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Survey Of Khutauna Block For The Plants Used In The Treatment Of Diabetes By The Remote Villagers.

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ABSTRACT:

Diabetes mellitus is a global metabolic epidemic affecting essential biochemical activities in almost every age group. In the present study, extensive survey was made in different villages of Khutauna Block of Madhubani district of Bihar for six month. With the help of village practitioners, the people of low income groups having either poor or no educations were consulted. It was noted that persons suffering from diabetes of different villages were using different plants to control their diabetes. The commonly used plants were easily available in their areas. They use different parts of the different medicinal plants. Leaves of Neem, juice of Amla fruits, Curry leaves, extract of stem of Giloe, gel of Ghikuwar, extract of seeds of Methi and the germinated seeds, extract of bark of Dalchini, and Arjun, cloves of Garlic, juice of fruit of Karaila, extract of Onion, powder of Haldi, fruits of Jamun and extract of its seed extract of cloves, extract of Okara, extracts of fruits and leaves of Shahjan, Roasted seeds of Flex, roasted fruits of Anar, leaves of Tulsi, extract of Bhumiamla, extract of roots of Ashwagandha, juice of Rati, Babul, Basak, leaves of Bael, extract of tuber of Satavari, leaves of Neem, whole plant juice of Punarnawa, fruits and seeds of Arhar, powder of seeds of Amaltas, Senna, flower of Sadabahar, leaves of Mandukparni, leaves of Tilkore, bark of Bargad, fruit powder of Gular, extract of Gumaa etc. In some villages, the village practitioners revealed that even some people use more than one medicinal plants, such as juice of Giloe and Amla, garlic cloves and Tulsi, extract of Zinger and Karaila, etc. These people are using the

medicinal plants without knowing their mode of action. Even herbal tea is also prescribed to treat the diabetes mellitus, as they are antidiabetic.

KEY WORDS: Herbal Medicine, Diabetes, Village Practitioners, Medicinal Plants, Antidiabetic, Germinated Seeds.

INTRODUCTION:

Type-2 diabetes mellitus is a multifactorial chronic disease characterized by various metabolic disorders involving both genetic and environmental factors such as hyperglycemia, insulin resistance and relative impairment of insulin secretion, which represents a health challenge World Wide (Noa *et al*; 2021). The prevalence of diabetes has increased faster in middle to lower income communities than high income group. Globally, the prevalence of type-2 diabetes mellitus is estimated to be 9.3% in adults between ages of 20 and 79 (Noa *et al*; 2021). The complications of diabetes range from retinopathy, nephropathy and neuropathy to myocardial infractions, cerebro-vascular damage etc. In the present 2025, prevalence of diabetes in India is estimated to be over 10% of the adults population, with millions of people unaware they have the condition, specific figures for 2025 show an estimated 101 million individuals living with diabetes and 136 million with prediabetes (Anjana *et al*; 2023, Mohan and Mangesh, 2025). It is supposed that the disease is caused due to food habits, obesity and adoption of sedentary lifestyle. Because our body cannot properly metabolize during diabetes the first symptom of the disease is an increased in blood sugar/ glucose or hyperglycemia. In this condition the pancreas is unable to produce insulin or there is inability of the body metabolic system to properly use the insulin produced. It is concluded that changes in food habit, lifestyle, no physical activities and in some case genetic disorder may be the root cause of the disease. Stress is also one of the factors for the disease. Due to disturbed metabolic activities, several vital organs are affected that causes mostly premature death. Mohammed *et al*; (2012) reported that the diabetes induced death may be due to oxidative damage in the body of the individuals.

Herbal medicines have been used for the treatment of diabetic patients since long and they are currently accepted as an alternative therapy for diabetes treatment. However, in the indigenous Indian system of Medicine, good number of plants was mentioned for the treatment of diabetes and most of them have been experimentally evaluated and active principles were isolated. From the survey of literature, it was noted that not only in India rather outside India, herbal medicines are being used for the treatment of diabetes. Ibrahim and Dawood from

Egypt (1989), and Shradha *et al*; (2023) from UK and several others from different countries have reported the use of medicinal plants or plant based medicines for the treatment of the disease. Similarly, there are reports that medicinal plants are being used to treat diabetes in different parts of India also. Some common reports that have been mentioned are, Modak *et al*; (2007); Gupta *et al*; (2008); Rizvi and Mishra (2013); Das and Mondal (2017); Adhan and Anand (2017); Bhat and Sharma (2025). Local people are using different medicinal plants for the treatment of diabetes because it is available in their localities, and it had no side effect. It is also cost effective.

MATERIALS & METHODS:

Study Area:

Khutauna block is one of the block of the district Madhubani in Bihar, India. The villages in this block have population of people living below poverty line. The latitude of Khutauna is 24.4089504 and the longitude is 86.3730535. Kamla Balan and Bhutahi-Balan Pass through the Khutauna block of Madhubani district. The agricultural lands are fertile and we get diversity of angiospermic plants here.

Methods:

Several field trips were carried out in remote villages of the blocks in different seasons. During each trip some village practitioners were taken in faith and they agreed only when they were convinced that we are not practitioners rather we are doing research. After then, some of them agreed toreveal the local name of the plants, their sites, the seasons in which they were growing, flowering etc. They also mentioned the parts used, methods of preparation and when to take these herbs or their products. We also contacted the vaidya of the block. We discussed with him to confirm the information given by the village practitioners. He was kind enough to help us and confirmed the plants and their parts used for the treatment of diabetes by the local people. Most of the species were identified on the site. Their local names were noted and in the laboratory some species were identified with thehelp of the flora. Most of the tree species were recognized on the basis of previous knowledge. After discussing with these people it was noted in tabular forms such as local name, parts used, methods of preparation and frequency of administration of the herbal medicines.

RESULTS AND DISCUSSION:

During different trips of different villages of Khutauna block, it was noted that the local people are using different plants and their parts to treat diabetes. They follow the advice of the village healers and vaidya and with their help they collect the plant to be used for the treatment of the diabetes. Among the plants they were suing tree species like Neem, Bargad, Gular, Mango, Arjun, Shahjan, Amrud, Jamun, Imlee, Hardiand Bair, Curry Patta, Amaltas, Bael, Amla. Different parts like leaves, fruits, barks and roots etc. were collected and used by them. Among the climbers they were using Giloe, Karaila, Kundary. Here also the stem, and fruits were collected and extract of these parts were taken. Similarly several seasonal herbs such as leaves of Basak, Kalmegh, Punarnava, Sadabhar, Gumma, Tulsi, Paan, Ashwagandha etc. were collected and aqueous extracts are taken as advised by the village healers. The local name, botanical name, family, parts used and methods of preparations have been maintained in the table-1.

The villagers as well as the vaidya and village healers do not know the acting principles of the herbal medicines but now we get several reports that the use of these herbal medicines and parts of these medicinal plants have been authenticated experimentally and their acting principles have been isolated and identified. Dawood *et al*; (1989) reported that extract of seeds *Acacia arabica* revealed antidiabetic activity in alloxanized albino rats. Karunanayak *et al*; (1989) reported that leaf extract of *Aeglemarmelos* revealed antidiabetic activity in alloxanized albino rat. Mathew and Augusti (1975) reported that when juice of 50 g of *Allium cepa* was given to a diabetic patient, it significantly controlled post prandial glucose level. Bever *et al*; (1979), Zacharias *et al*; (1980) reported that when extract of cloves of *Allium sativum* 10 gm a day for one month was give toa diabetic person, it reduced the fasting glucose and triglyceride levels. Al-Wadi and Gumma (1987) reported that extract of *Aloe vera* leaf gel revealed hypoglycemic effect in diabetic rats.

Chattopadhyay *et al*; (1987) reported that extract of leaves given to a streptozotocin treated rats revealed anti hyperglycemic activity. They further reported that this was due to increase in glucose uptake. Kamble *et al*; (1998) reported that oral administration of 500 mg/kg of leaf of *Coccinia indica* showed significant hypoglycemia in alloxanized diabetic dogs and increased glucose tolerance in normal and diabetic dog. Acherekar *et al*; (1991); Sheela and Augusti (1992) reported the fruits pulp and extract of seeds of *Eugenia jambolana* if given to a diabetic persons it reduced the blood glucose level. It also revealed increase in serum insulin level. Similarly, extract of pulp of fruits given to streptozotocin, induced rats revealed hypoglycemic

activity. Aderibigbe *et al*; (1999) reported that leaf extract of mango revealed hypoglycemic activities. Similarly, experimental evidences for other plants used to cure diabetes have been given by different workers like Shibbib *et al*; (1993) for *Momordica charantia*; Vats *et al*; (2002); Rai *et al*; (1997) for the leaves of *Ocimum sanctum*; Khosla *et al*; (1995); Sauvaire *et al*; (1998) for *Trigonella foenum*; Gupta *et al*; (1960); Stanely *et al*; (2003) for the aqueous extract of stem of *Tinospora cordifolia*; Simmonds and Howes (2006); Singh *et al*; (2011); reported that extract of bark of *Ficus religiosa* has antidiabetic activity. Krawinkel and Keding (2006) that extract of fruits of *Momordica charantia* had antidiabetic activity in vitro. Mukherjee *et al*; (2006) reported that bark extract of the tree *Ficus benghalensis* revealed antidiabetic activity in the diabetic rats. It was also beneficial in alloxan induced diabetic rabbits. Thus we get several experimental evidences about the antidiabetic properties of different medicinal plants. All these authenticate the use of medicinal plants to cure diabetes by the rural healers, vaidya and the common man and women.

Now a day, different workers have isolatedand identified the acting phytochemicals form different medicinal plants such as BIS-Oxovanadium IV, Allicin, Diallyltrisulphide, Lophenol, 24, Methyl Lophenol, 24-Methylene cycloartanol, Andrographolide, BBeta-Sitosterol, Leucodelphinide, Charantin, Vicin, (-) Epicatechin, Prerostilbene, Swerchirin, Trigonellin, 4-hydroxyisoleucine, as reported by Gupta *et al*; (2008).

CONCLUSION

Medicinal plants and plant based medicinesare being used to treat diabetes an alternative to the synthetic drugs. It has no side effect and easily available.

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CONFLICTS:

There are no conflicts regarding publication of this paper.

TABLES:

Table-1

S.N.	Botanical Name	Local Name	Parts Used	Family	Methods of Preparation
01	*Abrus precatorius* L.	Rati	Leaf	*Papilionaceae*	Leaves are boiled, extract half cup daily in morning.
02	*Acacia Arabica* L.	Babul	Leaf, Pod, Bark	*Fabaceae*	Bark or Young pods are boiled, extract is give one tablespoon twice a day
03	*Aegle marmelos* L.	Bael	Leaf, Fruit	*Rutaceae*	Three leaves + 5 seeds of black pepper, Unripe fruits are roasted, extract is taken.
04	*Azadirachta indica*	Neem	Leaf	*Meliaceae*	Green leaves chewed in morning
05	*Cacia fistula*	Amaltas	Seed	*Fabaceae*	Seeds are obtained from mature pods. 1 table teaspoon full is given in morning for 20 days.
06	*Ficus benghalensis*	Bargad	Bark	*Moraceae*	Powder of dried bark. One tablespoon full in cow milk for one month.
07	*Ficus racemosa*	Gular	Fruit	*Moraceae*	Dried fruits are taken in morning with lukewarm water.
08	*Ficus religeosa*	Peepal	Leaf, Fruit	*Moraceae*	They are consumed as raw, orally.
09	*Magnifera indica*	Aam	Leaf	*Anacardiaceae*	Extract of leaves after boiling is taken ½ cup full in the morning for one month.
10	*Phyllanthus emblica*	Amla/Awla	Fruit	*Euphorbiaceae*	Fruit juice is obtaining by crushing the pulp of fruits. ½ cup in morning for one month.
11	*Moringa olefera*	Sahjan/ Sohijan	Leaves, Fruits	*Moringaceae*	Young leaves (10) are taken as raw in morning fruit juice is extracted. ½ cup full daily in morning one or two months.
12	*Murraya koenigii*	Curry Patta/ Mitha Neem	Leaf	*Rutaceae*	8-10 leaves are eaten as raw in morning for 3-4 months.
13	*Syzygium cumuni*	Jamun	Fruits, Pulp and Seed	*Myrtaceae*	Juice of fruits pulp taken in morning for one month. Powder of dried seeds, 1 table spoon full for one month.
14	*Terminaliaarjuna*	Arjuna	Bark	*Combretaceae*	Root barks are used; aqueous extract is taken ½ cup in the morning for 2 months.
15	*Terminalia chebula*	Harre/ Harad	Fruit	*Combretaceae*	Dried fruits are soaked overnight. The water ½ glasses is taken in the morning for one month.
16	*Tinospora cordifolia*	Guduch / Giloe	Stem, leaf	*Menispermaceae*	Mature stem is cut into pieces of 2 inch 4-5 such pieces are soaked in 1 glass water, filtrate is taken daily for 2-3 months.
17	*Piper bettle*	Paan	Leaf	*Piperaceae*	Healthy leaf is chewed daily in the morning for 3-4 months.
18	*Boerhaavia diffusa*	Punarnawa	Whole Plant	*Nyctaginaceae*	Stem, Leaves are collected. Juice is extracted two table spoon full juice is given twice in a day for 2 months.
19	*Asparagus racemosa Willd*	Satavari	Tuber	*Liliaceae*	Decoction of tuber is mixed with bark extract of neem , ½ cup is given twice in a day for one month.
20	*Andrographis paniculata*	Kalmegh	Leaf	*Acanthaceae*	Leaves are crushed, taken with honey twice in a day for 2 months.
21	*Aloe vera*	Gheekuwar	Leaf	*Liliaceae*	Leaves are cut and placed vertically for 4-5 hours. Then gel is taken twice daily, 1 teaspoon full.
22	*Adhatoda vasica*	Basak / Bakar	Leaf	*Acanthaceae*	Juice is extracted from leaves. One table spoon full is taken twice daily

					for 2 months.
23	*Allium cepa*	Piyaz	Bulb	*Liliaceae*	Juice of bulb, one table spoonful taken twice daily for one month.
24	*Allium sativa*	Lahsun	Clove	*Liliaceae*	2-3 cloves are taken early in the morning for 3-4 months.
25	*Cassia tora*	Jhunjhunia	Roots	*Caesalpiniaceae*	Juice of fresh root is (10ml) boiled with curd water. ½ cup is taken once in a day for 20-25 days.
26	*Cajanus cajan*	Arhar / Rahri	Seed	*Fabaceae*	Cooked cotyledons are taken with food for several months.
27	*Catharanthus roseus* L.	Sadabahar	Flower	*Apocynaceae*	10g of fresh flower in 100 ml water boil. ½ cup taken orally for one time up to one month.
28	*Centella asiatica* L.	Maduk Parni	Leaf	*Apiaceae*	Leaf is chewed in morning leaf juice is taken in empty stomach.
29	*Cinnomomun tamala*	Tejpat/ Tejpatta	Bark, Root	*Lauraceae*	Powder of bark one teaspoon full with lukewarm water once a day leaf juice, one in a day for 30 days.
30	*Coccinia grandis*	Tilkore	Leaf, Fruit	*Cucurbitaceae*	Leaves are fried and eaten. Fruit juice (young) is given ½ cup once daily for 1 month.
31	*Abelmoschus esculentus* L.	Bhindi / Okara	Fruit	*Malvaceae*	Fruits are soaked in water for overnight. The filtered water is taken in the morning one glass.
32	*Linumusita tissiumum*	Tisi, Alsi	Seed	*Linaceae*	Seeds are roasted; The Powder obtained is given one table spoonful twice in a day for 30 days.
33	*Ocimum sanctum* L.	Tulsi	Leaf	*Lamiaceae*	Leaves are dried and powdered. One teaspoon powder with honey is taken twice for 30 days.
34	*Momordica charantia*	Karaila	Fruit	*Cucurbitaceae*	½ cup fruit juice is taken twice in a day for 3 months.
35	*Phyllanthus niruri*	Bhumi Amla	Whole Plant	*Euphorbiaceae*	Extract of plant is taken ½ cup twice in a day for 2 months.
36	*Curcuma longa*	Haldi	Rhizome	*Zingiberaceae*	Powder of rhizome 1 teaspoon is taken twice for 30 days.
37	*Withania somnifera*	Ashwagandha	Leaf	*Solanaceae*	Leaf extracts one table spoonful twice in a day for 30 days.
38	*Solanum nigruum* L.	Bhutkuiya	Leaf	*Solanaceae*	Leaf juice 1 teaspoon full twice in a day for two months.
39	*Zingiber officinale*	Aadi / Adrak	Rhizome	*Zingiberaceae*	Extract of rhizome is taken ½ cup daily for 2 months.
40	*Zizyphus jujube*	Bair	Fruit	*Rhamnaceae*	Powder of dried fruits is taken/ teaspoon full twice in a day.

The village healers revealed that, the duration of administration of medicinal herbs depends on the state or condition of the patients. It's used in prolonged when disease is old and continuing for weeks to months.

REFERENCES:

Abhishek, B. and Bag Arundhati (2022): An update on medicinal plants traditionally used to treat diabetes, in South East Sikkim, India. *Science Academy* 88: 186-196.

Acherekar, S., Kaklijj, G.S., Pote, M.S, and Kelkar, S.M. (1991): Hypoglycemic activity of *Eugenia jambolana* and *Ficus benghalensis:* mechanism of action. *In Vivo* 5: 143-147.

Aderibigbe, A.O., Emudianughe, T.S. and Lawal, B.A. (1999): Antihyperglycemic effect of *Mangifera indica* in rat. *Phytother Res*. 13: 504-507.

Adhan, K. and S.P. Anand (2017): Survey of medicinal plants used for the treatment of diabetes by the Paliyar's Tribe in Sadhuragiri hills, Tamilnadu, India. *Int. J. of Herbal Medicine* 5(3): 17-25.

Al-Awadi, F.M. and Gumaa, K.A. (1987): Studies on the activity of individual plants of an antidiabetic plant mixture. *Acta Diabetologica* 24: 37-41.

Anjana, R.M., Unikerishnan, R., Deepa M. (2023): Metabolic non communicable disease health report of India. The ICMR, INDIA B, National Cross Sectional Study. *Lancet Diabetes Endocrinol*. 11: 479-489.

Bever, B.O. and Zahnd, G.R. (1979): Plants with oral hypoglycemic action. *Quart J. Crude Drug Res*. 17: 139-146.

Bhatt, S., and N. Sharma (2025): The potential of various herbal plants for potential therapeutic treatment of diabetes management. *Annals of the National Head of Medical Sciences India*. 61(3): 213-223.

Chattopadhyay, R.R., Chattopadhyay, R.N., Nandy, A.K., Poddar, G. and Maitra, S.K. (1987): Preliminary report on antihyperglycemic effect of fraction of fresh leaves of *Azadirachta indica* (Beng neem). *Bull Cacutta Sch Trop. Med.* 35: 29-33.

Das Tamal and Tribeni Mandal (2017): Ethnobotanical plants used in various forms to cure diabetes: A brief study in Bhowraguri village of Kokrajhar district, Assam, India. *Int. J. of Pharmacy and Biol. Scie*. 7(4): 106-115.

Dixit Shikha; SugandhaTiwari (2020): Review on plants for management of diabetes in India. *An Ethno Botanical and Pharmacological Perspective. Pharmacogn J. 12(6): Suppl:* 1801-1810.

Gupta Rahul, Kumar G.B., S. Johari and A.M. Saxena (2008): An overview of Indian Novel Traditional Medicinal Plants with antidiabetic potential. *African J. of Traditional complementary and Alternative Medicines* 5(1): 1-17.

Gupta S.S., Varma, SCL., Garg, V.P. and Rai, M. (1967): Anti diabetic effect of *Tinospora cordifolia* Effect on fasting blood sugar level, glucose tolerance and adrenaline induced hyperglycemia. *Indian J. Exp. Biol*.55: 733-745.

Kamble, S.M, Kamlakar, P.L, Vaidya, S. and Bambole, V.D. (1998): Influence of *Coccinia indica* on certain enzymes in glycolytic and lipolytic pathway in human diabetes. *Indian J. med. Sci*. 52: 143-146.

Karunanayake, E.H., Welihinda, J., Sirimanne, S.R. and Sinadorai, G. (1984): Oral hypoglycemic activity of some medicinalplants of Sri Lanka. *J. Ethnopharmacol*. 11: 223-231.

Khosla, P., Gupta, D.D., and Nagpal, R.K. (1995): Effect of *Trigonella foenumgraecum* (fenugreek) on blood glucose in normal and diabetic rats. *Indian J. Physiol. Pharmacol.* 39: 173-174.

Mathew, P.T. and Augusti, K.T., (1975): Hypoglycemic effects of onion, *Allium cepa* Linn. On diabetes mellitus- a preliminary report. *Ind. J. Physiol. Pharmacol.* 19: 213-217.

Modak, M., p. Dixit, J. Londhe, S. Gwaskaubi and T. Paul A. Devasagayam (2007): Indian herbs and Herbal drugs used for the treatment of diabetes. *J. Clin. Biochem, Nutr*. 40: 163-173.

Mohan Vishwanathan, M. Tiwaskar (2025): The unrelenting epidemic of diabetes in India. Do the number matter? *J. Assoc. Physician India* 73(5): 12-13.

Noa, Y.R., Rocio, L.D., Reneso, I., Alan JRP, Castro AJHA, Marco, ARM, Jaan RZM (2021): Use of herbal medicines for diabetes mellitus in adults from Central Western Mexico. *Science Direct* 15(6): 1095-1099.

Pradeepa Rajendran, Vishwananthan Mohan (2021): Epidomology of type-2 diabetes in India. *Indian J. Opthalmol*. 69(1): 2932-2938.

Rai, V., Iyer, U. and Mani, U.V. (1997): Effect of Tulsi (*Ocimum sanctum*) leaf powder supplementation on blood sugar levels, serum lipids and tissue lipid in diabetic rats. *Plant Food for Human Nutrition* 50: 9-16.

Rizvi, S. I and Neetu Mishra (2013): Traditional Indian Medicines used for the management of diabetes mellitus. *Journal of Diabetes Res*. 2013:1-11.

Sauvaire, Y., Petit, P., Broca, C., Manteghetti,M., Baissac, Y., Fernandez-Alvarez, J., Gross, R., Roy, M., Leconte, A, Gomis, R. and Ribes, G. (1998): 4-hydroxyisoleucine: a novel amino acid potentiator of insulin secretion. *Diabetes*, 47: 206-210.

Sheela, C.G. and Augusti, K.T. (1992): Antidiabetic effects of S-allylcyxteinesulphoxide isolated form garlic *Allium sativum* Linn. *Indian J. Exp. Biol*. 30: 523-526.

Shibib, B.A., Khan, L.A.,adnRahman, R. (1993): Hypoglycemic activity of *Coccinia indica* and *Momordica charantia* in diabetic rats: depression of the hepatic gluconeogenic enzymes glucose-6-phoshatase and fructose-1, 6- biphosphatase and elevation of liver and re-cell shunt enzyme glucose-6-phohphate dehydrogenase. *Biochem J.* 292: 267-270.

ShradhaSriraman, D. Srejith, E. Andrew, Okello, I, M. Wilcox (2023): Use of herbal medicines for the management of type-II diabetes A systematic review of qualitative studies. Complementary *Therapy in Clinical Practice* 53(2023): 10808.

Stanely, P., Prince, M., and Menon, V.P. (2003): Hypoglycemic and hypolipidemic action of alcohol extract of *Tinospora cordifolia* roots in chemical induced diabetes in rats *Phytother. Res*. 17: 410-413.

Wadood, A., Waddod, N. and Shah, S.A. (1989): Effectsof *Acacia arabia* and *Carallu maedulis* on blood glucose levels on normal and alloxa diabetic rabbits. *J. Pakistan Med. Assoc.* 39: 208-212.

Zacharias, N.T., Sebastian, K.L., Philip, B., and Augusti, K.T. (1980): Hypoglycemic and hypolipidaemic effects of garlic in sucrose fed rabbits. *Ind. J. Physiol. Pharmacol.* 24: 151-154.