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Full Length Research Paper

Ethnobotanical Survey of Plants used for the Treatment of Malaria among the Owo Speaking People in Owo Local Government Area of Ondo State, Nigeria

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Ethnobotanical survey of medicinal plants used by the Owo speaking people of Owo Local Government Area of Ondo State for treatment of malaria was carried out. The survey was aimed at identifying the plants used in the treatment of malaria among the Owo people. Information was collected by interviewing indigenous Owo herbal medicine practitioners, herb sellers, and farmers making use of interviews and structured questionnaire. A total of 32 plant species belonging to 22 families were recorded from the survey that is being used in herbal anti-malarial recipes. *Asteraceae* were most represented with 4 species (13%), followed by *Euphorbiciceae* with 3 species (9.7%), *Anarcadaceae, Arecaceae, Meliaceae Rutaceae* represented with 2 plant species each (6.5%) while the remaining 16 families had 1 species each (3.2%). Investigations included the plant parts used, methods of preparing the herbal anti-malarial recipe and method of administration. The results indicated that the parts of the plants used could be the leaves, stem bark, roots or whole plant. Water was the main medium of anti-malarial recipe preparations, irrespective of the part, whole plant or combination of parts of plant used. Though, a large number of plants that are traditionally used for the treatment of malaria were identified, scientific validation of claims of anti-malarial potency is required.

Keywords: Ethnobotanical, survey, plants, treatment, malaria, Owo people

INTRODUCTION

Malaria is a serious disease that is spread by female anopheles mosquitoes and caused by blood Parasite *Plasmodium.* People with malaria often experience fever and chills. Other experiences include headache, pains in the joint, nausea, vomiting, anemia, diarrhea, muscle pain, convulsion and coma (Azoma, 2018). Malaria is one of the five major life threatening childhood conditions causing more than half a million deaths of African children annually (Snow *et al*., 2005). Malaria is regaining its earlier reputation as being one of the greatest threats to mankind especially in sub-Saharan Africa with *Plasmodium falciparum* possessing a number of efficient genetic mechanisms that enables it evolve resistance against most of the anti-malaria drugs that are presently available for treatment.

Traditionally, plants are reliable sources for the treatment of diseases in different parts of the world (Hostettmann *et al*., 2000). Their uses contribute significantly to the primary health care delivery (Holetz *et al*., 2002) as they are regarded as invaluable sources of pharmaceutical products (Olaide, 2005). Medicinal plants remain a major source of drugs in the treatment of various categories of human ailments especially in the developing countries. They have formed the basis of traditional medicine systems, which have been used for thousands of years in African countries. The World Health Organization estimates that 80% of the world`s inhabitants continue to rely mainly on traditional medicine

system for their health care (WHO, 2002).

The new interest in the strategies on malaria treatment and control is to investigate the folkloric medicine in the search for potent anti-malarial, since approximately 80% of the populations still depend on traditional medicines as its primary source of treatment of the disease (WHO, 2004).

Africa traditional healing system, also known as folk medicine, native medicine, herbal medicine, and ethno medicine has received appreciable attention (Louwi *et al.*, 2002). The administration of the native or traditional drugs has been in the hands of native herbalist and often the old people in the rural setting. According to the history of Nigeria traditional medicine, thousands of plant species have been used for many years in the treatment of diseases (Atawodi *et al.*, 2002).

Researchers are now studying traditional Africa herbal remedies against malaria. Extracts from *Azadirachta indica* (Meliaceae), *Microglossa pyrifolia* (Asteraceae), *Cassia singueana* (Fabaceae) and *Mammea africana* (Guttiferae), have shown promising results in the treatment of malaria (Coluzzi and Costantini, 2002; Kohler and Jenett-sierns,, 2002; Isah *et al.*, 2003; Bulus *et al.*, 2003; Wright, 2004; Jude *et al.*, 2006; Katsayal and Obamiro, 2007; Bulus *et al.*, 2008).

Plants used in traditional medicine are more likely to yield pharmacologically active compounds (Farnswort and Kass, 1981). The available knowledge on the use of plant preparations in traditional medicines allows a direct search for such compounds following scientifically established norms. Ethnobotanical survey is an important step in the identification, selection and development of the therapeutic agents from medicinal plants. In ethnobotany and natural products chemistry the mode of preparation and administration of herbal preparations are often crucial variables in determining efficacy in pharmacological evaluation (Lewis *et al.*, 1998, Albers-Schonerg *et al.*, 1997). The aim of this study was to collate information from an indigenous group of Owo people living in Owo Local Government Area of Ondo State about their current traditional use of plants for the treatment of malaria, the plant part(s) used, method of preparation and mode of administration.

MATERIALS AND METHODS

Study area

Owo local government is located at 7°11'N 5°35'E/ 7.183°N 5.583°E. Owo is situated in south-western Nigeria, at the southern edge of the Yoruba hills, and at the intersection of roads from Akure, Kabba, Benin city and Siluko. Owo is situated halfway between the towns of Ile-ife and Benin City. Owo popularly known as Ogho Imade comprises of people with different social and economic strata ranging from farmers, traders, fishermen and civil servants. The soil type is mostly loamy to sandy type and substantial amount of clay is found also. The natural vegetation is high forest with a blend of woody savanna.

Questionnaire administration

Ethno medicinal information was collected between June and August 2018 by means of oral interview with local herbal practitioners and herb sellers using structured questionnaire from the different villages. A total of 100 respondents were interviewed using the structured questionnaire and information on the demographic structure of respondents (age and sex) were generated from the questionnaire, the respondents provided information on plant part used, mode of preparation, method of administration and other medicinal uses. The respondents helped in the identification and collection of the indigenous plants.

RESULTS AND DISCUSSION

The information obtained through the ethno botanical interviews was tabulated based on the following parameters: scientific name, family name, vernacular name, parts of the plant used to treat malaria and mode of administration. The (Tables 1 and 2) contain the list of 32 medicinal plants species used for malaria treatment and malaria related diseases.

The research has provided information on 32 plant species that were collected and identified as being useful as food and in the treatment of malaria and some other human ailments, showing that traditional medicinal practice is an important component of our everyday life as earlier recorded by Omosun *et al.* (2013).

The most frequently used parts used are the leaves due to the ease by which leaves are extracted and used followed by the bark. Water was the preferred solvent of preparation and oral route of drug administration was used, followed by inhalation of steam. The preparations were administered depending on the severity of illness, sex and age. Recipes used could be combination of several species of plants or plant parts. Herbal remedies were either prepared from dry or freshly collected plants. These findings confirm earlier research works (Olorunisola *et al.,* 2013; Shosan *et al.*, 2014; Abubakar et al., 2016; Ene *et al.*, 2010).

Various ethno botanical studies have identified and revealed that Nigeria has remarkable diversity of flora and quite a number of them are used medically for the treatment of malaria. (Tolu *et al*., 2007; Ene *et al.*, 2010; Shosan *et al*. 2014; Precious *et al*., 2012; Abubakar *et al.,* 2016; Sanjay and Rupashree, 2014; Madara *et al*., 2018). There is no documented report on the plants traditionally used by Owo speaking people of Owo Local

Table 1. Common plants or herbs used among the Owo people of Owo LGA used for malaria treatment, their botanical names, local names, parts used, family, mode of preparation and administration.

Vernacular name	Common Name	Botanical Name	Family	Part used	Mode of Preparation	Administration
1. Tseketu	Country mallow	*Sida rhombifolia*	Malvaceae	Leaves	squeezing	Bathing
2. Ahon erin	Aloe Vera	*Aloe barbadensis Mill.*	Asphodelaceae	Stem	Infusion	Oral
3. Akintola	Siam weed	*Chromolaena odorata L.*	Asteraceae	Leaves	decoction	Oral
4. Mangoro	Mango	*Mangifera indica Linn*	Anarcadaceace	Stem, bark, leaves.	decoction	Oral and bathing
5. Iwe moba	Scent leaf	*Ocimum gratissium Linn*	Lamiaceac	Leaves	decoction	Oral
6. Kashu	Cashew	*Anacardium occidentale*	Anacadiaceae	Leaves, bark	decoction	Oral, bath, inhalation
7.Iwe Egungun	Masquerade leaf	*Polyalthia longifolia*	Annonaceae	Leaves	decoction	Oral
8.Lapalapa pupa	Bellyache bush	*Jatropha gossypiifolia*	Euphorbiaceae	Leaves	decoction	Oral
9.Gova	Guava	*Psidium gaujava*	Myrtaceae	Leaves	decoction	Oral & bathing
10.Ope	Palm tree	*Elaesis guinensis*	Arecaceae	Leaves	decoction	Oral & bathing
11.Ewe fruit	Almond	*Terminalia catappa*	combretaceae	Leaves	decoction	Oral
12. Ibepe	Paw paw	*Carica papaya Linn*	Caricacea	Fruit, leaves	Infusion	Oral
13. Dongoyaro	Neem	*Azadirachta indica A. juss*	Meliaceae	Leaves	Decoction	Oral & bathing
14. Oruwo	Brimstone tree	*Morinda lucida Linn.*	Rubiaceae	Leaves, bark	Decoction and infusion	Oral
15. Odan	Mulberry	*Ficus thoningii*	Moraceae	Leaves	Decoction	Oral
16. Lapalapa funfun	Barbados nut	*Jatropha curcas*	Euphorbiaceae	Leaves	Decoction	Oral
17. Ewe tea	Lemon grass	*Cymbopogon citrates*	Poaceae	Leaves	Decoction	Oral
18.Orombo wewe	Lime	*Citrus aurantifolia*	Rutaceae	Leaves, fruit	Decoction & Juice	Oral
19.Oganwo	Mahogany	*Khaya grandifolia*	Meliaceae	Bark, leaves	Infusion & decoction	Oral & bathing
20.Taaba	Tobacco	*Nicotiana tabacum*	Solanaceae	Leaves	Decoction	Oral
21.Moringa	Moringa	*Moringa oleifera*	Moringaceae	Leaves	Decoction	Oral & bathing
22. Paki	Cassava	*Manihot esculenta*	Euphorbiaceae	Leaves	Decoction	Oral & bathing
23. Ajara	Grape	*Citrus paradisi*	Rutaceae	Leaves, fruit	Decoction	Oral
24. Bombom	Milk weed	*Calotropis procera*	Apocynaceae	Leaves	Decoction	Oral
25. Ori	Shea butter	*Vitellaria paradoxa*	Sapotacea	Leaves	Decoction	Oral
26. Kokodiya	Coconut	*Cocos nucifera*	Arecaceae	Leaves	Infusion	Oral
27. Gbalu	Tree marigold	*Tithonia diversifolia*	Asteraceae	Leaves	Squeezing	Oral
28. Ewuro	Bitter leaf	*Vermonia amygdalina*	Asteraceae	Leaves	Decoction	Oral
29.Pakududu	Goat weed	*Ageratum conyzoides*	Asteraceae	Leaves	Decoction	Oral
30.Ogede	Banana	*Musa sapientum*	Musaceae	Leaves	Decoction	Oral & bathing
31.Sese orisa	Hairy senna	*Cassia hirsuta [Li] H.S Irwin*	Fabaceae	Leaves	Infusion	Oral

Table 2. The Botanical names of the plants and their other medicinal uses.

Botanical Name	Other Medicinal Uses
1. Sida rhombifolia	Typhoid, toothache
2. Aloe barbadensis Mill.	Skin Rashes, Hypertension, diabetes
3. Chromolaena odorata L.	Dysentery, toothache
4. Mangifera indica linn	Typhoid,
5. Ocimum gratissium linn	Stomach ache
6. Anacardium occidentace	Cough, stomach ache
7. Polyalthia longifolia	-
8. Jatropha gossypiifolia	Dysentery, ringworm
9. Psidium gaujava	Typhoid, worms, diabetes, diarrhea
10. Elaesis guinensis	Measles

Table 2.Contd.

11.Terminalia catappa	Dysentery, asthma, cough
12.Carica papaya linn	Diabetes, worm
13.Azadirachta indica A. juss	Typhoid, skin rashes
14.Morinda lucida I.	Fever
15.Ficus thoningii	-
16.Cymbopogon citrates (D.C) stapf	Cough, worms, stomach ache
17.Citrus aurantifolia	Typhoid, cough
18.Khaya grandifolia	Typhoid, skin rashes
19.Nicotiana tabacum	Convulsion
20.Moringa oleifera	Cough, Diarrhoea
21.Manihotesoulentum crantz	-
22.Citrus paradisi	Typhoid
23Calotropis procera R.Br	Measles
24.Vitellaria paradoxa	Nasal congestion
25.Cocos nucifera	The water neutralizes poison
26.Tithonia diversifolia	Typhoid
27.Vermonia amygdalina delile	Diabetes, pile
28.Ageratum conyzoides	Ulcer, diarrhea
29.Musa sapientum	Hypertension
30.Cassia hirsuta [Li] H.S Irwin	-

Government Area of Ondo State for treatment of malaria.

The study identified 32 plant species that are useful in the treatment of malaria which may provide a lead for the identification and isolation of potentially active compounds that may be useful in the development of new, cheaper and more effective anti-malarial drugs.

Authors` Declaration

We declare that this study is an original research by our research team and we agree to publish it in the journal.

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