
Ethnomedicinal Survey of Folkloric Plants Used in Managing Breast Cancers by the Traditional Medical Practitioners of North- East Nigeria

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ABSTRACT

An ethnomedicinal survey of plants used in the folkloric treatment of breast cancer and other breast related diseases was conducted in three locations of North East, Nigeria. About fifty respondents made up of traditional medical practitioners located within Maiduguri, Nguru and Jimeta were interviewed orally through the use of questionnaires. Twenty five different plant species belonging to different families (leguminosae (also fabaceae) (5), combretaceae (3), capparidaceae (2), asclepiadaceae, moracaceae, loranthaceae, orobanchaceae, sterculiaceae, polygalaceae, oleaceae, sapotaceae, puriaceae, annonaceae, bignonaceae, amaryllidaceae, burseraceae and mimosaceae (2) were identified to be useful in treating breast and other forms of cancer. These plants were taxonomically identified and classified according to their habitats, families and genera. This work provides an inventory of North East Nigeria plants with anti-breast cancer potentials for future verification and scientific validation.

Keywords: Breast, Cancer, Ethnomedicinal, Plants, Traditional

INTRODUCTION

A large population of the world (more than 85%) especially in developing countries depend on traditional systems of medicine for treatment of a variety of diseases (WHO, 1993). This widespread use of medicinal plants is not limited to the developing countries, there's a renewed interest by the public and scientific organisations concerning

plants and cure for diseases. An intensive survey of plants, microorganism and marine animals for antitumor activity began as far back as the 1950s by the United States National Cancer Institute (Dhanamani, 2011). These researches led to the discovery of anti- cancer drugs like camptothecine, tamoxifen and vincristine from plant sources. Others are *Salix* spp (source of

aspirin), *Rauwolfia serpentina* (source of antihypertensive drug), *Artemisia annua* (source of antimalarial drug artemisinin) (Sofowora, 2008).

Traditional medicine is defined as health practices knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being (WHO, 2003). To the traditionalists, disease is a supernatural phenomenon governed by a hierarchy of vital powers beginning with a most powerful deity followed by lesser spiritual entities, ancestral spirits, living persons, animals, plants and other objects (Kale, 1995). Scientific or western (orthodox) medicine believes that a disease arises from contact with a causative agent such as bacteria, viruses or fungi through a series of complex processes in the living body. Traditional medicine is inexpensive and the most affordable and accessible system of health care for the majority of African rural population mainly due to belief, the relatively high cost and limited access to Western medicine (Busia, 2005). These issues have made the role of ethnomedicine a very important one. Ethnomedicine is the study of the traditional medicine practiced by various ethnic groups and indigenous people.

Cancer is a major leading cause of death in the world today. The primary modalities used in conventional treatment are chemotherapy, radiation and surgery. However, these approaches are costly and toxic with many adverse side effects. An estimated 14.1 million new cancer cases and 8.2 million cancer-related deaths occurred in 2012, compared with 12.7 million and 7.6 million respectively in 2008 (WHO, 2013). Breast cancer is one of the most commonly diagnosed cancers (1.7 million, 11.9%) in women in 140 countries Of 184 worldwide. The most commonly diagnosed cancer in Nigerian women is breast cancer and the University of Maiduguri Teaching Hospital Cancer Registry reported breast cancer to have accounted for 31% of all forms of cancers diagnosed in 2005 - 2008 (Ngadda *et al.*, 2008). It is estimated that most patients diagnosed with cancer have explored herbal medicines in an attempt to treat cancer and avoid the adverse side effects associated with conventional treatment (Kosty, 2004 and Straus 2002). Majority of the Nigerian population use traditional medicine for relief from various ailments largely due to inadequate medical facilities, high poverty rate and many other socio- economic/ socio- cultural factors. Local herbalists for ages claim the possession of remedies useful in

curing various forms of diseases including cancers and cancer - related diseases (Sofowora, 1984). Such knowledge however, is secretive and is kept within close family circle where it is passed on from one generation to the next (Atawodi *et al.*, 2002).

Research on medicinal plants is geared towards verifying and validating such ethnomedicinal claims with the ultimate aim of isolating the active metabolites in the plants and standardization for subsequent

drug development. However, the custodians of knowledge on medicinal plants are the elderly. This generation of people are fast aging and facing out. Therefore, the urgent need to preserve such valuable knowledge becomes necessary. This present study was conducted in some parts of North East Nigeria with a view to document important medicinal plants with possible anti breast cancer potentials for future verification and scientific validation.

MATERIALS AND METHODS



Map of Study Site

The survey was conducted in three distinct areas of North East Nigeria; Maiduguri (Borno State), Jimeta (Adamawa State) and Nguru (Yobe State). Maiduguri is located about 800km NE of the Federal Capital Territory Abuja with Kanuri and Hausa being the dominant ethnic

groups. Other groups such as Babur/Bura, Fulani and Marghi are found in the metropolitan city. Jimeta is the capital city of Adamawa state located on 7^o and 11^o N of the equator and 11^o and 14^o of the Greenwich meridian. Inhabitants are mostly Hausa traders with many

other ethnic groups similar to those found in Maiduguri. Nguru is a town near the Hadejia river located at 12⁰ 52'N 10⁰ 27'E with an area of 916km² and a population of 150, 632 at the 2006 census. Inhabitants are Hausa, Kanuri, Fulani and Yoruba immigrants from the Western Nigeria who came for trade many years ago because of the railway corporation. Plant samples (leaves, roots, stem bark, seeds or whole plants) were identified and collected by the traditional medical practitioners, authenticated by a taxonomist and voucher specimens deposited at the Herbarium of the Department of Biochemistry, University of Maiduguri Nigeria.

Administration of Questionnaire

Ethno-medicinal information on the plants was obtained by consulting traditional medical practitioners, herb sellers and herbalists. Semi-structured questionnaire and oral interview were adopted to obtain relevant ethnomedicinal data. The questionnaire was divided into three sections. Section 1 deals with demographic information such as: age, sex, religion, nationality and duration of practice. Section 2 consists of professional experience on the treatment of diseases and includes questions like: plant and part used, local names, frequency/duration of treatment, recipe and any accompanied instructions. The questionnaire was

translated and interpreted orally in the local language and responses filled into the questionnaire after each interview. Participants were assured of confidentiality and their responses only meant for research purposes.

RESULTS

A total of twenty five plant species belonging to different families were documented to possess possible anti-breast cancer properties. Table 1 shows the list of plant species with the botanical, family, local names as well as the plant parts used and relevant pharmacologic activity. Figure 1 shows the age distribution of respondents in the survey and Figure 2 shows the route of administration of the medicinal plants.

Table1: Medicinal Plants Used by Traditional Medical Practitioners in North East Nigeria for the Management of Breast Cancer and Other Breast Related Diseases (H- Hausa K- Kanuri F- Fulfulde B- Babur/Bura).

Botanical Name	Family	Local Names	Part Used	Voucher Number	Relevant Pharmacological Activity
<i>Acacia nilotica</i> Lam (Del.)	Mimosaceae	Gabaruwar kasa (H)	Whole plant	BCH020	Anticancer, antimutagenic Anti- viral (Atif et al., 2011). In vitro anti proliferative (Salau et al., 2013)
<i>Anogeissus leiocarpus</i> Guill & Perr	Combretaceae	Marke (H) A'nuum (K) Suraa (B)	Stem bark	BCH021	Anti- leukemic, anti- skin cancer (Burkill, 1985; Abubakar et al., 2007).
<i>Annona senegalensis</i> Pers.	Annonaceae	Gwandar daji (H) Nganawu (K) Thibo (B)	Leaves, stem	BCH022	Wound healing (Etuk, 2006).
<i>Boswellia dalzielii</i> Hutch	Burseraceae	Ararrabi (H) Dikkwar (K) Deburow (B)	Stem bark	BCH023	Anti- cancer (Graham et al., 2000; Al- Fatimi et al., 2007), wound healing (Habib et al., 2004)
<i>Cadaba farinosa</i> Forssk	Capparaceae	Bagayi (H) Marra (K) Marka (B)	Leaves	BCH024	Analgesic and anti- inflammatory (Otimenyan et al., 2007).
<i>Cassia singueana</i> Del.	Ceasalpinaceae	Runhu (H) Fanalewa (K) Bag'sha (B)	Leaves	BCH025	Anti- tumour, anti- viral, immune- stimulating and analgesic (Burkill, 1985).
<i>Crinum ornatum</i> (Ait Bury)	Amaryllidaceae	Gaadalino nono (H) gaadal (K)	Bulb	BCH026	Moderate anti breast tumour activity (Abreu et al., 1999), in vitro anti- HIV1 & 2 (Mahmood et al., 1993)
<i>Detarium microcarpum</i> (Guill & Perr)	Fabaceae	Taura (H) Gatafo(K) gwalangwalan (B)	stem bark	BCH027	Anti- bacterial, in vitro anti- viral (Kudi and Myint, 1999) Analgesic, anti- tumour and anti- cancer (Adjanohoun, 1996; Arbonnier, 2004).
<i>Dichrostachys cineria</i> L. (Wight et Arn)	Leguminaceae	dundu (H)	leaves	BCH028	Anti- inflammatory, cytotoxic against human monocytes (Fiot et al., 2006). Anticancer, antimutagenic Anti- viral (Atif et al., 2011).
<i>Ficus asperifolia</i> Linn	Moraceae	baure (H) Tarmu (K) Kamdath (B)	leaves, bark, roots	BCH029	In vitro anti proliferative (Salau et al., 2013) Anti- inflammatory (Adamu et al., 2007).
<i>Guiera senegalensis</i> J.F.Gmel	Combretaceae	Sabara (H) Kasheshi (K) Mwapkr (B)	Leaves	BCH030	
<i>Kigellia africana</i> Lam Benth	Bignoniaceae	Rahaina(H)	Stem bark	CH031	Anti- tumour (Hamdi and Castellon, 2005).

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<i>Leptadenia hastate</i> (Pers.) Decne.	Asclepiadaceae	Yaadiya (H)	Whole plant	BCH032	Wound healing (Ezike et al., 2010).
<i>Maerua angolensis</i> DC	Capparidaceae	Ciciwa (H) Legel baali (F)	Leaves	BCH033	Anti- inflammatory (Adams et al., 2006; Schubert et al., 1999).
<i>Olea europaea</i> L.	Oleaceae	Zaitun	Seed oil	BCH034	Anti- proliferative (Lawal et al., 2012), anti- inflammatory, anti- rheumatic (Neuwinger, 1996).
<i>Prosopis africana</i> Guill. (Perr & Rich)	Fabaceae	Kiriya (H)	Stem bark	BCH035	Anti- oxidant (Choudhury et al., 2000).
<i>Punica granatum</i> L.	Puriaceae	Ruman (H) Ruman (K) Ruman (B)	Fruit pericarp	BCH036	Anti- inflammatory (Fook et al., 2005), cytotoxic against FL- cells (Al- Fatimi et al., 2007).
<i>Securidaca longepedunculata</i> Fresen.	Polygalaceae	Sanya (H) Uwar mugunguna (H)	Stem, roots	BCH037	--- In vitro anti- proliferative (Salau et al., 2013).
<i>Striga hermonthica</i> (Del.) Benth	Orobanchaceae	Wutawuta (H)	Whole plant	BCH038	Anti- cancer (Soladoye et al., 1989).
<i>Tamarindus indica</i> Linn	Fabaceae	Tsamiya (H) Tamsu (K) Mbula (B)	Fruits pod	BCH039	Anti- inflammatory (Vedavathy and Rao, 1995).
<i>Tapinanthus preusii</i> (Engl.) Tiegh	Loranthaceae	Kauchi (H)	Whole plant	BCH040	
<i>Terminalia avicennioides</i> Guill & Perr.	Combretaceae	Baushe (H)	Roots	BCH041	
<i>Vitellaria paradoxa</i> (Gaertn. P)	Sapotaceae	Kadanya (H) Kareji (F) Fuma (B)	Stem bark, seed- oil	BCH042	
<i>Waltheria indica</i> Linn	Sterculiaceae	Hankufa (H)	Whole plant	BCH043	

DISCUSSION AND CONCLUSION

This study attempted to document plants with possible anti-breast cancer potentials. A total of twenty five plant species from distinct families were identified. Table 1 above shows the list of plant species with their families, botanical names, local names and parts used. Findings from this survey showed that the leaves, stem bark, fruits, bulb and roots of plants are important in preparing various medicinal recipes. The use of different parts of medicinal plants by various ethnic groups in Nigeria was documented by Idika and Niemogha (2008). These authors reported over 250 ethnic groups in Nigeria each with a distinct vast bio resources, extremely varied socio-economic and socio-cultural disposition. Therefore, the use of plants for disease conditions varies widely from culture to culture. Sawadogo *et al.*, 2012 reported the roots and stem as the most popularly used part of a plant followed by seeds and whole plant, and the least frequently used part was the flower and rhizome. The presence of varied active ingredients in different parts of a plant could explain the diversity of use in different disease conditions. These authors have identified the active components of some West African plants such as diterpenes, triterpene,

sesquiterpenes, steroids, flavonone and styrene against cancers and inflammation. Chronic inflammation has been associated with DNA damage and the development of cancers and many other chronic diseases.

Traditional Hausa Fulani medicine defined cancer as "daji" and different forms of inflammatory diseases as "kumburi", "gyambo", "tusan jaki" which are treated similarly (Abubakar *et al.*, 2007). Surh *et al.*, 2001 reported the anti-tumor effects of phytochemicals curmin, epigallocatechin gallate, resveratrol and guggulsterone to be largely attributed to their anti-inflammatory activities. Plates 1- 18 show the different plants from the findings of the survey. Figure 1 shows the age distribution of respondents. From the results, 62% of the respondents were above the age 50 years while the younger active age group between 1 - 30 years was only 10%. This discovery revealed that there is little or no replacement in the practice by the younger generations, therefore, the custodians of this traditional knowledge are and still remain the older generations. Ibrahim *et al.*, (2007); Ene and Atawodi, (2012) also made a similar observation. It is worthy to note that the inhabitants of the study areas are

predominantly of Islamic faith with an inclination towards Islamic medicine hence the similarities in their medical practices. Respondents from this survey showed that the administration of the acclaimed herbs were both orally and topical (Figure 2). Eighty eight percent of the respondents claimed administering the herbal formulations orally and topically on the affected parts. The modes of preparation of the formulations were either as decoctions of roots and stem bark or infusions of leaves taken orally daily for a number of weeks depending on the severity of the disease. Poultices of the ground herbs are applied on the affected skin area to facilitate wound healing. The plants identified are documented to be useful in the treatment of many other diseases by different ethnic groups in Nigeria (Odugbemi, 2008; Idi and Ndukwu, 2006; Ene and Atawodi, 2012). Medicinal property of plants is attributed to the presence of varying types of phytochemicals and essential oils (Iwu, 1993 and Odugbemi, 2008). Flavonoids and other phenolic compounds are potent water soluble antioxidants and free radical scavengers which prevent oxidative cell damage and have strong anticancer activities (Salah *et al.*, 1995).

Aliyu *et al.*, (2008) reported alkaloids to constitute most part of

valuable drugs. Camptothecin, vincristine, vinblastine, homoharringtonine, colchicine, ellipicine and indirubin are alkaloid - derived anticancer agents. A survey of plants used by the Ijaw people of Bayelsa, Nigeria showed the presence of various flavonoids and alkaloids in the plants (Nyananyo and Akada, 2011). These phytochemicals have been shown to inhibit cell growth, protein kinase activity, matrix metalloproteinase's and induce apoptosis in cancerous cells (Kandaswani *et al.*, 2005).

The World Health Organisation in a number of resolutions emphasized the need to ensure quality control of plant products by using modern techniques and applying suitable standards (WHO, 1992). Thai/Lanna folklore medicine has been characterized for its potency and consists of over 200,000 recipes covering all diseases including cancer (Kitdamrongtham *et al.*, 2013). Current study on some of the identified plants has shown presence of alkaloids, tannins, flavonoids and saponins, antioxidants and cytotoxic properties against MDA- MB 231 breast cancer cell line (unpublished). Owing to limited financial resources and scarcity of adequate technical facilities, research on natural anticancer agents in West Africa is still at its infancy (Sawadogo, 2012). There is a great need to create awareness, provide funding and

incentive to encourage researches and the younger generations to undertake such an area of study that is so important to indigenous health care delivery in Nigeria since the older generations are seriously decreasing in number due to ageing and death.

This survey has provided additional information on plants with possible anti-breast cancer potentials in our society. It is a step forward towards investigating the medicinal plants diversity in North Eastern Nigerian flora. However, there is the need to scientifically validate the efficacy of the highlighted plants.

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