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2           **THE ETHNOMEDICINAL SURVEY OF PLANTS USED FOR THE**  
3           **TREATMENT/MANAGEMENT OF DIABETES IN BURUKU LOCAL**  
4           **GOVERNMENT OF BENUE STATE, NIGERIA**

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6   **Abstract**

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

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23   **Key words:** Diabetes Mellitus, Ethnomedicinal, Medicinal plants, Extract, and species

25       **1. Introduction**

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

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

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

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

50 have been used ethnomedicinal or experimentally for the treatment of diabetic symptoms and  
51 complications.

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

## 61 **2. Material and Methods.**

### 62 **2.1 Study area**

63 The ethnomedicinal survey of medicinal plants used for the treatment of Diabetes mellitus  
64 was carried out in Shorov, Mbatie, Mbaade, Mbaya, Binev and Etulo Council Wards of  
65 Buruku Local Government of Benue State, Nigeria. The area falls within the latitudes 6°25'N  
66 and 8°8'S and longitudes 6°25'N and 10°E. The majority of people in this study area belong  
67 to the Tiv and minority to Etulo ethnic groups. The people in the study area use herbal  
68 medications **for the treatment of different diseases** including diabetes.

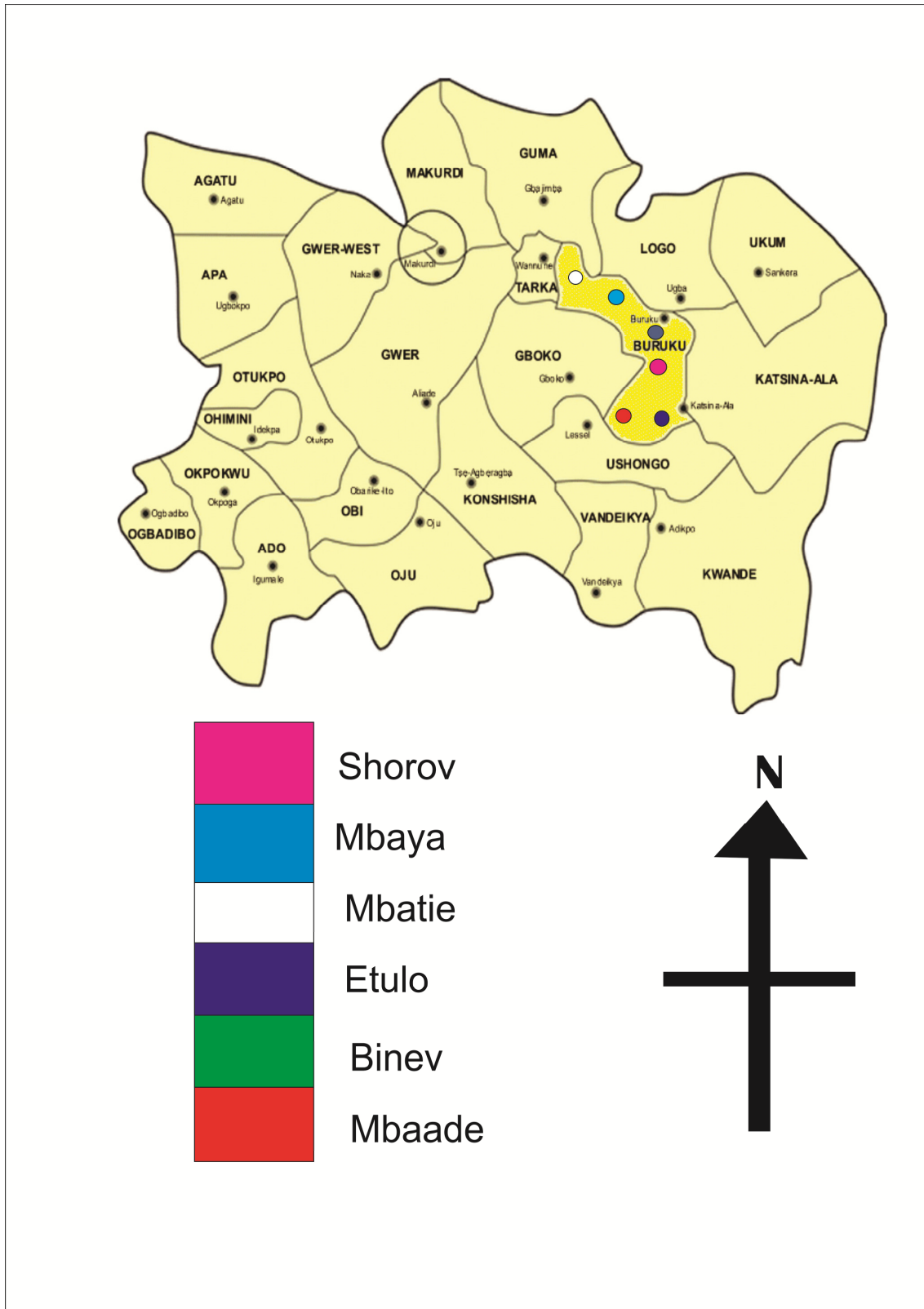
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77 **2.2 Ethnomedicinal survey**

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

86 **3. Results and Discussion**

87 **3.1 Species of Plants used in Treating of Diabetes Mellitus**

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

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102 Table 1 Plants used for treating/management of diabetes mellitus in Buruku Local

103 Government

Plant species	Family	Local names (Tiv)	Frequency of mention (n=6)	Parts used	Method of preparation and used
<i>Ageratum conyzoides</i>	Asteraceae	Hurhur	1	Whole plant	Maceration of the whole plant, taken orally 3times a day
<i>Allium sativum</i>	Liliaceae	Alabesa upupuu	3	Bulb	Boil in water, take one glass 3 times for 21days
<i>Azadirachta indica</i>	Meliaceae	Dogoyaro	3	Leaves, stem bark	Leaves and stem distilled with steam and a small glass drink orally twice a day
<i>Bidens pilosa</i>	Asteraceae	Korakondo	1	Whole plant	Boil the whole plant for 20 minutes, take 3times daily for mild hyperglycemia
<i>Bridelia ferruginea</i>	Euphorbiaceae	Ikpine	1	leaves	Herbal infusion made from the leaves, take 3times a days
<i>Citrus aurantifolia</i>	Rutaceae	Alom uangen	2	Fruits	Herbal infusion made from the fruits
<i>Cocos nucifera</i>	Palmae	Ikeve, Ikewe	2	fruits	By taking 5 spoons of the fruit water after every meal
<i>Cymbopogon citrate</i>	Gramineae	Toho gile	2	Whole plant	Herbal infusion made from the leaves, take 3times a days
<i>Ficus sycomorus</i>	Moraceae	Hirkar	1	Stem bark	Dry and ground into powder, take 2 teaspoon in 1 glass of hot water
<i>Gardenia erubescens</i>	Rutaceae	Ibohogh	1	Leaves	Boil the leaves for 30minutes, take 3times daily after meal
<i>Lannea spp</i>	Anacardiaceae	Nimbiligh	1	Whole plant	Boil the whole plant, take 1 glass twice daily for 21days
<i>Momordica charantia</i>	Cucurbitaceae		2	Fruits	Dried and powdered fruits taken orally or fruits macerated with olive oil and one spoon taken orally a day

<i>Morinda lucida</i>	Rutaceae	Akinde nor	2	Roots	Boil the roots for 20minutes, take 1 glass cup daily
<i>Moringa oleifera</i>	Moringaceae	Jegelede	4	Leaves	Decoction in water, take regularly for 14days
<i>Musa sapientum</i>	Musaceae	Ayaba	2	Fruits	Dried and ground into floor or cook and eat matured and unripe fruits
<i>Occimum gratissimum</i>	Labiatae	Kungureku	3	Leaves	Squeeze the leaves in water or boil the leaves, take 3times a day for 14days
<i>Ricinus communis</i>	Euphorbiaceae	Jija	2	seeds	Dry the seeds, take 4-5 seeds a day
<i>Sesamum indicum</i>	Pedaliaceae	Ishwa	2	Seeds	25-30g of seeds eaten raw daily.
<i>Solanum aethiopicum</i>	Solanaceae	Mngishim	1	Leave, fruits	As vegetable
<i>Vernonia amygdalina</i>	Asteraceae	Ityuna, Ituna	4	Leave	Squeeze the leave in water, take 3times daily
<i>Viscum album</i>	Santalaceae	Nonor	1	Leaves	Squeeze the leaves in water, take 3times a day
<i>Ximenia americana</i>	Olacaceae	Alomade	1	Leaves, seeds, roots, bark	Dry and ground into powder, take 1 glass cup 3times a day for 21days

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105 Information obtained from the Herbalist shows that traditional knowledge on medicinal  
106 plants and plant use is prevalent in Buruku Local Government of Benue State. From the  
107 ethnomedicinal investigation conducted, different plant parts have been used by traditional  
108 herbalist in treating or managing diabetes in Buruku Local Government. This is in  
109 concordance with the work (14) who documented 34 medicinal plants used by the Herbalists  
110 in the Northwestern, Nigeria for the treatment of Diabetes mellitus; with *M. indica* and *V.*  
111 *amygdalina* as well as *Allium sativum* ranked highest based on Informant consensus.

112 Furthermore, (15) identified 31 plants used by traditional healers to treat diabetes mellitus in  
113 Southwest Nigeria.

#### 114 **4.0 CONCLUSION**

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

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178 **Research Questionnaire**



179 **AHMADU BELLO UNIVERSITY, ZARIA**  
180 **FACULTY OF LIFE SCIENCES**

181 **DEPARTMENT OF BOTANY**

182 **RESEARCH QUESTIONNAIRE**



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

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188 Serial number of the questionnaire.....

189 Name of interviewer ..... Date .....

190 **PART ONE: CONSENT**

191 **A. RESEARCHER'S DECLARATION**

192 1. The following research will be undertaken with respect to the indigenous knowledge and  
193 intellectual proprietary of the herbal practitioners.

194 2. I will at no given time initiate or conduct practices that are deemed to obtain information  
195 from the respondents by intimidation, coercion or false pretence.

196 3. I will be under no obligation to edit or tamper the information provided by the respondents.

197 4. The information collected will be used for the described research purpose only and not any  
198 undisclosed intentions.

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201 **Signatory Researchers:**

202 **1) Suurshater, INDYER ..... Date .....**

203

204 **B: RESPONDENTS CONSENT AGREEMENT**

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

208 **Signature/Thumb print.....Date.....**

209

210 **PART TWO**

211 **INFOFRMATION ON TRADITIONAL HERBAL PRACTICE**

212 1. Do you treat diabetes mellitus?

213 .....

214 .....

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216 **MEDICINAL PLANTS USED**

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

218

<b>Vernacular name</b>	<b>Ingredient</b> (whole plant, leaves, roots, seeds, flowers)	<b>Preparation/Quantity</b> <b>Used and method of administration</b>
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219 (2) Which three plants do you most commonly use?

220 a.....

221 b.....

222 c.....

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

225 .....

226 .....

227 .....

228 .....

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

230 .....

231 .....

232 .....

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

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UNDER PEER REVIEW