

Ethnobotanical study of medicinal plants useful for malaria therapy in eight local government areas of Abia State, Southeast Nigeria

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ABSTRACT

An ethnobotanical survey on the medicinal plants used in treating malaria by traditional healers in eight local government of Abia State, Nigeria was conducted using oral interviews of the practicing herbalists and other individuals involved in the use of medicinal plants. Results of this survey indicated that twenty-one plant species belonging to eighteen families of plants featured as recipes in the preparation and treating of infectious diseases including malaria. Investigation on plant parts used, mode of preparations and administration, indicated that irrespective of plant and plant parts or their combination used, water was the main medium for all medicinal preparations. Treatment regime included drinking the aqueous preparations for five to ten days or until malaria fever symptom disappeared. Although the efficacy of the recipes described by the respondents is not known with certainty, the people are certain that it works for them and they still rely heavy on herbal medicines than orthodox malaria drugs. This survey provides a basis for further screening and research on these plants used for malaria in the eight local government of Abia State, Nigeria.

Keywords: Ethnobotanical, medicinal plants, malaria, Abia State, Nigeria.

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INTRODUCTION

Malaria is a parasitic disease transmitted by the bites of anopheles mosquitoes infected with plasmodium species, four of which infect humans: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malariae* and *Plasmodium ovale*. In Nigeria, malaria is mostly caused by *P. falciparum* and *P. malariae*. The female anopheles mosquitoes transmit these parasites to humans. The disease primarily affects poor populations in tropical and subtropical areas, where the temperature and rainfall are suitable for the development of vectors and parasites (Greenwood et al., 2008). Malaria is a major global health problem. There is an estimated 247 million malaria cases with almost half of the global population at risk and nearly a million deaths each year (WHO, 2008). Malaria is one of the major tropical parasitic diseases responsible for significant morbidity and mortality especially among

children and pregnant women. It is estimates that 1 to 2 million people die yearly as result of malaria (Sudhanshu et al., 2003). A WHO (2008) report stated that Nigeria accounts for a quarter of all malaria cases in Africa. In the southern part of Nigeria, transmission occurs all year round while in the north it is mostly seasonal (Adebayo and Krettli, 2011).

Drug resistant malaria has become a major problem in malaria control. Resistance *in vivo* has been reported against almost all anti-malaria drugs except Artemisinin and its derivatives (Zucker and Campbell, 1992; Sharma, 1997). Resistance to anti-malarials has been reported in both *P. falciparum* and *P. vivax*. Drug resistance in *P. falciparum* is not confined to chloroquine alone, but also to the other currently used anti-malarials and is widespread (Umar and Mahajan, 2004). Malaria is

becoming more resistant to a number of current drugs and is on the increase because of the global warming process (Martin and Lefebvre, 1995). Thus, many communities who live in endemic areas have started to look for malaria remedies in plants in their local environments (Miliken, 1997). It is believed strongly that if the herbs used to treat malaria by our ancestors in Africa hundreds of years ago were not effective, malaria would have destroyed Africa (Idowu et al., 2010).

Ethnobotanical survey is an important step in the definition, selection and development of the therapeutic agents from medicinal plants. According to the WHO (2001), 80% of the world population uses natural remedies and traditional medicines and Nigeria is not an exception. In recent times, despite all the advances in modern and orthodox medicines, traditional medicines have gained renewed interest in healthcare services of Cameroonians. This may be attributable to increased unawareness in the potential and curative ability of the alternative medicines and particularly as of the various shortcomings revealed for several synthetic drugs (Ugbogu and Odewo, 2004).

The objective of the present study was to obtain information on the uses of local herbs in the treatment of malaria fever, the plant(s) used, method of preparing herbal anti-malaria remedies, and how it is administered in some local government areas of Abia State, south eastern Nigeria. This is with a view to contribute to the search for new and alternative natural anti-malaria medicines.

MATERIALS AND METHODS

An ethno-medicinal survey was conducted among indigenes of eight local government areas of Abia State. The local government areas included Ikwuano, Umuahia North and South, Isialangwa North and South, Osisioma, Obingwa and Bende. Using oral interview to ensure effective survey coverage, the study area was divided into 6 zones (Table 1) and a selected sample population which were principally traditional medicine practitioners or herbalists; in a few cases, farmers and hunters that patronized these herbalists at one time or another were also interviewed.

Information sought during the interview included the following recipes for medicines, local names for plants and parts used in medical practices, mode of preparation and extraction, dosage and duration of administration, and state of parts used (fresh, dried or powdered). Subsequently, the interviewers were accompanied to the field to ensure identification and collection of these plant specimens. Plant specimens collected were identified at the Department of Plant Science and Biotechnology, Michael Okpara University of Agriculture, Umudike, Nigeria. Voucher specimens were also deposited in the university herbarium for reference purposes.

RESULTS AND DISCUSSION

Table 1 shows the various survey areas in the state under review. A total of 21 plants were identified to be used in treating infectious disease in the studied areas and these were found in 18 families (Table 2). Based on

Table 1. Ethno-medicinal surveys zones.

Zone	State	Local Government Area
1	Abia	Ikwuano
2	Abia	Umuahia North
3	Abia	Umuahia South
4	Abia	Isialangwa North
5	Abia	Isialangwa South
6	Abia	Osisioma
7	Abia	Obingwa
8	Abia	Bende

the returned interviews, the ubiquity and usage of medicinal plants used in treating infectious disease in eight local government of Abia State in Nigeria are shown in Table 3. Details on the recipes, preparation, modes of administration and dosage were also summarized in Table 3. Table 4 is a display of reported cases of malaria and various medicinal plant parts used for the treatment by traditional herbalists in various areas surveyed.

From all the medicinal plants used for malaria therapy in the eight local government areas of Abia State, this study has shown that indigenous medical plants exist, that can be exploited in the development of new anti-malaria drugs. The herbal remedies used may be in liquid, solid, semi- solid or vapour form (Sofoworo, 1984). Water and alcohol are usually the main solvent of extraction of the active components either by maceration, decoction, and infusion or concoction. The survey has shown that a good number of respondents still rely on traditional herbal remedies for the treatment of malaria. It has continually been relied upon by these people who refused to be swayed in spite of criticisms and the trend modern medicine, because these traditional herbs have been working for them. The major reasons have been that they are the only source of medicine available to them. Also, the herbs are cheaper and the herbalists and the plant materials for herbal preparations are readily accessible to the people.

The survey identified 21 plant species from 18 families which were used for the treatment of malaria in the study area. Presently, it is important that a developing nations like Nigeria to document uses of medicinal plants in all communities, which are still largely explored. This is because of old folks area usually custodians of such information and with the fast disappearance of traditional cultures and natural resources arising from urbanization and industrialization of these areas, such information could be lost forever (Igoli et al., 2003). Documentation of this kind of information will be beneficial in general healthcare, ecological control, forest conservation of endangered species, research and providing leads to plants with useful medicinal properties.

The prescriptions were both mono-plant and poly-plant, with poly-plant prescription dominating. Although none of the identical recipes were administered on any patient to

Table 2. Medicinal plant species used in treating malaria.

S/No	Family	Species	Common name	Local name	Parts used
1	Meliaceae	<i>Azadirachta indica</i>	Neem	Dogoyaro	Leaves
2	Anonaceae	<i>Uvaria chamae</i>	Finger root	Mmimiohia	Bark, leaves and root
3	Asteraceae	<i>Vernonia amygdalina</i>	Bitter leaf	Onugbu	Leaves and young stem
4	Compositae	<i>Aspillia Africana</i>	Haemorrhage plant	oranjila	Leaves
5	Asclepidiceae	<i>Gongronema latifolium</i>	Amaranth globe	Utazi	Leaves
6	Solanaceae	<i>Solanum</i> spp.	Garden egg	Anara	Leaves
7	Euphorbiaceae	<i>Manihot esculentum</i>	Cassava stem	Akpu	Leaves
8	Anacardiaceae	<i>Anacadum occidentale</i>	Cashew	Cashew	Leaves and bark
9	Fabaceae	<i>Pterocarpus santalinoides</i>	Red sandal wood	Ntururopa/mbori	Leaves
10	Cactaceae	<i>Cactus opuntia</i>	Prickly pear	Ujuju	Leaves
11	Anacardiaceae	<i>Mangifera indica</i>	Mango	Mangoro	Leaves and bark
12	Caricaceae	<i>Carica papaya</i>	Pawpaw	Mbimbi, okpurukwa	Leaves, seeds
13	Labiataeae	<i>Ocimum gratissimum</i>	Scent leaf	Nchanwu	Leaves
14	Myrtaeae	<i>Psidium guajava</i>	Guava	Gova	Leaves
15	Poaceae	<i>Cymbopogon citrates</i>	Lemon grass	Achara tea	Leaves
16	Rutaceae	<i>Citrus aurantifolia</i>	Lime	Oroma nkirishi	Leaves, skin of fruit
17	Bromeliaceae	<i>Ananas comosus</i>	Pineapple	'Akwu olu'	Skin of fruit
18	Myrtaeae	<i>Eucalyptus citriodora</i>	Eucalypt, lemon scented gum		Leaves and bark
19	Poaceae	<i>Bambusa vulgaris</i>	Indian bamboo	Atosi	Leaves
20	Euphorbiaceae	<i>Phyllanthus amarus</i>	Wonder plant	Enyikwonwa, Ngwu	Leaves
21	Fabaceae	<i>Caesalpinia pulcherrima</i>	Pride of Barbados		Bark, seeds and leaves

Table 3. Recipes, preparation, mode of administration and dosage of the medicinal plants used for malaria treatment.

S/No	Recipes	Mode of preparation	Administration and dosage
1	<i>Azadirachta indica</i> , <i>Ocimum gratissimum</i>	Leaves washed and pounded or squeezed and the juice filtered	The filtrates is taken twice daily
2	<i>Citrus aurantifolia</i>	Leaves washed and boiled in water. The juice from the fruit is squeezed and separately too	300 ml of the tisane is taken once a day and 10 ml spoonful of the squeezed juice is taken 3 times daily
3	<i>Carica papaya</i> , <i>Psidium guajava</i> , <i>Eucalyptus</i> , <i>Mangifera indica</i>	Leaves washed and boiled in water for 20-50 min	300 ml of the concoction is taken twice for 10 days and the water used for bathing during the duration of treatment
4	<i>Uvaria chamae</i> , <i>caesalpinia pulcherrima</i>	Roots and bark boiled in water for 30-40 min	300 ml of the tisane is taken 2 times daily for seven days
5	<i>Mangifera indica</i> , <i>citrus aurantifolia</i>	Roots and leaves boiled in water for 50 min	300 ml of extract is taken 3 or 4 times daily for 5 days
6	<i>Pterocarpus santalinoides</i> , <i>caesalpinia</i>	Leaves washed and boiled in water for 20-30 min	The filtrate is taken twice daily
7	<i>Cymbopogon citrates</i> , <i>Eucalyptus citriodora</i> , <i>phyllanthus amarus</i>	Macerate fresh leaves in water.	300 ml of extract is taken 3 or 4 days times daily for 10 days.

Table 3. Continueus.

8	<i>Ocimum gratissimum</i>	Leaves washed and pounded or squeezed and the juice filtered	Drink the filtrate until malaria symptoms disappear.
9	<i>Bambusa vulgaris, uwaria chamae, cymbopogon citratus</i>	Make aqueous decoction of mixed fresh leaves	300 ml of the decoction is taken 4 times daily until symptoms disappear
10	<i>Azadirachta indica, carica papaya, psidium guajava, eucalyptus citsodora, mangifera indica</i>	Leaves sun-dried and then pounded and mixed with water then filtered	300 ml of the filtrate is taken twice daily for 7 days
11	<i>Carica papaya, mangifera indica</i>	Leaves wash and boiled in water for 30 min	300 ml of the concoction is taken twice daily for 10 days
12	<i>Cymbopogon citrates</i>	Leaves washed and boiled water is added to it and let for 10-50 min	300 ml of the infusion is taken 2 times daily until symptoms disappear
13	<i>Gongronema latifolium</i>	Leaves washed and pounded or squeezed and the juice filtered	300 ml of the filtrate is taken until symptoms disappear
14	<i>Anacadum occidentalis</i>	Leaves washed and boiled in water for 20-50 min	300 ml of the tisane is taken once a day for 1 week or until the symptoms disappear
15	<i>Aspilla Africana, bambusa vulgaris</i>	Leaves washed and pounded or squeezed and the juice filtered	Taken or rubbed on forehead until the fresh symptom disappears
16	<i>Vernonia amygdalina, gongronema latifolium</i>	Leaves washed and pounded or squeezed and juice filtered	300 ml of the concoction is taken for 10 days
17	<i>Solanum spp., pterocarpus santalimoides</i>	Leaves washed and boiled in water for 5 min	300 ml of the concoction is taken for 2 weeks
18	<i>Solanum spp.</i>	Leaves washed and pounded or squeezed and the juice filtered or eaten raw	The filtrate is taken twice daily or eaten raw for 1 week
19	<i>Gongrononama latifolium</i>	Leaves washed and boiled in water, 20-50 min	Take 3 times daily until the symptoms disappear
20	<i>Psidium guajava, citrus aurantifolia, carica papaya, Annana comosus</i>	Leaves washed and boiled in water for 20-50 min	300 ml of the concoction is taken once a day for 7 days and the water used for bating during the duration of treatment.
21	<i>Citrus aurantifolia, cymbopogon citrates, eucapyptus citrissodora, psidium guajava.</i>	leaves washed and boiled for 50 min	300 ml of the concoction is taken once a day for 7 days and the water used for bathing during the duration of treatment
22	<i>Azadirachta indica, psidium guajava, carica papaya</i>	Leaves washed and boiled in water for 30-50 min	300 ml of the concoction is taken twice for 7 days
23	<i>Cactus opunita</i>	Leaves sun-dried and pounded, the mixture is poured into cold water and left to stand for 5 min and then filtered	300 ml of the decoction is taken daily
24	<i>Manihot esculentum</i>	Root washed and eaten raw	Taken once daily for 5 days
25	<i>Pterocarpus</i>	Leaves washed and boiled in water for 20-30 min	300 ml of the filtered will be taken 3 times daily for 3 days

test the efficacy, the fact that the herbalists are well patronized suggests the recipes may indeed be efficacious and safe, most practicing respondents claimed that their patients were completely cured and clients claimed complete relief following treatment. It is worthwhile to note

that in this survey, no attempt was made to screen plants phyto-chemically, but possible compositions contained in these plants were obtained from literature, since the primary focus of survey was to document plants and recipes derived from the plants used in the treatment of malaria in the

study area.

CONCLUSION AND RECOMMENDATION

Considering the fact that most of these useful

Table 4. Reported composition of medicinal plant used in treating malaria in eight local government areas in Abia State.

S/No	Plant materials	Tissue/parts used	Class of compound	Reference
1	<i>Azadirachta indica</i>	seeds	Limonoids	Gbeassor et al. (1996)
2	<i>Bambusa vulgaris</i>	Available literature none reported	Anthraquinone, glycoside, alkaloids, flavonoids	Tekpetey et al. (2008), Malligeswari and Suseela (2011)
3	<i>Carica papaya</i>	Latex roots	Alkaloids glycosides	Burkill (1985), Ekpendu (2000)
4	<i>Citrus aurantifolia</i>	Fruits and leaves	Vitamin glycosides, essential oils, limonene	Burkill (1997)
5	<i>Ananas comosus</i>	Leaves, fruits and roots	Bromelina, alkaloid	Burkill (1985)
6	<i>Cymbopogon citrates</i>	Leaves	Alkaloid	Ogie-odia et al. (2010)
7	<i>Eucalyptus citridora</i>	Leaves	All major compounds except amines	Pathmanathan et al. (2010)
8	<i>Mangifera indica</i>	Stem bark	Tannins	Garrido et al. (2001), Githens (1994)
9	<i>Ocimum gratissimum</i>	Whole plant	Essential oils	Edeoga et al. (2006), El-Said et al. (1969)
10	<i>Psidium guajava</i>	Leaves	Gingerol glycosides	Gbeassor (1996)
11	<i>Uvaria chamae</i>	root	Alkaloids, tannins	Okwu and Iroabuchi (2009)

plants are grown in the wild, and the fact that the numerous human activities of man in an attempt to exploit natural resources constitute big problems in destruction of these plants, there is urgent need to map out strategies for conservation of these plants to avoid their extinction in the nearest future.

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