> (Linn.)	POACEAE	"Ooloo, Ulu"(B, "Dabh, Srni"(H, "Darbha"(S.	C	Root
45	<i>Ipomoea aquatica</i> Forsk.	CONVOLVULACEAE	"Kalmisak"(B)	C	Leaf and twigs
46	<i>Jatropha curcas</i> Linn.	EUPHORBIACEAE	"Lalbherenda"(B, "Nikumba"(S, "Verenda, Bherenda"(H.	C	Leaf and twigs
47	<i>Kalanchoe pinnata</i> Pers.	CRASSULACEAE	Kophpata or patharkuchi (B)	C,R	Whole plant
48	<i>Mangifera indica</i> L.	ANACARDIACEAE	Am (B)	C, Hm	Tender leaves
49	<i>Mimosa pudica</i> L.	MIMOSACEAE	Lajjabati (B)	C, Hm	Whole plant
50	<i>Momordica charantia</i> Linn	CUCURBITACEAE	Korola (B)	C, Hm	Leaf
51	<i>Mussa Paradisica</i> L.	MUSACEAE	Kola (B) Kela (H)	C, Hm	Flower and fruits
52	<i>Nyctanthes arbortristis</i> Linn.	CLEACEAE	Shiwli (B)	C,Hm	Leaf
53	<i>Oxalis corniculata</i> L.	OXALIDACEAE	Amrul (B & H)	C,Hm	Leaf
54	<i>Phyllanthus emblica</i> Linn.	(EUPHORBIACEAE)	"Amlaki"Amla"(B, "Amla, Amlika"(H, "Amlaki"(S.	R	Seeds
55	<i>Streblus asper</i> Lour	MORACEAE	Doi Shang (Reang(Rupashi (B, Sheora (B)	R	Bark

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56	<i>Syzygium cumini</i> (Linn.) Skeels.	MIRIACEAE	Kalam (B)	R	Bark, fruit and seeds
57	<i>Terminalia chebula</i> Retz.	COMBRETACEAE	Hortokhi (B)	R	Seeds
58	<i>Tinospora cordifolia</i> (Willd.) Hook. f. & Th.	MENISPERMACEAE	Vanrui (Chorei) Golancha (B)	R, C	Leaf and Bark

(C- Chorei, R-Reang, Hm-Hmar, H- Hindi, B-Bengali, A-Assamese, S- Sanskrit)

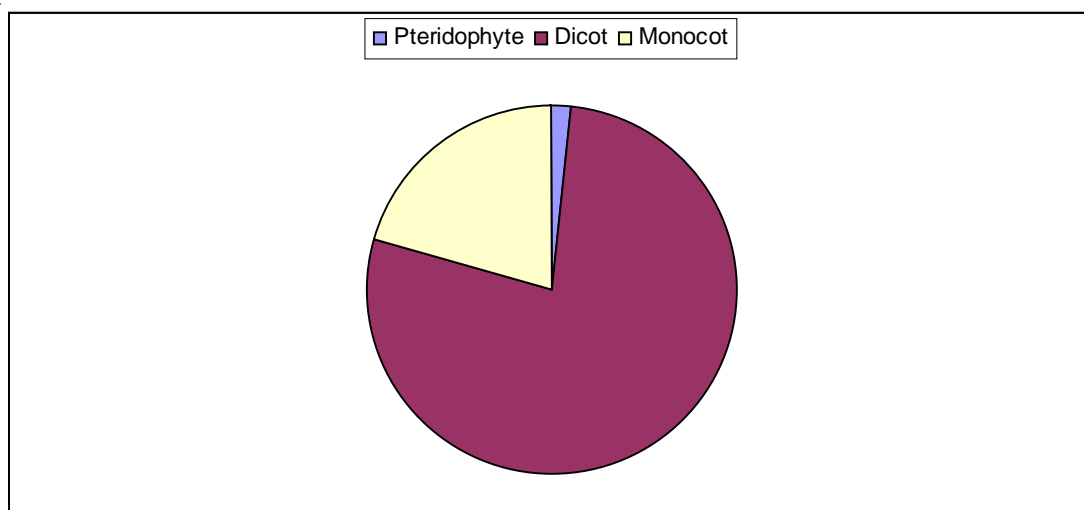


Fig 1. The Pteridophyte, Dicot and Monocot ratio of the anti-diabetes plants of Southern Assam

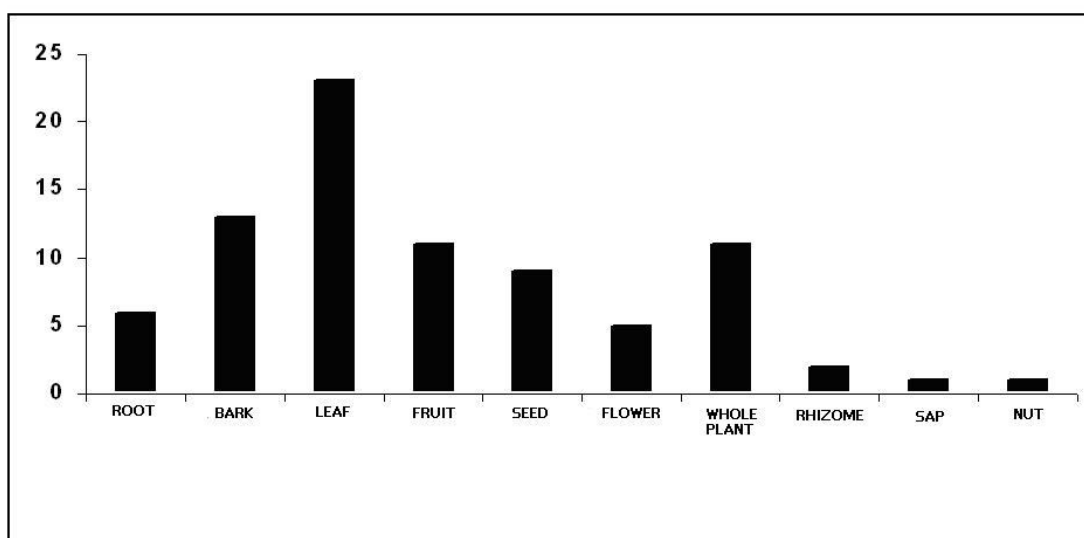


Fig 2. The plant parts used in the treatment of diabetes

A total of fifty eight (58) Ethnomedicinal plants have been collected from Southern Assam. The Ethnomedicinal aspect of Chorei, Reangs and Hmars in the treatment and management of Diabetes has been thoroughly studied for the first time. Intensive field work for a period of two and a half years (April 2006 to Sep 2008) were carried out in villages in Southern Assam so as to obtain detailed information on each and every plant

species used by the tribe in management of diabetes in their traditional way of treatment. A large number of medicine men and informers were consulted and repeated queries for authenticity of the information have been made. The data on Indian Medicinal plants have been systematically compiled in number of illustrations books viz., Directory of Economic Plants by Watt (1890); Indian Medicinal Plants by Kritikar and Basu

(1933); Medicinal Plants of India and Pakistan by Dastur (1952); Glossary of Indian Medicinal Plants by Chopra *et al.*, (1956); Medicinal Plants by Jain (1985); Economic Plant by Nayer *et al.*, (1969); Compendium of Indian Medicinal Plants by Rastogi and Mehrotra (1993-94), etc. Jain (1981, 1985, 1991) recorded useful information on medicinal plants and laid pioneering work in the field of ethnobotany in India.

Table-1. shows the collected anti-diabetes plants

of Southern Assam used in treatment and management of diabetes. Of the collected plants dicotyledons showed higher percentage of use as compared to monocot and pteridophytes (Fig.1). Among the plant parts used, leaf is highly used followed by bark, root, whole plant, fruit, seeds, roots, flowers, rhizome, sap and nuts (Fig.2). This data shows that leaf is the main source of anti-diabetic crude drugs used by various tribes of Southern Assam.

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