***Original Research Article***

# ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED FOR TREATMENT OF VARIOUS AILMENTS IN KANO METROPOLIS, NIGERIA


## ABSTRACT

**AIM**: The aim of this research is to conduct an Ethno botanical survey of medicinal plants used in the treatment of various ailments in Kano metropolis.

**METHODOLOGY**: A systematic survey of medicinal plants used in the treatment of different diseases in Kano metropolis involving 66 participant (30 herbalists, 18 old people with knowledge of traditional medicine, 6 Botanist and 12 tradition medicine users) was conducted from February 2016 to August 2016 using simple structured questionnaire.

**RESULTS**: The result revealed that 79 different plant species belonging to 48 plant families used for curing various ailments in Kano metropolis. The most mentioned plant family used as medicinal plant in Kano Metropolis according to this study includes Fabaceae, Moraceae, Combrataceae, Rubiceae and Anacardiaceae. The ailments mostly mentioned in the application of these medicinal plants/preparations included; pile, typhoid fever, pains, cancers, cough/colds, rheumatism, diabetes and sexual dysfunction. The plant habit and habitat of collection showed that 52% of the medicinal plant species are trees and mostly found in the wild (62%). The survey also revealed that the leaves were the major parts used for herbal preparation accounted for 45%. The main methods of preparation are mostly decoction, then infusion and pounding.

**CONCLUSION**: Plants continue to provide a source of hope for novel drug compounds as it have made large contributions to human health and well-being.


***Keywords:*** *Ethno botanical survey, medicinal plants, Kano, Ailment*

## 1. INTRODUCTION

Since ancient times, plants have been indispensable sources of both preventive and curative traditional medicine preparations for human beings and livestock. Historical accounts of traditional medicine depict

that different plants were used as early as 5000 - 4000 BC in China and 1600 BC by Syrians, Babylonians, Hebrews and Egyptians [1]. Considerable indigenous knowledge system, from the earliest times, is linked to the use of traditional medicine in different countries [2]. According to the World Health Organization (WHO) approximately 80% of the world's population relies on traditional medicine to fulfill their daily health needs [3]. Sofowora [4] reported that about 60-85% of the population in every country of the developing world has to rely on traditional medicine. The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka and Thailand. In china, about 40% of the total medicinal consumption is attributed to traditional tribal medicines [5].

In Nigeria, traditional medicine is well acknowledged and established as a viable profession [6], and almost all plants seem to have some kind of application in traditional medicine [7]. Searches for substances with antimicrobial activity in plants are frequent, due to their popular use as remedies for many infectious diseases [8]. Plants are rich in different types of secondary metabolites, such as tannins, terpenoids, alkaloids, and flavonoids, which have been found *in vitro* to have antimicrobial properties [9][10].

Consequently, the development of drug resistance in human pathogens against commonly used antibiotics has necessitated a search for new antimicrobial substances from other sources including plants [11]. Today, it is estimated that plant materials are present in or have provided the models relatively for 50% Western drugs [12]. Traditional medical practitioners in Nigeria use herbal preparations to treat microbial infections such as typhoid and para-typhoid infections and they claimed that the primary benefit of using plant derived medicines is that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits and more affordable treatments.

Several workers have conducted ethnobotanical surveys among various tribes of the African continent and some other parts of the world [13] in search of plants with antibacterial, antiviral and antifungal properties. The medicinal values of these plants lie in some chemical substances they contain that produce a definite physiological action on the human body [11]. Ethno botanical surveys are important in order to understand the social-cultural and economic factors influencing ideas and actions concerning health and illness and to get information on type of diseases and health problems prevalent among the people of a particular locality. Such studies, as suggested by Lawal *et al*. [14], may help to

provide the basic health care services needed to improve health challenges of the rural population. The potentials of the plants are far from being tapped. This study is intended to document such valuable information. The aim of this survey is to document some herbal medicines used in the treatment of various ailment in Kano metropolis.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

Kano State is a state located in North-Western Nigeria and the largest State of the Nigerian Federation, Created on May 27, 1967 from part of the Northern Region. Kano state is bordered by Katsina state to the North-West, Jigawa state to the north-east, Bauchi state to the south-east and Kaduna state to the south-west. Kano is located on 12° N and 8°30'E. It has a total area of 20,131 $km^2$. The urban area covers 137km2 and comprises of six LGAs - Kano municipal, Fagge, Dala, Gwale, Tarauni and Nassarawa with population of 2,163,25 as at 2006 (NPC, 2006). Climate of the study areas have been described as 'AW' type as identified by Koppen's climatic classification [15]. The vegetation is a Savanna type simply described as closed grass or other predominantly herbaceous vegetation with scattered or widely spaced woody plants. Vegetation types in the state are the northern Guinea savanna and Sudan savanna. Northern Guinea Savanna is open woodland with grasses shorter than in the southern guinea where grasses are 1.5 to 3m tall. The Sudan Savanna has scattered trees in open grassland with grasses under 1.2m tall. The vegetation has been largely cleared for cultivation to form cultivated parkland. Parkland has scattered protected trees at some distance apart in open cultivated land [16].

### 2.2 Population and Sampling Procedure

The study is a survey research in which a total of 66 participants (30 herbalists, 18 old people with knowledge of traditional medicine, 6 Botanist and 12 tradition medicine users) in six local governments (Kano municipal, Fagge, Dala, Gwale, Tarauni and Nassarawa) that makes up the metropolitan Kano were used. Using the purposive technique, 5 herbalists, 3 old people, 1 botanist and 2 traditional medicine user were selected from each Local Government as respondents. The herbalists were identified during drug sales in some markets in the study area.

**Table 1:** Herbal selling points from the study area and number of respondents

| Local Government | Herbal Selling Point | Herbalist | Botanist | Aged people | Herb users |
|---|---|---|---|---|---|
| Kano Municipal | Kurmi Market | 5 | 1 | 3 | 2 |
| Fagge | Fagge Social Welfare | 5 | 1 | 3 | 2 |
| Tarauni | Tarauni Central Market | 5 | 1 | 3 | 2 |
| Dala | Kukar idaw, Gwammaja | 5 | 1 | 3 | 2 |
| Gwale | Mandawari | 5 | 1 | 3 | 2 |
| Nassarawa | Gama Market | 5 | 1 | 3 | 2 |
| **Total** | | **30** | **6** | **18** | **12** |

### 2.3 Data Collection Procedure

The survey was conducted from February 2016 to August 2016 covering 6 six local governments (Kano municipal, Fagge, Dala, Gwale, Tarauni and Nassarawa) that makes up Kano metropolis. A semi-structured questionnaire is used for data collection. Enquired items include; Indigenous name of herbal medicinal, plants medicinal use, part of plant used, location from where plants were collected, and method of preparation of the herbal medicine.

### 2.4 Data Analysis

A checklist of all recorded species of medicinal value was compiled, including their indigenous, common and scientific names, plant origination (wild or cultivated), medicinal uses and location found. Data was also presented in terms of the methods of preparation and administration to patients All the lists generated by the different key informants were presented inform of a table.

Plate 1: Some traditional drugs selling points in Kano Metropolis

## 3. RESULTS

The survey of medicinal plants used in the treatment of various ailments in Kano metropolis is presented in Table 2. Total of 79 species belonging to 48 different families were reported.

**Table 2: Botanical, common, local, family and sources of the medicinal plants used in Kano metropolis**

| Botanical name | Common name | Local name | Family name | Source |
|---|---|---|---|---|
| *Acacia nilotica* | Gum Arabic | Bagaruwa | Fabaceae | Wild |
| *Acacia sebriana* | Paper back acasia | Farar kaya | Fabaceae | Wild |
| *Acacia senegalenis* | Gum acacia | Dakwara | Fabaceae | Wild |
| *Adansonia digitata* | Baobab | Kuka | Malvaceae | Wild |
| *Allium cepa* | Onion | Albasa | Amaryllidaceae | Cultivated |

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|---|---|---|---|---|
| *Alium sativa* | Gallic | Tafarnuwa | Amaryllidaceae | Cultivated |
| *Anacardium occidentale* | Cashew | Kashu | Anacardiaceae | Cultivated |
| *Ananas comosus* | Pineapple | Abarba | Bromeliaceae | Cultivated |
| *Annona senegalensis* | Custard apple | Gwandar daji | Annonaceae | Wild |
| *Anogeisus leocarpus* | Axle wood tree | Marke | Combrataceae | Wild |
| *Artemesia annua* | Sweet annie | Tagargade | Arteraceae | Cultivated |
| *Azadirachta indica* | Neem | Dogonyaro | Meliaceae | Wild/cultivated |
| *Balanites aegyptica* | Desert date | Aduwa | Balanitaceae | Wild |
| *Boerhavia diffusa* | Spreading hog weed | Gadon maciji | Nyetaginaceae | Wild |
| *Boswellia dalzielii* | Frankincense tree | Hararrabi | Burseraceae | Wild |
| *Calotropis procera* | Sodom apple | Tumfafiya | Asclepidaceae | Wild |
| *Carica papaya* | Pawpaw | Gwanda | Caricaceae | Cultivated |
| *Cassia albida* | Cassia tree | Gawo | Fabaceae | Wild |
| *Cassia fistula* | Golden rain tree | Fulasko | Fabaceae | Wild |
| *Cassia siamea* | Kassod tree | Dorawar turawa | Ceasalphinoideae | Wild |
| *Catunaregam nilotica* | - | Kwanarya | Rubiaceae | Wild |
| *Ceiba pentendra* | Silk cotton | Rimi | Malvaceae | Wild |
| *Citrallus lanatus* | Water melon | Kankana | Curcubitaceae | Cultivated |
| *Citrus aurantifolia* | Lime | Lemon tsami | Rutaceae | Cultivated |
| *Commiphora africana* | Corkword | Dashi | Burseraceae | Wild |
| *Crinum jagus* | Harmattan lily | Gadeli | Amaryllidaceae | Wild |
| *Cymbopogan citratus* | Lemon grass | Ciyawar lemon | Poaceae | Cultivated |
| *Cyperus articulate* | Jointed flat sedge | Kajiji | Cyperaceae | Wild |
| *Detarium microcarpum* | Tallow tree | Taura | Fabaceae | Wild |
| *Diospyros mispiliformis* | African ebony | Kanya | Ebenaceae | Wild |
| *Dodonea viscosa* | Hop bush | Fil fil | Sapindaceae | Wild/ Cultivat |
| *Erythrina senegalesis* | Senegal coral tree | Minjirya | Papilionoidea | Wild |
| *Eucalyptus camadulensis* | River red gum | Turare | Myrtaceae | Wild/ Cultivat. |

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|---|---|---|---|---|
| *Fiscus congensis* | - | Baure | Moraceae | Wild |
| *Fiscus iteophylla* | - | Shirinya | Moraceae | Wild |
| *Fiscus platyphylla* | Flake rubber tree | Gamji | Moraceae | Wild |
| *Fiscus thoningii* | Strangler fig | Chediya | Moraceae | Wild |
| *Garcinia kola* | Bitter kola | Namijin goro | Clusiaceae | Cultivated |
| *Gardenia aqualla* | - | Gaude | Rubiaceae | Wild |
| *Gossypium hirsitum* | Cotton plant | Auduga | Malvacea | Cultivated |
| *Guiera senegalensis* | Guiera | Sabara | Combrateceae | Wild |
| *Gynandropsis gynandra* | Cat's whiskers | Gasaya | Cleomaceae | Wild |
| *Hibiscus sabradifa* | Roselle | Zobo | Malvaceae | Cultivated |
| *Hyphaena thebaica* | Doum palm | Goruba | Aracaceae | Wild |
| *Jatropha curcas* | Physics nut | Binidazugu | Euphorbiaceae | Wild |
| *Khaya senegalensis* | Mahogany | Madaci | Meliaceae | Wild/ Cultivat. |
| *Leptadenia hastata* | Tears | Yadiya | Apocynaceae | Wild |
| *Lowsonia inermis* | Henna plant | Lalle | Lythraceae | Wild |
| *Mangifera indica* | Mango tree | Mangwaro | Anacadiaceae | Cultivated |
| *Menta piperita* | Pepper mint | Na'a na'a | Lamiaceae | Cultivated |
| *Mitracarpus hiartus* | Girdle pod | Goga masu | Rubiaceae | Wild |
| *Momardica balsamina* | Balsam apple | Garahuni | Curcubitaceae | Wild |
| *Moringa oleifera* | Moringa | Zogale | Moringaceae | Cultivated |
| *Nauclea diderrichii* | Box wood | Tafashiya | Rubiaceae | Wild |
| *Nigella satila* | Black cumin | Bakin algarif | Ranunculaceae | Cultivated |
| *Ocimum gratissimum* | Tea bush | Doddoya | Laminaceae | Cultivated |
| *Olea eupopeen* | Olive tree | Zaitun | Oleaceae | Cultivated |
| *Parkia biglobosa* | African locust bean | Dorawa | Fabaceae | Wild |
| *Piliotigma thonningii* | Monkey bread | Kalgo | Caesalphinoideae | Wild |
| *Pistia stratiotes* | Water cabbage | Kainuwa | Araceae | Wild |
| *Piper negrum* | Black pepper | masoro | Piperaceae | Cultivated |

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|---|---|---|---|---|
| *Plumeria rubra* | Temple tree | | Apocynaceae | Wild |
| *Psidium guajava* | Guava | Goba | Myrtaceae | Cultivated |
| *Proposis africana* | Iron tree | Kirya | Fabaceae | Wild |
| *Sclerecarya birrea* | Marula | Danya | Anacardiaceae | Wild |
| *Securidaca longependulata* | Violet tree | Sanya | Polygalaceae | Wild |
| *Sienna obtusifolia* | Sickle pod | Tafasa | Fabaceae | Wild/cultivat |
| *Senna occidentalis* | Negro coffee | Rai dore | Ceasalphinoideae | Wild/ Cultivat. |
| *Senna singuena* | Wild cassia | Runhu | Fabaceae | Wild |
| *Sorghum bicolor* | Guinea corn | Dawa | Poaceae | Cultivated |
| *Strychnos spinosa* | Monkey orange | Kokiya | Loganiaceae | Wild |
| *Syzygium aromaticum* | Clove | kanumfari | Myrtaceae | Cultivated |
| *Terminalia avicennioides* | Black limba | Baushe | Combrataceae | Wild |
| *Vernonia amygdalina* | Bitter leaf | Shuwaka | Asteraceae | Cultivated |
| *Vitex doniana* | Black plum | Dinya | Verbaceae | Wild |
| *Ximenia americana* | Wild olive | Tsada | Olacaceae | Wild |
| *Zingiber officinale* | Ginger | Citta | Zingebaraceae | Cultivated |
| *Zizizpus mauritiana* | Indian plum | Magarya | Rhamnaceae | Wild |
| *Zizipus mucoronata* | Buffalo thorn | Magaryar kura | Rhamnaceae | Wild |

**Table 3:** The medicinal purposes, method of preparation and plant parts used for medicinal purpose is presented in Table 3. Leaves are the most common part used for medicinal purpose according the study.

**Table 3: Medicinal purpose, method of preparation, habit and plant parts used for medicinal purpose**

| Botanical name | Habit | Part used | Medicinal purpose | Method of preparation |
|---|---|---|---|---|
| *Acacia nilotica* | Tree | Fruit | File | Decoction |
| *Acacia sebriana* | Tree | Leaves/stem bark | Pain reliever and wound healing | Pounded and crushed |
| *Acacia senegalenis* | Tree | Stem bark | Soothes cough and sore throats | Pounded and crushed |
| *Adansonia digitata* | Tree | Leaves | Cancer, inflammation, cardiovascular diseases | Powder leaf eaten as soup |

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|---|---|---|---|---|
| *Alium cepa* | Herb | Bulb | Cancer, lower cholesterol and improve immunity | Bulb taken in food as condiment |
| *Alium sativa* | Herb | Bulb | Cold | Bulb taken in food or orally |
| *Anacardium occidentale* | Tree | Leaves/stem bark | Diarrhea and thrush | Decoction |
| *Ananas comosus* | Shrub | Fruit | Laxative | Taken orally |
| *Annona senegalensis* | Shrub | Leaves/stem bark | Cancer and pile | Decoction |
| *Anogeisus leocarpus* | Tree | Stem bark | Pile and cough | Soak in water/infusion |
| *Artemesia annua* | Herb | Leaves | Yellow fever and vomiting | Infusion |
| *Azadirachta indica* | Tree | Leaves/stem bark | Typhoid, malaria and yellow fever | Pounded and taken orally |
| *Balanites aegyptica* | Tree | Fruits/leaves | Intestinal worm, leucoderma and psychiatric disorder | Decoction |
| *Boerhavia diffusa* | Herb | Leaves/root | Stomach ache and pain reliever | Infusion |
| *Boswellia dalzielii* | Tree | Stem bark | Pile and body heat | Decoction |
| *Calotropis procera* | Shrub | Leaves | Cancer | Pounded and apply to infected area |
| *Carica papaya* | Tree | Leaves | Antimicrobial and Gastrointestinal disorder | Decoction |
| *Cassia albida* | Tree | Stem bark | Body pain | Decoction |
| *Cassia fistula* | Tree | Leaves | Diarrhea, antimicrobial agent | Decoction |
| *Cassia siameae* | Tree | Leaves | Rheumatism | Decoction |
| *Catunaregam nilotica* | Tree | Root | Snake bite, Genital disorder | Applied powdered root |
| *Ceiba pentendra* | Tree | Leaves | Gastrointestinal disorder | Infusion |
| *Citrallus lanatus* | Herb | Fruit | Laxative | Fruit taken orally |
| *Citrus aurantifolia* | Shrub | Leaves/fruit | Cold and body rashes | Taken orally |
| *Commiphora Africana* | Shrub | Leaves | Malaria and ulcer | Decoction |
| *Crinum jagus* | Herb | Bulb | Anti-oxidant, diabetes | Bulb taken orally |
| *Cymbopogan citrates* | Herb | Leaves | Malaria, convulsion and anti bacterial | Decoction |
| *Cyperus articulate* | Herb | Root | Cold | Decoction with potash |

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|---|---|---|---|---|
| *Detarium microcarpum* | Tree | Fruit | Pile, tuberculosis, meningitis and diarrhea | Decoction or taken orally |
| *Diospyros mispiliformis* | Tree | Leaves | Pile | Decoction |
| *Dodonea viscose* | Shrub | Leaves | Typhoid fever | Decoction |
| *Erythrina senegalesis* | Tree | Leaves/stem bark | Dysentery | Infusion or taken in pap |
| *Eucalyptus camadulensis* | Tree | Leaves | Fever, cold and stomach upset | Infusion |
| *Fiscus congensis* | Tree | Root | Arthritis | Apply to infected part |
| *Fiscus iteophylla* | Tree | Leaves | Blood clotting | Apply powder to infected part |
| *Fiscus platyphylla* | Tree | Leaves/stem bark | Malaria and convulsion | Infusion or decoction |
| *Fiscus thoningii* | Tree | Stem bark | Yellow fever, UTI and diarrhea | Taken orally in beverages or pap |
| *Gardenia aqualla* | Shrub | Leaves/root | Sedative, laxative, diabetes and liver diseases | Decoction |
| *Gossypium hirsitum* | Herb | Leaves | Skin problems | Decoction |
| *Guiera senegalensis* | Shrub | Leaves, root | Pile, body heat | Decoction |
| *Gynandropsis gynandra* | Herb | Leaves | Anemia and blood loss | Eaten as vegetable |
| *Hibiscus sabradifa* | Herb | Flower | Blood tonic and hypertension | Boil in water and taken as beverage |
| *Hyphaena thebaica* | Tree | Fruit | Pile and stomach upset | Decoction or eaten orally |
| *Jatropha curcas* | Herb | Whole plant | Body pain | Decoction |
| *Khaya senegalensis* | Tree | Leaves/stem bark | Pain, inflammation and diarrhea | Decoction |
| *Leptadenia hastate* | Herb | Root | Yellow fever | Decoction |
| *Lowsonia inermis* | Shrub | Root | Cancer and anti inflammatory | Boil powdered root |
| *Mangifera indica* | Tree | Leaves/stem bark | Malaria, typhoid, jaundice in children | Decoction |
| *Menthe piperita* | Herb | Leaves | Anti cancer, oxidant and anti plasmodic | Decoction |

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|---|---|---|---|---|
| *Mitracarpus hiartus* | Herb | Whole plant | Eczema | Applied to infected part |
| *Momardica balsamina* | Herb | Whole plant | Fertility in women | Decoction |
| *Moringa oleifera* | Tree | Leaves | Blood tonic | Cooked and taken as food |
| *Nauclea diderrichii* | Tree | Stem bark | Ulcer | Decoction |
| *Nigella satila* | Herb | Seeds | Diabetes and cancer | Eating in food as condiment |
| *Ocimum gratissimum* | Herb | Leaves | Antibiotics, diabetes, pain killer | Decoction |
| *Olea eupopeen* | Shrub | Leaves/seeds | Heart and kidney diseases, arthritis | Decoction |
| *Parkia biglobosa* | Tree | Fruits | Dysentery | Taken orally |
| *Piliotigma thonningii* | Shrub | Leaves/root | Pile | Infusion with red potash |
| *Pistia stratiotes* | Herb | Whole plant | Mental illness | Burning in charcoal fire |
| *Piper negrum* | Herb | Seeds | Constipation and anti inflammatory agent | Grounded and use as spices |
| *Plumeria rubra* | Tree | Leaves/flower | Fever, dysentery and pertusis | Infusion |
| *Psidium guajava* | Shrub | Leaves/stem bark | Dysentery and gastrointestinal disorder | Decoction |
| *Proposis Africana* | Tree | Stem bark | Pile and fire burn | Decoction or applied to infected part |
| *Sclerecarya birrea* | Tree | Leaves/stem bark | Antibacterial | Decoction |
| *Securidaca longependulata* | Tree | Leaves/stem/root | Burn | Applied to infected part |
| *Sienna obtusifolia* | Herb | Stem bark/seed | Eye disorder and conjunctivitis | Pounded |
| *Senna occidentalis* | Herb | Leaves | Malaria, Fever | Decoction |
| *Senna singuena* | Herb | Leaves | Malaria, fever and wound infection | Decoction/infusion |
| *Sorghum bicolor* | Grass | Leaves | Immune modulator | Decoction |
| *Strychnos spinosa* | Tree | Leaves/root and fruit | Snake bite, purgative, analgesic | Decoction |
| *Syzygium aromaticum* | Herb | Seeds | Cough and catarrh | Decoction/ used in food as spices |
| *Terminalia avicennioides* | Tree | Leaves | Pain killer, diarrhea, dysentery and wound | Decoction |

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|---|---|---|---|---|
| *Vernonia amygdalina* | Herb | Leaves | Fever, typhoid fever | Cooked and eaten as soup |
| *Vitex doniana* | Tree | Leaves/stem bark | Gastrointestinal disorder | Infusion/decoction |
| *Ximenia Americana* | Tree | Leaves/ stem/root | Fever, cold, dysentery, used as laxative | Decoction |
| *Zingiber officinale* | Stem | Rhizomes | Cold and catarrh | Decoction/ used in food as spices |
| *Zizizpus mauritiana* | Tree | Leaves/root | Malaria, stomach upset, spiritual problems | Decoction |
| *Zizipus mucoronata* | Tree | Stem bark/root | Pain killer, respiratory ailment | Pounded/decoction |

## 4. DISCUSSIONS

The revival of interest in the use and importance of African medicinal plants by many developing countries has led to intensified efforts on the documentation of ethno medicinal data of medicinal plants, since most traditional healers keep scanty records and their information is passed on, mainly verbally, from generation to generation [17]. Although traditional medicines are highly recognized and commonly used both in the rural and urban communities in Nigeria, the accurate knowledge of these plants and their medicinal properties are known mostly by traditional medicine sellers and only by few individuals in the community especially aged people, Botanist and medicinal plant users . Plants are more easily recognized by their local names in every part of the world. These local names play a vital role in ethno botanical study of a specific tribe or region [18]. In the present study, respondents interviewed gave local names of plants in recipes for treating particular disease(s). Local names provide means of reference by local people in a particular area. Information gathered showed that increasing number of people is turning to herbal remedies for prevention and cure of various diseases.

In this study, Seventy-nine (79) plants from 48 different families were recorded as medicinal plants used in treatment of various illness within Kano metropolis. The most mentioned family include; Fabaceae (10 members), Moraceae (5 members), Combrataceae, Rubiceae and Anacardiaceae (4 members each), Amaryllidaceae, Myrtaceae and Ceasalphinoidea (3 members each). All plant forms such as trees, shrubs and herbs represented the medicinal plant species mentioned in this study. Trees were found to be the most used plants accounted for 52 % followed by herbs 33 % while shrubs

129 accounted for 15 %. Some of the plants revealed in the survey have been cited in the ethno botanical
130 survey of some African countries [19]. The continuous search for natural plant products for use as
131 medicines is encouraged by ethno botanical survey; Igoli *et al*. [20] recognized ethno botanical survey as
132 one of the major approaches for selecting plants for pharmacological screening.
133
134 The plant parts mostly used in this study are the leaves with 36 entries followed by stem bark and
135 roots with 21 and 12 entries respectively. The use of whole plant has 4 entries; fruits had 6 entries while
136 seeds and flower had 3 and 1 entries each. Therefore, the plant leaves are important ingredient in
137 traditional treatment of various ailments in Kano Metropolis as it is the component that featured most in
138 many herbal preparations which were in agreement with Adekunle [21] and Abdulsalami [22]. The result
139 of this study revealed that decoction is the most frequent method of preparing medicinal plants, which
140 accounted for over 52% of the methods used. This is followed by infusion and pounding which accounted
141 for 15% and 8% respectively. On the hand, the ailments mostly mentioned in the application of these
142 medicinal plants/preparations included; pile, Malaria, typhoid fever, pains, cancers, cough/colds,
143 rheumatism, diabetes and sexual dysfunction.
144 Most of the plants sourced from the wild with the exception of few. Out of the 79 plants recorded
145 in this study, 49 plants are sourced from the wild accounted for 62%, 24 sourced from gardens and farms
146 i.e. cultivated (30%) while 6 sourced from both wild and gardens (8%). This result is inconformity with the
147 study of Muhammad et al. [16](2015) who found that 72% of the medicinal plants used in Kano metropolis
148 are sourced from wild. In a study conducted on medicinal plants by Mesfin *et al.* [23], it found out that
149 58% of all medicinal species in the study area in Ethiopia are sourced from the wild while only 6.4% are
150 cultivated.

151 **5. CONCLUSION**

152 The present study has established a data bank for some medicinal plants that are used in the
153 management of various ailments in Kano Metropolis. The results of the study revealed that there is high
154 diversity of medicinal plants and traditional knowledge about the use, preparation, and application, which
155 is still maintained among local people of metropolitan Kano. It has found that 79 Species of plants
156 covering 48 families are available as medicinal plants used in Kano metropolis. The most mentioned plant

family used as medicinal plant in Kano Metropolis according to this study includes Fabaceae, Moraceae, Combrataceae, Rubiceae and Anacardiaceae. The ailments mostly mentioned in the application of these medicinal plants/preparations included; pile, typhoid fever, pains, cancers, cough/colds, rheumatism, diabetes and sexual dysfunction. From this survey it is now known that the plant parts mostly used for herbal preparations found in Kano Metropolis are the leaves, stem bark, and roots in that order followed by whole plants and fruits and least seeds and flower. Therefore, based on the present study, Plants continue to provide a source of hope for novel drug compounds as it have made large contributions to human health and well-being. It is recommended that further research on the screening of the secondary metabolites of these medicinal plants for biological and pharmacological studies will be necessary as well as the isolation of active compounds and their structural elucidation for the maximal use of the medicinal plants.

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