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Ethno Medicinal Survey of Plants with Anticancer Activities in Lapai, Agaie and Bida, Niger State, Nigeria

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Abstract : Ethno-botanical survey of plants used in the management of cancer related ailments was conducted in selected areas of Agaie, bida and Lapai towns respectively. The continuous rise in cancer morbidity and death, as well as high cost and sde effects of the cancer therapies in use today, necessitates the need for the discovery of new and safe anticancer agents. Herbalists, herb sellers and traditional medicine practitioners (TMPs) living within the area of study were interviewed using a semi structured questionnaire. Snowball method was used to seek for respondents. Thirty two different species of plants were descovered to be used in treating cancer. Noticeable among these are Neem Tree, Pawpaw, Coconut, Moringa, Baobab leaves, Lime, Locust bean tree, Castor and Jatropha which are from the members of Fabaceae, Maliaceae, Moringaceae and Rutaceae family and were noticed to be very efficient and useful in the treatment of the disease based on their frequency of occurrence in the recipes. The plant part mostly used by the locals are the Leaves, roots, Fruits, bark, bulb, seeds and Rhizome. Common modes of administration done by the locals of these communities are Chewing, Infusion, Concoction and Decoction. A need for more research based on the findings of this survey is indeed very essential and recommended which can lead to discovery of new cancer drugs as well as keeping ample records of indigenous ways of treating cancer for future reference especially in the study area and hence reduce pain, cost and sudden deaths.

Keywords: Ethnobotany, Cancer, Medicinal Plants, Traditional Medicine

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1. Introduction

Traditional medicine denotes ways of safeguarding and restoring health which has been in existence before the arrival of orthodox medicine [1]. The World Health Organization defines traditional medicine a practice, approach, knowledge and beliefs which is applied either singular or synergistically to treat, diagnose and maintain health [2]. It is an important aspect of health care provision in the developing countries and its use has also gained significance in developed countries thus increasing its commercial value. Herbal medicines are naturally occurring plant and animal substances with little or no industrial processing that are used to treat or mitigate ailments within some healing practices [3]. Although orthodox medicine may exist in combination with such traditional practices, herbal medicines have more often maintained their significance for historical and cultural reasons. Herbal products have become readily available commercially not only in developing countries but in developed countries as well [5]. Many communicable diseases are known to be treated with traditional herbal remedies throughout the history of mankind. The maximum therapeutic and less side effects of herbal remedies have been confirmed in many scientific investigations. Even at present, naturally occurring plant materials continue to play a vital role in primary health care as therapeutic remedies in many developing countries [3]. Medicinal plants belong to a vast group plants with a great interest due to its pharmaceutical, cosmetic as well as nutritional application. Furthermore, they also serve as alternative to traditional crop with species in high demand at the international market, the term of medicinal plants include a various types of plants used in herbal practice and some of these plants have a medicinal activities [12].

Medicinal plants are also consider as a rich resource of raw materials which are used in drug development and synthesis. These plants also play a vital role in the development and maitainance of human cultures around the whole world [17].

Cancer is a disease in which normal cells are being replaced by a group of abnormal cells which grow uncontrollably by ignoring the normal rules of cell division . Normal cells are continuously subject to signals that commands them whether the cell should divide, differentiate or die. Cancer cells develop a degree of independence from these signals, resulting in uncontrolled growth and multiplication. If this proliferation is allowed to continue and spread, it can be deadly. In fact, almost 90% of cancer-related mortality are due to tumor spreading – a process called metastasis [16]

2. Materials and Methods

2.1 Study Area

The study was conducted in some selected areas in three (3) Local Governments in Niger State, which include; Lapai, which is situated at latitude 9.0493^{o}N and longitude 6.5797^{o}E, Agaie situated at latitude 9.0085^{o}N and longitude 6.3173^{o}E and Bida situated at longitude 9.0797^{o}N and latitude 6.0097^{o}E respectively.

2.2 Data Collection

Data collection was done with the aid of a semi structured questionnaire. Snowball method [7] was used to search for respondents. An interpreter was required during the administration of the questionnaire to speak orally/verbally as most of the custodians of this knowledge are either old or uneducated to read a constructed questionnaire. Some of the information the respondents gave includes the local names of plants, important plant parts, methods of herbal formulation, dosage and other medicinal uses. Numerous plants were documented by their local names provided by the informants. Literature search was used to interprete the local names to the common names and the collected plant samples were dully identified to get the Scientific names. The names from literatures and the proper taxa nomenclature was validated in the plant list database at www.plantlist.org

3. Results

The survey comprised 80 respondents, which comprise herb sellers (52.50%), traditional medicine practitioners (18.75%), herbalist (23.75%) and pharmacognosist (5.00%). The male respondents (71.25%) were much higher than the female respondents (28.75%). Majority of the respondents were found to be within the age range of 51-60 years (30.00%), this is followed by 61-70years (18.75%) and the least was observed within the age range of 21-30years (6.25%). The highest level of education was seen to be at the Secondary level with (48.75%). The summary of the demographic information is given on **Table 1** below.

Table 1: Demographic information of respondents.

Variables	Categories	Categories	Percentage (%)
Gender	Male	57	71.25
	Females	23	28.75
Age (years)	21-30	5	6.25
	31- 40	8	10.00
	41-50	14	17.50
	51- 60	24	30.00
	61- 70	15	18.75
	71-80	8	10.00
	81- 90	6	7.5
Level of education	Illiterate	8	10.00
	Primary	21	26.25
	Secondary	39	48.75
	Tertiary	12	15.00
Occupation	Traditional medical practitioners	15	18.75
	Herb Sellers	42	52.50
	Herbalist	19	23.75
	Pharmacognosist	4	5.00

A total number of 67 plant species were recorded in the three LGA pooled together but after separating them according to the LGA, and frequency of occurrence taking, it was narrowed down to 32 plant species belonging to 23 families (**Table 2**) mentioned as traditional remedy for treating different cancer types in the study area. The most frequently used plant parts are the leaves, followed by the bark and the least used parts are the oil, juice and fruits.

Table 2: Profile of plants claimed by the respondents in the treatment of different cancer types

S/N	Family Name	Scientific Name	Common Name	Parts Used	Mode of Administration
1	*Maliaceae*	*Azadirachta indica*	Neem Tree	The bark & Leaf	Concoction & Infusion
2	*Caricaceae*	*Carica papaya*	Pawpaw	The leaves	Infusion
3	*Arecaceae*	*Cocos nucifera*	Coconut	The juice	Drinking
4	*Moringaceae*	*Moringa oleifera*	Moringa	The leaves	Chewing, Infusion & Concoction
5	*Malvaceae*	*Adansonia digitata*	Baobab leaves	The leaves	Powder is used as soup
6	*Rutaceae*	*Citrus aurantium*	Lime	The juice	Add to water
7	*Fabaceae*	*Parkia biglobosa*	Locust bean tree	The Seed & barks	Decoction, Dawa dawa is added to food

8	*Pedaliaceae*	*Sesamun orientale*	Sesame	The seeds	Add to food as Recipe or seasoning
9	*Euphorbiaceae*	*Ricinus communis*	Castor	The juice/oil	Decoction & Castor oil is to be rob
10	*Euphorbiaceae*	*Jatropha curcas*	Jatropha	The leaves	Decoction & Infusion
11	*Cucurbitaceae*	*Cucumis sativus*	Cucumber	The seed	Eating Raw
12	*Moraceae*	*Ficus benjamina*	Ficus tree	Bark & leaves	Decoction & Infusion
13	*Annonaceae*	*Annona senegalensis*	Wild custard apple	Leaf, root & Fruits	Decoction
14	*Amaryllidaceae*	*Allium sativum*	Garlic	Bulb	Chewing
15	*Convolvulaceae*	*Ipomoea batatas*	Sweet potatoes	The seed	Eating
16	*Asteraceae*	*Vernonia amygdalina*	Bitter leaf	The leaves	Infusion, Concuction & Decoction
17	*Zingiberaceae*	*Zingiber officinale*	Ginger	The root	Concuction, Infusion, Decoction
18	*Apiaceae*	*Daucus Carota*	Carrot	Root	Eat Raw
19	*Cactaceae*	*Opuntia sp.*	Cactus	Leaf	Decoction
20	*Bignoniaceae*	*Kigelia africana*	Kigelia	Bark, Fruit	Concoction
21	*Burseraceae*	*Canarium schweinfurtii*	Canarium	Fruit	Eating
22	*Burseraceae*	*Commiphora kerstingii*	Commiphora	Leaves & Roots	Decoction & Infusion
23	*Amaranthaceae*	*Beta vulgaris*	Beetroot	Bulb	Eat Raw, Decoction
24	*Malvaceae*	*Abelmoschus esculentus*	Okra	Fruit	Eating as Soup
25	*Meliaceae*	*Lovoa trichilioides*	Lovoa	Seed, leaves & bark	Ointment
26	*Moraceae*	*Ficus dawei*		Bark	Decoction
27	*Moraceae*	*Ficus natalensis*	Natal fig	Root	Decoction
28	*Moraceae*	*Ficus thonningii*		Leaves	Decoction & infusion
29	*Combretaceae*	*Guiera senegalensis*	Guiera	Leaves	Decoction & infusion
30	*Fabaceae*	*Detarium senegalense*	Tallow tree	Bark & leaf	Decoction
31	*Capparaceae*	*Maerua angolensis*	Maerua	Bark	Decoction Infusion
32	*Zingiberaceae*	*Curcuma domestica*	Turmeric	Rhizome	Concoction, add to food as spices

Table 3: Profile of some plants claimed by the respondents in the treatment of different cancer type's in Agaie LGA.

S/N	Family Name	Scientific Name	Common Name	Hausa Name	Nupe Name	Ailments
1	*Maliaceae*	*Azadiracht a indica*	Neem Tree	Dalbejiya	Nimu	Stomach, Breast Skin cancer
2	*Caricaceae*	*Carica papaya*	Pawpaw	Gwanda	konkeni	Prostate cancer

3	*Arecaceae*	*Cocos nucifera*	Coconut	Kwakwa	Yikunu kpota	Liver and oral cancer
4	*Moringaceae*	*Moringa oleifera*	Moringa	Zogale	Zogali	Pancreatic, liver, colon, leukemia
5	*Malvaceae*	*Adansonia digitata*	Baobab leaves	Kuka	Kuka	Stomach cancer, Anti inflammatory
6	*Rutaceae*	*Citrus aurantium*	Lime	Lemun tsami	Lemu bakagi	Breast, colon, Lung and Liver cancer
7	*Fabaceae*	*Parkia biglobosa*	Locust bean tree	Dorawa	Lonci	Diabetes, hypertension, wound healing , stomach cancer
8	*Pedaliaceae*	*Sesamun orientale*	Sesame	Ridi	Nimbolo	Anti inflammatory, liver cancer throat cancer
9	*Euphorbiaceae*	*Ricinus communis*	Castor	Cika gida	Kpamfini gulu	Breast cancer, blood cancer, skin cancer, wound healing
10	*Euphorbiaceae*	*Jatropha curcas*	Jatropha	Binda zugu	Kasha	Cervix cancer, Breast cancer

Table 4: Profile of some plants claimed by the respondents in the treatment of different cancer types in Lapai LGA

S/N	Family Name	Scientific Name	Common Name	Hausa Name	Nupe Name	Ailments
1	*Maliaceae*	*Azadirachta indica*	Neem Tree	Dalbejiya	nimu	Stomach, Breast Skin cancer
2	*Caricaceae*	*Carica papaya*	Pawpaw	Gwanda	konkeni	Prostate cancer
3	*Arecaceae*	*Cocos nucifera*	Coconut	Kwakwa	Yikunu kpota	Liver and oral cancer
4	*Moringaceae*	*Moringa oleifera*	Moringa	Zogale	Zogali	Pancreatic, liver, colon, leukemia
5	*Malvaceae*	*Adansonia digitata*	Baobab leaves	Kuka	Kuka	Stomach cancer, Anti inflammatory
6	*Rutaceae*	*Citrus aurantium*	Lime	Lemun tsami	Lemu bakagi	Breast, colon, Lung and Liver cancer
7	*Fabaceae*	*Parkia biglobosa*	Locust bean tree	Dorawa	Lonci	Diabetes, hypertension, wound healing , stomach cancer
8	*Cucurbitaceae*	*Cucumis sativus*	Cucumber	Kokwamba	Agbyadya	Colorectal cancer, Anti inflammatory , wound healing
9	*Moraceae*	*Ficus benjamina*	Ficus tree	Cediya/Baure	Gbanci poto	Stomach cancer, Cancerous wounds
10	*Annonaceae*	*Annona senegalensis*	Wild custard apple	Gwandan daji	Ishenebobo	Bladder cancer, kidney cancer

Table 5: Profile of some plants claimed by the respondents in the treatment of different cancer types in Bida LGA

S/N	Family Name	Scientific Name	Common Name	Hausa Name	Nupe Name	Ailments
1	*Amaryllidaceae*	*Allium sativum*	Garlic	Tafarnuwa		Lunger cancer
2	*Arecaceae*	*Cocos nucifera*	Coconut	Kwakwa	Yikunu kpota	Liver and oral cancer
3	*Asteraceae*	*Vernonia amygdalina*	Bitter leaf	Shuwaka	Tsula	Lung, Breast, Prostate cancer, skin cancer
4	*Bignoniaceae*	*Kigelia africana*	Kigelia		Beci	Boils, Acne, Cysts
5	*Burseraceae*	*Canarium schweinfurtii*	Canarium		Danbokungi	Not specify
6	*Burseraceae*	*Commiphora kerstingii*	Commiphora	Ararrabi	Enagun boci	Cancerous wounds
7	*Cactaceae*	*Opuntia sp.*	Cactus	murtsunguwa		Ovarian cancer
8	*Caricaceae*	*Carica papaya*	Pawpaw	Gwanda	konkeni	Prostate cancer
9	*Combretaceae*	*Guiera senegalensis*	Guiera	Sabara	Sabara	Anti inflammatory
10	*Convolvulaceae*	*Ipomoea batatas*	Sweet potatoes	Dankali	Duku	Colorectal Cancer, Breast cancer
11	*Cucurbitaceae*	*Cucumis sativus*	Cucumber	Kokwamba	Agbyadya	Colorectal cancer, Anti 483nflammatory , wound healing
12	*Euphorbiaceae*	*Ricinus communis*	Castor	Cika gida	Kpamfini gulu	Breast, blood, skin cancer, wound healing
13	*Euphorbiaceae*	*Jatropha curcas*	Jatropha	Binda zugu	Kasha	Cervix and Breast cancer
14	*Fabaceae*	*Parkia biglobosa*	Locust bean tree	Dorawa	Lonci	Diabetes, hypertension, wound healing , stomach cancer
15	*Fabaceae*	*Detarium senegalense*	Tallow tree	Taurar kurmi	Gugoroci	Boils, tuberculosis, Pancreatic cancer

Table 6: Occurrence of plants within the families

Family Name	Frequency
Zingiberaceae	*2*
Amaranthaceae	*1*
Amaryllidaceae	*1*
Annonaceae	*1*
Asteraceae	*2*

Apiaceae	*1*
Arecaceae	*3*
Bignoniaceae	*1*
Burseraceae	*2*
Cactaceae	*1*
Capparaceae	*1*
Caricaceae	*1*
Combretaceae	*1*
Convolvulaceae	*1*
Cucurbitaceae	*1*
Euphorbiaceae	*2*
Fabaceae	*2*
Maliaceae	*1*
Malvaceae	*2*
Moraceae	*4*
Moringaceae	*1*
Pedaliaceae	*1*
Rutaceae	*3*
Total	32

4. Discussion

The knowledge of traditional medicine practice is slowly going into extinction, this is due to lack of proper documentation of this treasured heritage. Although some traditional medicine practitioners, aged men and women are still involved and using this art of therapy, the youths and more educated generations rarely believe in or have no interest in traditional medicine practice [8]. The ratio of male to female respondents with the knowledge of herbal medicine obtained from the study areas in our findings is in agreement with the report of [14] conducted out in Algiers. Also, the little levels of education among the traditional healers and herbalist was also in line with the observations of [6]. The findings from this work revealed that a resonable number of plant parts reported from the 32 species of plants especially the leaves, roots, barks and seeds have been found efficient in the treatment of cancer.

However, the noticeable plants are Neem tree, Moringa, Bitter leaf, Baobab leaves, Locust bean tree and Lime which are suggestive of their importance in the treatment of the disease. Similarly, *Cucurbitaceae, Fabaceae, Maliaceae, Malvaceae, Moringaceae, Rutaceae* and *Zingiberaceae* families appeared more frequently in the list of plant families identified but the occurrence of other families also indicates the significance of all those families as sources of useful chemical compounds which may be explored for drug descovery in the treatment of cancer. Some of these plants are related to those reported to be used to formulate anticancer remedy in other regions of the world [10]. For instance, *Allium sativum, Aloe vera, Plumbago zeylanica* and *Zingiber officinale* were seen in the findings of Sharma *et al*. [13]

In orthodox medicine, cancer can be treated using chemotherapy and radiotherapy if detected early, otherwise surgical operation is used at some stage after which it become almost difficult and hopeless. However, nature has some cure for cancer patients. Some substances have been found to be anti-carcinogenic, i.e they fight cancer forming cells and help to remove them from the body.

Also, a lot of research has been conducted and is still being done on the effectiveness of these ethno-medicinal for treating cancer. Studies have revealed that most of the synthetic drugs that have been used in the past have adverse effects that were of great significance in some cases, especially when taken by patients on self-medication after an initial visit to the physician [15]. A resonable a number of challenges were encountered during the reserach. The most important among the problems is the fact that many of the respondents were reluctant in revealing some secretes which include plants with synergistic effect, refusal to mention other ingredients used in formulating the anticancer remedy. They stated that the

plant mentioned was the main component of the herb. Some thought the complete information should be of topmost secrecy only to family members or whosoever properly enrolled for traineeship and serve them. This is because they see it as a legacy that was passed on from their ancestors and should be passed down to the next generation. Unfortunately, many of the youths who are now educated usually have little or no interest in practicing the long aged tradition. This problem is in line with the findings of (Ngulde *et al*., [11] who also reported similar challenges.

5. Conclusion

Traditional medicinal practice is a traditional knowledge that is to be preserved and protected as it is vanishing on an alarming rate. Large scale misuse of natural resources which include plants and dependency on chemical resources in speed of development, agriculture, urbanization, industrialization etc by humans has open a pathway for future insecurity of natural resources and ultimately loss of biodiversity and human lives. Important medicinal plants are part of the biodiversity being lost. This study has found and documented 32 plants species belonging to 23 families which are used in treating cancer and cancer related ailments in the study area. This information will serve as reference point for future research, herberium samples as well as data bank containing useful information on traditional medicinces with anti cancer activity.

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