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The Ethnomedicinal Survey of Plants Used for the Treatment/Management of Diabetes in Buruku Local Government of Benue State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Diabetes mellitus is becoming an increasing concern all over the world. Many people especially in poor communities have been using medicinal plants to treat diabetes and its complications. In Nigeria, the number of people suffering from diabetes is believed to be rising steadily.This study aimed at documenting the plants that have been tried for the treatment of diabetes mellitus in Buruku Local Government of Benue State, Nigeria. The ethnomedicnal information was collected through a structured questionnaires, sample collection and identification of the plant specimens. Twenty eight plants were mentioned as being used for treatment of Diabetes mellitus in Buruku Local Government of Benue State by the herbalists. Out of these, a total of twenty two (22) plant species, distributed across 17 families were identified. The most commonly species were *Moringa oleifera* and *Vernonia amygdalina.* The families Asteraceae and Rubiaceae was represented by the highest number of species (three species each), followed by Euphorbiaceae (two species). The rest were represented by one species each (14 families). In all cases, the treatment involved drinking the extracts for a long period of time. There was a general belief on the efficacy of the prepared extracts.

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Keywords: Diabetes mellitus; ethnomedicinal; medicinal plants; extract; species.

1. INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by high glucose levels in blood. This comes about as a result of absence of insulin or improper utilization of insulin by target cells [1]. Diabetes is a major crippling disease leading to huge economic losses around the world [2].

Diabetes can be associated with serious complications and premature death [3]. There are nearly 285 million (6.6% of population aged 20-79 years) diabetic patients across the world. In 2005, nearly 1.1 million people died worldwide due to this disease [4]. It is estimated that the number of diabetes patients will reach 450 million in 2030 with 97% showing type 2 diabetes mellitus (T2DM; non-insulin dependent diabetes mellitus) [4,5].

Over the past century, diabetes mellitus was considered a rare medical condition in Africa, as illustrated by the famous statement of Dr. Cook who wrote "... diabetes is very uncommon but very fatal..."in his 1901 notes on the diseases he met in Africa [6]. Diabetes mellitus is known to affect 3% on average of adult Nigerians [7]. According to the 2004 estimates of the Diabetes Association of Nigeria (DAN), the diabetics' population in Nigeria was about 10 million [8]. However, epidemiological studies carried out in the last decade of the 20th century have provided evidence of a different picture [1].

In order to handle the medical apocalypse that diabetes has become, multitudinous treatments have been evolved. Recently, there has been a surge in the use of botanicals to treat and control diabetes, due to the common perception that the pharmaceutical products on the market induce severe complications following long term use [9]. There is global resurgence in the use of herbal preparations and in some developing countries like Nigeria; it is being gradually integrated into the primary and secondary health care systems [10]. Nearly all societies have used herbal materials as sources of medicines and the development of these herbal medicines depended on local botanical flora [10]. Thousands of these plant species have been used ethnomedicinal or experimentally for the treatment of diabetic symptoms and complications.

In order to preserve traditional medicinal knowledge, it is necessary that inventories of plants with therapeutic value are carried out, and the knowledge related to their use documented in systematic studies [11]. These studies too can add value to the society besides conserving traditional knowledge, but can help to identify plants with market potential that can generate incomes for local communities. It can also provide the rationale for selection and scientific investigation of medicinal plants. The traditional plant medicines have proven to be of great help all through the history. A recent survey has revealed that 35 to 41% of diabetic patients use complementary and alternative medicines (mostly botanicals) in addition to conventional medicine [12].

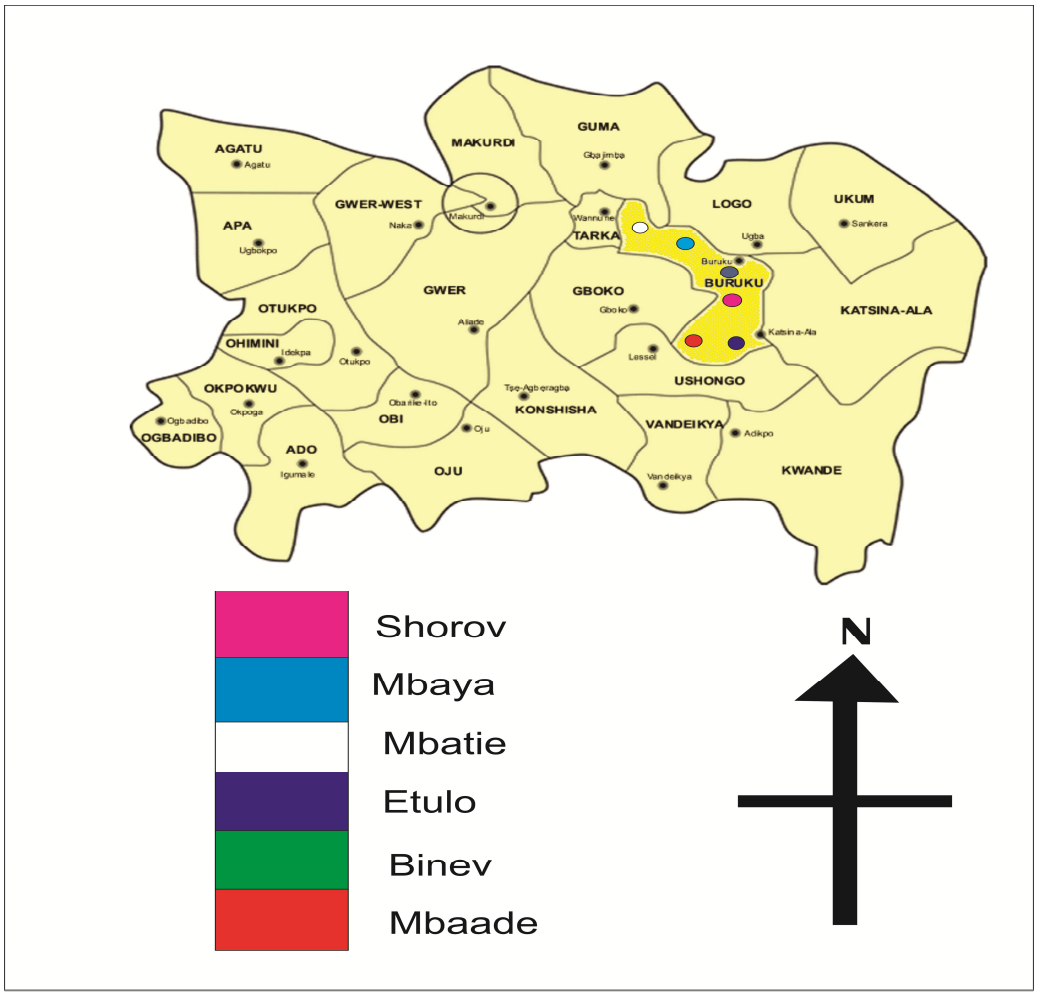
2. MATERIALS AND METHODS

2.1 Study Area

The ethnomedicinal survey of medicinal plants used for the treatment of Diabetes mellitus was carried out in Shorov, Mbatie, Mbaade, Mbaya, Binev and Etulo Council Wards of Buruku Local Government of Benue State, Nigeria. The area falls within the latitudes 6º25'N and 8º8'S and longitudes 6º25'N and 10ºE. The majority of people in this study area belong to the Tiv and minority to Etulo ethnic groups. The people in the study area use herbal medications for the treatment of different diseases including diabetes.

2.2 Ethnomedicinal survey

Using the method of [13], a semi- structured questionnaire was used to obtain ethnomedicinal information. Each of the herbalists visited, the essence of the study was explained to them. An interview guide with different questions was used to collect information from the traditional herbalists concerning knowledge of the plant and set modes of preparation. Some plants were obtained directly from the healers and/herbalists, while some were collected in the wild. The plants were identified by their vernacular names and packed separate polythene bags. It was then validated at the Herbarium Unit, Department of Biological Sciences, Ahmadu Bello University, Zaria.



Map of the study area

3. RESULTS AND DISCUSSION

3.1 Species of Plants used in Treating of Diabetes Mellitus

From the study conducted, twenty eight plants were mentioned as being used for treatment of Diabetes mellitus in Buruku Local Government of Benue State. Out of these, a total of twenty two (22) plant species, distributed across 17 families were identified. The plant species, family, vernacular names, the parts used, and mode of preparation are presented in Table 1. The most frequently mentioned plants were *V. amygdalina* and *M. oleifera*. The families Asteraceae and Rubiaceae were represented by the highest number of species (three species each), followed by Euphorbiaceae (two species). The rest were represented by one species each (14 families). The reason why some plants were frequently mentioned could be as the result of the efficacy of the plants.

Information obtained from the Herbalist shows that traditional knowledge on medicinal plants and plant use is prevalent in Buruku Local Government of Benue State. From the ethnomedicinal investigation conducted, different plant parts have been used by traditional herbalist in treating or managing diabetes in Buruku Local Government. This is in concordance with the work [14] who documented 34 medicinal plants used by the Herbalists in the Northwestern, Nigeria for the treatment of Diabetes mellitus; with *M. indica* and *V. amygdalina* as well as *Allium sativum* ranked highest based on Informant consensus. Furthermore, [15] identified 31 plants used by traditional healers to treat diabetes mellitus in Southwest Nigeria.

Table 1. Plants used for treating/management of diabetes mellitus in Buruku local government

Plant species	Family	Local names (Tiv)	Frequency of mention (n=6)	Parts used	Method of preparation and used
Ageratum conyzoides	Asteraceae	Hurhur	1	Whole plant	Maceration of the whole plant, taken orally 3 times a day
Allium sativum	Liliaceae	Alabesa upupuu	3	Bulb	Boil in water, take one glass 3 times for 21 days
Azadirachta indica	Meliaceae	Dogoyaro	3	Leaves, stem bark	Leaves and stem distilled with steam and a small glass drink orally twice a day
Bidens pilosa	Asteraceae	Korakondo	1	Whole plant	Boil the whole plant for 20 minutes, take 3times daily for mild hyperglycemia
Bridelia ferruginea	Euphorbiaceae	Ikpine	1	leaves	Herbal infusion made from the leaves, take 3times a days
Citrus aurantifolia	Rutaceae	Alom uangen	2	Fruits	Herbal infusion made from the fruits
Cocos nucifera	Palmae	Ikeve, Ikewe	2	fruits	By taking 5 spoons of the fruit water after every meal
Cymbopogon citrate	Gramineae	Toho gile	2	Whole plant	Herbal infusion made from the leaves, take 3 times a days
Ficus sycomorus	Moraceae	Hirkar	1	Stem bark	Dry and ground into powder, take 2 teaspoon in 1 glass of hot water
Gardenia erubescens	Rutaceae	Ibohogh	1	Leaves	Boil the leaves for 30minutes, take 3times daily after meal
Lannea spp	Anacardiaceae	Nimbiligh	1	Whole plant	Boil the whole plant, take 1 glass twice daily for 21days
Momordica charantia	Cucurbitaceae		2	Fruits	Dried and powdered fruits taken orally or fruits macerated with olive oil and one spoon taken orally a day
Morinda lucida	Rutaceae	Akinde nor	2	Roots	Boil the roots for 20 minutes, take 1 glass cup daily
Moringa oleifera	Moringaceae	Jegelede	4	Leaves	Decoction in water, take regularly for 14 days
Musa sapientum	Musaceae	Ayaba	2	Fruits	Dried and ground into floor or cook and eat matured and unripe fruits
Occimum gratissimum	Labiatae	Kungureku	3	Leaves	Squeeze the leaves in water or boil the leaves, take 3times a day for 14 days
Ricinus communis	Euphorbiaceae	Jija	2	seeds	Dry the seeds, take 4-5 seeds a day
Sesamum indicum	Pedaliaceae	Ishwa	2	Seeds	25-30 g of seeds eaten raw daily.
Solanum aethiopicum	Solanaceae	Mngishim	1	Leave, fruits	As vegetable
Vernonia amygdalina	Asteraceae	Ityuna, Ituna	4	Leave	Squeeze the leave in water, take 3times daily
Viscum album	Santalaceae	Nonor	1	Leaves	Squeeze the leaves in water, take 3times a day
Ximenia americana	Olacaceae	Alomade	1	Leaves, seeds, roots, bark	Dry and ground into powder, take 1 glass cup 3times a day for 21 days

4. CONCLUSION

The results of this study indicated that different plants have been used for the treatment of diabetes mellitus by traditional herbalists in Buruku local Government of Benue State. The documentation of traditional medicinal practices used for the treatment of diabetes mellitus in the study areas was achieved. In addition, this study further strengthened the relationship between indigenous knowledge and ethnomedicinal practices. Despite the use of advanced oral hypoglycemic agents for the management of diabetes, use of herbal remedies is gaining higher importance because these oral hypoglycemic agents have drawbacks and limitations [16]. The increasing interest in the use of herbal medicine demands information on the efficacy, toxicity and also risk assessment on various plant concoctions used in management of diseases. Numerous medicinal plants have been reported to be effective in treating diabetes, yet plenty of research is still needed to be done.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Research Questionnaire

AHMADU BELLO UNIVERSITY, ZARIA

FACULTY OF LIFE SCIENCES
DEPARTMENT OF BOTANY
RESEARCH QUESTIONNAIRE

TITLE: THE ETHNOMEDICINAL SURVEY OF PLANTS USED FOR THE TREATMENT/MANAGEMENT OF DIABETES IN BURUKU LOCAL GOVERNMENT OF BENUE STATE, NIGERIA

Serial number of the questionnaire……
Name of interviewer …… Date ……

PART ONE: CONSENT

A. RESEARCHER'S DECLARATION

1. The following research will be undertaken with respect to the indigenous knowledge and intellectual proprietary of the herbal practitioners.
2. I will at no given time initiate or conduct practices that are deemed to obtain information from the respondents by intimidation, coercion or false pretence.
3. I will be under no obligation to edit or tamper the information provided by the respondents.
4. The information collected will be used for the described research purpose only and not any undisclosed intentions.

Signatory Researchers:

1) Suurshater, INDYER …….. Date ……

B: RESPONDENTS CONSENT AGREEMENT

I..... hereby agree to participate in this study with my full consent and conscience and declare that to the best of my knowledge the information that I have provided is true, accurate and complete.

Signature/Thumb print.....Date.....

PART TWO

INFOFRMATION ON TRADITIONAL HERBAL PRACTICE

1. Do you treat diabetes mellitus?
.....
.....

MEDICINAL PLANTS USED

1. Which plants do you use to treat the above condition?

Vernacular name	**Ingredient** (whole plant, leaves, roots, seeds, flowers)	**Preparation/Quantity Used and method of administration**
1		
2.		
3.		

4.		
5.		
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29		
30		

(2) Which three plants do you most commonly use?

a……...
b……...
c……

(3) Is this remedy used fresh or dried? If used dried, how is it dried? In the sun or in the shade?

……
……
……
(4) How is the remedy prepared?.....
.....
.....

(5) How often does one take the medicine? For how long?

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