An ‘Avalanche’ of Plant Species for the Traditional Cure of Diabetes mellitus in South-Western Nigeria

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ABSTRACT

Ethnobotanical survey of the plants used in the treatment of Diabetes mellitus was conducted in some areas of South-Western Nigeria. The survey revealed the use of about 132 different plants species belonging to 56 families in the treatment of Diabetes mellitus. Taxonomic practice of specimen preparation for herbarium storage was performed for each of the plants and some were deposited at the Elikaf herbarium of Olabisi Onabanjo University, Ago-Iwoye. The identified plants have been confirmed to possess anti-diabetic properties. Prominent among them are Senna alata Linn, Curculigo pilosa (Schumach & Thonn.) Engl, Cucurmeropsis mannii Naudin, Anthochleista spp, Vernonia amygdalina Del and Allium spp. These species were found to be very important and useful in the treatment of diabetes based on their frequency of occurrence in the recipes obtained, although only few of the recipes are listed in this work. Most of these plants are available in the area of study. A need for further scientific research based on the findings of this work is needed and recommended so that adequate records of indigenous methods of treating Diabetes mellitus can be kept for posterity, especially in the study area.

Key words: Ethnobotany, Diabetes, Medicinal plants, Traditional medicine, Herbal Treatment.

INTRODUCTION

Studies have shown that Nigeria is endowed with abundant forest lands, rich in valuable plants and raw material (1). Nature provides materials for the treatment of diseases and ailments in the different flora and fauna of the world hence there is an extensive worldwide exploration of local flora for bioactive components. The potential of the Nigeria flora as a veritable source for pharmaceuticals and other therapeutic have variously been expressed by several authors (2, 3, 4, 5 & 6).
Phytomedicine as the name suggests means medicine from plants. According to (7), the history of the use of herbs dated back to the time of the early man who had the crudest tools as the implements. The art of using herbs to enhance his health must have come to him in the most unscientific manner. The use of plant extracts in the treatment of diseases is known as herbal medicine, it is the oldest form of medicine dating back to the Genesis of man. Despite the increase in the production of synthetic drugs, natural plant drug materials are still economically significant in the world and large quantities are harvested.

The alarming rate at which traditional medicine is now patronized by all segments of the society— the rich, the poor, educated and the uneducated—clearly signifies one thing, “the realization that traditional medicine which as long been taken for granted and rejected for decades has a crucial role to play in making affordable health care delivery system available to the entire populace” (8). As a result of increased demand for alternative medicine, renewed interest in drugs of plant origin has been growing steadily (9).

Ethnobotanical survey is therefore important in our societies because there is need to have proper and comprehensive documentation of all the plants used in treatment of different diseases. Since the herbalist and local people who are knowledgeable about medicinal plants do not keep record or have scanty records but only passed information (if at all they did) about these plants verbally from generation to generation. Ethnobotanical survey also stimulates research into Medicinal plants and provides scientific evidence for the claimed therapeutic efficacy of those herbs by traditional healers. For instance, *Catharanthus roseus* (L.) G.Don as a source of anti-cancer contains alkaloids—vincristine and vinblastine. Also, dried sclerotium of the fungus—*Claviceps purpurea* (Fr.) Tul. is known to contain alkaloids that are of therapeutic importance; ergometrine and ergotamine (10 & 11). It is no doubt that ethnobotanical survey have greatly contributed to the discovery and development of new drugs from plants kingdom (12), e.g Artemisinin; an anti-malaria drug from *Artemisia annua* L. (13).

In Africa, the diversity of the flora partly explains the strength of traditional medicine and the wide varieties of medicinal recipe utilized by traditional healers (14). Although, much ethnobotanical survey had been carried out on plants, more survey is still necessary with regard to the plants used in treating diabetes as there is increase in the rate of *Diabetes mellitus* manifestation in Nigeria and African countries in general. It is also necessary to carry out survey in order to avert many complications associated with the disease; retinopathy, gangrene, etc (15). (16), suggested that diabetes is a chronic disease, which usually involves loss of weight, excessive urination, and weakness of the body and may also affect any organ or tissue in the body. Similarly, (17) opined that diabetes is the disease presented when the insulin produced by the pancreas in the body is unable to control the level of sugar within the body, with the result that the patient has a high level of sugar (glucose) carried in the blood around the body. However, (18) also suggested that *Diabetes mellitus* (DM) is not a single entity, but rather a group of metabolic disorder sharing a common underlying features of hyperglycemia. Hyperglycemia in diabetes results from defect in insulin secretion, insulin action or most common both. The chronic hyperglycemia and attendant metabolic dis-regulation may be associated with secondary damage in multiple organ systems, especially the kidney, eye, nerves and blood vessels (18). The disease is common and it affects over three million people in Nigeria when the insulin produced by the pancreas in the body is unable to control the level of sugar within the body.

*Diabetes mellitus* is common in both young and old people especially in pregnant women. Rare cases have been attributed to diabetes coma. There are two major types of *Diabetes mellitus*;
insulin dependent *Diabetes mellitus* (IDDM) type I and Non-Insulin Dependent *Diabetes mellitus* (NDDM) type II. The type I occur in young people usually below 35 years of age while the type II occur in older people usually above 35 years old and often overweight. In type I, the pancreas cannot make insulin so the patient must be treated with insulin in the absence of which they cannot survive, since insulin can not be orally administered, the patient receive insulin injections once or twice a day or the patients takes herbal medicine like *Carica papaya* Linn. mixed with *Xylopia aethiopica* (Dunal) A.Rich to manage the disease which will not cost much money or pain. On the other hand, in type II, the pancreas does make insulin, but the body cannot use the insulin properly (19). In this case, the patient is treated with oral medication. However, during periods of stress or infection, they may need short term insulin treatment; they could take herbal medicines made from *Mangifera indica* Linn, *Azadirachta indica* (Linn.) G.Don. and *Morinda lucida* Benth to cure the disease. Approximately 80-90% of diabetes is type II, and insulin resistance is one of the greatest enemies of their health as opined by (19).

Generally, it is possible for a person to have high level of sugar in his blood without having any symptoms. However, in more cases, the person who has diabetes would complain of feeling thirsty and passing large quantities of urine (20). Effects of uncontrolled diabetes include: inability to see clearly, recurrent boils on the skin, leg ulcers that fail to heal, frequent urination, loss of flesh, inordinate appetite, constant hunger, mental depression, progressive weakness, great thirst and dry tongue (7). The patient could be restless, irritable and morose. It is most helpful to conduct a test for a patient and get a doctor’s diagnosis to confirm that such patient is diabetic or not.

While it is clear that the rate of occurrence of diabetes is growing fast, ethnobotanists have taken a firm decision to embark on herbal medicine in the treatment of the disease and indeed taken a specific measure towards achieving it. It is on this note that this work was embarked upon to critically evaluate plants used in the treatment of *Diabetes mellitus* in South-Western Nigeria and also to examine how they are used and the progress made with the use of these plants.

**MATERIALS AND METHODS**

The ethnobotanical survey of plants used in the treatment of *Diabetes mellitus* was conducted in Ibadan, Abeokuta, Ijebu-Ode, Ijebu-Igbo, Oru-Ijebu, Ago-Iwoye and Lagos all within the area of study, South-Western Nigeria. For the survey, questionnaires were prepared to interview several herb sellers, herbalists and traditional medicine practitioners within the area of study and a number of plants were gathered from this exercise. These plants were then collected from the wild, pressed and dried (showing both the abazial and adaxial parts) poisoned and mounted on standardized herbarium sheets according to taxonomic practice. The plants were properly poisoned using mercuric chloride solution mixed with phenol in 70% methylated spirit to reduce fungal load and prevent insect attack. Identification and authentication was done by the senior author, a plant taxonomist, and confirmed at the Forest Herbarium, Ibadan (FHI). Some of the identified specimens were later deposited at the Elikaf Herbarium of Olabisi Onabanjo University, Ago-Iwoye; although not listed in (21).

**RESULTS**

A total of 132 plant species belonging to 56 families were said to be useful in the treatment of diabetics. Plants identified in this work have been tested by the herbalists and according to them are quite efficacious. Tables 1 and 2 give useful information on each of the plants and the distribution of species within each of the families respectively while the method of preparation.
and administration of each recipe is shown in Table 3. However, only 14 of the recipes are enumerated below owing to space. Figure 1 is a graphical representation showing the percentage occurrence of each of the families.

Table 1. List of Medicinal Plants Used by the Traditional Healers in South-Western Nigeria in treating diabetes

<table>
<thead>
<tr>
<th>S/No</th>
<th>Botanical Names</th>
<th>Family</th>
<th>Local Names</th>
<th>Common Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abelmoscus esculentus (Linn.)</td>
<td>Malvaceae</td>
<td>Ila</td>
<td>Okra</td>
</tr>
<tr>
<td></td>
<td>Moench</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Abrus precatorius L.</td>
<td>Leguminosae-</td>
<td>Oju ologbo</td>
<td>Crab eye</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Papilionoideae</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Adansonia digitata L.</td>
<td>Bombacaceae</td>
<td>Ose</td>
<td>Baobab</td>
</tr>
<tr>
<td>4</td>
<td>Adenanpus breviflorus Benth</td>
<td>Cucurbitaceae</td>
<td>Tagiri</td>
<td>Pseudo colocynth</td>
</tr>
<tr>
<td>5</td>
<td>Aerva lanata (L.) Juss. ex Schult.</td>
<td>Amaranthaceae</td>
<td>Eweowo</td>
<td>Morning leave</td>
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<tr>
<td>6</td>
<td>Aframomum melegueta (Loskoe) K.</td>
<td>Zingiberaceae</td>
<td>Atare</td>
<td>Alligator pepper</td>
</tr>
<tr>
<td></td>
<td>Schum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Ageratum conyzoides L.</td>
<td>Asteraceae/Compositae</td>
<td>Imi esu</td>
<td>Goat weed</td>
</tr>
<tr>
<td>8</td>
<td>Alafia barteri Oliv.</td>
<td>Apocynaceae</td>
<td>Agbari etu</td>
<td>Guinea-fowl's crest</td>
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<tr>
<td>9</td>
<td>Albizia adianthifolia (Schumach.)</td>
<td>Leguminosae-</td>
<td>Bonabona</td>
<td>Flatcrown albizia</td>
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<tr>
<td></td>
<td>W. Wight</td>
<td>Mimosoideae</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>Alchornea cordifolia (Schurn &amp;Thonn.) Mull. Arg.</td>
<td>Euphorbiaceae</td>
<td>Ipa</td>
<td>Christmas bush</td>
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<tr>
<td>11</td>
<td>Allium ascanolicum Linn</td>
<td>Liliaceae</td>
<td>Alubosa elewe</td>
<td>Spring onion</td>
</tr>
<tr>
<td>12</td>
<td>Allium cepa L</td>
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<td>Alubosa</td>
<td>Onion</td>
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<tr>
<td>13</td>
<td>Allium sativum Linn</td>
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<td>Ayu</td>
<td>Garlic</td>
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<tr>
<td>14</td>
<td>Alstonia boonei L</td>
<td>Apocynaceae</td>
<td>Ahun</td>
<td>Stoolwood</td>
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<tr>
<td>15</td>
<td>Amaranthus spinosus L</td>
<td>Amaranthaceae</td>
<td>Tete elegun</td>
<td>Prickly amaranthus</td>
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</tr>
<tr>
<td>16</td>
<td>Ananas comosus (L.) merr</td>
<td>Bromeliaceae</td>
<td>Ope oyinbo</td>
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<tr>
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<td>Annona senegalensis Pers.</td>
<td>Annonaceae</td>
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<td>Anthocleista djalonensis A.chew</td>
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<tr>
<td>19</td>
<td>Anthocleista nobilis G. Don</td>
<td>Longaniaceae</td>
<td>Shapo</td>
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<tr>
<td>20</td>
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<td>Loganiaceae</td>
<td>Sapo</td>
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<td>21</td>
<td>Argemone mexicana L.</td>
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<td>Ikanekun</td>
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<td>22</td>
<td>Aristolochia albida Duch.</td>
<td>Aristolochiaceae</td>
<td>Paran funfun</td>
<td>dutchman's pipe</td>
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<td>Asparagus africanus Lam.</td>
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<td>Aluki</td>
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<td>Azadirachta indica (Linn.) G.Don</td>
<td>Meliaceae</td>
<td>Dongooyaro</td>
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<td>Bambusa vulgaris Wendel.</td>
<td>Poaceae/Graminace</td>
<td>Oparun</td>
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<td>26</td>
<td>Blighia sapida K.D.Koenig</td>
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<td>Isin</td>
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<td>27</td>
<td>Bombax buonopozense P. Beauv</td>
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<td>Ponpola</td>
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<td>Brachystegia eurycoma Harms</td>
<td>Leguminosae-</td>
<td>Itipase eku nla</td>
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<td>Caesalpinioideae</td>
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<tr>
<td>29</td>
<td>Bridelia ferruginea Benth</td>
<td>Euphorbiaceae</td>
<td>Ira</td>
<td>Ira</td>
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<tr>
<td>30</td>
<td>Caesalpina bunduc (Linn.) Roxb</td>
<td>Leguminosae-</td>
<td>Ayo</td>
<td>Nicker nut</td>
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<td></td>
<td></td>
<td>Caesalpinioideae</td>
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</table>

<p>| 31   | Calotropis procera R.B           | Asclepiadaceae          | Bomubomu    | Giant milk week      |
| 32   | Canarium schwerinbaurhii Engl.   | Burseraceae             | Awogbaarun  | Bush candle tree     |
| 33   | Capsicum frutescens L.           | Solanaceae              | Ata weve    | African pepper       |
| 34   | Carica papaya L.                 | Caricaceae              | Ibepe       | Pawpaw               |
| 35   | Chenopodium ambrosioides Linn    | Chenopodiaceae          | Arunpale    | India worth seed     |
| 36   | Milicia exelsa (Welw.) C.C. Berg | Moraceae               | Igi-Iroko   | Iroko                |
| 37   | Chrysophyllum albidum Linn.      | Sapotaceae              | Agbalumo    | African star apple   |
| 38   | Cissampelos mucronata A. Rich.   | Menispermaceae          | Jenjoko     | Pareira brava        |
| 39   | Citrullus colocynthis (Linn.) Schrad | Cucurbitaceae | Egusi bara  | Bitter gourd        |
| 40   | Citrullus lanatus (Thumb) mansf  | Cucurbitaceae           | Egusi-baara | Water melon     |
| 41   | Citrus aurantifolia (Christm.) Swingle. | Rutaceae          | Osan weve   | Lime                |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific Name</th>
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<td>Coconut palm</td>
<td>Agbon</td>
<td>Palmae</td>
<td>Coconut palm</td>
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<td>73</td>
<td>Cola acuminata (P.Beauv.) Schott &amp; Endl.</td>
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<td>Kola</td>
<td>Obi-abata</td>
<td>Sterculiaceae</td>
<td>Kola</td>
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_Scholars Research Library_
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<th>Common Name</th>
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<tr>
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<td>Musa sapientum Linn.</td>
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<td>Ogede (Banana)</td>
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<tr>
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<td>Nauclea latifolia Smith</td>
<td>Rubiaceae</td>
<td>Egbesi (Nauclea)</td>
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<td>92</td>
<td>Newbouldia laevis (P.Beauv.)</td>
<td>Bignoniaceae</td>
<td>Akoko (Tree of life)</td>
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<td>93</td>
<td>Nicotiana tabacum Linn.</td>
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<td>Taba (Tobacco)</td>
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<td>94</td>
<td>Nymphaea lotus Linn</td>
<td>Nymphaeaceae</td>
<td>Osibata (White pond lily)</td>
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<td>Ocimum basilicum Linn</td>
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<td>Effrin (Sweet basil)</td>
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<td>96</td>
<td>Ocimum gratissimum Linn</td>
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<td>Effrin-nla (Sweet basil)</td>
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<td>Olax subscorpioidea Oliv.</td>
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<td>Ifon</td>
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<td>Parinari macrophylla Sabine</td>
<td>Chrysobalanaceae</td>
<td>Abere (Ginger bread plum)</td>
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<td>Peperomia pellucida (Linn.) H.B. &amp; K</td>
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<td>Rinrin (Cowfoot)</td>
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<td>Pergularia daemia (Forsskal) Chiov.</td>
<td>Asclepiadaceae</td>
<td>Kuleri-ogba</td>
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<td>101</td>
<td>Phyllanthus niruri L.</td>
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<tr>
<td>102</td>
<td>Picralima nitida (Stapf) Th. &amp; H. Dur.</td>
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<td>Eso abere (Picralima)</td>
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<tr>
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<td>Picralima umbellata (K.Schum.) Stafp</td>
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<td>Erin</td>
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<tr>
<td>104</td>
<td>Pilostigma thonningii (Schum.) Milne Readhead</td>
<td>Leguminosae-</td>
<td>Abafe (Caesalpinioideae)</td>
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<tr>
<td>105</td>
<td>Piper guineense Schum &amp; Thonn</td>
<td>Piperaceae</td>
<td>Iyere</td>
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<td></td>
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<td>West African Black pepper</td>
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<td>106</td>
<td>Portulaca spp</td>
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<td>Papasan (Purslove)</td>
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<td>107</td>
<td>Rauvolfia vomitoria Afzel</td>
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<td>Asofoeyeje (Rauvolfia)</td>
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<td>108</td>
<td>Saccharum officinarum L.</td>
<td>Poaceae/Graminace</td>
<td>Irke (Sugarcane)</td>
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<td>109</td>
<td>Sansevieria libérica Ger. &amp; Labr.</td>
<td>Dracaenaceae</td>
<td>Pasan-ikoko (Bowstring Hemp)</td>
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<td>Securidaca longipedunculata Fres.</td>
<td>Polygalaceae</td>
<td>Ipeta (Violet tree)</td>
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<tr>
<td>111</td>
<td>Senna alata Linn</td>
<td>Leguminosae-</td>
<td>Asunwon Oyinbo (Candle bush)</td>
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<tr>
<td></td>
<td></td>
<td>Caesalpinioideae</td>
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<td>112</td>
<td>Sida acuta Burm. F.</td>
<td>Malvaceae</td>
<td>Isokotu (Horn beam)</td>
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<tr>
<td>113</td>
<td>Sida veronicifolia Lam.</td>
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<tr>
<td>114</td>
<td>Solenostemon</td>
<td>Labiatae</td>
<td>Agogoigun (Catrip)</td>
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<tr>
<td></td>
<td>Monostachys (P.Beauv) Briq</td>
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<tr>
<td>115</td>
<td>Sorghum caudatum (Hack.) Stapf</td>
<td>Poaceae/Graminace</td>
<td>Oka baba (Sorghum)</td>
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<td>Spilanthes aliginosa Sw.</td>
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<tr>
<td>117</td>
<td>Spondias mombin L.</td>
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<td>Ieye (Hog plum)</td>
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<td>Stachytarpheta jamaiicensis (L.)</td>
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<td>Apari-igun (Devil’s coach)</td>
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<tr>
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<td>Vahl</td>
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<td>Strophantus hispidas D.C</td>
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<td>Sagere (Arrow poison)</td>
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<td>Syzygium aromaticum (L.)</td>
<td>Myrtaceae</td>
<td>Konafuru (Clove)</td>
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<tr>
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<td>Merrill &amp; Perry</td>
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<td></td>
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<td>121</td>
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<td>Furutu (Almond)</td>
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<tr>
<td>122</td>
<td>Tetracarpidium conophorum (Mull.-Arg.) Hutch. &amp; Dalz.</td>
<td>Euphorbiaceae</td>
<td>Asala (Walnut)</td>
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<tr>
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<td>Tetrapleura tetraperta (Schun &amp; Thonn) Taub.</td>
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<td>Aidan (Mimosoideae)</td>
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<td>123</td>
<td>Triumfetta cordifolia A. Rich.</td>
<td>Tiliaceae</td>
<td>Akeenii</td>
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<tr>
<td>124</td>
<td>Tylophora spp</td>
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<td>Esiriju</td>
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<td>125</td>
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<td>Gbongbose (Bush banana)</td>
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<tr>
<td>126</td>
<td>Vernonia amygdalina Del.</td>
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<td>Viscum album Linn.</td>
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<td>Afomo (Mistletoe)</td>
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<td>Afomo osan (Mistletoe)</td>
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<td>Lali-funfun (Ginger)</td>
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Table 2. Distribution of species within the families

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<td>Zingiberaceae</td>
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Table 3. Preparation of Anti-diabetic Recipes

**Recipe A**

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
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</thead>
<tbody>
<tr>
<td>Morinda lucida</td>
<td>Oruwo</td>
<td>Leaves</td>
</tr>
<tr>
<td>Momordica charantia</td>
<td>Ejinrin</td>
<td>Leaves</td>
</tr>
<tr>
<td>Vernonia amygdalina</td>
<td>Ewuro</td>
<td>Leaves</td>
</tr>
<tr>
<td>Musa sapientum</td>
<td>Ogede</td>
<td>Fruit</td>
</tr>
</tbody>
</table>

**Preparation:** The leaves of *Morinda lucida*, *Momordica charantia*, *Vernonia amygdalina*, and unripe fruit of *Musa sapientum* are boiled together with fermented Zea mays liquor.

**Application:** Two tablespoonful of the preparation is taken three times daily.

**Recipe B**

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnifera indica.</td>
<td>Mongoro</td>
<td>Stem bark</td>
</tr>
<tr>
<td>Alstonia boonei</td>
<td>Ahun</td>
<td>Stem bark</td>
</tr>
</tbody>
</table>

**Preparation:** The stem bark of *Magnifera indica* and *Alstonia boonei* are boiled together in fermented corn water for about 15 minutes.

**Application:** Half glass cup full of the extract is taken twice daily.
Recipe C

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musa sapientum</td>
<td>Ogede</td>
<td>Fruit</td>
</tr>
<tr>
<td>Allium sativum</td>
<td>Ayun</td>
<td>Leaves and bulb</td>
</tr>
<tr>
<td>Tetracarpidium conophorum</td>
<td>Asala</td>
<td>Seeds</td>
</tr>
<tr>
<td>Other ingredients:</td>
<td>Alcohol</td>
<td></td>
</tr>
</tbody>
</table>

**Preparation:** The listed plant parts are ground together and soaked for 24 hours in alcohol before administration.

**Application:** One tablespoonful is taken after meal.

Recipe D

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vernonia amygdalina</td>
<td>Ewuro</td>
<td>Leaves</td>
</tr>
<tr>
<td>Citrus aurantifolia</td>
<td>Osan wewe</td>
<td>Fruit juice</td>
</tr>
</tbody>
</table>

**Preparation:** Scotch the leaf of *Vernonia amygdalina* with the juice from *Citrus spp* and separate the extract.

**Application:** The patient takes one glass cup of the preparation daily.

Recipe E

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium sativum</td>
<td>Ayuu</td>
<td>Bulb</td>
</tr>
<tr>
<td>Vernonia amygdalina</td>
<td>Ewuro</td>
<td>Leaves</td>
</tr>
<tr>
<td>Ocimum gratissimum</td>
<td>Efirin nla</td>
<td>Leaves</td>
</tr>
</tbody>
</table>

**Preparation:** Boil the three plant parts together with concentrated fermented corn water (omi ogi or omidun-yoruba) or ordinary water for 30 minutes.

**Application:** One glass cup is taken every morning until ailment disappears.

Recipe F

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
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</thead>
<tbody>
<tr>
<td>Carica papaya</td>
<td>Ibepe</td>
<td>Leave</td>
</tr>
<tr>
<td>Xylopia aethiopica</td>
<td>Eru</td>
<td>Fruit</td>
</tr>
</tbody>
</table>

**Preparation:** Boil the dried leaves of *Carica papaya* and fruit of *Xylopia aethiopica*, add one teaspoonful of salt, and allow the mixture to settle.

**Application:** Half a glass cup is taken every morning.

Recipe G

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocos nucifera</td>
<td>Agbon</td>
<td>Bark</td>
</tr>
<tr>
<td>Elaeis guineensis</td>
<td>Ope</td>
<td>Bark</td>
</tr>
<tr>
<td>Potash</td>
<td>Kanbilala</td>
<td>Black soap</td>
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</tbody>
</table>

**Preparation:** The bark of *Cocos nucifera* and *Elaeis guineensis* are burnt together, and then added to ground potash in a bottle of schnapps.

**Application:** One tea spoon to be taken 3 times daily.

Recipe H

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sena alata</td>
<td>Asuwon</td>
<td>Leaves</td>
</tr>
<tr>
<td>Anthocleista djalonensis</td>
<td>Sapo</td>
<td>Bark</td>
</tr>
<tr>
<td>Curculigo pilosa</td>
<td>Epakun</td>
<td>Corm</td>
</tr>
<tr>
<td>Gladiolus ferruginea</td>
<td>Baka</td>
<td>Bulb</td>
</tr>
<tr>
<td>Citrus aurantifolia</td>
<td>Osan wewe</td>
<td>Juice</td>
</tr>
<tr>
<td>Cucurmeropsis mannii</td>
<td>Bara</td>
<td>Fruit</td>
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**Preparation:** All the plant parts mentioned above are soaked with lime water for 3-7 days before being administered.

**Application:** One glass cup to be taken once daily.
Recipe I

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
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<tbody>
<tr>
<td>Senna alata</td>
<td>Asuwon</td>
<td>Leaves</td>
</tr>
<tr>
<td>Bambusa vulgaris</td>
<td>Oparun</td>
<td>Leaves</td>
</tr>
<tr>
<td>Ocimum gratissimum</td>
<td>Efinrin</td>
<td>Root</td>
</tr>
<tr>
<td>Hoslundia opposita</td>
<td>Efinrin oso</td>
<td>Root</td>
</tr>
</tbody>
</table>

**Preparation:** The leaves and roots are rinsed in clean water and boiled in a clay pot with enough water for about 30-35 minutes and drank when warm.

**Application:** Half a glass cup to be taken 3 times daily. This recipe is only effective in the early stage of diabetes and not the chronic situation.

Recipe J

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senna alata</td>
<td>Asuwon</td>
<td>Leaves</td>
</tr>
<tr>
<td>Picralima nitida</td>
<td>Abeere</td>
<td>Pod</td>
</tr>
<tr>
<td>Lawsonia inermis</td>
<td>Laali</td>
<td>Leaves</td>
</tr>
<tr>
<td>Gladiolus ferruginea</td>
<td>Baka</td>
<td>Bark</td>
</tr>
<tr>
<td>Citrus medica</td>
<td>Jaganyin</td>
<td>Juice</td>
</tr>
</tbody>
</table>

**Preparation:** Citrus medica is cut into four and boiled together with the remaining plant parts for 40 minutes.

**Application:** To be taken 3 times daily with a glass cup.

Recipe K

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khaya grandifoliola</td>
<td>Oganwo</td>
<td>Bark</td>
</tr>
<tr>
<td>Kigelia africana</td>
<td>Pandoro</td>
<td>Bark</td>
</tr>
<tr>
<td>Garcinia kola</td>
<td>Orogbo</td>
<td>Fruit</td>
</tr>
<tr>
<td>Allium ascolanicum</td>
<td>Alubosa-elewe</td>
<td>Root</td>
</tr>
</tbody>
</table>

**Preparation:** All the plant parts are ground together after sun-drying.

**Application:** Small quantity of the prepared material is taken on the palm with water. This should be done in the morning and later at night.

Recipe L

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nauclea latifolia</td>
<td>Egbesi</td>
<td>Bark</td>
</tr>
<tr>
<td>Gongronema latifolium</td>
<td>Madunmaro</td>
<td>Root</td>
</tr>
<tr>
<td>Xylopia aethiopica</td>
<td>Eeru</td>
<td>Pod</td>
</tr>
<tr>
<td>Anthocleista djalonensis</td>
<td>Sapo</td>
<td>Bark</td>
</tr>
<tr>
<td>Aristolochia albida</td>
<td>Paranfunfun</td>
<td>Root</td>
</tr>
</tbody>
</table>

**Preparation:** The plant parts are cut into pieces, rinsed with clean water and soaked in half a bottle of schnapps for about 12 hours.

**Application:** One glass cup to be taken in the morning and at night.

Recipe M

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aframomum melegueta</td>
<td>Atare</td>
<td>Fruit</td>
</tr>
<tr>
<td>Strophantus hispidus</td>
<td>Sagere</td>
<td>Bark</td>
</tr>
<tr>
<td>Gladiolus ferruginea</td>
<td>Baka</td>
<td>Bulb</td>
</tr>
<tr>
<td>Curculigo pilosa</td>
<td>Epakun</td>
<td>Corm</td>
</tr>
</tbody>
</table>

**Preparation:** All the plant materials are cut into pieces, sun-dried and grounded smoothly.

**Application:** Small quantity on the palm is taken with adequate water in the morning and later at night.
Recipe N

<table>
<thead>
<tr>
<th>Plants</th>
<th>Vernacular Name</th>
<th>Plant part used</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Markhamia tomentosa</em></td>
<td>Oruru</td>
<td>Stem bark</td>
</tr>
<tr>
<td><em>Khaya ivorensis</em></td>
<td>Oganwo</td>
<td>Stem bark</td>
</tr>
<tr>
<td><em>Tetrapleura tetraptera</em></td>
<td>Aidan</td>
<td>Seed/pod</td>
</tr>
</tbody>
</table>

**Preparation:** The dried stem bark of the three plant parts and ginger (*Zingiber officinale*) are properly grinded together to a powdery form. The remnant from the grinded ginger is again mixed with *Khaya ivorensis* and *Tetrapleura tetraptera* and boiled for 20 minutes. Allow to cool.

**Application:** The prepared concoction is used to wash the wound on the leg, while the dried powder is applied to the washed wound and allowed to dry. It should be noted that this recipe is only meant to work for wounds on the leg of a diabetic patient.

Figure 1. Graphical representation of percentage occurrence of species in each family
DISCUSSION AND CONCLUSION

The families with the highest occurrence of species include Leguminosae with 10 species, followed by Euphorbiaceae (9), Apocynaceae (6), Cucurbitaceae, Moraceae, and Rutaceae (5 each) which is indicative of their importance in the treatment of Diabetes mellitus (Table 2). However, Bromeliaceae, Burseraceae, Capparaceae, Caricaceae, Combretaceae, Hypoxidaceae, Loranthaceae among others have the least number of species (1), this call for urgent attention on these families before they go into extinction. The frequent occurrence of other families also suggests their importance as repository of useful plants which may be explored for diabetes and other diseases treating drugs. Results also revealed that quite a number of plants parts especially the fruits, seeds, leaves, bulbs and the roots have been found efficient in the treatment of the disease. The most prominent in the recipes are Senna alata, Curculigo pilosa, Cucurmeropsis mannii, Anthocleist spp, Vernonia amygdalina and Allium s pp showing that they posses important anti-diabetic properties as reported by (22) and (23).

Some traditional remedies for Diabetes mellitus may create feeling of improved conditions without necessarily reducing hyperglycaemia (high sugar content in the body) because of claims that certain plants can ameliorate the complication of diabetes. According to (24), the Allium family, particularly Garlic is traditionally considered to give strength, reduce polydipsia (excessive thirst) and dehydration as demonstrated in severely streptozotocin induced diabetic mice without improving glycemic control. The use of traditional medicine with synthetic drugs must be approached with caution to avoid severe hypoglycaemia and coma. This is because studies on the interaction of traditional medicine with conventional drugs are not common but a case study by (25), indicated that hypoglycaemic effect of Momordica charantia Schum & Thonn. was addictive to that of chlorpropamide (Diabinese) which apparently reduce insulin requirement.

Today, ethnobotany is in the midst of renaissance. This revival reflects increasing concern about the disappearance of the rain forests and the tribal cultures inhabiting them. According to (26), medicinal plants should be focused for regeneration and propagation as (27) earlier reported that only about 39% of Rural Communities in Nigeria have access to modern health care services.

The usage of herbal remedies in treating Diabetes mellitus is useful because of long cultural history of utilization and the current renewed interest in natural products to sustain global health. As a way of recognizing the values and roles of traditional medical knowledge in health care provision, further research into the efficacy and safety of herbal remedies employed in the treatment of diabetes is very important in Nigeria and Africa as a whole. There is therefore the need for rejuvenation of these medicinal plants to preserve their genetic diversity. (28), concluded that conservationists in Nigeria must begin to address this area of genetic erosion at the genetic level which is the most neglected area of biological Diversity.

Since the overall aim of health care delivery is to better the health of people, the orthodox medical practitioners should tolerate, abjure antagonism and co-operate with traditional practitioners in order to create a conducive atmosphere for much needed research into traditional medicine. In this way, we can mate the two practices to produce a hybrid (29).
REFERENCES