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Ethnobotanical Survey of Plants used for Cancer Treatment in Akinyele Local Government of Ibadan, Nigeria and Preliminary Cytotoxic Activity of Selected Plants

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article.

Abstract

Background: In Nigerian ethnomedicine, a few anticancer constituents of medicinal plant of natural products have been reported in the literature. Although several traditional medical practitioners (TMPs) have claimed to have managed this disease with plants that have been in existence from ancient times.

Objective: This study aimed at the documentation and validation of plants that are commonly used in the treatment of cancer in Akinyele Local Government of Oyo State, Nigeria.

Materials and methods: Focus-Group discussion and administration of semi-structured questionnaires were used to discover the practice of traditional medicine using plants. The methanol extracts of the commonly cited plants were then screened for cytotoxicity using the Brine shrimp lethality (BSL) and *in vitro* [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. Two cancer (Rhabdomyosarcoma; RD and cervical; Hep-2C) and normal (Vero) cell lines were used for the screening of the extracts.

Results: A total number of 45 Traditional Medical Practitioners and herb sellers were recruited for this study, 26 different plants were recorded with their local names and parts used for therapeutic preparation. Two plant extracts; *Aframomum melegueta* and *Strophanthus hispidus* were found to be active against the cancer cell lines and selective to normal cell line used.

Conclusion: Some of the plants had cytotoxic properties on the cancer cell lines which supports the claims of the Traditional Medicinal Practitioners. However, the non-selectivity of some plants to normal cells could be a great threat to the cancer patients being treated.

Keywords: Ethnobotanical survey, Cancer, Conservation of knowledge

INTRODUCTION

The incidence of cancer is highest in developed countries and recently, there is an alarming rate of growth in the developing world (Bray and Møller, 2006)). The disease is the second source of death in developing countries (Mbaveng *et al.*, 2011). According to National Cancer Institute, it is estimated that about 1,735,350 new cases of cancer will be diagnosed in the United States and 609,640 people will die from the disease in 2018 (Siegel *et al.*, 2018). Several chemotherapeutic agents are used for the management of the disease but with no selectivity and thereafter prolonged side effects. In the early 20th century, it was proposed that in a bid to reduce the adverse effects of toxicity on healthy tissues, drugs should be selectively delivered to targeted cells and not the surroundings (Strebhardt and Ullrich, 2008). As a result of this, there is an urgent need for the search for new anticancer compounds which could serve as a lead to drug discovery.

Historically, plant-derived drugs have made a large contribution to human health (Elsenberg *et al.*, 1990). Over the past two decades, there has been a great increase in the use of herbal medicine because of the presence of diverse classes of bioactive constituents (Cimbora-Zovko *et al.*, 2004). Phytochemicals have always been sought after because of their potential to manage cancer (Farnsworth, 1988, Grabley and

Thiericke, 1999, Kim and Park, 2002). Effective cancer chemotherapeutic drugs have been derived from natural origin (Demirgan *et al.*, 2016).

Nigeria depends on herbal medicine for medical needs, it is richly blessed with a wide range of flora with medicinal importance (Epidi, 2016, Kigigha, 2016). Documentation of the indigenous knowledge through ethnobotanical surveys is important in the sustainability and utilization of medicinal plants for the discovery of new and potent drugs. According to previous studies, many traditional practitioners have died their talents in ethnomedicine because of their inability to put the knowledge in writing (Onimhawo and Ebhomienlen, 2014). In this study, an ethnobotanical survey was conducted focusing on medicinal plants used for the treatment of cancer in Akinyele Local Government Area (Ak LGA), Oyo State. With the help of TMPs diagnosis and treatments of cancers are carried out. Though several studies have shown treatment of cancer with the Nigerian herbs but none of the plants investigated have served as leads to drug discovery. This study was used in the documentation and conservation of traditional knowledge of plants used.

METHODOLOGY

Study area

The research was conducted in some in Akinyele Local Government area of Oyo state in the Southwestern, Nigeria. The LGA shares boundaries with Afijio, Lagelu, Ido, and Ibadan North LGAs. It occupies about 464.89 km^2. As of 2010, the estimated numbr of individuals in the LG is about 239,745 as regards to 2006 census estimate. It lies between latitude 7.531^0 north and 3.911^0 east. The study was conducted in three traditional markets of Akinyele LGA. The herbal markets include Onidundun, Ayomaya, and Oloya. The language in the study area is Yoruba with the main occupation being farming and trading.

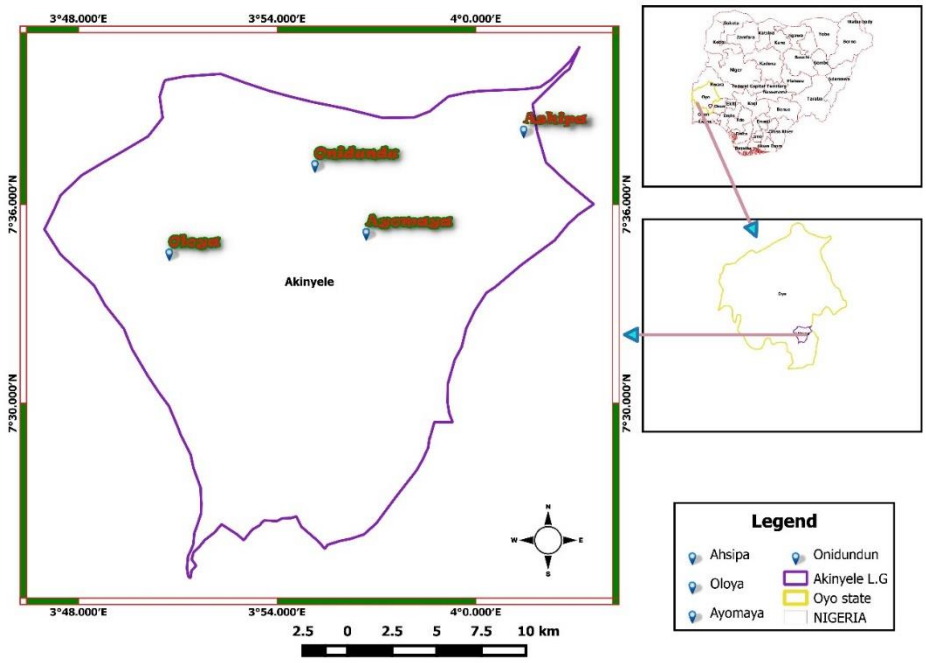

Figure 1: Map of Akinyele Local Government Area showing the villages where the survey was conducted.

Administration of Questionnaire

At the beginning of the study, a consent form was administered to the group of traditional medical practitioners, herb sellers, and herbalists. The signed consent was obtained from individual interviewees. Well semi-structured questionnaires were then administered to obtain information used for the study. A focus group discussion was carried out among the TMPs during their monthly meetings. Due to the low level of education and understanding of the English language, the discussion was carried out by speaking the native language, Yoruba, which was fully understood by all. Full transcription of the information obtained was carried out by the researchers. A total number of forty-five individuals were interviewed, comprising herbalists, TMPs, and herb sellers were interviewed. The traditional healers and herbalists

helped with the provision of local names of the plants mentioned. Scientific names were thereafter validated at the Department of Pharmacognosy herbarium, University of Ibadan where plants were identified and voucher specimens deposited.

Preparation of Crude Extracts

Six plants/plant parts were selected for cytotoxicity study based on literature survey and history of use as recorded in the ethnobotanical surveys. The plants were collected between June 2016 and March 2017 in their natural environment. The plants were identified and authenticated by matching appropriate voucher specimens by Mr. P. Agwu in the Department of Pharmacognosy Herbarium University of Ibadan (DPHUI) and Forest Herbarium Ibadan. Plant parts were air-dried under shade and pulverised into a coarse powder. Each plant material (250 g) was macerated in methanol and stirred intermittently for 72 h at room temperature (26-33 °C). Extracts were filtered and concentrated *in vacuo* using a rotary evaporator. Crude extracts were thereafter stored at 4ºC until needed for use.

Brine Shrimp Lethality Assay (BSLA)

This is a bench-top assay used for screening natural products for the presence of bioactive compounds. The experiment was carried out by standard methodology described by McLaughlin (1991). The eggs of the shrimps were hatched using a hatching chamber in a divider tank filled with filtered natural seawater. It was exposed to light and left for 24- 36 h for complete hatching. The plant extracts were dissolved with sea-water with 2 drops of Tween 80 and a concentration of 1000 to 1 µg/mL. Ten hatched shrimps were counted to each vial and places under the light. Seawater only served as negative control and experiment were in triplicates. After 24 h, the number of surviving and dead nauplii were counted using a magnifying glass and recorded. The 50% lethal concentration (LC_{50} value) and the standard error mean (SEM) were calculated using a non-linear regression curve contained in the Graph pad prism statistical software.

Cell Proliferation by MTT Assay

Cell culture

Cytotoxic activities were determined in human Rhabdomyosarcoma (Rd) cells (CDC, Atlanta, USA), African green monkey kidney (Vero) cell (WHO Reference Polio laboratory, UCH, Ibadan, Nigeria) cell line obtained from the (WHO Reference Polio laboratory, UCH, Ibadan, Nigeria). Cells were grown in Eagle's MEM supplemented with 10% FBS, 100 units/mL of penicillin, 100 mg/mL of streptomycin, 2 mM L-glutamine, 0.07% $NaHCO_3$, and 1% non-essential amino acids and vitamin solution. Cultures were maintained in a humidified atmosphere with 5% CO_2 at 37 °C and passaged bi-weekly.

Cytotoxicity assay

Cytotoxic studies were determined using human Rhabdomyosarcoma (RD) and cervical adenocarcinoma (Hep- 2C) and normal (Vero) cell lines. Cell viability was observed by the ability of the cells to cleave the tetrazolium salt MTT [3-(4,5-dimethylthiazol-2-yl)-2,5- diphenyl tetrazolium bromide (Sigma, Chem, St. Louis, MO), by the mitochondrial enzyme succinate dehydrogenase following the procedure as described (Mosmann, 1983, Buch, 2012). Each extract was dissolved briefly in dimethyl sulphoxide (DMSO) at room temperature to serve as a stock solution. Ten-fold serial dilutions were made from the stock to give a final concentration ranging from 1000-1 µg/mL. The confluent monolayers of the cell lines were grown in 96 well-microlitre plates for 24 h. the cells were then incubated with various concentrations of the extracts and run in triplicates. Cyclophosphamide (CTX) and the growth medium alone served as positive and negative control respectively. The cytopathic effect of the extracts on the cell aswas observed microscopically, then after the treatment period of 72 h, supernatants were decanted and 25 µL of MTT solution [2 mg/mL] in Phosphate buffer saline were added to each well. Microliter plates were incubated for 1.5 h at room temperature and then 125 µL of DMSO was added to each well to dissolve the developed formazan and then optical density was determined using a multi-well spectrophotometer (Multiskan Thermo Fisher Scientific, Waltham, MA) at 492 nm. The CC_{50} value and standard error mean (SEM) were calculated using a non-linear regression curve in Graph pad prism statistical software.

Data analysis

The frequency index, an expression of the percentage/ ratio of informants who cited the same plant species against the total number of the informant. The CC_{50} value and the standard error mean (SEM) were calculated using a non-linear regression curve contained in the Graph pad prism statistical software while the statistical significance was evaluated using student's t-test and results with $P < 0.05$ were considered significant. Selective index (SI) was calculated as the ratio of cytotoxic effect on normal cell line to the cytotoxic effect on cancer (Rd and Hep 2C) cell line.

RESULTS AND DISCUSSION

Ethnobotanical survey

The results obtained from the study revealed the age range of the respondents to be between 50 to 70 years. The respondents included healers (44.4%), herb sellers (33.3%), hunters, and elders (22.2%). Most of the respondents were male (67%), consisting of the herb sellers and the TMPs. The study also showed that most of them were not educated. The data collected showed that the respondents used medicinal plants for the treatment of diseases due to the belief in the effectiveness of plants in the treatment and management of the disease. Furthermore, most patients resort back to the use of traditional herbs due to the high cost of conventional drugs used for the treatment of cancer.

The results obtained from types of plants used in the management of cancer in Akinyele LGA, Oyo state included 26 plants from 18 families shown in Table 1. The plant family used mostly were Apocynaceae (22%), Crassulaceae (16%), and Euphorbiaceae (16%) as shown in figure 2.

Table 1. Medicinal Plants used in the Management of Cancer in Akinyele LGA

S/N	Botanical name	Vernacular names in Yoruba	Family	Voucher number	Parts used	FI (%)
1	*Euphorbia lateriflora* Schumach.	Enu- kopire	Euphorbiaceae	FHI 109056	Aerial part, Whole plant	66.6
2	*Kigelia africana* (Lam.) Benth.	Pandoro	Bignoniaceae	FHI 107654	Bark	62.2
3	*Khaya ivorensis* A. Chev.	Oganho	Meliaceae		Stem bark	33.3
4	*Strophanthus hispidus* DC.	Sagere	Apocynaceae	FHI 112443	Aerial part, Root	44.4
5	*Euphorbia poissonii* Pax	Oro adete	Euphorbiaceae	FHI 109035	Whole plant	22.2
6	*Acanthus montanus* (Nees) T. Anderson	Ahon ekun	Acanthaceae	FHI 106492	Leaves	40.0
7	*Securidaca longependiculata* Fresen.	Ipeta	Polygalaceae	FHI 109972	Root, stem bark	22.2
8	*Calotropis procera* (Aiton) Dryand.	Bombom	Apocynaceae	FHI 107882	Aerial part	33.3
9	*Cleome ciliate* Schumach. & Thonn.	Ekuya funfun	Capparidaceae	DPHUI 0793	Leaves	26.6
10	*Euphorbia hirta* L.	Oro alagogo	Euphorbiaceae	DPHUI 1594	Whole plant	60.0
11	*Morinda lucida* Benth.	Oruwo	Rubiaceae	FHI 106992	Leaves, stem bark	53.3
12	*Rauvolfia vomitoria* Afzel.	Asofeyege	Apocynaceae	FHI 112866	Leaves	33.3
13	*Canavalia ensiformis* sensu auct.	Sese nla	Fabaceae	FHI 110444	Leaves, peas	24.4
14	*Zanthoxylum zanhoxyloides* Zepern. And Timler	Orin Ata	Rutaceae	FHI 109064	Root	11.1
15	*Funtumia africana* Benth.	Ako-ire	Apocynaceae	FHI 109039	Root	17.7
16	*Mitragyna inermis* Kuentz	Okobo	Rubiaceae	FHI 109049	Bark	4.4
17	*Aframomum melegueta* K. Schum	Atare	Zingiberarceae	FHI 112374	Seed	71.1
18	*Calliandra portoricensis* (Jacq.) Benth	Tude	Fabaceae	FHI 109672	Root, leaves	33.3
19	*Plumbago zeylanica* L	Inaberi	Plumbainaceae	FHI 112211	Root	44.4
20	*Garcinia kola* Heckel	Orogbo	Clusiaceae	FHI 109896	Seed, stem bark	48.8
21	*Viscum album* L.	Afomo	Santalaceae	FHI 108411	Root	22.2
22	*Beohivia diffusa* Linn.	Itiponola	Nyctaginaceae	FHI 109603	Root	53.3
23	*Lecaniodiscus cupanioides* Planch. Ex. Benth.	Akika	Sapindaceae	FHI 110081	Stem bark, leaves	57.7
24	*Ageratum conyzoides* (L.) L.	Imi eesu	Compositae	DPHUI 1734	Whole plant	28.9
25	*Bryophyllum pinnata* (Lam.) Oken	Abamoda	Crassulaceae	FHI 112041	Leaves	22.2
26	*Cajanus cajan* (L.) Millsp.	Otili	Fabaceae	FHI 106993	Leaves	55.5

Table 2: Enumeration of recipes, method of preparation, mode of administration used in the treatment of cancer in Akinyele LGA, Oyo State

Disease	Recipe	Method of preparation	Mode of administration
Cervical and Prostrate cancer	Boil the stem back and root of *Kigelia africana* for about 2 hours and then allow to cool	Decoction	1 teacup twice daily for 1-2 months depending on the severity and stage of the disease
	Boil the bark of *Morinda lucida* with *omi dun*	Decoction	1 teacup daily
	The dried stem bark of *Securidaca longependiculata* is grinded into smooth powder and then mixed with continuously boiled *E. hirta* and *E. poissonii*	Concoction	1 shot 3 times daily
	The aerial part of *Calotrophis procera* is boiled for 1 hour	Decoction	1 teacup 3 times daily
	The whole plant of *S. hispidus*is boiled either with locally sourced water from stream or *omi dun*	Decoction	1 teacup each morning and night
	Thoroughly washed stem bark of *Zanthoxylum zanhoxyloides* and the root of *Funtumia africana* are boiled in water for about 2 hours	Concoction	Drink when warm once daily
	Fresh leaves of *Cleome ciliate* is ground and the juice is extracted and the mixed with *adi agbon* in equal volume.	Paste	Lick morning and night and then administered on affected area

	Fresh roots of *Beohivia diffusa* is parboiled and cooked with locust beans, "alubosa-elewe" and intestine of goat and then ate as soup	Concoction	Eat once a week
	The aerial part of the *Ageratum conyzoides* is rinsed with water to remove attached insects and then boiled with water for about an hour	Decoction	Drink a glassful 3 times daily
	The fresh leaves of *Cajanus cajana* and *Bryophyllum pinnata* are both cut into tiny pieces and the pounded. It is then soaked into *omi dun* for about 3 days	Concoction	One tablespoon must be taken at least 2 times daily for 1 month
	Dried leaves of *Acanthus montanus* with seeds of *Aframomum melegueta* is grounded and mixed with hot pap	Powder	1 teaspoon daily at dawn
Breast cancer	Pound the *Cleome cilata* leaves with black soap	Paste	Wash open wound daily
	Cook the fresh leaves of *Cleome cilata* with soup condiment	Concoction	2 times a week
	Properly air-dried stem and leaves of *E. lateriflora* boiled with water and *epo-orombo*	Concoction	1 shot Once daily
	The powdered stem of E. *lateriflora* mixed with shea butter	Paste	Rubbed of the open wound daily

	The root of *Morinda lucida*, completely air-dried, pound into fine powder with potash and then mixed with *adi-agbon*	Paste	Rubbed of the open wound daily
	Rauwolfia vomitora leaves is boiled with water, a teaspoon of *adi-agbon*	Concoction	Administered 3 times daily
	Tude and inaberi is grinded into fine powder and then mixed with shea butter	Paste	Applied topically to the open wound
	Seeds of *Garcinia kola* and *A. melegueta* are macerated in alcohol for 2 days.	Concoction	Administered orally as tincture twice daily
	Ageratum conizoides leaves is dried and powdered smoothly and mixed with either sheabutter or *adin-agbon*	Paste	Rubbed of the open wound on the breast daily
	Viscum album (whole plant) is blended together with honey and taken as juice	Paste	Administered once a day
	The seeds and leaves of *Canavalia ensiformis* is dried at room temperature and ground into a fine powder, it is then mixed with honey	Paste	Administered morning and night till the open wound gets dried

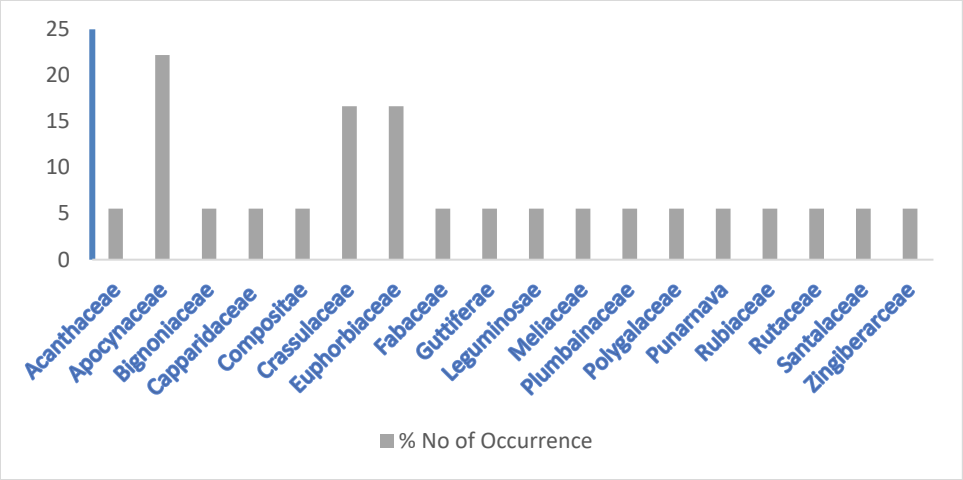

Fig. 2: Percentage occurrence of overall plant families

Brine shrimp lethality and MTT assays

The results obtained showed concentration-dependent activity in Table 2. The plants screened showed LC_{50} values lower than 1000 µg/mL indicating toxicity, but the root part of *Strophanthus hispidus* had the highest cytotoxicity.

All the plants studied were cytotoxic with CC_{50} less than 30 µg/mL except *Khaya ivorensis*, *Strophanthus hispidus* aerial part (2.94 ±0.01 µg/mL); its roots (1.71 ± 0.04 µg/mL); and *Aframomum melegueta* (5.18 ± 1.15 µg/mL) were the most cytotoxic comparable to cyclophosphamide in RD cell line. Similar results were obtained in Hep 2C cell line as regards the activity of the plants (Table 4).

Vero cell line obtained from African Green monkey epithelial cell was selected for the screening of plants on normal cell line to determine selectivity. Results obtained showed little or no toxicity with SI of 11.75, 16.17, and 20.92 against RD and 6.25, 28.63, and 18.25 against Hep-2C as seen in Tables 3 and 5.

Table 3: Brine Shrimp Lethality Activity and *in vitro* Cytotoxicity of plant extracts on Human Cancer Cell lines

Crude extract	LC_{50} (µg/mL)	Rhabdomyosarcoma (µg/mL)	Hep-2C (µg/mL)
Aframomum melegueta (S)	7.22	5.18 ± 1.15	9.74 ± 0.16
Acantus monantus (L)	272.76	40.57 ± 0.03	39.21 ± 0.02
Euphorbia lateriflora (W)	259.20	17.29 ± 0.08	26.79 ± 0.05
Khaya ivorensis (B)	435.62	90.15 ± 0.19	115.90 ± 0.04
Euphobia poissonii (W)	336.79	28.17 ± 0.12	11.11 ± 0.09
Strophanthus hispidus (A)	9.23	2.94 ± 0.01	1.66 ± 0.03
Strophanthus hispidus (R)	1.54	1.71 ± 0.04	1.96 ± 0.02
*CTX	22.74	1.80 ± 0.01	2.20 ± 0.02

Key: S: seed; L: leaf; W: whole plant; B: bark; A: aerial part; R: root; CTX: cyclophosphamide

Table 4: *In vitro* Cytotoxic Activity of plant extracts on Normal (Vero) Cell line

Crude extract	Vero (µg/mL)
Aframomum melegueta (S)	60.87± 0.23
Acantus monantus (L)	103.94±1.57
Euphorbia lateriflora (W)	57.09±0.98
Khaya ivorensis (B)	215.01±0.52
Euphobia poissonii (W)	78.32±3.21
Strophanthus hispidus (A)	47.54±1.14
Strophanthus hispidus (R)	35.78±2.36
*CTX	23.92±0.05

Key: S: seed; L: leaf; W: whole plant; B: bark; A: aerial part; R: root; CTX: cyclophosphamide

Table 5: Selective index of plant extracts

Crude extract	RD	Hep-2C
Aframomum melegueta (S)	11.75	6.25
Acantus monantus (L)	2.56	2.65
Euphorbia lateriflora (W)	3.30	2.13
Khaya ivorensis (B)	2.38	1.85
Euphobia poissonii (W)	2.78	7.05
Strophanthus hispidus (A)	16.17	28.63
Strophanthus hispidus (R)	20.92	18.25
*CTX	13.28	10.87

Key: S: seed; L: leaf; W: whole plant; B: bark; A: aerial part; R: root; CTX: cyclophosphamide

DISCUSSION

The prevention and management of several diseases such as cancer in humans have been by the use of medicinal plants. Several reports have shown that these treatments have been successful with herbal therapy because of the cost of treatment, easy accessibility, and most times less toxicity (Ogbole, 2018b, Sidiq *et al.*, 2018, Pare *et al.*, 2016).

Some of the plants revealed in the ethnobotanical survey by the TMPs for use in the treatment of cancer in Akinyele LGA were readily available in the local markets while some were only planted by the herbalists and the TMPs only in the forests. The herbal preparations mentioned by the TMPs were found to be a mixture of two or more plants because they believed their potency is better if the plant is not used singly. Studies have shown that herbal mixtures with several plant species have synergism in the management of disease (Ebong *et al.*, 2008, De Wet *et al.*, 2010).

In this study, a total number of twenty-six plants were mention for the treatment of cancer, with various means used for the preparation of the recipes. Methods of preparations included decoction, infusion, powder, and paste. For decoction, the plant materials are boiled in large pots over fire and then sieved for drinking. Infusions are made by pouring boiled water over the herb and then covered to simmer for few minutes before intake. The plant part used were mainly leaves, and whole plants (herbaceous plants) and most times soaked in gin or local spirits for three days. Data obtained from the study showed that *A. melegueta* was the most commonly used plant with the FI of 71.1%. Other plants mentioned that are commonly used for treatment included *E. lateriflora* (66.6%), *K. Africana* (62.2%), *E. hirta* (60.0%), and then *S. hispidus* (44.4%).

A total number of seven plants from five families were selected for preliminary screening using BSLA and MTT assays. Even though BSLA is insufficient in defining the mechanism of action of the bioactive substances in plants or its specificity for antitumor activity, it could help in providing a basic step that can be supported by a more specific bioassay (Meyer *et al.*, 1982). Plants found to be toxic to brine shrimp could be an indication of significant activity in the anticancer studies. The methanol extracts of *A. melegueta* and *S. hispidus* (aerial part and root) were toxic to the brine shrimps. *In vitro* cytotoxicity evaluated using the MTT assay, a colorimetric assay for cell viability (Gerlier, 1986, Riss, 2016). According to the American National Cancer Institute (NCI), the standard of cytotoxicity for crude extracts is a CC_{50} < 30 µg/mL after an exposure time of 72 h in a preliminary assay (Suffness, 1990, Segun *et al.*, 2018a). Out of the seven plants screened, four plants met the criteria with the CC_{50} less than 30 µg/mL as illustrated in Table 2 below. The crude extracts of the aerial parts and roots of *Strophanthus hispidus* were the most cytotoxic which correlates with cytotoxic concentration value in BSLA. It was noted that *Strophanthus hispidus* root had the highest cytotoxicity followed by *A. melegueta* among all the plant extracts. This study,, correlates the report demonstrated on the cytotoxicity of *S. hispidus* on colon (Caco2) cell line (Al-Qathama *et al.*, 2016). Studies have shown the traditional usage of *A. melegueta* for cancer management (Segun *et al.*, 2018b, Famojuro and Elufioye 2020). An extensive literature review revealed that there has been no report on the isolation of cytotoxic compounds from *Strophanthus hispidus*.

A previous study by Al-Qubais and co-workers highlighted the selective index helps in the determination of toxicity of a plant extract (Al-Qubaisi *et al.*, 2011). Selective index value higher than two (2), of a pure compound, gives a good selectivity towards cancer cells (Demirgan *et al.*, 2016).

The selective index indicated in Table 3 below showed the plants *Aframomum melegueta* and *Strophanthus hispidus* which were cytotoxic to cancer cells were relatively selective to normal, Vero cell line. Therefore, it can serve as potent anticancer plants which can be further evaluated on other cancer cell lines, thereafter leading to discovery drug and development.

CONCLUSION AND RECOMMENDATIONS

This ethnobotanical survey has revealed that the traditional healers have rich knowledge to help in building on information on therapeutic uses of plants. Based on discussions with the TMPs, even though the plants are cytotoxic, oral administration has not proved lethal, thus they can be considered for further studies on drug discovery and development. The extracts of *Aframomum melegueta* and *Strophanthus hispidus* (aerial part and root) were found to be of considerable activity against the cancer cell lines. Thus, might lead to the isolation of cytotoxic principles and this could lead to drug discovery in natural products management of cancer in Nigeria and then globally. The knowledge about plants in nature with several pharmacological potentials such as cytotoxic activity is not widely spread, thus the lack of proper and adequate treatment of an individual with different life-threatening diseases. To cub the menace of untimely death, there should be regular visits or interaction with the traditional medical practitioners to garner information that can be useful in solving diseases that can be treated with plant medicines. Knowledge should also be properly documented. The plants in nature should be properly conserved and re-planted after each harvest to have easy access to medicinal plants.

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