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ETHNOBOTANICAL PLANTS USED IN VARIOUS FORMS TO CURE DIABETES- A BRIEF STUDY IN BHOWRAGURI VILLAGE OF KOKRAJHAR DISTRICT, BTC, ASSAM, INDIA

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ABSTRACT

Aim: *Diabetes mellitus (DM) commonly referred to as diabetes, is a group of metabolic disorder in which there is high blood sugar level for a prolonged period. The main objective of the study is to present the medicinal plants used in Bhowraguri village of kokrajhar district for anti-diabetic purpose.* ***Methods:*** *A thorough study was carried out in Bhowraguri, which is a small village in kokrajhar district. The collected plant samples were identified with the help of taxonomic literature. The voucer specimens were deposited in the same herbarium for record. The photos were collected from our own houses, some neighbours etc.* ***Result:*** *A total of 39 medicinal plant species belonging to 31 families were found to be used by the local people of the area surveyed under study for treatment of diabetes. The plant parts used for the treatment of diabetes include leaves, fruits, flowers, barks, stems, roots, seeds as well as whole plants.* ***Conclusion:*** *For the treatment of diabetes various anti-diabetic drugs are used which are not only expensive but also produce side effect. Therefore, there has been a growing interest in the ethnobotanical approach to examine the anti-diabetic properties of plant traditionally used by the ethnic groups in different parts of the world. During our study we recorded 39 species of antidiabetic medicinal plant from Bhowraguri, a small village under kokrajhar district. Hence our record on anti-diabetic medicinal plants from this region is very important for further studies.*

KEY WORDS

Anti-diabetic medicinal plant, anti-diabetic drugs, diabetes mellitus, Ethnobotany.

Introduction:

Diabetes mellitus (DM) commonly referred to as diabetes, is a group of metabolic disorders in which there are high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent urination, increased thirst and increased hunger.

Diabetes is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced. There are three main types of diabetes mellitus which are-Type 1, Type 2 and Gestational diabetes.

According to WHO report globally, approximately 347 million people or 5-8% of the global population is estimated to be affected by this disease. Diabetes now is becoming the third "killer" of mankind along with cancer, cardiovascular and cerebrovascular disease. IT has also been predicted that by the year 2025 more than 75% of people with diabetes will reside in developing countries, as compared with 62% in 1995.A good number of synthetic commercial anti-diabetic drugs/agent like sulfonylureas, biguanides, glucosidase inhibitors and thiazolindiones are well known today which are not only expensive but also produces side effect. Therefore, there has been a growing interest in the ethnobotanical approach to examine the anti-diabetic properties of plant traditionally used by the ethnic groups in different parts of the world. A large no. of plants and plant-parts has been investigated for their

beneficial role and anti-diabetic properties. In view of its medicinal importance the present study has been focused to know the traditional medicinal plant wealth that is being used by the tribal people of BTC area against diabetes (Swargiary et al., 2013).

Materials and Methods:

Geographical position of study area:

Kokrajhar district is an administrative district in the state of Assam in North-Eastern India. The district headquarter is located in Kokrajhar town. It is located at a latitude of 24° 24' 0" N and a longitude of 90 ° 16' 0" E. It covers an area of 3,169.22 sq.km. The district is hot in summer. In Kokrajhar the highest day temperature is in between 28 °c to 40 °c. The average temperature in Jan is 20 °c, Feb is 22 °c, March is 28 °c, April is 29 °c, May is 28 °c. Bhowraguri is a small village in kokrajhar district and it is 26 kms away from kokrajhar town.

A thorough study was carried out in Bhowraguri which is a small village in kokrajhar district. During our survey the information was gathered from the local elderly people (kobiraj,ojha) and some diabetic patients from the survey areas. The collected plant samples were identified with the help of taxonomic literature. The voucer specimens were deposited in the same herbarium for record. The photos were collected from our own houses, some neighbours etc.

Result and Discussion:

A total of 39 medicinal plant species belonging to 31 families were found to be used by the local people of the area surveyed under study for treatment of diabetes (table 1). It was observed that the plant parts used for the treatment of diabetes include leaves, fruits,flower, barks, stems, roots, seeds as well as whole plants. The number of species along with their families are given below-

Rutaceae - 2 (species), Asteraceae- 2 (species), Celastraceae- 1 (species) , Meliaceae -1 (species), Apiaceae- 1 (species), Fabaceae -2 (species), Annonaceae- 1 (species), Phyllanthaceae- 1 (species), Crassulaceae- 1 (species) , Zingiberaceae- 1 (species) , Moraceae- 3 (species), Poaceae- 1 (species), Myrtaceae- 1 (species), Lamiaceae- 4 (species), Cucurbitaceae- 1 (species), Anacardiaceae- 1 (species), Apocynaceae- 1 (species), Menispermaceae - 1 (species), Arecaceae- 1 (species) , Oleaceae -1 (species), Caricaceae- 1 (species), Cannabaceae- 1 (species), Araceae- 1 (species), Lauraceae- 1 (species), Moringaceae- 1 (species), Malvaceae- 1 (species), Asphodeloideae- 1 (species), Oxalidaceae- 1 (species), Musaceae -1 (species), Combretaceae- 1 (species) and Acanthaceae - 1 (species).

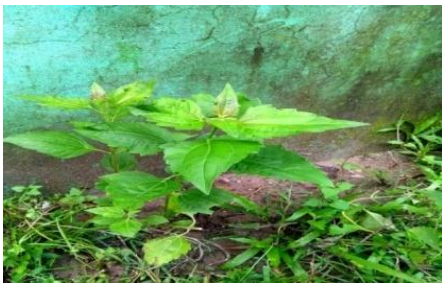
Table -1: The scientific names, families, local names, parts used, and preparations done in order to collect the anti-diabetic medicinal plants are listed below-

Sl.No	Scientific name & Family	Local name	Part used	Preparation to use
1	*Murraya koenigii* (L.) sprengel. (Rutaceae)	Narahingha	Leaves	The leaf of this plant is consumed raw, early in the morning, in empty stomach.
2	*Chromolaena odorata* (L.) R.M.King & H.Rob. (Asteraceae)	Motmoti	Leaves	The leaf of this plant is pasted, and the juice is consumed raw, early in the morning, in empty stomach.
3	*Artocarpus heterophyllus* Lam. (Moraceae)	Kothal	Leaves	The leaf of this tree is deepened into a glass of water overnight and the water is drunk in the next morning.
4	*Tinospora cordifolia* (Thunb.) Miers (Menispermaceae)	Guloncholota	Stem	The stem of this plant is soaked in water overnight and the water is drunk the next morning.
5	*Catharanthus roseus* (L.) G. Don,1837 (Apocynaceae)	Noyontora	Leaves	Fresh leaf extracts or fresh leaves may be chewed in empty stomach (Swargiary et al.,2013)
6	*Mikania micrantha* Kunth (Asteraceae)	Kemlota	Leaves	The leaf of this plant is chewed raw.
7	*Salacia reticulata* Wight (Celastraceae)	Xeora	Leaves	The leaf of this plant is pasted, and the juice is taken.
8	*Mangifera indica* L. (Anacardiaceae)	Aam	Leaves	The new leaves of this tree are chewed raw.
9	*Ficus benghalensis* L. 1753 (Moraceae)	Bot	Leaves	Bark infusion or decoction is used (Mondal et al.,2013)
10	*Cucumis sativus* Manicgardener, March 17,2011 (Cucurbitaceae)	Telakucch	Leaves	The leaf of this plant is pasted, and the juice is taken.
11	*Clerodendrum infortunatum* L. (Lamiaceae)	Bhetita	Leaves	Pasted leaves is taken orally (Mondal et al,2013)
12	*Ocimum tenuiflorum* L. (Lamiaceae)	Tuloxi	Leaves	Powdered leaves are taken with honey to treat diabetes (Mondal et al,2013)
13	*Aegle marmelos* (L.) Correa (Rutaceae)	Bel	Leaves	Leaves are boiled, and the juice is taken (Mondal et al.,2013)
14	*Azadirachta indica* A. Juss., 1830 (Meliaceae)	Neem	Leaves	Raw leaf extracts mixed with little water is taken at a dose of 2-3 tea spoon daily in empty stomach (Swargiary et al, 2013)
15	*Centella asiatica* (L). Urban (Apiaceae)	Manimuni	Whole plant	The leaf of this plant is taken raw or pasted and taken as chutney. The root is also consumed raw and even cooked.
16	*Erythrina variegata* L. (Fabaceae)	Mandaar	Root	Fresh roots are grounded for obtaining juice. 25 ml of juice is taken for 1 week without water.
17	*Annona squamosa* L. (Annonaceae)	Aataphol	Bark, leaves	Raw bark or/and leaves are grinded, and the extracts are obtained by squeezing. The extract is then filtered and used 2 to 3 spoons full every morning (Swargiary et al, 2013)

18	*Phyllanthus emblica* L. (Phyllanthaceae)	Amlokhi	Fruit	Fruit juice or raw fruit is taken orally (Mondal et al,2013)
19	*Syzygium cumini* (L.) Skeels. (Myrtaceae)	Kolajam	Seed	Powdered seeds about 1 teaspoonfull is taken with water in the morning in empty stomach and also in the evening before meals (Swargiary et al,2013)
20	*Kalanchoe pinnata* (Lam.) pers. (Crassulaceae)	Pategoja	Leaves	1g of raw leaves grinded with 100 ml of water is consumed. Leaf extracts ,2-3 tea spoons early in the morning is also taken (Swargiary et al,2013)
21	*Leucas aspera* (Lamiaceae)	Dron	Whole plant	It is used as potherb during diabetic treatment (Swargiary et al,2013)
22	*Curcuma Longa* L. (Zingiberaceae)	Halodhi	Root	About 8g of raw turmeric is grinded, mixed with water and ½ spoon of honey and taken for 1 month after meal (Swargiary et al,2013)
23	*Cynodon dactylon* (L.) pers. (Poaceae)	Duburi	leaves	This leaf is taken raw or sometimes it may be dried up, preserved in a container and taken with water, food or tea.
24	*Ficus religiosa* Linn. (Moraceae)	Aahot	Leaves, fruit	Leaf or fruit is consumed orally (Mondal et al.,2013)
25	*Areca catechu* L. (Arecaceae)	Tamul	Nut	Dried and soaked with water (Mondal et al.,2013)
26	*Nyctanthes arbor-tristis L. (Oleaceae)*	Hewali	Leaves, flowers	Young leaf juice, flower paste is taken orally. (Mondal et al.,2013)
27	*Carica papaya* L. (Caricaceae)	Amita	Seed	Powdered seed is mixed with water (Mondal et al.,2013)
28	*Cannabis sativa* L. (Cannabaceae)	Bhaang	Leaves, stems, flowers	Leaves and stems are soaked in water. (Mondal et al.,2013)
29	*Alocasia macrorrhizos (L.) G.Don.* (Araceae)	Maankochu	Rhizomes	Dried rhizome is used (Mondal et al.,2013)
30	*Gmelina arborea* Roxb. (Lamiaceae)	Gomari	Leaves, fruits	Leaf juice is used (Mondal et al.,2013)
31	*Cinnamomum tamala (Buch. -Ham.) T.Nees & C.H.Eberm.* (Lauraceae)	Tezpat	Bark, root	Powdered bark is consumed (Mondal et al.,2013)
32	*Moringa oleifera* Lam. (Moringaceae)	Sajna	Leaves, fruits	The leaf of this plant is pasted, mixed with water and consumed early in the morning, in empty stomach. Drumsticks are taken as vegetables after cooking.
33	*Abelmoschus esculentus* (L.) Moench (Malvaceae)	Bhendi	Vegetable	The vegetable is taken raw and cooked. The vegetable is soaked overnight in water and the same is consumed the next morning.
34	*Aloe vera* (L.) Burm.f. (Asphodeloideae)	Ghrita kumari	Leaves	The juice of the plant is taken.

35	*Averrhoa carambola* L. (Oxalidaceae)	Kordoitenga	Fruit	The fruit is taken raw and cooked both.
36	*Musa acuminata* Colla (Musaceae)	Kol	Stem, fruit, flower	The stem, fruit, and flower is cooked and taken.
37	*Cajanus cajan* (L.) Millsp. (Fabaceae)	Rohorpaat	Leaves	Leaves are cooked and taken.
38	*Hygrophila auriculata* Schumach. (Acanthaceae)	Kulekhara	Leaves	Leaves are taken cooked and raw.
39	*Terminalia arjuna* (Roxb.) Wight & Arn. (Combretaceae)	Arjun	Bark	The bark is dipped in water and the water is consumed.

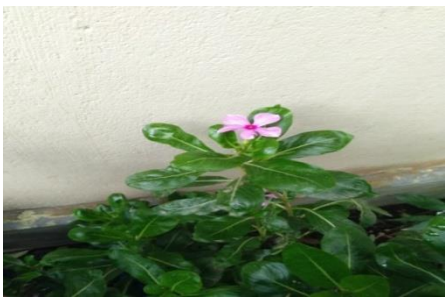
(1) *Murraya koenigii*



(2) *Chromolaena odorata*

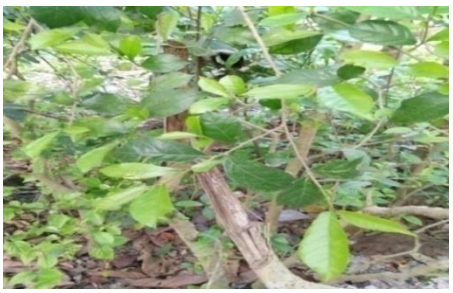
(3) *Artocarpus heterophyllus*

(4) *Tinospora cordifolia*



(5) *Catharanthus roseus*

(6) *Mikania micrantha*

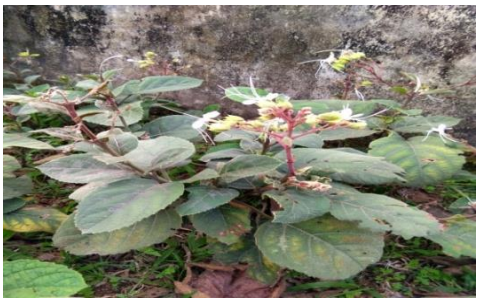


(7) *Salacia reticulata*

(8) *Mangifera indica*

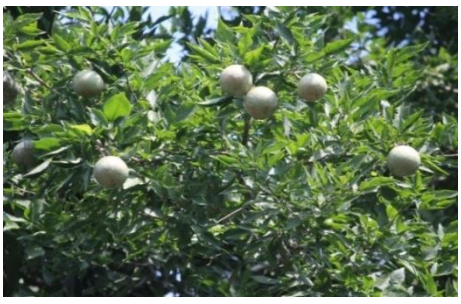
(9) *Ficus benghalensis*

(10) *Cucumis sativus*



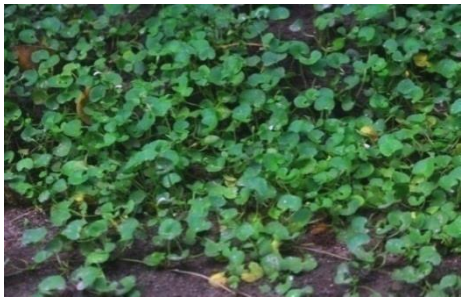
(11) *Clerodendrum infortunatum*

(12) *Ocimum tenuiflorum*



(13) *Aegle marmelos*

(14) *Azadirachta indica*



(17) *Centella asiatica*

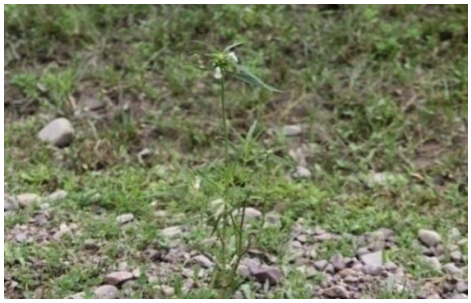
(16) *Erythrina variegata*

(17) *Annona squamosa*

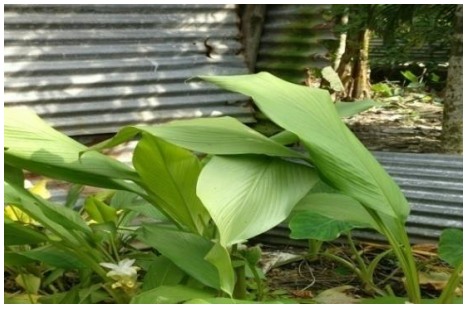
(18) *Phyllanthus emblica*

(19) *Syzygium cumini*

(20) *Kalanchoe pinnata*

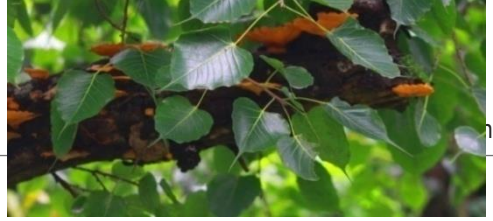


(21) *Leucas aspera*



(22) *Curcuma Longa*

(23) *Cynodon dactylon*



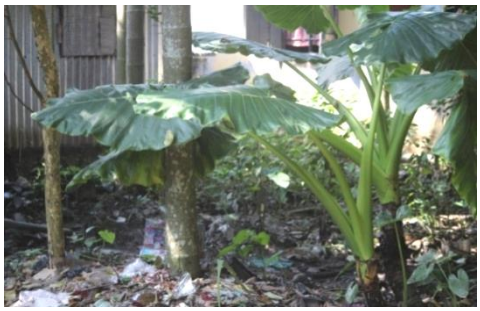
(24) *Ficus religiosa*

(25) *Areca catechu*

(26) *Nyctanthes arbor-tristis*

(27) *Carica papaya*

(28) *Cannabis sativa*



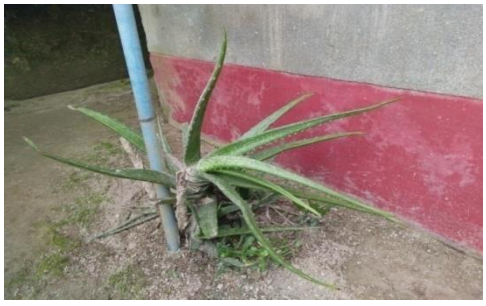
(29) *Alocasia macrorrhizos*

(30) *Gmelina arborea*

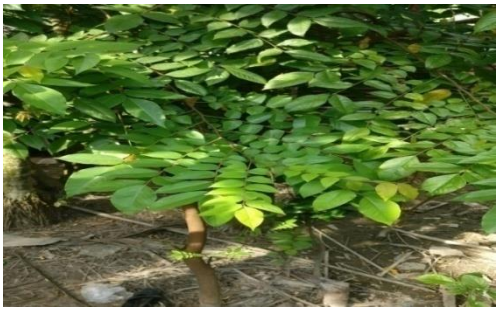
(31) *Cinnamomum tamala*

(32) *Moringa oleifera*

(33) *Abelmoschus esculentus*



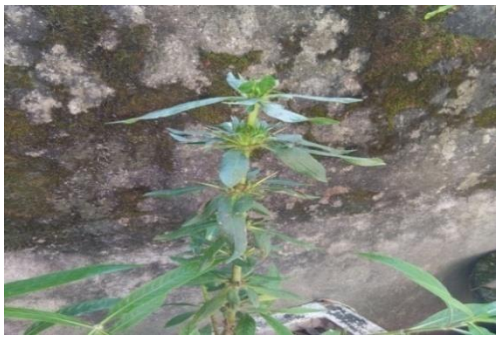
(34) *Aloe vera*



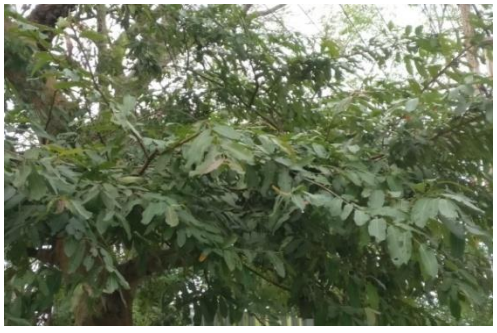
(35) *Averrhoa carambola*

(36) *Musa acuminate*

(37) *Cajanus cajan*



(38) *Hygrophila auriculate*



(39) *Terminalia arjuna*

Conclusion:

Mondal et al., 2013 has reported 141 species of antidiabetic medicinal plant from the North-Eastern part of India and during the study we recorded 39 species of antidiabetic medicinal plant from Bhowraguri which a small village under kokrajhar district is. Bhowraguri is a small village which has a large diversity of antidiabetic medicinal plants. Previously no one has recorded any information on antidiabetic medicinal plants from this small area. Hence the record on antidiabetic medicinal plants will hopefully play an important role and will be very helpful for further studies in the field.

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