Journal of Ethnopharmacology ∎ (∎∎∎∎) ∎∎∎–∎∎∎

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jep

An ethnobotanical survey of antidiabetic plants used by Hausa–Fulani tribes in Sokoto, Northwest Nigeria

Tijjani Salihu Shinkafi [a,b], Lawali Bello [b], Sanusi Wara Hassan [b], Shakir Ali [a,*]

[a] Department of Biochemistry, Faculty of Science, Jamia Hamdard, New Delhi 110062, India
[b] Department of Biochemistry, Usmanu Danfodiyo University Sokoto, PMB 2346, Nigeria

ARTICLE INFO

Article history:
Received 10 March 2015
Received in revised form
2 June 2015
Accepted 10 June 2015

Keywords:
Antidiabetic
Traditional medicine
Ethnobotanical survey
Nigeria
Hausa
Fulani

ABSTRACT

Ethnopharmacological relevance: Sokoto is known for its diverse traditional medicinal wealth and international market of traditional medicines in Africa. However, information of the folk knowledge, especially for the treatment of diabetes, is not documented.
Aim of the study: This survey identified and documented the information on traditional medicinal plants used by Hausa–Fulani community of Sokoto for the treatment of diabetes.
Materials and method: Demographic data and information about the medicinal plants were collected via administration of semi-structured oral questionnaires. Willing herbal medical practitioners/traditional healers were interviewed. The medicinal plants mentioned by herbalists were collected and authenticated by a taxonomist and the voucher specimens were preserved.
Results: Fifty one informants across the state divulged information on traditional medicinal plants and practices used in diabetes and revealed 54 species, belonging to 33 families, with *Cassia sieberiana* being cited the most (19 times) and ranked first (39%). *Azadirachta indica*, *Ficus exasperata* and *Schwenckia americana* ranked second (15%), each cited 8 times.
Conclusion: The survey documented the rich wealth of knowledge and usage of plants for the treatment of diabetes in Sokoto. The paper will not only serve as a source of information but will also help to make the knowledge accessible for further drug screening and development, and at the same time underlines the need for biodiversity conservation of this traditional wealth.

1. Introduction

Diabetes is a major life threatening disease all over the world. It is seen as a complex and rapidly growing problem that results in shortage or lack of insulin secretion and/or reduced sensitivity of tissue to insulin (WHO, 2006). The World Health Organization (WHO) has defined diabetes as primarily a condition associated with hyperglycemia that gives rise to microvascular damage including retinopathy, neuropathy and nephropathy (WHO, 2006). According to the WHO projections, diabetes will be the 7th leading cause of death by the year 2030 (Mathers and Loncar, 2006). Its prevalence has been increasing over the past few decades, which may be attributed to a number of factors such as obesity, change due to urbanization, and sedentary lifestyle (Ginter and Simko, 2010; Hu, 2011; Wu et al., 2014; Gutch et al., 2014). According to an estimate, there were about 382 million peoples with diabetes in 2013, in addition to 316 million with impaired glucose tolerance that were at a high risk from the disease. The number of people with diabetes by the year 2035 is alarmingly expected to reach 471 million (IDF, 2013). Also, the global prevalence for adults between 18 years and above who suffered from diabetes during the year 2014 was 9% (WHO, 2012; IDF, 2013). In Africa, where diabetes was once rare, 19.8 million peoples suffered from diabetes in 2013, and the figure is expected to rise to 41.5 million by 2035 (Peer et al., 2014). This is undoubtedly an alarming figure that shows close to 50% of the African people are suffering from diabetes. Epidemiological data from International Diabetes Federation (IDF, 2013) on the prevalence of diabetes ranked Nigeria first in African region with about 4 million people suffering from the disease and the figure is expected to double by the year 2035. Several reports indicate that the disease is on increasing trend with more than 80% cases of death mostly coming from low and middle income countries (WHO, 2014a, 2014b).

In Africa, patients rely mostly on complementary and alternative medicine (CAM) as well as other beliefs and methods to cure diabetes since most of the conventional drugs are either

* Corresponding author. Fax: +91 11 26059663.
E-mail address: sali@jamiahamdard.ac.in (S. Ali).
URL: http://orcid.org/0000-0002-1231 (S. Ali).

http://dx.doi.org/10.1016/j.jep.2015.06.014
0378-8741/

costly or not available (Matheka and Demaio, 2013). African traditional system of medicine is considered to be the oldest and diversified of all the known therapeutic systems (Mahomoodally, 2013). WHO has mentioned that up to 80% of African population relies on traditional medicine in meeting some of their health care needs (WHO, 2008). Historically, plants have been traditionally used for ages to cure ailments. Today, over 70% proportion of patients and healthcare providers in the world rely on herbal medicines directly or indirectly for meeting their health care needs (Wills et al., 2000; Sofowora et al., 2013). A large number of active ingredients in medicinal plants, phytochemicals, have been isolated and proved to be responsible for their pharmacological actions and efficacy (Mukherjee et al., 2010). Some of these are reported for several therapeutic effects, including antidiabetic (Andreu et al., 2005), antibacterial, antiplasmodial (Talontsi et al., 2013), antiviral (Zhang et al., 2014) and many other effects. Knowledge of medicinal plants/herbs in the developing world and their usage in the management of diseases is popular especially among the traditional medical practitioners (TMPs) and is usually retained and transferred among the family members generation upon generation. The efficacy claims of these medicinal plants, however, remain to be elucidated and scientifically validated due to the lack of information and suitable screening/bioassays, thus compromising the acceptability of these herbs being traditionally used for centuries by TMPs.

Nigeria, the most populous country in the African continent with a population of over 160 million, is divided into six geo-political regions (North Central, North East, North West, South South, South East and South West) with 36 states and a total of 774 local government areas (Millar et al., 2014). The country has more than 250 different ethnic groups living together. Among the ethnic groups, Hausa and Fulani are the two major tribes which are most commonly found in the northwest of the country (Adekunle and Otolorin, 2000; Abubakar et al., 2007). Hausa–Fulani people live together sharing common norms and values, having many cultural and social resemblances. They are known to be mostly farmers and cattle rearer (Obi, 1978; Cadmus et al., 2008). The country is endowed with biodiversity of medicinal plants which are used in the African traditional system of medicine for the management of different diseases (Gbile and Adesina, 1987; Ajose, 2007). In a recent review (Lifongo et al., 2014), the economic/traditional uses of some of these medicinal plants of Nigeria have been found to be correlated with their biological activities. But much less attention has been paid to this area when compared with the plethora of information available in traditional Chinese and Indian systems of medicine. Culturally, Sokoto has a good history of herbal trade owing to the fact that the state is on the borderline of the country to the west. The state has a centralized market which attracts people from within and outside the country; thus promoting herbal trade activities in the area. There are reports indicating that the ethnic groups of Sokoto, who are mostly nomadic farmers with widespread use of traditional medicines, have low prevalence of diabetes (Sabir et al., 2013a). This ethnobotanical survey was intended to document medicinal plants which are traditionally used by the Hausa–Fulani peoples for the treatment of diabetes in Sokoto.

2. Materials and methods

In this study, five local government areas (LGAs) of Sokoto, comprising both rural and urban localities, were selected (Fig. 1). The urban localities included Sokoto North and South, and rural localities included Wamako, Kware and Rabah local government areas. Sokoto, which has a total of 23 LGAs, is located in the northwestern Nigeria with mainly Hausa and Fulani as the dominant tribes (Ebenso et al., 2001). It approximately covers 25,973 km^2 and lie between latitude 13°3′5N and longitude 5°13′ 53E, with 3,696,999 population (NPC, 2006). The state borders with Niger republic to the north, and shares boundary with Zamfara state to the south and east and Kebbi state to the west and south (Muhammad et al., 2011).

2.1. Survey design/questionnaire

The semi-structured questionnaire method (Gbolade, 2009) was used with some modifications for interviews. The targeted groups for this study were mainly herbalists and herb sellers, and traditional medical practitioners in selected local government areas. The questionnaire was divided into three sections. The first section contained personal information of the respondents such as the age, sex, religion, contact number, local tribe and nationality.

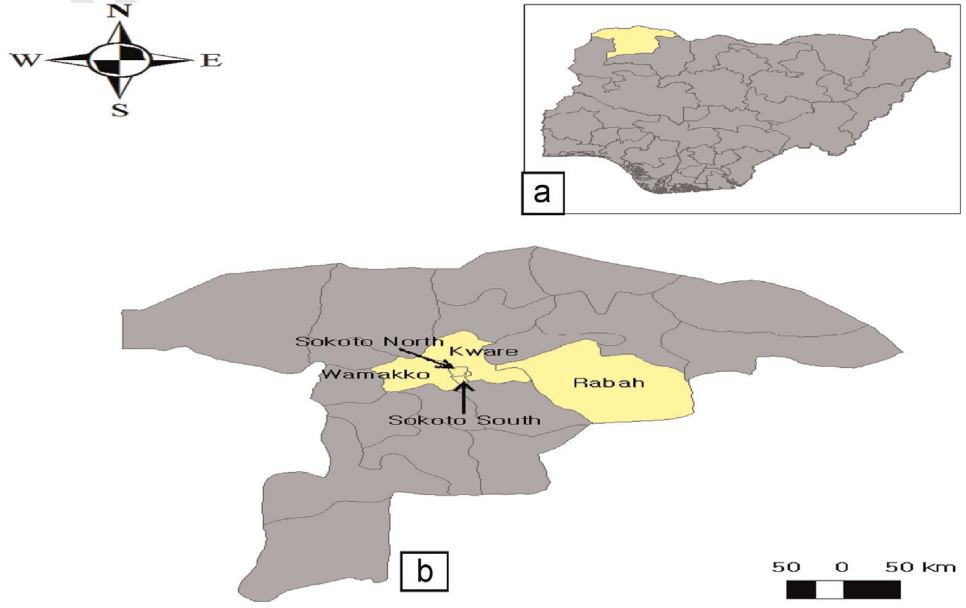

Fig. 1. The map of the study area; (a) Nigeria. (b) Study area in Sokoto showing five local government areas (shaded).

Please cite this article as: Salihu Shinkafi, T., et al., An ethnobotanical survey of antidiabetic plants used by Hausa–Fulani tribes in Sokoto, Northwest Nigeria. Journal of Ethnopharmacology (2015), http://dx.doi.org/10.1016/j.jep.2015.06.014