



# Ethnomedicinal plant species commonly used to manage arthritis in North-West Nigeria

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## ABSTRACT

Arthritis is one of the leading causes of disability among millions of people in Nigeria. The limitations in the use of conventional analgesic and anti-inflammatory drugs for the management of arthritis include their exorbitant costs, adverse effects and inability to permanently resolve the cases hence the need for alternatives. Research on herbal remedies effective for the management of arthritis has grown in recent years in a bid to find leads for new bioactive compounds. This study was aimed at documenting and validating medicinal plant species used traditionally in North-West Nigeria for the management of arthritis. As a preliminary step in a series of proposed studies, semi-structured questionnaires were used to gather ethnobotanical and sociodemographic data from 112 traditional medicine practitioners in twenty-four local government areas across Kaduna, Kano, Jigawa and Katsina States. Information collected included the plant species and parts used, common/vernacular names of the plants, methods of preparation/administration and toxicity of the plant species. An extensive literature survey was thereafter done to check the veracity of the claims. A total of 30 plant species belonging to 18 plant families were documented. The leaves were the most commonly used plant part given as oral decoctions. *Annona senegalensis* and *Boswellia dalzielii* were the plant species with the highest relative frequency of citation. Approximately 66% of the listed plant species were found to have similar ethnomedicinal uses in some other African States and 85% have been reported to be pharmacologically active in the literature surveyed. Knowledge on the use of these plants were mainly communicated orally from generation to generation. Lack of proper documentation can lead to loss of the traditional medicinal knowledge and resources threatening the sustainability of rural healthcare systems. Integration of some of these plant species into orthodox medicine may produce better therapeutic effects in reducing disabilities and loss of income in impoverished African states.

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## 1. Introduction

Arthritis is a sudden or gradual inflammation of one or more joints (Athanasiou et al., 2013). There are over 100 types of arthritis of which osteoarthritis (degenerative joint disease) and rheumatoid arthritis are most common (March et al., 2014). Pain, which varies in severity, is a common symptom of the disease. Other symptoms include stiffness, swelling and decreased range of motion of the affected joints (March et al., 2014). The decrease in mobility makes it difficult for a person to remain physically active, contributing to an increased risk of obesity and vulnerability to cardiac disorders (Tonsey, 2017). This can have extensive impacts on quality of life, with loss of productivity leading to loss of sources of income. For people living in rural areas, this is a big problem as many jobs involve some level of manual labour

and resource-starved African states such as Nigeria can afford only limited to no welfare support for disabled persons (Mody, 2009; Dowman et al., 2012). Globally, osteoarthritis accounts for half of all chronic conditions in persons over 65 years of age and the prevalence is expected to rise significantly in the coming decades due to increasing life expectancy. In Nigeria, osteoarthritis is the most common cause of disability and affects approximately 8 million people which portends a mounting public health burden (Akinpelu et al., 2009).

Despite considerable progress in the treatment of arthritis using nonsteroidal anti-inflammatory drugs and other chemotherapeutic agents, the unpleasant adverse effects associated with these drugs (cardiovascular, gastrointestinal and renal adverse effects) and the inability of the drugs to provide long-term remission is problematic (Crofford, 2013). These concerns have sparked renewed interest in traditional herbal remedies. Herbal medicines are accessible, affordable, culturally and socially acceptable and easy to prepare, hence, a lot of people prefer taking them to the more highly priced orthodox medicines (Wambugu et al., 2011). Moreover, herbal medicines are an important part of the culture and traditions of the African people (Wambugu et al., 2011).

Abbreviations: LGA, local government area; RFC, relative frequency of citation; TMPs, traditional medicine practitioners.

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Knowledge about the use of individual plant species varies between localities in Africa and scientific validation of their uses may increase the range of plant species available for management of arthritis, fully exploit their potentials as sources of medicines and reduce the burden substantially on plant species that are at risk of extinction. This study aims to document and validate indigenous plant species used for the management of arthritic conditions by traditional medicine practitioners (TMPs) in North-West Nigeria.

## 2. Materials and methods

### 2.1. Description of the study site

Nigeria is divided into six geopolitical zones among which economic, political and educational resources are shared (Eze et al., 2014) (Fig. 1). North-West Nigeria comprises seven states, namely, Sokoto, Kebbi, Zamfara, Katsina, Kaduna, Kano and Jigawa States (Fig. 1). The zone occupies a land mass of about 214,395 km<sup>2</sup>, lies between longitude 12° 10' North and latitude 6° 15' East. Based on the 2006 National Census, North-West Nigeria is the most populated geopolitical zone with 35,786,944 people.

There are two climatic seasons; the wet season which lasts from April to October and the dry season which lasts from November till March. The dry season commences with harmattan, a dry chilly spell that lasts till February and is associated with lower temperatures. February to March, is the hottest period of the year and temperature ranges from 33 to 41 °C. In line with rainfall distribution, the drier North-West zone has the sahel savanna vegetation.

As a preliminary step in a series of proposed studies, ethnobotanical surveys were conducted in four of the seven states in North-West Nigeria, namely, Kaduna, Kano, Katsina and Jigawa States. The four states have 128 local government areas (LGAs) of the 774 LGAs in Nigeria. Each LGA is administered by a local government council consisting of a chairman and other elected members known as councilors. Every LGA is further subdivided into 10–15 wards. Twenty-four LGAs were surveyed and these were chosen based on the presence of large numbers of well-known TMPs and ease of access to the study site by the research team.

### 2.2. Ethnobotanical survey and data collection

The ethnobotanical survey involved the use of participatory epidemiological approaches (interviews, questionnaires and focused group discussion) involving the LGA councilors and TMPs.

#### 2.2.1. Ethnobotanical workshop

Pilot field studies using rapid community participatory appraisal were conducted. Preliminary data was obtained with regard to the socio-economic and geographical aspects of the region, all of which culminated in an ethnobotanical workshop organized by the Nigeria Natural Medicine Development Agency for TMPs in Kaduna and Kano States (Fig. 2). Eighty-six well-known TMPs were selected to participate in the ethnobotanical workshop based on their long practice in providing traditional health care services to their communities. The purpose of the workshop was to serve as a platform for the research team to identify prominent TMPs active in traditional medicine practice that could be interviewed (Fig. 2). The chairman of the National Association of Traditional Medicine Practitioners assisted in obtaining prior informed consent from the TMPs and thus helped to create trust and ease the interview process.

#### 2.2.2. Interviews

A validated semi-structured questionnaire was used to obtain information on medicinal plant knowledge and utilization with special emphasis on chronic joint pains (osteoarthritis and rheumatoid arthritis). A total of 112 TMPs were interviewed and they were assured that their responses would remain confidential and would only be used for research purposes. The interviews were conducted in Hausa and Fulfulde (native languages in the area) with the help of an interpreter and voice recording was done (Fig. 3). Questions asked focused on the sociodemographic profile of the TMPs and their knowledge of medicinal plant species. Such questions included TMPs name and surname, sex, age and educational level; origin of knowledge (from parents, learned, others) and main symptoms treated.

Information on the plant species included name of plant species used for inflammation/chronic joint pains, the common/vernacular names of the plants, plant parts used (e.g. roots, leaves, seeds, flowers, stems or others), the methods of preparation (e.g. decoction, infusion,

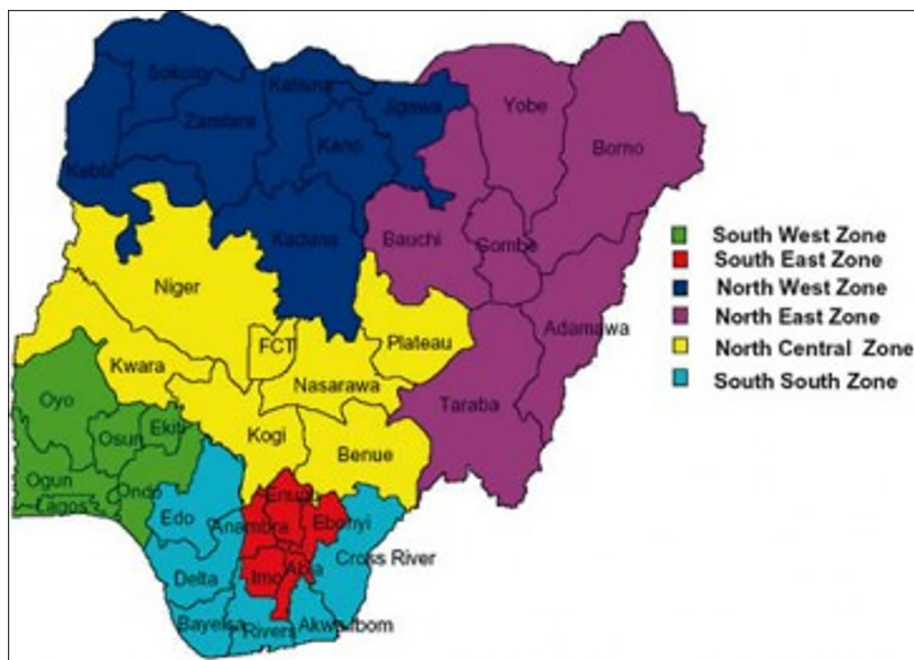


Fig. 1. Map of Nigeria showing the six geopolitical zones, North-West Nigeria is coloured dark blue (nigerianbestforum.com). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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