

ETHNOBOTANICAL SURVEY OF SOME ANTIMALARIAL MEDICINAL PLANTS, THEIR THERAPEUTIC PREPARATION AND ADMINISTRATION IN ABIA STATE, SOUTHEASTERN NIGERIA

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ABSTRACT

An ethnobotanical survey of medicinal plants used for the treatment of malaria in Abia State, Southeastern Nigeria was carried out using questionnaire and oral interviews of practicing orthodox medicine dealers and patrons. Results indicated that 23 plant species belonging to 18 families were identified. Investigations on the plant part(s) used and mode of preparation and administration indicated that irrespective of plant and part(s) used, water was the main medium for all medicinal preparations. Treatment regimes generally included drinking the aqueous preparation until symptoms disappear. Although the anti-malarial efficacy of the plants described in this paper is not known with certainty, this survey adds to the efforts of the World Health Organization (WHO) in the search for natural antimalarials and provides a basis for future research on these plants.

Keywords: Ethnobotanical Survey, Medicinal Plants, Orthodox Medicine, Antimalarials.

INTRODUCTION

Medicinal plants are used throughout the developed and developing countries as some remedies, over-the-counter drug products, and raw materials for pharmaceutical industries (Rahaman and Choudhary, 1999). Nigeria flora contain 7,349 species of higher plants alone (Heppler, 1972) and have made serious impacts on the health and wealth of Nigeria (Gbile and Adesina, 1986) and could be a significant source of foreign exchange for the country (Mann, bate, Umar, 2003). Many of the Nigerian medicinal plants are collected in the wild, and only a few are cultivated domestically (Saganuwan, 2009).

Over 80% of the world's population uses herbs as their primary source of medication (Farnsworth *et al.*, 1985; Farnsworth and Sacjarto, 1991; Cordell, 2000). These plants, which represent a substantial proportion of the global drug market (WHO, 1998), contain phytochemicals, bioactive compounds used to maintain health and treat diseases in many parts of the World (Remillard and Wynn, 2005). Indeed, traditional medicine systems that use medicinal plants are part of the National Health Care System in several countries, including China, Gambia, India, Ethiopia, Zambia, Cameroon, Ghana, Congo, and Nigeria, among others (Adepoju, 2005). For example, in China, about 40% of the total medicinal care is attributed to traditional medicine, and in Vietnam, 80% of the therapy is completed using folk medicine (Hoareau and Edgar, 1999). The World Health Organization (WHO, 1998) has recognized medicinal plants as any plant in which one or more of the plant organs contain substances that can be used for therapeutic purpose or are precursors for the synthesis of useful drugs (Mann *et al.*, 2003).

Malaria has continued to be the most dreaded infection in tropical areas of the world. In Africa alone, the infection rate for malaria is estimated at over one hundred million people annually (Ransome-Kuti, 1990) and remains the leading causes of morbidity and death in Nigeria (Ekanem, 1990). In areas where the disease is common, the greatest impediment to malaria treatment has been the increasing problem of drug resistance, occasioned by lack of faithful compliance of conventional antimalarial drugs prescriptions and self-medication by most infected persons (UNDP/World Bank/WHO, 2000). In many indigenous African communities, these actions are compounded by the absence of basic infrastructure (including hospitals), crushing poverty, and cultural beliefs. Traditional knowledge and the use of plant-based medicines remain important in the prevention and treatment of malaria in Nigeria. The purpose of this research was to document information on the plants used by the Igbo speaking people of Abia State, Southeastern Nigeria for treatment of malarial fever.

MATERIALS AND METHODS

The study was carried out in Abia State Southeastern Nigeria (Latitudes $5^{\circ}47^1$ and $6^{\circ}12^1$ N and Longitude $7^{\circ}23^1$ and $8^{\circ}02^1$ E). The rainfall ranged from 1860mm to 2600mm and the mean annual temperature varied from 25°C to 28°C . While humidity ranged from 65 to 80. The soil type is of oxisol with an excellent granular and is slightly acidic. An ethnobotanical survey was conducted in Abia State in Southeastern Nigeria, using oral interview and questionnaire. Abia State is an Igbo speaking state in Nigeria. To ensure effective survey coverage,

the study area was divided into three agricultural zones of the state (Table 1) and selected sample population was, principally, traditional medicine practitioners or herbalists (also known as native doctors or traditional healers). In a few cases farmer, hunters and traders (> 55 years old), that patronized these "doctors" at one time or another were also interviewed. Information sought in the questionnaire and during the interview included the following: local names for plant (s) and part (s) used in medical practices, modes of extraction and preparation, state of part (s) used (fresh, dried, or powdered), and availability (occurrence) of the plant (s). Subsequently, the interviewees were accompanied to the field to ensure identification and collection of the plant specimens. Collected specimens were identified systematically at the Department of Forestry and Environmental Management, Michael Okpara University of Agriculture, Umudike, using the floras of Keay *et al.*, (1964), Hutchison and Dalziel (1954, 1963) and Burkill (1985).

Table 1: Ethnobotanical Surveyed Agricultural Zones of Abia State

Zone ¹	Local Government Area ²
Ohafia	Isiukwuato, Ohafia, Bende, Arochuku and Umunneochi
Umuahia	Umuahia North, Umuahia-South, Ikwuano, Isiala Ngwa North and Isiala Ngwa South
Aba	Aba North, Aba South, Osisioma Ngwa, Obingwa, Ukwu East, Ukwu West and Ugwuagbo

¹Sampling sites in Abia State

²Each area represents the smallest administrative units in Nigeria. Each has a population of approximately 160,000.

RESULTS

Of the 300 questionnaires issued across the three zones, 278 were returned for an overall response rate of 93 percent. Oral interviews were also done with those returning the questionnaires (Table 2). Based on the questionnaires returns and interviews, the presence and usage of medicinal plants used in anti-malaria plants in Abia State of Southeastern Nigeria, details on the preparation modes and treatment regimes could also be summarized (Table 3). No phytochemical screening was done on any of the plants.

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Table 2: Response Rate for Ethnobotanical Survey

Zone	Respondents		Response rate (%)
	Farmers/Hunters/Traders	Herbalists	
	- (number responding) ¹ -		
Ohafia	18	76	94
Umuahia	16	70	86
Aba	19	79	98
Total	53	225	93

¹ A total of 100 questionnaires were sent to each zone.

Table 3: Medicinal Plants of Antimalarial Value and Preparation in Abia State, Nigeria.

Plant material family, genus, species & (English name)	Vernacular name (s)	Availability	Plant part (s) used	Mode of preparation	Administration
Poraceae <i>Cymbopogon citratus</i> (Lemon grass)	Acharatii	Available in all zones, scarce plant, cultivated	Aerial part (leaves)	Make decoction	1 tea cup 3x daily
Anacardiaceae <i>Mangifera indica</i> (Mango)	Mangoro	Available in all zones, common plant, cultivated	Leaves	Infusion of dry leaves/decoction of fresh leaves	1 tea cup 2x daily
Caricaceae <i>Carica papaya</i> (pawpaw)	Ogworo-bekee, Okpoaru	Available in all zones, common plant, cultivated	Root, leaves & unripe fruit	Infusion of leaves, decoction of leaves and unripe fruit	1 tea cup 3x daily
Meliaceae <i>Azadirachta indica</i> (Neem)	Akumsirop	Available in all zone, scarce plant, cultivated	Leaves	Infusion/decoction	1 tea cup 3x daily
Asteraceae <i>Chromolaena odorata</i> (Siam weed)	Ahikia-awolowo, Manimugebi	Available in all zones, common plant, collected wild	Leaves/whole plant	Infusion/decoction	1 tea cup 2x daily
Anacardiaceae <i>Anacardium occidentale</i> (Cashew)	Kashuu	Available in all zones, scarce plant, cultivated	Leaves/bark	Decoction	1 tea cup 2x daily
Myrtaceae <i>Psidium guajava</i> (Guava)	Gova	Available in all zones, common plant, cultivated	Leaves	Decoction	1 tea cup 3x daily
Meliaceae <i>Khaya senegalensis</i> Mahogany	Iroko	Available in all zones, scarce plant, collected wild	Leaves/bark	Decoction	1 tea cup 2x daily
Asteraceae <i>Vernonia amygdalina</i> (bitter leaf)	Olugbu, Onugbu	Available in all zones, common plant, cultivated	Leaves, stem	Infusion/decoction	1 tea cup 3x daily
Leguminosae <i>Dialium guineense</i> (Velvet tamarind)	Icheku, Nkwa	Available in Ohafia & Aba Zones, scarce plant, collected wild	Leaves/bark	Decoction	1 tea cup 2x daily

Asclepiadaceae <i>Gongronema latifolium</i>	Utazi	Available in all zones, scarce plant, cultivated	Leaves/stem	Infusion/decoction	1 tea cup 3x daily
Annonaceae Annona muricata (soursop)	Chopchop	Available in all zones, scarce plant, cultivated	Leaves, bark, roots & unripe fruit	Decoction	1 tea cup 3x daily
Bignoniaceae <i>Spathodea campanulata</i> (fountain tree)	Imi-ewu	Available in Ohafia & Aba zones, scarce plant, collected wild	Stem bark	Decoction	1 tea cup 2x daily
Labiatae <i>Hyptis suaveolens</i> (Bush tea)	Nchuwaohia	Available in Ohafia & Aba zones, scarce plant, collected wild	Leaves	Infusion/decoction	1 tea cup 3x daily
Lecythidaceae <i>Pterianthus macrocarpus</i> (Pterianthus)	Anwushi	Available in Ohafia & Aba zones, scarce plant, collected wild	Leaves	Infusion/decoction	1 tea cup 3x daily
Burseraceae <i>Dacryodes edulis</i> (African pear)	Ube	Available in all zones, common plant, cultivated	Leaves	Decoction	1 tea cup 2x daily
Bignoniaceae <i>Newbouldia laevis</i> (fertility tree)	Arifu	Available in all zones, scarce plant, cultivated	Stem bark, leaves	Decoction	1 tea cup 2x daily
Apocynaceae <i>Alstonia boonei</i> (Alstonia)	Egbu	Available in all zones, scarce plant, collected wild	Stem bark, leaves	Decoction	1 tea cup 3x daily
Leguminosae <i>Pentaclethra macrophylla</i> (African oil bean)	Ugba	Available in all zones, common plant, collected wild	Bark	Decoction	1 tea cup 3x daily
Lauraceae <i>Persea Americana</i> (Avocado pear)	Ubebekee, Ubeoyibo	Available in all zones, scarce plant, cultivated	Leaves	Decoction	1 tea cup 2x daily
Rutaceae <i>Citrus aurantifolia</i> (lime)	Oromankirisi, Epentiti	Available in all zones, scarce plant, cultivated	Leaves, Fruits	Decoction	1 tea cup daily
Moraceae <i>Milicia excelsa</i> (iroko)	Oji	Available in all zones, scarce plant, collected wild	Roots, Leaves, Bark	Infusion/decoction	1 cup daily
Bromeliaceae <i>Ananas comosus</i> (pineapple)	Nkugbo	Available in all zones, scarce plant, cultivated	Unripe fruit	Decoction	1 tea cup 3x daily

DISCUSSION

This survey revealed majority of identified plants used widely in Abia State, Nigeria for the treatment of malaria. Water was the common extraction solvent either by infusion or decoction. Administration of preparations was mainly by drinking cupfuls of the extract one to three times a day. In the course of interviewing respondents, a good number of the plants and mode of preparation

described were clearly indigenous to the people of Abia State. Although none of the preparation of identified plants was administered on any patient to test efficacy, the fact that the herbalists are well patronized suggests the plants may indeed be efficacious and safe. Most practicing respondents claimed their patients were completely cured and clients claimed complete relief following treatment. The attention and recognition being accorded traditional medicine practitioners across Africa and elsewhere by local government and other agencies, such as the World Health Organization (WHO), is an indication of some confidence in claims of herbalists of formulations that cure and invigorate the natural defenses of the body. Moreso, the claims in this study of the people of Abia State have not been scientifically proven, meaning further investigations are needed to establish authenticity. Apart from efficacy tests, phytochemical screening of medicinal plants is usually required to establish the nature of the active ingredients in the plants. No such screening was done in the present study. As the World Health Organization increases efforts to locate new anti-malarial drugs that can offset the resistance of malarial parasites to synthetic drugs, indigenous knowledge of traditional groups such as the Abian becomes valuable for identifying new anti-malarial compounds. Such plant material could contribute to effective new drugs or supplements for existing synthetic drugs.

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