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Ethnopharmacological survey of Annonaceae medicinal plants used to treat malaria in four areas of Cameroon

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ABSTRACT

Ethnopharmacological relevance: Malaria endemic countries have vital resources that are medicinal plants on which their traditional medicines depend. In some Cameroonian settings, in addition to the commonly used potions from plants like *Alstonia boonei, Zanthoxylum macrophylla* and *Mangifera indica,* other herbal species are being increasingly used to treat malaria. So, specialized traditional healers have developed alternative reasonably priced therapies, relying on the signs and/or symptoms of malaria. Within this framework, Annonaceae plants were found to be increasingly utilized and therefore, highlighting the need to document this traditional knowledge for better malaria control.
Materials and methods: Interview approach was used to document indigenous knowledge, usage customs and practices of Annonaceae species in the treatment of malaria in four Cameroonian areas (Yaoundé and its surroundings, Ngoyang, Kon-Yambetta and Mbalmayo).
Results: A total of 19/30 users of plants accepted to share their experiences during a semi-structured survey. Twelve of the respondents were men and seven were women. Thirty recipes based on twenty-one plants were recorded.
Conclusion: Annickia chlorantha was the only plant commonly found in the four study sites. Seven species of Annonaceae were found to be used to treat malaria, while 14 were used to treat symptoms that might be related to malaria.

1. Introduction

Malaria is the major pathology in the tropics. So despite the benefits of modern medicine, malaria remains a serious public health problem for one of the main reasons: anti-malarial drugs are generally expensive for people in endemic countries, in addition to drug resistant *Plasmodium falciparum*, which extends even to the latest drugs (Dondorp et al., 2009).

Overall, 3 billion people are at risk of malaria infection in 109 countries and territories, with infections causing disease in 300–500 million people and killing about 1 million people annually (Hay et al., 2010). Pregnant women and children less than five years are at the greatest risk of serious morbidity.

This disease is a major obstruction to socioeconomic development in endemic countries especially in Sub-Saharan Africa. It constitutes about 10% of Africa's total disease burden; 40% of its health expenditure and 30–50% of inpatient cases (World Malaria Report, 2010). Consequently, thousands of people continue to die from malaria each year and people living in endemic areas are all at risk.

Cameroon is amongst the top 18 countries where 90% of recorded deaths due to malaria occur (World Malaria Report, 2010). In daily practice, the huge majority of the Cameroonian people recognizes and utilizes the properties of several plants to combat malaria and other diseases (Tsabang, 2008). Amongst these, current trends indicate that the Annonaceae are increasingly used and have been proved to be promising source of antimalarial agents (Boyom et al., 2003, 2009, 2011a,b; Boyom, 2004).

The aim of the present study was to collect and document information on the traditional use of medicinal plants for the treatment of malaria by Bakola pygmies, Yambetta and cosmopolitan populations of Yaoundé and Mbalmayo in Cameroon. The outcome of interactions with information providers indicated Annonaceae as a promising plant family. Therefore, we have decided to report on this family. Specifically, the study sought to document the species

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Fig. 1. Study sites.

of Annonaceae used, methods of preparation and administration of the herbal remedies by the traditional herbal practitioners to treat malaria. It is hoped that the results of this study will provide the basis for further pharmacological studies that are critical for the development of alternative antimalarial drugs.

2. Methodology

2.1. Sites of study and justification

In the framework of this study, four sites were chosen in the centre and South regions of Cameroon (Fig. 1): Yaoundé and its surroundings, Kon-Yambetta, Mbalmayo (Centre region) and Ngoyang (South). The following reasons have motivated the choice of these areas.

Yaoundé area and its surroundings (1): This is an area of semi-deciduous forest strongly degraded by the population burden. It is a cosmopolitan site where people from various areas and cultures cohabit. Environmental degradation and mismanagement foster the development of malaria vectors (mosquitoes), thereby fostering the level of parasite transmission. Due to the high level of malaria transmission in this area, practicing herbal medicine is a valid source of income.

Ngoyang area (2): Ngoyang is situated at around 15 km from Lolodorf on the Eséka-Lolodorf highway. Bakola pygmies who reputedly rely on herbal medications live in this area. The vegetation consists mainly of evergreen littoral humid rain forest with *Lophira alata*.

Kon-Yambetta area (3): This site is situated at around 150 km (northwest) from Yaoundé. This area has Guinea savannah-type flora and is inhabited by yambetta, and bamoun people to a lesser extent, who principally rely on herbs to treat their ailments.

Mbalmayo area (4): Mbalmayo is located at around 55 km (southern) from Yaoundé, and is the entering gate to the South region. It is a cosmopolitan area. In addition, the National School of Water and Forestry is in Mbalmayo, and has favoured the preservation of a forest where we conducted the survey.

The survey was preliminarily based on the selection of herbal practitioners for their ability to treat malaria and/or related symptoms using herbs. Subsequently, the identification of antimalarial plants with associated recipes was achieved through face-to-face interaction with practitioners.

2.2. Identification of herbal practitioners and selection to the survey

Patients identified through a brief information survey and villages' heads were interviewed to select herbal practitioners who treat malaria successfully within their communities and to include them in the study.