ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED IN THE MANAGEMENT OF DIABETES MELLITUS IN IKODODU, NIGERIA

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ABSTRACT

The use of medicinal plants is common among populace in many developing countries, including Nigeria. This study reports an ethnobotanical survey used in the management of Diabetes mellitus in Ikorodu area of Lagos State, Nigeria. This was done through the administration of questionnaires in the six (6) Local Council Development Areas of Ikorodu division of Lagos State, South-west Nigeria, reputed for the treatment of diabetes. 300 male and female respondents (50 from each LCDA) were given the questionnaire in 60:40 percentage ratios respectively. Many of the respondents were either herbalists or herb sellers with many years of experience in treating diabetes using mainly herbs. 94 different plant species and 44 polyherbal formulations were revealed for the treatment of Diabetes. Many of these plants are prepared by infusion or decoction and administered in liquid form without any observable side effects.The comonest plants used to treat Diabetes mellitus include Vernonia amygdalina (15%), Ocimum gratissimum (7%), Carica papaya and Citrus aurantifolia (6% each), as well as Momordica charantia and Bidens pilosa (5% each). In conclusion, this study documented medicinal plants and recipes in Ikorodu that may be useful for the management of Diabetes mellitus. The outcome suggests the rich and diverse potentials of herbs and plants present in Ikorodu that may be used in the management of diabetes after proper investigations.

KEYWORDS: ***Ethnobotanical survey, Diabetes mellitus, Medicinal plants, Polyherb formulation.***

INTRODUCTION

The use of medicinal plant is the oldest and first form of medicine on earth (Kobarfard *et al*., 2004, Ozioma and Chinwe, 2019). It serves as an alternative to orthodox medicine in many countries including Nigeria, which is blessed with abundance of medicinal plants with pharmacological potentials (Adebayo *et al*., 2004; Sonibare *et al*., 2008). It can also be referred to as herbs, herbal materials, herbal preparations, and finished herbal products that contains part of plant or other material as active ingredient (Pan *et al*., 2014). High cost and adverse effect of orthodox medicines contributed to an increase in the demand for alternative drugs. Traditional medicine is often referred

to as Complementary Therapy (CT) when used in combination with orthodox medicine, and Alternative Therapy (AT) when used in place of orthodox medicine (Amed and Abdullah, 2012, National Centre for Complementary and Alternative Medicine, 2013, Duru et al., 2016).

Diabetes mellitus is a complex metabolic disorder characterized by total derangement in carbohydrate, fat and protein metabolism resulting from deficiency in insulin secretion and/or action (Luo *et al.*, 2004, Klein *et al.*, 2007, American Diabetes Association, 2007,Samreen, 2009). International Diabetes Federation (IDF) in 2019 estimated the world's case of diabetes to be 463 million with 19 million and over 2 million diabetics in Africa and Nigeria, respectively. Half of the number of diabetics in Nigeria is resident in Lagos State because of its cosmopolitan nature (Ogbera *et al.*, 2005). Diabetes have devastating effect on individual, societies and countries and lead to over 4 million death yearly and about 578 million and 700 million is projected to have diabetes in the world by 2030 and 2045, respectively (International Diabetes Federation, 2019). The two major types of Diabetes mellitus are Insulin Dependent Diabetes Mellitus (Type-1 Diabetes), which occurs when the β-islet of Langerhans of the pancreas cannot produce insulin, so the patients must be treated with insulin injections and Non-Insulin Dependent Diabetes Mellitus (Type-II Diabetes), which occurs when the pancreas produces insulin, but the body cannot recognize nor use the insulin properly, so the patient is treated by the indigenous health practitioner with oral herbal medication. Type II diabetes is the most predominat type of diabetes and insulin resistance is one of its major causes (Cobert, 1999).

Due to the increasing prevalence of diabetes globally, which led researchers to the growing need to develop to manage and/or prevent it by exploring indigenous plants (Gbolade, 2009). A couple of studies have reported a survey of antidiabetic plants used in Lagos State (Gbolade, 2009, Makinde *et al.*, 2015). However, none of the studies covered antidiabetic plants used in Ikorodu division of Lagos. Therefore, an ethnobotanical survey was conducted to identify antidiabetic plants with particular emphasis on the six Local Governments/LCDAs of Ikorodu Division of Lagos State, Nigeria. This is aimed at documentation of antidiabetic plants for the discovery of drugs from plants within Ikorodu division.

Lagos State, located in the southwestern geopolitical zone of Nigeria with land area of 3577Km^2, is one of the fastest growing cities in the world (Alo *et al.*, 2014), most populous city in Nigeria and second largest city in Africa, having a population of 14.8 million within the city proper (World Population Review, 2021). Lagos State is classified into five divisions collectively known as IBILE, including Ikeja, Badagry, Ikorodu, Lagos Island/ Mainland and Epe. Ikorodu is a city located in the northeastern part of Lagos state, sharing boundary with Lagos Lagoon on the south and Ogun State on the north. Six Local Council Development Areas (LCDA) constitutes Ikorodu Division which includes Ikorodu central, Ikorodu west, Ikorodu north, Ijede, Imota and Igbogbo-Bayeku.

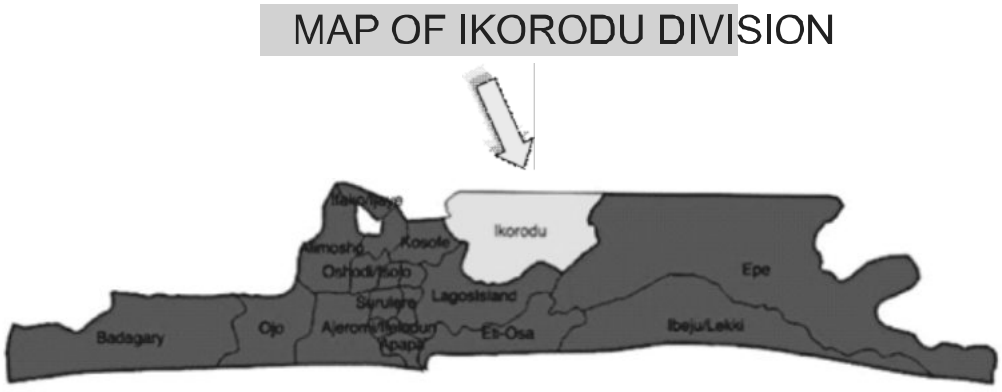

FIGURE 1: MAP OF THE STUDY AREA- IKORODU DIVISION (IN YELLOW), LAGOS STATE, NIGERIA (Google search engine, 2021).

MATERIALS AND METHODS

The ethnobotanical survey was conducted in all the six Local Council Development Areas of Ikorodu division of Lagos State, South-Western Nigeria namely; Ikorodu central, Ikorodu West, Ikorodu-North, Ijede, Imota and Igbogbo/Bayeiku. Male and female herbalists, registered and non-registered herb sellers and Traditional medicine practitioners (TMPs) within the Local Council Development Area of study and number of plants were gathered from this exercise. Questionnaires were administered to skilled and semi-skilled participants while oral interviews were conducted for the unskilled ones.These plants were collected and identified by Botany Department's herbarium, Lagos State University.Further identification and local names of the plants were gotten from experienced adult male and female local traditional medicine practitioners.

RESULTS

Tables 1 shows the list of medicinal plants used in the management of diabetes mellitus in Ikorodu division of Lagos State, Nigeria. A total of 94 plant species belonging to 45 families were found to be useful in the management of Diabetes within these areas of study. The underlisted plants in this survey have been used and confirmed by the herbalists and according to them are quite efficacious. Percentage of occurrence of each of the plant used in the herbal recipe are also included in this table.

TABLE 1. LIST OF MEDICINAL PLANTS USED IN THE MANAGEMENT OF DIABETES MELLITUS IN IKORODU DIVISION OF LAGOS

S/No	Family	Botanical Names	Common Names	Local Names (Yoruba)	%Frequency of Plants in Herbal recipes
1	Malvaceae	*Abelmoscus esculentus*	Okra	Ila	1
2	Leguminosae	*Abrus precatorius*	Crab eyes	Oju olongbo	1
3	Bombacaceae	*Adansonia digitata*	Baobab	Ose	1
4	Cucurbitaceae	*Adenopus breviflorus*	Pseudo colocynth	Tagiri	1
5	Amaranthaceae	*Aerva lanata*	Morning leave	Ewe owo	1
6	Zingiberaceae	*Aframomum melegueta*	Alligator pepper	Atare	3
7	Asteraceae	*Ageratum conyzoides*	Goat weed	Imi esu	2
8	Apocynaceae	*Alafia barteri*	Guinea-fowl's crest	Agbari etu	1
9	Leguminosae	*Albizia adianthifolia*	Fatcrown	Bonabona	1
10	Euphorbiaceae	*Alchornea cordifolia*	Christmas bush	Ipa	1
11	Liliaceae	*Allium ascolanicum*	Spring onion	Alubosa elewe	1
12	Liliaceae	*Allium cepa*	Onion	Alubosa	3
13	Liliaceae	*Allium sativum*	Garlic	Ayu	3
14	Asphodelaceae	*Aloe vera(L.) Burm. F*	Aloe	Aloe	1
15	Apocynaceae	*Alstonia boonei*	Stoolwood	Ahun	2
16	Amaranthaceae	*Amaranthus spinosus*	Prickly	Tete elegun	1

17	Bromeliaceae	*Ananas comosus*	Pineapple	Ope oyinbo	1
18	Annonaceae	*Annona senegalensis*	Sour sap	Abo	1
19	Loganiaceae	*Anthocleista djalonensis*	Cabbage tree	Shapo	3
20	Papaveraceae	*Argemone Mexicana*	Mexican poppy	Ikan ekun	1
21	Aristolochiaceae	*Aristolochia albida*	Dutchman's pipe	Paran funfun	1
22	Liliaceae	*Asparagus africanus*	African asparatus	Aluki	1
23	Meliaceae	*Azadirachta indica*	Neem Tree	Dongoyaro	1
24	Poaceae	*Bambusa vulgaris*	Bamboo	Oparun	1
25	Phyllanthaceae	*Bidens pilosaL.*	Black Jack	Abere	5
26	Bombacaceae	*Bombax buonopozense*	Silk cotton tree	Ponpola	1
27	Leguminosae	*Caesalpina bunduc (Linn.)*	Nicker nut	Ayo	1
28	Asclepiadacea	*Calotropis procera*	Giant milk week	Bomu bomu	1
29	Burseraceae	*Canarium schweinfurthii*	Bush candle tree	Awogba arun	1
30	Solanaceae	*Capsicum frutescens*	African pepper	Ata wewe	1
31	Caricaceae	*Carica papaya*	Pawpaw	Ibepe	6
32	Sapotaceae	*Chrysophyllum albidum*	African star apple	Agbalumo	1
33	Cucurbitaceae	*Citrullus lanatus (Thumb)*	Water melon	Egusi baara	1
34	Rutaceae	*Citrus aurantifolia (Christm.)*	Lime	Osan wewe	1
35	Rutaceae	*Citrus aurantifolia L.*	Bitter orange	Osan jagun	6
36	Palmae	*Cocos nucifera Linn.*	Coconut palm	Agbon	1
37	Sterculiaceae	*Cola acuminate (P. Beauv)*	Kolanut	Obi abata	1
38	Tiliaceae	*Corchorus olitoris L.*	Jute plant	Ewedu	1
39	Leguminosae	*Crotalaria retusa Linn.*	Rattle weed	Koropo	1
40	Euphorbiaceae	*Croton lobatus Linn.*	Fruit Cascarilla	Eru alamo	1
41	Fabaceae	*Crudia klainei De Wild.*	Leaf Winding tree	Afomo	1
42	Cucurbitaceae	*Cucumeropsis mannii (Naud).*	-	Egusi-itoo	3
43	Amaranthaceae	*Cyathula prostrate (L.)*	Pasture weed	Ewe sawerepepe	1
44	Dichapetalaceae	*Dichapetalum toxicarium (G. Don) Baill.*	Rat's bone	Itakun	1
45	Annonaceae	*Enantia chlorantha Oliv.*	African yellow wood	Awopa	1

46	Meliaceae	*Entandrophragma macophylla*	West African cedar	Ewe arunje	1
47	Myrtaceae	*Eugenia aromatic Linn.*	Clove	Kanafuru	1
48	Moraceae	*Ficus exasperate Vahl.*	Sand paper leaf	Ewe epin	1
49	Guttiferae	*Garcina kola*	Bitter kola	Orogbo	1
50	Tiliaceae	*Glyphaea brevis (Spreng.)*	Masquerade stick	Atori	1
51	Euphorbiaceae	*Hevea brasiliencis*	Rubber leaf	Ewe rubber	1
52	Convolvulaceae	*Ipomea batata Linn.*	Potato	Odunkun	1
53	Euphorbiaceae	*Jatropha curcas L.*	Pignut plant	Botute	2
54	Meliaceae	*Khaya ivorensis*	Mahogany	Oganwo	1
55	Lythraceae	*Lagerstroemia speciosa Linn.*	Queen crapemyrtle	Abere	1
56	Lythraceae	*Lawsonia inermis Linn.*	Henna plant	Laali	1
57	Euphorbiaceae	*Macaranga barteri Mull. Arg.*	-	Agbosa/ Arasa	2
58	Anacardiaceae	*Magnifera indica Linn.*	Mango	Mangoro	2
59	Euphorbiaceae	*Manihot spp.*	Cassava	Ege	1
60	Moraceae	*Milicia exelsa*	Iroko tree	Igi iroko	1
61	Cucurbitaceae	*Momordica charantia (Schum &Thonn.)*	African cucumber	Ejirin wewe	5
62	Rubiaceae	*Morinda lucida Benth*	Brimestone tree	Oruwo	2
63	Moringaceae	*Moringa oleifera*	Horse radish	Ewe igbale	1
64	Musaceae	*Musa paradisiaca Linn.*	Plantain	Ogede agbagba	2
65	Rubiaceae	*Nauclea latifolia Smith*	Nauclea	Egbesi	1
66	Solanaceae	*Nicotiana tabacumL.*	Tobacco	Taba	1
67	Labiatae	*Ocimum gratissimum Linn.*	Sweet basil	Efirin	7
68	Piperaceae	*Peperomia pellucida(L.) H.B.K.*	Shiny bush	Rinrin	1
69	Euphorbiaceae	*Phyllanthus niruri L*	-	Feshinsowo	1
70	Apocynaceae	*Picralima nitida (Stapf)*	Picralima	Eso abeere	1
71	Apocynaceae	*Picralima umbellata (K. Schum)*	-	Erin	1
72	Apocynaceae	*Rauvolfia vomitoria Afzel*	Rauvolfia	Asofeyeje	1
73	Poaceae	*Saccharum officinarium L.*	Sugar cane	Ireke	1

74	Polygalaceae	*Securidaca longipedunculata Fres.*	Violet tree	Ipeta	2
75	Leguminosae	*Senna acuta Burm. F*	Horn beam	Isekotu	1
76	Leguminosae	*Senna alata Linn*	Candle bush	Asunwon oyinbo	2
77	Caesalpiniaceae	*Senna podocarpa (Guill. &Perr.) Lock*	Senna	Asunwon egba	1
78	Asteraceae	*Senecio biafrae Oliv. &Hiern.*	-	Worowo	1
79	Malvaceae	*Sida veronicifolia Lam.*	Sida	Eesin ile	1
80	Poaceae	*Sorghum caudatum (Hack.) Stapf*	Sorghum	Oka baba	1
81	Asteraceae	*Spilanthes uliginosa Sw*	Brazil cress	Awere pepe	1
82	Anacardiaceae	*Spondias mombinL.*	Hog plum	Iyeye	1
83	Apocynaceae	*Strophantus hispidus D.C*	Arrow poison	Sagere	1
84	Myrtaceae	*Syzygium aromaticum (L.)*	Clove	Konafuru	1
85	Myrtaceae	*Syzygium guineense (Willd.) DC.*	Snake bean tree	Ori	1
86	Combretaceae	*Terminalia catappa L.*	Almond	Furutu	1
87	Euphorbiaceae	*Tetracarpidium conophorum (Mull.-Arg.)*	Walnut	Asala	1
88	Leguminosae	*Tetrapleura tetraptera (Schun & Thonn)*	-	Aidan	1
89	Tiliaceae	*Triumfetta cordifolia A. Rich.*	-	Akeenii	1
90	Annonaceae	*Uvaraia chamae P. Beauv.*	Bush banana	Gbongbose	1
91	Asteraceae	*Vernonia amygdalina Del.*	Bitter leaf	Ewuro	15
92	Loranthaceae	*Viscum album Linn.*	Mistletoe	Afomo	1
93	Poaceae	*Zea may L.*	Maize	Agbado	1
94	Zingiberacaee	*Zingiber officinale*	Ginger	Atale	1

Table 2 illustrates the polyherbal formulations used in the management of Diabetes mellitus in Ikorodu division of Lagos. This table includes the plants' parts, solvent type, methods of preparation and administration utilised in the study areas for the management of diabetes.

TABLE 2: POLYHERBAL FORMULATIONS USED IN THE MANAGEMENT OF DIABETES MELLITUS IN IKORODU DIVISION OF LAGOS.

S/N	METHOD OF PREPARATION OF EACH PLANT SPECIES WITH RESPECTIVE SOLVENTS
1	Stem bark of *Magnifera indica* and *Alstonia boonei* are boiled together in fermented corn water for about 15 minutes. Half glass cup full of the extract is taken twice daily.
2	*Vernonia amygdalina* leaves should be squeezed till the juice comes out and mixed with salt and drink.
3	*Momordica charantia* bark and leaves are boiled with water and taken twice daily.
4	*Allium cepa* dried leaf; *Carica papaya* root and *Aframomum melegueta* leaf are grounded and taken with hot pap.
5	Juice of *Vernonia amygdalina* leaves mixed with the juice from *Citrus aurantifolia and citrus aurantum*. One glass cup is taken daily.
6	Boil *Allium sativum* Bulb, *Vernonia amygdalina* Leaves, *Ocinum gratissimum* Leaves together with concentrated fermented corn water (omiogi or omidun) or ordinary water for 30 minutes. One glass cup is taken every morning until ailment disappears.
7	*Vernonia amygdalina* leaves should be squeezed with water and taken twice daily or *Vernonia amygdalina* juice mixed with potash, salt and honey. One cup is taken every morning and night.
8	*Rauvolfia vomitoria* leaves are squeezed with water, mixed with *Citrus aurantiifolia* juice and boiled for 10 minutes.
9	*Khaya ivorensis* bark, *Dichapetalum toxicarium* root and shaft of *Sorghum caudatum* are soaked in hot water for 10–15 mins.
10	Leaves of *Saccharum officinarum* and *Morinda lucida* are squeezed with water, then a glassful juice mixture is to be taken twice daily.
11	Leaves of *Peperomia pellucida, Ocimum gratissimum* and *Vernonia amygdalina* are squeezed with water, filtered and taken with glass cup thrice daily.
12	*Bidens pilosa* fruits and *Vernonia amygdalina* leaves are soaked in water. One glass cup is taken three times daily.
13	Leaves of *Jatropha curcas* and *Syzygium guineense* and palm oil are boiled with water. One glass cup is taken every morning.
14	Leaves of *Lawsonia inermis*, potash and salt are boiled with water. One glass cup is to be taken every morning.
15	Dried roots of *Bidens pilosa* grounded into powder, mixed with hot pap and honey. Two teaspoonfuls are taken twice daily.
16	*Musa paradisiaca, Allium sativum* Leaves and bulb, *Tetracarpidium conophorum* seeds are grounded together and soaked for 24 hours in alc ohol before administration. One tablespoonful is taken after meal.
17	Leaves of *Aloe vera* and *Crudia klainei* are squeezed and half glass cup of the juice is to be taken twice daily.
18	Leaves and roots of *Vernonia amygdalina, Momordica charantia, Carica papaya, Bidens pilosa* and *Ocimum gratissimum* are soaked in alcohol (ogogoro). One glass cup is taken thrice daily.
19	Roots of *Uvaria chamae* boiled with water. One glass cup is taken daily.
20	Leaves of *Macaranga barteri, Ageratum conyzoides* and *Vernonia amygdalina* are
21	***Vernonia amygdalina* leaves and *Allium cepa* bulb are soaked in water for 5 days. One glass cup is taken daily.**
22	Roots of *Garcinia kola* and *Anthocleista djalonensis* is mixed with cow urine and boiled with water.

23	Leaves of *Alchornea cordifolia*, *Securidacalongipedunculata* and seeds of *Bidens pilosa* are boiled with water. One glass cup is to be taken daily.
24	*Senecio biafrae* roots, *Carica papaya* leaves and *Aframomum melegueta* seeds are soaked in alcohol. One glass cup is to be taken daily.
25	The leaves of *Morinda lucida*, *Momordica charantia*, *Vernonia amygdalina* and unripe *Musa paradisiaca* are boiled together with fermented *Zea mays* liquor. Two tablespoonful of the preparation is taken three times daily.
26	*Bidens pilosa* seeds, *Vernonia amygdalina* leaves, *Momordica charantia* fruits and *Ocimum gratissimum* leaves are soaked in local alcohol.
27	Whole plant of *Ageratum conyzoides*, leaves of *Momordica charantia* and *Magnifera indica* are boiled with cold water.
28	Fruits of *Ananas comosus* and unripe *Carica papaya* are boiled with water.
29	*Senna alata* Leaves, *Anthocleista djalonensis* Bark, *Citrus aurantifolia* Juice and *Cucumeropsis mannii* Fruit are soaked with lime water for 3-7 days before being administered. One glass cup is to be taken daily.
30	*Alstonia boonei* bark, *Citrus aurantiifolia* fruit juice and *Cucumeropsis mannii* seeds are burnt into ashes and drunk with water.
31	*Nauclea latifolia* Bark, *Anthocleista djalonensis* Bark and *Aristolochia albida* Root are cut into pieces, rinsed with clean water and soaked in half a bottle of schnapps for about 12 hours. One glass cup is to be taken in the morning and at night.
32	*Carica papaya* fruits are boiled with water and then taken twice daily.
33	Leaves of *Vernonia amygdalina* and *Ocimumgratissimum* are squeezed with water and taken daily.
34	*Jatropha curcas* fruits are burnt into ashes and taken with pap.
35	*Vernonia amygdalina* leaves, *Croton lobatus* fruits and *Macaranga barteri* leaves are boiled with water for 15mins. One glass cup is to be taken daily.
36	The fresh leaves and roots of *Senna podocarpa* are boiled with water for 20 mins. One glass cup is taken every morning.
37	*Citrus aurantiifolia* juice and potash mixed with bile of cow. One glass cup is to be taken every 3 days.
38	*Cucumeropsis mannii* fruit juice and potash are mixed with *Citrus aurantiifolia* juice. One table spoonful is taken at night.
39	Leaves of *Vernonia amygdalina* and *Glyphaea brevis* are boiled with water for 20 min and then drunk.
40	*Citrullus lanatus* fruit and potash are boiled with water for 20mins. One glass cup is taken every 3 days.
41	**Dried bulb of *Allium cepa*, dried root of *Carica papaya* and dried seeds of *Aframomum melegueta* are ground into powder and taken with hot pap.**
42	*Securidaca longipedunculata* root is soaked in alcohol for 10 days. One glass cup is taken daily.
43	Leaves of *Allium sativum*, *Vernonia amygdalina*, *Ocimumgratissimum*, and potash are boiled with water. One glass cup is taken daily.
44	*Senna alata* Leaves, *Bambusa vulgaris* Leaves and *Ocimum gratissimum* Root are rinsed in clean water, boiled with enough water for about 30-35 minutes and taken when warm. Half glass cup is to be taken three times daily. This recipe is only effective in the early stage.

DISCUSSION

This survey shows popular plants used in Ikorodu division of Lagos State for the management of diabetes. The family of plants commonly used are found to be Euphorbiaceae (8); Leguminosae (7); Apocynaceae (6); Asteraceae, Liliaceae, Cucurbitaceae & Poaceae (4 each). Several species from these families, including the plants recorded in this survey have been reportedly used in the management of diabetes in different countries of the world (Abo *et al*., 2008, Elya *et al.,* 2012, Sidhu and Tanu, 2013, Zuber *et al*., 2013, Verna *et al*., 2018, Phumthum and Balslev, 2018), however, some of the species belonging to these families still lack scientific prove of their local antidiabetic potential claims.

The plants with highest occurrence in plant recipes and polyherbal formulations in the areas of study includes *Vernonia amygdalina* (15), *Ocimum gratissimum* (7), *Carica papaya* (6), *Citrus aurantifolia* (6), *Bidens pilosa* (5) and *Momordica charanthia* (5), which is an indication of their exploration, importance and the efficiency of the plants' parts (leaves, roots, seeds, fruits and bulbs) in managing diabetes (Table 1). Soladoye *et al*., (2012) reported some of these plants and suggested that their frequent use maybe due to increased awareness and attentiveness to their importance as an antidiabetic plant. *Vernonia amygdalina* (Asteraceae) have been reported in several literatures to posses antihyperglycemic potential, most probably through increasing GLUT-4 translocation and the inhibition of hepatic G6Pase (Ong *et al*., 2011, IfedibaluChukwu *et al*., 2020).

Chen *et al*., (2009) and Hsu *et al*., (2009) reported that *Bidens pilosa* (Asteraceae) ameliorates type 2 diabetes through regulation of insulin secretion and islet protection. Also, *Momordica charantia* (curcubitaceae) have been reported to posses antidiabetic potential which is suggested to be related to improvement of lipid metabolism disorder, reduction in oxidative stress level and regulation of insulin signaling pathway (Raman and Lau, 1996, Leung *et al*., 2009, Jiang *et al*., 2020). Inhibition of cortisone activity have been postulated as possible mechanism of *Ocimum gratissimum* anti-diabetic action (Okoduwa *et al*., 2017, Okon and Umoren, 2017). The polyphenol compounds in *Carica papaya* have been suggested as a candidate responsible for its antidiabetic activity (Airaodion *et al*., 2019, Solikhah *et al*., 2020). *Citrus aurantifolia* as an antidiabetic plant have been reported to show glucose lowering effect as well as the potential to ameliorate hyperglycaemia-induced dyslipidaemic complications (Ibrahim *et al*., 2018, Kazeem *et al*., 2020). Additionally, this survey reveal medicinal plants used locally for the management of diabetes but not yet proven scientifically to authenticate the local antidiabetic potential claims.

Moreso, since there are historical evidences and continuous use of phytomedicine (natural products) as well as current high research interest for the search for alternative to orthpdox medicine, further research into the efficacy and safety of these herbal recipes are recommended to ascertain their mechanism of action and optimum method of use in order to reduce the world's diabetes cases. Medicinal plant recipes and orthodox medicine individually play a vital role in ameliorating different kind of diseases like diabetes but there's need to increase awareness on the likely dangers such severe hypoglycemia and/or coma, associated with combined use of orthodox and traditional medicine (Soladoye *et al*., 2012, Duru *et al*., 2016), eventhough there's need for the two practices to corroborate and tolerate each other, since both practices work towards the same goal of improving global health.

CONCLUSION

In conclusion, the ethnobotanical survey of medicinal plants and herbal recipes used in the management of diabetes in Ikorodu division of Lagos State clearly identified Euphorbiaceae family as the most planted and *Vernonia amygdalina* as the most frequently used plant species with an antidiabetic property in herbal recipes. In addition, *Ocimum gratissimum; Carica papaya*; *Citrus aurantifolia*; *Momordica charantia and Bidens pilosa* are also frequently used in polyherbal formulations in the areas of study.

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