

Contribution to the knowledge of Medicinal plants used in the Treatment of Arterial Hypertension by traditional Practitioners Bouar in CAR

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Abstract

This research was conducted in Bouar (Nana, Mambere). The city is located 450 km away from Bangui the capital city of Central African Republic. Bouar is a mountainous city is covered by the Yade Mountains. It is between 15 ° and 16 ° east longitude and between 6 ° and 7 ° of latitude north with an area of 26,600 km². The Bouar city occupies relatively the entire Northwest Territory, sharing border with the Republic of Cameroon and comprises about 5% of the total population. Census of the area population took place in December 2003 which was 172.754 habitants, with a density population on average of 8.8 to 10 inhabitants per km². Bouar city is endowed with immense natural resources and varied rainfall, rich soils and a basement of mining, a diverse and abundant wildlife, and a diversity of savanna. Despite all these potentials, Bouar is in a continuous cycle of impoverishment. Socio-sanitary situation continues to deteriorate, access to health care is very difficult, life has become increasingly complex with varied needs and people expect favorable actions from their leaders and efficiency in meeting their immediate needs based on the improvement of their health conditions. The objective of this paper is assessment of medicinal plants used as medicines in the treatment of hypertension in Bouar. Ethno botanical method is recognized as the safest and least expensive method of plant-based drugs on the one hand, but also to help poor farmers who can not afford modern drugs on the other. Bouar has nineteen (19) medicinal species that have been identified and belong to 14 different families with a predominance of Magnoliopsida (Dicotyledonous) on 19 species, 10 are not in the visible flora. This paper is an avenue of our modest contribution to knowledge on medicinal plants used for the treatment of sion in Bouar (Aloe vera, Voacanga africana Lophira lanceolata, Zea mays, Bambusa vulgaris, Elaeis guineensis, Bridelia ferrugenea Protea madiannesis, Lycopersicum esculentum and Capsicum Annuun). Furthermore other hypertension, treating plants are Aloe vera which treats diabetes and the madianensis protea that is used to treat epilepsy, malaria and fever. These plants are commonly used in the treatment of hypertension and other related diseases.

Keywords: Inventories, medicinal plants, high blood pressure; Bouar (Nana Mambéré).

INTRODUCTION

High blood pressure (HBP) is a chronic metabolic disorder that occurs in all people of both sexes across all age groups (Vignalou 1981). The United States is an example of the countries where occurrence of hypertension is very early and occurs in children from their second birthday (Lawrence 2000). However, in developing countries, it only becomes visible from 20 years and upwards due to lack of diagnosis in the early stages. The disease is severe among people advanced in age.

The latest statistics from 2000 showed that the disease affects 26% of the adult general population, and by 2025 this figure could reach 29% or more. Hypertension is a major public health problem worldwide as it is a asymptomatic disease and 43% of people are unfortunately not diagnosed, only 13% more people are treated adequately (Lawrence 2000). In Africa, there are no figures available for this condition because of insufficient infrastructure and lack of health personnel (abigera 2000).

According Deteix (2005), hypertension affects more than 6 million of the French population. Beyond 55 years, the prevalence of hypertension in the United States exceeds 30% among whites and 40% higher among blacks (reaching 72% among black women over 65).

The occurrence of hypertension depends both on genetic and environmental factors, especially with the amount of sodium (salt), obesity, alcohol, stress etc.

Bouar is not spared with a higher occurrence in rural and then urban areas (Kalité, 1984); and little statistical data is available. Hypertension was excluded from the Directory of health on diseases until 2002. It was from 2003 that they began counting and found 1,085 cases and 2,046 cases in 2004 (source: Ministry of Public Health and Population MSPP). This disease is characterized by lifelong treatment and that creates a lot of complications, including cardiovascular diseases (75% of deaths per year); diabetes, kidney failure, blindness, etc., and causes high morbidity and mortality (Menard and Corvol, in Hambourger et al., 1979).

Considering that at present about 75% of the African population has recourse to plants for medication and do not have access to "modern" medicine, traditional medicines discovered by early explorers of Africa provide another way of treatment .plant medication has long been introduced in many Europe societies. On the other hand it has led to great discoveries such as reserpine of *Rauvolfia vomitoria* including neurosedatives. About 40 years now, a number of studies have tried to verify the action of traditional medicines and their toxicities. Many of the used plants are as effective as the imported western drugs but unknown by the majority of the population (Pousset 2004).

The World Health Organization (WHO) has asked member countries to support research aimed at defining strategies for community-based intervention including one that uses the phototherapy (7th WHO meeting).

It appears imperative to identify and know the medicinal plants used in the treatment of hypertension. Given that the district of Bouar has an abundant and varied flora, allowing for multiplicity of recipe based plants that are used by traditional healers against hypertension. This could form the basis of usable data for other purposes therefore. This study was limited to Bouar due to a lack of resources and difficulties encountered in the field that did not allow for extension to other parts of the country.

The findings of the study are a contribution to the knowledge of medicinal plants used by traditional healers to treat Bouar hypertension. The objective is to make an exhaustive inventory of medicinal plants used in the treatment of this disease and to contribute to the research already undertaken by ACTC and University of Bangui in medicinal plants.

History and popularity of herbal medicines Herbal medicine has existed since prehistoric times. Neanderthals were buried with plants known now to have medicinal properties. They were the first people to have probably discovered these properties empirically and over the centuries, each generation has accumulated knowledge about medicinal plants. This knowledge continues to grow today in parts of the world where indigenous cultures have escaped the destructive influence of modern society.

In other countries, information on plants has been written and organized in form of long texts known as pharmacopoeia, which explains the method of preparation of each plant and how it is used for a given treatment. The choice of plants and how they are used depended on the idea of the company. For example, the Mediterranean people employed garlic to ward off evil spirits, they believed caused diarrhea, while the Chinese were using garlic to cure diseases which, according to them, was due to a disturbance spleen and kidney.

In our time, medicinal plants generate some interest for several reasons, because we believe they can keep us healthier. People with arterial hypertension gather various types of information before adopting a form of herbal medicine. They frequently rely on knowledge that had been acquired long before we discovered the existence of arterial hypertension. Many questions relating to herbal medicine remain unanswered. This reality does not surprise people with hypertension whose lives is full of unanswered questions and has to make choices without having complete information. Many people with high blood pressure constantly try herbal medicine in the hope to recover one day, that high blood pressure is a disease necessitating a lifetime treatment.

This work presents some herbal medicines which are not yet used by people with high blood pressure and summarizes each type of treatment. Our goal is not to recommend any of these therapies, but rather to provide people with arterial hypertension as a starting point that will allow them to learn more about herbal medicines.

At the end of this work, we propose suggestions that development partners (UNDP, WHO, etc. ..), decision makers (government), the University of Bangui can adopt and finally allow researchers to take account, in order to promote herbal medicine and the fight against high blood pressure, to find improved traditional medicines suitable against this disease. We believe that all the above mentioned are interested in this topic and works from different angles of research (ethno botany, etc...) in the fight against high blood pressure and create a practical guide of medicinal plants for people who are living with this disease.

EQUIPMENT

In this present research work, our equipment was only medicinal plants harvested in the course of our ethno botanical surveys, where healers have knowledge of plants that can fight against arterial hypertension.

METHODS AND MATERIEL

To address this study; that is to identify and know the medicinal plants used by traditional healers of Bouar in the treatment of high blood pressure, we choose the methods based on the following scheme:

- The identification of traditional healers;
- The harvest-verification and botanical samples;
- The retrieval.

IDENTIFICATION OF TRADITIONAL HEALERS

At the beginning of our investigations, we got close to a traditional healer in Bouar that helped us to get in touch with other healers of the locality. A total of 16 (sixteen) healers helped and welcomed us. They showed us recipes used in treatment of hypertension. They did not hesitate to give us their traditional knowledge because very often, most of the traditional healers are afraid of being expropriated by scientists without the benefit of transmitting knowledge.

Among the problems encountered worth mentioning, were; financial constraints, because most of the traditional healers required a certain amount to be paid in part for the displaying of the plants and offer of recipe and transmission of traditional knowledge and know-how, often very difficult when researchers are not from the same area as traditional healers.

HARVESTING AND VERIFICATION BOTANICAL SAMPLES

All plants were identified among traditional practitioners in our ethno botanical surveys and were identified using floras of Central Africa, the West African and structures of traditional pharmacopoeia of reference consulted.

BIBLIOGRAPHIC SEARCH

Bibliographic research allowed us to obtain information on high blood pressure and also contribute to the brief description of the plant species and their identified ecology .Finally the same literature search allowed us to make a comparison of our results with the one we have realized before.

RESULTS

A total of 19 medicinal plants were identified in Bouar in the treatment of arterial hypertension. They were classified according to the alphabetical order of families, after the scientific name of the species. We indicated vernacular names used in Bouar, the photo of the species, the brief description of the species, its ecology, its biological, as well as its phytogeographical distribution. The different recipes were indicated, dosages and other usages. Finally curative principles of some species are reported.

In the present work, we only limited ourselves to 10 species not visible in the flora and constitute our modest contribution to the knowledge of medicinal plants in treating hypertension in Bouar: these were; (Aloe vera, Voacanga africana Lophira lanceolata, Zea mays, Bambusa vulgaris, Elaeis guineensis, Bridelia ferruginea Protea madiannesis, Lycopersicum esculentum and Capsicum Annuun).

ALOACEAE

1-Aloe vera (town.)

Common name: Aloe (french)

Photo: Aloe vera

Description: crassulescente plant reaching 0.5 to 1 m high. Leaves up to 70 cm long and 10 cm wide, thick, sometimes spotted aboard prickly, pointy at the top. Lateral inflorescences, yellow, larger than the leaves. Yellow or reddish flowers (Adjanohoun et al, 1982)

Origin (Ecology): Species native North Africa, often grown as an ornamental. In some countries, it is found in grasslands and in degraded areas. The plant is often planted on graves in most Central African villages. Aloe vera is an ancient ercia cultigen and forms the basis of a very large industry mainly in Central America and the southern USA.

Biological type: herbaceous rhizomatous phanerophyte

Phytogeographical distribution: cosmopolitan

Recipe: pick 2-3 leaves, wash them and then mash adding 1.5 liters of water. Filter the macerated remains.

Dosage: Administer orally to the sick person three times per day at the rate of one tablespoon morning, noon and night.

Other uses: gelatinous extract of the leaves disinfects and soothes the stomach. It is useful in cases of gastritis and gastric ulcer. Is used as a stimulant of the gallbladder.

Externally, it relieves rashes, eczema, skin blemishes. It also relieves pain burns and festering conjunctivitis and facilitates wound healing (REINALDO, 1985). Here we also note that the macerated may be administered orally to people suffering from intestinal parasites (Ascaris, amoebas, etc.). The dosage is the same as that for a diabetic (Pousset, 2004).

Healing Principles: there are two very different activity components; gel and juice. The gel content in the parenchyma mucilaginous maybe easily separated from the outer part of the

leaves and fibers pericolic (Maret Pousset in 2004). The cosmetics industry uses more and more the gel for this property "moistening" in training bombs, lip masks, creams and sunscreens to avoid and heal burns. In both dermatitis obtained after irradiation by the rays of accidental burns, the gel speeds healing more or less according to their severity (Bunyapratsara in Pousset, 2004). Similarly, it allows faster preparation of surgical scars. It appears that the aloe gel in both cases prevents the formation of thromboxane B₂ and prostaglandin PGF₂ which are Vasoconstrictors plaquetaires and aggregation. Thus, the blood flow will be maintained and this would allow for better healing (in Pousset Robson, 2004). In addition, the aloe gel is a very good anti-inflammatory. In edema of the rat paw caused by kaolin, carrageenan, albumen, gelatin, the gel is particularly active. Oral inflammation due to ingestion of cottonseed oil is easily reduced (Davis in Pousset op-cit).

The juice is well known as a laxative that contains anthracene derivatives also known as an important development in aloe-emodin anthraquinone form inhibits herpes virus HSV-1 and HSV-2 and aloe juice that can be used in herpes labialis (Sydiskis). The juice also can be used by giving a half teaspoon in diabetic mice to decrease glycaemia after five days (Ghannam). Finally, an aqueous aloe reduces excess ethanol in the blood of rats intoxicated. The latter is due to the protection of the activity of alcohol dehydrogenase in the liver and catabolism of ethanol (Sakai, chung).

APOCYNACEAE

Voacanga africana

Vernacular name: Binse (Gbaya)

Photo: *Voacanga Africana*



Description: bush of 10 to 15m tall with legs splayed. Leaves opposite, obviated, skin the basis, acuminate the top 10 to 30cm in length and 6 to 12cm wide, lateral veins prominent, glabrous or finely pubescent to the lower face of terminal corymbs flowers often in pairs, white and fragrant. Marbled green fruit, yellow when ripe, spherical and contiguous pairs, envelope's in a yellow pulp (Pousset, 2004) seeds.

Origin (Ecology): species native, tropical Africa and Eastern widespread in the undergrowth of semi-deciduous forests. Quite rare in certain areas or it could be exploited for medicinal purposes locally common herd (Pousset, 2004).

Biological type: Mesophanerophyte.

Phytogeographical distribution: Afro tropical

Recipe: Harvest some roots and wash. Boil in two liters of water until 1.5 L of decoction and cool and then filter.

Dosage: the decoction is drunk half a glass bamboo three times a day (morning, afternoon and evening) for a week and then checks the voltage.

Other Uses: The latex is used as an external rube facient and can be applied to wounds and decayed teeth. The decoction of leaves is regarded as a tonic and anti-fatigue. Bark has a power of stomach ulcers. The root decoction is used for women to prevent preterm birth (Pousset, 2004).

Healing principles: From the bark of the trunk and roots, many alkaloids have been isolated. The main ones are Voacamine and vobtusine. Voacamine has major cardiac glycosides that are comparables properties of digital and strophatus. Voacamine voacagine are equipped with hypotensive properties. The vobtusine is a cardiac depressant, hypotensive and has sedative actions.

In ducts, the main alkaloid is tabersonine. Seeds Voacanga thouarsii contain greater than Voacanga Africana (poison) amount. Industrially tabersonine turned into Voacamine. Voacamine increases cerebral blood flow, without reducing blood pressure, decreases cerebral vascular resistance and activates the metabolic processes of the central nervous system. It confers to the brain the opportunity to capture more and better use of blood oxygen (Pousset, op.cit).

ARECACEAE

3-*Elaeis guineensis* Jacq

Common Name: Palm Oil (English) Vernacular name Mbourou (Sango)..

Photo: *Elaeis guineensis*



Description: tree grows up to 30 cm high, covered with young stipe base of petioles, becoming smooth possibly on topics most ages. Epiphytes pinnate leaves up to 7.5 m long petiole, arms down to 2 rows of spines, unisexual inflorescences produced by alternating series in males, 3 sepals, Flowers females larger than males have ovarian curved stigmata. Fruits are ovoid or somewhat angular, often red and glossy black at maturity. Part fiber outside is rich in oil, inside hard part welded to the spontaneous seed in Equatorial Africa (Pousset, 2004).

Ecology: This species is currently cultivated in the tropics; you can also find it on more or less waterlogged soils.

Biological type: Mesophanerophyte

Phytogeographical distribution: Tropical Africa

Recipe: Boil fresh leaves in 2L water until it reaches 1.5 L allow cooling and then filtering.

Dosage: The decoction is taken orally to the patient suffering from hypertension a glass per day.

Other uses: According to Elian, 2004 macerated sticky young leaves is administered orally for diarrhea; therefore (Adjonou, Ake Assi et al, 1986) argue that the decoction of the fruit shells can be used for drinking and bathing in the treatment of sickle cell disease.

Healing Principles: The composition provided by the two Palm oil and Palm olein differs. Palm oil is composed mainly of triglycerides of palmitic acid (C16: 0) and oleic (C18: 1) with 10% linoleic acid (C18: 2). This worth of unsaturated linoleic acid reduces the formation of lipids and cholesterol in eggs supplied by hens fed with palm oil (Punita in Pousset, 2004). Its physical characteristics such as semi-solid vegetable oil make it an interesting component for margarines, shampoos and fats for confectionery. Palm oil may be fractionated in a separate healing and olein, a liquid, and more stearin to the above melting point. Palm oil and palm olein are especially used in cooking food on an industrial scale "Fast Foods". The feed is continuously fed through the oil subjected to a temperature of 180 °. Experience has shown that palm olein and palm oil, are better than any other treatment because they have no linoleic acid (C18: 3) and only 10% of linoleic acid (C18: 2). In addition, they contain tocopherols, natural antioxidants that resists temperature. Palm oil provides good quality soap with fatty acids of different chain lengths. It contains 48% lauric acid (C12: 0) and 15% myristic acid (C14: 0).

EUPHORBIACEAE4 *Bridelia ferruginea* Benth-

Vernacular name: Nonro (Gbaya Kara)

Photo: *Bridelia ferruginea*

Description: Shrub January to August, cracked bark, often bright red sectional, sometimes thorny branches. Leaves with stipules ovate - lanceolate, tomatoes, deciduous, blade elliptical, oblong or oval, more or less irregularly crenate, upper face pubescent then glabrescent late to lower face pubescent, secondary veins confluent into a marginal vein; tertiary rib prominent. Inflorescences in clusters multi Flores, axillary; very dense verticillate male flowers; drupe fruits, unilocular, oblong or sometimes subglobose green pericarp; red blue and black at maturity (Pousset, 2004).

Origin (Ecology): This is a species that characterizes the savannas and forests also clear, highly resistant to fire (pyrophyte species).

Biological type: Mesophanerophyte

Phytogeographical distribution: Afro-tropical

Recipe: harvest some fresh roots and wash. Boil 2 liters of water to obtain 1.5 L of decoction cool then filter.

Dosage: drink one glass in the morning after breakfast for a week while the patient is checking his blood pressure.

Other uses: In the book "Contribution to ethno botanical and floristic studies in the People's Republic of Congo", the decoction of the roots is indicated anti dysenteric per-os; it is also recommended for anemia, oral ingestion.

Healing principles: An aqueous extract and methanol bark showed antibacterial activity against Gram-negative bacteria. The activity is due to tannins and phenols. A methanol extract of the fruit has the same property.

OCHNACEAE

5-Lophira lanceolata van

Common name: Azobé savannah (French) vernacular name; Ngokolé (Gbaya).

Photo: Lophira lanceolata



Description: Medium tree up to 18 m high and 50 cm in diameter. Leaves simple whole, grouped in tufts at the ends of branches. Long petiole 1.5 to 6 cm, glabrous, swollen at the base. The fruits are panicles of approximately 10 cm long; white flowers; fragrant orange to yellow stamens, very showy. The fruit is conical caps; 2-3 cm to 0.5 cm 1, sub-woody; to accrescent calyx forming two wings cross linked full bright red colors containing elongated ovoid seed oilseed (Pousset et al op.cit).

Origin (Ecology): Species characteristic of woodlands.

Biological type: Mesophanerophyte

Phytogeographical distribution: Tropical African.

Recipe: Make a decoction of a handful of fresh leaves or two dry leaves in a liter of water.

Dosage: Drink ½ cup 3 times a day (morning, afternoon and evening) to treat hypertension.

Other uses: The decoction of the roots fight against hemorrhoids per-bone and intestinal worms. The aqueous decoction of leaves and bark of the roots of the trunk is used orally in the treatment of primary or secondary infertility for women. Powder (boiled) root bark associated with *Butyrospermum parkii* and seeds *Piper guineensis* fight against kwashiorkor. The macerated roots associated with *Tinnea baterii* fight against pinworms per - bone (Chenu and Oury, 1987).

POACEAE

6-Bambusa vulgaris Schrol ex Wendel

Commonname: Bamboo China

Photo: Bambousa vulgaris

Description: Large shrub or grass tree, reaching 5-150 m tall with numerous side branches. Limbo, oblong leaf; lanceolate, measuring 10 to 25 cm in length and from 1 to 4 cm in width; broadly rounded to acuminate; very short petiole. The plant is characterized by large amplexicaul seeds. Spikelet's leafy inflorescences panicles multiflorous in upper and lower sterile flowers. Lower glumes are short, subscoriated in membranous, upper, and similar to lemma (Adjanooun, Ake Assi et al, 1988).

Origin (Ecology): This species is spontaneous, now widespread in the tropics.

Biological type: Mesophanerophyte

Phytogeographical distribution: Pan tropical

Recipe: Harvest green or yellow leaves. Boil in 2 L of water. Let it cool, strain and obtain 1.5 L of water.

Dosage: Drink the decoction morning and evening.

7- Zea maysL

Common name: But (French) Vernacular names: Ndjo (Sango) Nkodji (Gbaya).

Photo: Zea mays



Description: Maize is a robust annual grass up to 3m in height with thick stems and broad, sheeting leaves, male flowers are born in clusters at the tips of the branches, while female flowers are arranged in thick spikes in the leaf axils, tripped by long, slender styles visible as a beard-like mass.

Origin (ecology): cosmopolitan. Central America (now cultivated in practically all parts of the world)

Biological type: Therophyte

Phytogeographical distribution: Cosmopolitan

Recipe: Take a large amount of the stigma of flowers. Boiled in 200 ml of water and filter to obtain 150 cl.

Dosage: Drink 2 tablespoons morning and evening

Other uses: According to N'guéssan Koffi (1995); decoction of flowers of maize stigmas against macroglossia, we recommend lap, mixed with oil palm powder obtained by roasting and pulverizing the bone of the corn stalk associated with the stem bark of Albizia Zygia and maniguettes.

PROTEACEAE

8-Protea madiannensis

Vernacular names: Gbogbo (Banda) Zeradope (Gbaya)

Photo: Protea madiannensis

Description: Tree or small tree from March to June, bypassed branched from the base, open with leaves glangues usually oriented in the vertical plant crown. Bark thick, corky, scaly, brown blackish; with red edges. Leaves alternate, leathery, sessile or nearly so, more or less densely covered with pubescence (especially when young); elliptic or elliptic lanceolate, 12 - (25) * 4-14 cm; obtuse apex or more or less pointed, base cuneate or mitigated. Pinnately veined, 10 -20 pairs of irregular secondary veins slightly prominent on both sides, connecting to a sub marginal rib 12 mm blade. Sessile white flower, with narrow corolla tube 1-25 cm long; very hairy outside, style exceeds about 1 cm of the corolla, which is then stretched in two equal lobes. Nut, elongated, about 0.6 cm long hair bristling with long reddish and persistent style (Pousset, 2004).

Origin (Ecology): This species characterizing woodland and clear forests in tropical Africa.

Biological type: Mesophanerophyte

Phytogeographical distribution: tropical African

Recipe: Harvest the roots of Protease and wash. Boil 200 ml water until 150 cl decoction cool then filter.

Dosage: The decoction is; drink ½ cup in the morning and evening after having a meal.

Other uses: The decoction of the roots is used to treat epilepsy. The bark is used to treat malaria and fever, after our survey of traditional healers of Bouar.

SOLONACEAE

9 Capsicum annuun-L

Common name: Pepper (English) Vernacular name: Ndongo (Sango)

Photo: Capsicum Annuum



Description: chilli pepper is a perennial herb (up to 0,5m) with dark green, stalked leaves, white flowers and oblong, green or red fruit that are carried up right. It is often confused with pungent forms of C annum (paprika, hot pepper, Spanish pepper), annual plant with drooping fruit.

Origin (Ecology): both species are indigenous to tropical America and have become important crop plant in most parts of the world.

Biological type: Chamaephyte

Phytogeographical distribution: pan tropical

Recipe: Boil fresh leaves in 2 L of water until it reaches 1.5 L and cool. Strain the decoction.

Dosage: Drink 1/4 cup of decoction morning and evening against hypertension.

Other uses: in "the book's contribution to ethno botanical and floristic studies in Togo", the aqueous decoction obtained by crushing the fruit with phyllanthus muellananus is used orally to treat constipation.

10-Lycopersicum esculentum L

Common name: Tomato (English) vernacular name: Tomato (issongo)

Photo: *Lycopersicon esculentum*

Description: Annual herb, up to 1 or 1.5 m tall, woody at the base. Stem and green twigs and leaves, a white pubescent. Simple pinnate leaves with deeply divided lobes unequal, more or less stalked on midrib size that has the appearance of a spine. Axillary umbels of yellow flowers corolla attached, about 20 to 25 mm in diameter. Yellow stamens with anthers connivances'. Fruits, red berries mature spherical, spherical or spherical - flattened variable size depending on the variety of 5-15 cm on average, along with five sepals lanceolate, acuminate, and persistent and accrescent. Species cultivated in the village as a condiment (Adjanohoun et al, 1989).

Origin (ecology): cultivated in all tropical plants.

Biological type: Nanophanerophyte

Phytogeographical distribution: tropical African

Recipe: Harvest leaves and washes thoroughly. Then crush and add native salt in 1.5 L of water while leaving the aqueous mixture for 2 hours in a saucepan. Filtering the macerated.

Dosage: Give ½ cup soaked morning and evening every two days to hypertensive subjects.

Other uses: According Adjanohoun, Ake Assi et al, (1988): The maceration of the stem with leaves in palm wine is used to treat sexual asthenia.

DISCUSSION

Species inventoried and Literature Search

Ethno botanical field surveys were used to the inventory of 19 plant species in the treatment of hypertension.

They are divided into 14 families, with 5 families Liliopsida

(Monocotyledons): Aliaceae, Aloaceae, Arecaceae, Dioscoreaceae and Poaceae and 9 family's magnoliopsida (broadleaf). Our descriptions are mainly on the morphology of plants, leaves and flowers, and fruit, not to mention from time to time their respective biotope.

For medical purposes: the recipe and dosage are briefly presented specifying the organs used for each recipe. Finally, the works of traditional Senegalese pharmacopoeia contribution to ethno botanical and floristic studies in the People's Republic of Congo and the contribution to the identification and inventory of plants used in traditional medicine and pharmacopoeia in Central African Empire were usually several times mentioned.

BIOLOGICAL TYPES

The type of biological species is the set of "Eco morphological features that characterize its vegetative. They hone his face and its habitat (APEMA, 1995).

Phytogeographical distribution

The main types of phytogeographical distribution observed and used in this work were prepared with reference to accept the chronological subdivisions for Central Africa (APEMA, 1995).

Organs used

We proceeded to the distribution of information collected according to the characteristics of income and organs used. Leaves are the most used plant organs and pharmaceutical decoction as the dominant form, the remedy is administered orally (90% Pousset, 2004). Adjanohoun et al (1988) have made the same observation that the leaves are richer in chemicals plant organs. Regarding to the plants that treat hypertension, the debarking techniques used so far on medicinal plants are detrimental to species regeneration and sustainable biodiversity conservation.

After comparison of results against bibliographic data from different pharmacopoeias consulted confirms the existence of 10 medicinal species that not reported in the treatment of hypertension and are our modest contribution. They are: (Aloe vera, Voacanga africana, Elaeisguineensis, Bridelia ferruginea; Lophira lanceolata, Zea mays, Bambusa vulgaris, Protea madiannensis, Lycopersicum esculentum and Capsicum Annuun).

Moreover, the active involvement of traditional healers identified in Bouar shows the actual existence of expertise in the treatment of hypertension within local knowledge often overshadowed by prejudices and lack of initiative implementation value (Pousset, 2004).

The male predominance observed in the detention of the exercise of this knowledge by traditional healers is related to trust of men in our societies in terms of heritage and inheritance within lineages (Yangni, and al.2004)

.In addition, the downward heredity is the main mode of transmission of knowledge about the traditional treatment of hypertension (Pousset,et al 2004), indicating the aspect of local knowledge that often accompanies initiation rituals sometimes surrounded by mysteries and remain subject to the gravity of secret traditions jealously kept within lineages (OMS.2002). Early transmission of this knowledge is favored for having long experience accumulated by these healers in the treatment of hypertension.

CONCLUSION

Completion of this work is based on the identification and knowledge of medicinal plants used by traditional healers of Bouar in the treatment of hypertension, we can say that the construction and completion of this work have encountered several major constraints, including the shortcomings of certain information collected from traditional healers and

people resources on the identification of some plants used in the treatment of hypertension. Access to certain preparations of products delivered to patients was very difficult.

However, positive results were obtained in this study and on the recognition and identification of 19 plant species and treating hypertension in the context of plant biodiversity, especially the knowledge of flora, its operations and its sustainable use in traditional medicine in Central African Republic, the city of Bouar more precisely. Of the 19 species recorded, 10 are not listed in the various documents consulted and is our contribution to the knowledge of plants used in the pharmacopoeia in the Central African Republic and especially the city of Bouar.

The results are the first attempts to research and thereby make a modest contribution to WHO with encouraging recommendation of herbal medicine for its use in health care systems. Hence the celebration for 7 years, every August 31 of the World Day of traditional medicine with the participation of WHO. Medicinal plants have identified their biological types and their phytogeographical distribution. The organs most commonly used are also reported where treatment leaves are predominating. Bottle "Evian" is for all healers found as a measure of dose decoction and maceration administered to patients. Comparisons of results obtained in Bouar were performed with the pharmacopoeias Congolese, Senegalese and even that of the Central African Empire, including the APEMA work (et al, URSAD, 2004 and Pousset; 2004.) We also like to point out, that among the 19 species recorded from healers of Bouar, four are the most frequently cited and appear to be most effective for patients. These four are: (*Hymenocardia acida*, *Protea madianensis*, *Bridelia ferruginea* and *Lophira lanceolata*).

Finally, some needs at various levels are expressed in the context of the problems of access to genetic resources, equitable benefit sharing and the knowledge, innovations and practices of medicinal plants in Central African Republic, particularly the Bouar city.

SUGGESTIONS

Hypertension is a major public health problem, specifically in our great country and in the world and very little work has been done in traditional medicine in Central Africa, which leads us to make the following suggestions:

1. To the Government on literate healers,
2. To organize national and sub-regional workshops and seminars to share experiences among traditional healers;ü
3. To finance research projects in traditional medicine;
4. To promote the use of medicinal plants;
5. Establish a national herbarium;
6. To create a laboratory to enable the manufacture of improved traditional medicines (ITM) as is already done in some countries, example: Cameroon, Senegal, Burkina Faso, Congo, etc..

The development partners (WHO, UNDP etc ...

1. Support specially from scientific research on medicinal plants and carry out preventive screening for hypertension in the Central African Republic;ü
2. Finally equip NGOs and local associations working in the framework of herbal material and financial resources in organizations.

At the University of Bangui

1. To form taxonomists (plants) specialized in collaboration or partnership with other universities;
2. Establish a documentation of medicinal plants and equipment botany and ethno botany research.
3. For researchers, physicians, chemists, pharmacists, toxicologists, physiologists, phytotopathologiste and botanists.ü

The theme in this work is timely and aims to promote herbal medicine and the fight against hypertension, to find improved traditional medicines suitable against this disease starting knowledge and traditional knowledge. We sincerely believe that everyone mentioned above is interested in this topic and works from different angles of research (ethno botany, etc.) in the fight against hypertension.

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