

PROSTATIC ILLNESSES: EPIDEMIOLOGY AND TREATMENT WITH MEDICINAL PLANTS IN MAROUA (CAMEROON)

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ABSTRACT

Three fieldworks were carried out in Maroua area in the Northern Cameroon to evaluate the epidemiology and the prophylaxis of prostatic illnesses, in 2008-2010.

Data from the Central Hospital of Maroua permitted us to appreciate the epidemiology. Interviews on 22 patients showed the risk factors for the appearance of prostatic illnesses and discussion, with 27 phytotherapists indicated the treatments as done in the study area.

Surgical interventions of Urogenital tumors related to prostatic illnesses occupy a preponderant place (51%) in the surgery Service of the regional Hospital of Maroua. The patients prefer to go to traditional Doctors for treatment although there, the diagnoses by symptoms are approximate. Four plants are the most used by the traditional healers in the treatment of the prostatic illnesses: *Azadirachta indica*, *Moringa oleifera*, *Sansevieria senegambica* and *Tamarindus indica*; and 5 are new in the Cameroonian ethnobotany literature: *Hyparrhenia nyassae*, *Hyphaene thebaica*, *Prosopis africana*, *Marsdenia sylvestri* and *Thelepogon elegans*. The rate of monospecific recipe is lower (2/18) with respect to bispecific (12/18) or trispecific ones. The population of Maroua, both patients and phytotherapists, need some information on the feeding, the type of foods and the temperament of the prostate.

KEYWORDS: Ethnobotany, Prostatic illnesses, Traditional medicines, Maroua, Cameroon.

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INTRODUCTION

The prostate is situated in front of the rectum, under the bladder and is crossed by the urethra. It has the dimension of a palm walnut in an adult man, and weighs about 20 grams¹ (**Fig.1**). Yet the prostate holds a major place all along in a man's life, considering the control that it exercises in the regulations of urination rhythm and its role in the sexual and reproductive life by the production of a big part of the spermatic liquid. The discovery of the PSA (Prostate Specific Antigen) antigen produced almost exclusively by the prostatic cells raised a great interest among researchers, and some famous men decided to sensitize a majority of the public about prostate-related affections, including cancer². In Maroua the phytotherapists regroup all prostate illnesses under the name of urinary illnesses of the old man: " Niaw Tilé Dotièl " in Fufuldé. The blood rates of PSA permit to track down and to follow up the illnesses as well as the evolution of the organ. The illnesses of the prostate are three in number³⁻⁴: prostatitis (inflammation of the gland), benign prostatic hyperplasia (BPH), and cancer of prostate (malign tumor adenocarcinoma, ADK).

In Cameroon previous works reported that the urogenital cancers account for about 6.5% of the set of the diagnosed shrewd neoplasia⁶; and several researches are made on this thematic⁷⁻⁹. Our team went to the Far-North of Cameroon to explore the contribution of the Sudano-Sahelian flora to the treatment of the prostatic tumours. Is the science of the Maroua phytotherapists dynamic to the point of finding adequate solutions to a set of prostatic illnesses, which have the reputation of being civilization illnesses nowadays? That was the question of the survey.

The goal of this work is to raise the importance of prostatic illnesses in the epidemiology of urogenital tumors at the hospital and to lead an ethnobotanical investigation, to document the therapeutic preparations and the treatments as done in the locality of Maroua, and to appreciate the degree of their knowledge by the local phytotherapists through the number of their quotations.

STUDY AREA

The study area of Maroua (10°35'-10°85' North latitude and 14°14'-14°19' East longitude) includes the neighbouring villages: Balaza, Gades and Mwo. Maroua

is the head-quarter of the Far-North Region of Cameroon, situated at an altitude of 423 m (**Fig. 2**).

The population of the study zone, organized in a community (Lamida) controlled by a Lamido, fundamentally Moslem, is estimated to 272,000 inhabitants in January 2010, that is 10.6% of the region of the Far-North Region and 1.7% of the population of Cameroon¹¹. The inhabitants are constituted of 51% of Moslems and of 47% of Christian. The natives are the Giziga and Bi-Marvas. Some ethnic groups like the Tupuri and Mundang are well represented. There, the artisanal activities are well developed.

The climate is tropical, of sudano-sahelian type¹². The averages of rains and temperatures are 830 mm and 25.92°C respectively. The humid season lasts between 4 and 5 months. The minimal temperatures are observed in December-January, period corresponding to the continental influence, with a very weak haziness and cool nights. The maximum of temperature in April corresponds to the end of the dry season (**Fig. 3**). The set of the rivers of the locality are characterized by non permanent out-flows. Their regime is bound more to the importance of the length of the dry season than to the yearly modesty precipitation¹³.

Vegetation is a spiny steppe of the sahelian sector¹⁴. Among the woody plants, *Acacia hockii* is very extensively dominant. One also notes: *Anogeissus leiocarpus*, *Combretum glutinosum*, *Boswellia dalzielii*, *Acacia senegal*, *Sterculia setigera* and *Balanites aegyptiaca*. The dominant herbaceous species are represented by: *Loudetia togoensis*, *Andropogon pseudapricus*, *Schoenefeldia gracilis*, *Sporobolus festivus* and *Schizachyrium exile*¹⁵.

MATERIALS AND METHODS

Data on the epidemiology of the prostatic illnesses was obtained from the registers of the regional hospital of Maroua. Two questionnaires were established, one for the patients, the other for the phytotherapists. For the patients the questions were relative relating to age, matrimonial status, type of treatment solicited, weight and waist measurement of the patient, food. For the phytotherapist the questions were about their ages, method of tracking the illness, the plants and the therapeutic preparations. At every moment the objectives of the research were explained to the informant. The criteria followed in conducting the interviews, outlined many authors¹⁶⁻¹⁹. The gathered information was consigned on a file. We avoided interrupting all spontaneity when asking the questions. The interviewees gave their agreement to publish the results of the survey as contribution of the Maroua phytotherapists to the treatment of prostatic illnesses. The phytotherapists for

this survey were all of masculine sex, 15 men aged 30 to 90 years. All were living in the zone of survey and had been carrying out treatment for the past 10 years. The traditional medicine in this region is exclusively a man's profession, transmitted from a father to his son according to the explanatory theory "social learning".

The phytotherapists who collaborated in this research gave the plants and the subsequent preparations used. Only the recipes indicated at least in 3 different localities have been kept in this survey. The number of quotations of the species is derived from those of the recipes. The specimens have been collected, dried and identified by the authors, authenticated by comparison to the specimens of the National Herbarium of Cameroon (YA) and the use of the volumes of the Flora of Cameroon²⁰⁻²². All specimen collected were deposited in the Department of Biological Science of the Higher Teachers' Training College of the University of Yaoundé

RESULTS

Epidemiology and treatment of prostatic diseases

In the logbook of the surgical Service of the regional hospital of Maroua (2007-2009), 127 patients underwent surgical interventions: 51% for prostatic illnesses, 24% for urinary calculus and 16% for ovarian cysts (**Fig. 4**). Prostatic illnesses had the highest rate in the distribution of urogenital surgical intervention.

With the help of medical doctors we met 44 patients of prostate illness, 36 of whom suffered from benign prostatic hyperplasia (BPH) (81.8% of the total) and 8 from cancer (ADK) (18.1%). No cases of prostatitis were recorded in the register of the patients followed up in the hospital service. The BPH covers all age brackets above 40 years old (**fig. 5**). The traditional healers permitted us to join 22 former Prostatitis patients. The treatments undergone by the patients are either modern, traditional or mixed (modern and traditional). According to the analyses, the patients resort more to the traditional treatment (55%), while only 27% to resort the modern treatment and 18% both the traditional and modern products at the same time. In general 73% of the patients follow the traditional treatment. According to Sissoko²³, at least 80% of populations in Africa resort to the traditional medicine to solve their health problems. The traditional healer has a considerable influence on his community and he is often better listened to than all other health specialist. The waist measurement of 16 patients of cancer is superior to 80 cm; 80-90 cm for BPH and 80-100 cm for ADK, while their weight is between 65-75 kg for ADK and 45-85 kg for BPH (**Fig. 6**). These patients have a diet rich in red meat and in dairy products, poor in tomatoes and fishes (**Fig. 7**).

Phytotherapy

The plants used are listed in **Table 1** in family order followed by their botanical names, and the percentages of citations for use with respect to the total citations are also given in brackets. The local (Tupuri or Fulfulde) names and the voucher specimen number of an author are shown in column 3, while the number of recipes in which each plant is used appears in the last column. Twenty-three plant species belonging to 18 families were collected. The more diversified families are *Poaceae* with 3 species, *Fabaceae*, *Liliaceae* and *Meliaceae* with 2 species each.

Twenty three plants species treating prostate diseases, identified, are used in 18 preparations, and the AMP = 0.78. The higher degree of anti-prostatic phytotherapeutic knowledge in Maroua is determined by the average citation per informant (2.6), the average number of preparations per plant (0.78) and the value of therapeutic uses per plant (2.1) (**Table 2**, last column). Ethnobotanical survey from the traditional healers shows that some plants appear regularly in the therapeutic preparations, particularly for *Azadirachta indica* (11% of total preparations) (**Fig. 8**), *Moringa oleifera* (8%), *Sansevieria senegambica* (8%), *Tamarindus indica* (8%) (**Fig. 9**). The frequency of use of these plants would be due to their efficiency in the treatment of the prostatic illnesses (**Fig. 10**)

DISCUSSION

At the regional hospital of Maroua, the rate of prostatic illnesses reaches 51% of the surgical interventions on urogenital tumors. The value is the average of those concerning shrewd tumors (32.78%) and benign tumors (67.22%) of the prostate. It is the same value with respect to all urogenital tumors in hospital milieu in Cameroon⁶. Prostate illnesses are tumors of the aged individuals with more than 40 years old, and with a pick between 60 and 70 years. Figure 5 shows that BPH ranks high on the graph amongst the patients encountered. Hence the prostate health conditions are well handled by both health care systems: conventional and traditional. On the other hand, only few patients (27%) were treated in the hospital service for prostatic troubles, while healers frequently report plant remedies for BPH.

Some of the species reported, such as *Hyparrhenia nyassae*, *Hyphaene thebaica* (**Fig. 11**), *Marsdenia sylvestri*, *Prosopis Africana* (**Fig. 12**), *Thelepogon elegans* have never been reported in the Cameroon ethnopharmacological literature^{9, 24-27}.

For others, new therapeutic uses are here reported: *Cassia mimosoides*, *Khaya senegalensis*, *Sansevieria senegambica* and *Tamarindus indica*. Likewise, the

uses of plant species like: *Aloe barteri*, *Allium sativum*, *Citrus aurantiifolia* and *Ocimum basilicum* are found to be similar to the uses by Bamoun people in Fouban (Cameroon)⁹, thus indicating the authenticity of their usefulness in the treatment of the prostate ailments. The uses of *Ziziphus mauritania* Lam (**Fig. 13**) in Maroua and *Ziziphus spina-christi* (L.) Derf. in the Adamaoua²⁷ confirm their generic efficiency in the treatment of prostatic illness; and those of *Hyphaene thebaica* (palm of Maroua) and *Serenoa repens* (palm of Floride) are for their family efficiency.

The results show that the rate of appearance of the benign hypertrophy of the prostate is higher among the persons whose bodily mass is between 65 and 75 kg. A survey published in 2002 by the team of Pr Walter Willett of the university of Harvard shows that men who eat 2700 calories on an average have 30% of risk in addition, to suffer from the benign prostatic hyperplasia, more than those who only consume about 1200 calories per day⁵. These results show that the abdominal fat represents a real risk factor. Men who have a waist measurement superior to 109 cm have close to two times and half more risk to suffer from benign hypertrophy of the prostate than those whose waist measurement is less than 89 cm²⁸. A relation therefore exists between the weight of the individual and the risk of the manifestation of the prostatic illnesses. For cancer of the prostate, the risk of the appearance of this illness occurs at 50 years of age. Some foods like tomato and fish would decrease the risk of prostatic illnesses. Among the inhibitors one can cite: the lycopene; natural antioxydant of the tomato²⁹; the fatty acids omega 3 family in fishes and in plant oils with anti-inflammatory and anti – tumoral properties; the linoleic acidic and minerals such as zinc and the vitamins (B, C, E); the seeds of gourds extracts that permit to improve on the symptoms of the prostate³⁰. Most of the common foods in the study area are claimed to be highly effective remedies against prostatic diseases, since immemorial time, and have a wide local consumption as preventive measures: *Arachis hypogaea*, paste covered red dried meat called "klishi"; *Allium cepa* directly eaten with roasted red meat called "Soya". Although low in citation rate, healers also mentioned plant remedies for other chronic conditions, such as HIV/AIDS with *Azadirachta indica* already mentioned³¹ and anticancerous activity³²; malaria with *Tamarindus indica*. The fruit preparations of the latter is antibacterial, diuretic and urinary antiseptic in case of cystitis³³. Hence, traditional health care appears to be complementary to biomedical health care for chronic illnesses. Another domain where traditional medicine offers predominant care is that of folk illnesses such as

malediction linked to prostate disease, which are particularly relevant within the local cultural context. We did not document these recipes.

Research on the therapy of prostatic illnesses in the European zone presents a singular plant species as *Epilobium parviflorum* Schreb (Onagraceae) which has some virtues to a large spectra against prostate unrests: prostatitis, benign prostate hyperplasia, cancer of prostate and bladder³⁴ Adenoma of the prostate is treated by mistletoe (*Viscum album* L., Loranthaceae), the lyciet (*Lycium barbarum* L., Solanaceae) and the chestnut tree of India (*Aesculus hippocastanum* L., Hippocastanaceae)³⁵.

CONCLUSION

More than half of the surgical interventions on urogenital tumors at the regional Hospital of Maroua are due to prostatic illnesses. This rate is far from the reality since at least 50% of prostate patients prefer the traditional medicine. The traditional healers do not overcome prostatic illnesses and their diagnosis. The study area is a cattle rearing zone and the food is rich in red meat, dairy products and their derivatives, predisposing them to the prostatic illnesses. The most used plants in the traditional medicine to treat prostatic illnesses are *Azadirachta indica*, *Moringa oleifera*, *Sansevieria senegambic* and *Tamarindus indica*. Some information is necessary to the population and to the phytotherapists of Maroua to align the remedies and the food with the temperament of the prostate.

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REFERENCES

- 1-Antoine B, Mulonguet A. Manuel des maladies des reins et des voies urinaires. Paris : Edition Masson; 1976.
- 2-Coulange C. Du bon PSA (Antigène Prostatique Spécifique) : recommandations de l'association Française d'Urologie. E-mémoires de l'académie nationale de chirurgie 2006 ; 5(1) : 19-21.
- 3- De la Taille A Urologie. Paris : Édition Estem ; 1998.
- 4- Navratil F. Prostate adenoma. Paris: Review of the practitioner 1998: 1827-1830.
- 5- Pfeifer P. Docteur, c'est la prostate? Monaco : Edition Alpen ; 2005.
- 6-Sow M, Nkegoum B, Essame Oyono JL, Garoua, Nzonkou A. Aspects épidémiologiques et histopathologiques des tumeurs urogénitales au Cameroun 2006 ; 16 : 36-39.
- 7-Zoung-Kanyi J, Sow M. La lithiase urinaire au Cameroun, considérations éthiopathogénique, clinique et thérapeutique. A propos de 118 cas. Médecine d'Afrique Noire 1990; 37(4) : 176-192.
- 8- Mefo H. Infertilité masculine à Yaoundé (Aspect Epidémiologique, Clinique, Biologique, Anatomopathologique et Immunologique à propos de 51 cas. Yaoundé : Thèse de médecine ; 1981.

- 9- Noumi E. Ethno medicines used for treatment of prostatic disease in Fouban, Cameroon. African Journal of Pharmacy and Pharmacology 2010; 4(11): 793-805.
- 10- Keeton WT, Gould JL. Biological Science. 5th edition vol.2, W.W. New York: Norton company ; 1993.
- 11- Anonymous, République du Cameroun. 3^{ème} RDPH, Rapport de présentation des résultats définitifs. Yaoundé : BUCREP (Bureau Central des Recensements et des Etudes de la Population ; 2010.
- 12- Suchel J. The distribution of rainfall and rainfall patterns in Cameroon. Paris: Pap. Work Trop. Geogr., Centre for the Study of Tropical Geography (EGTC) 1972; 5: 287.
- 13- Seignobos C, Iyébi-Mandjek O. Atlas de la Province Extrême-Nord Cameroun. Yaoundé: IRD éditions ; 2000.
- 14- LETOUZEY R. Notice de la carte phytogéographique de Cameroun au 1/500000. Yaoundé : I.R.A ; 1985.
- 15- Fotius G. Rapport préliminaire sur la végétation du Nord-Cameroun. Paris: Orstom ; 1974.
- 16- John's T, Kokwaro JO, Kimanani EK. Herbal remedies of the Luo of Siaya District, Kenya: establishing quantitative criteria for consensus. Economic Botany 1990; 44: 369-381
- 17- Hedberg I. Botanical methods in ethnopharmacology and the need for conservation of medicinal plants. Journal of Ethnopharmacology 1993; 38: 121-128.
- 18- Walter DP. Methods in ethnopharmacology. Journal of Ethnopharmacology 1993; 38: 189-196.
- 19- Bruni A, Ballero M, Poli F. Quantitative ethnopharmacological study of the Campidano Valley and Urzulei. District, Sardinia, Italy. Journal of Ethnopharmacology 1997; 57: 97-124.
- 20- Aubréville A, Leroy JF, Flore G. Flora of Cameroon. Paris: Muséum National d'Histoire Naturelle ; Volume 1 (1963) à 34 (1998).
- 21- Lebrun JP, Stork A. Enumeration of the flowering plants of tropical Africa. Geneva: Conserv. Bot. Garden (1991-1997) ; 4 vol.
- 22- Geerling C. Guide de terrain des ligneux sahéliens et soudano-guinéens. Wagenigen : Agricultural University Wagenigen Papers ; 1987.
- 23- Sissoko M., 2006. Comment guider les tradipraticiens pour qu'ils jouent un rôle dans les changements de comportement, notamment du couple « mère-enfant » ? Paris : Karthala ; 2006.
- 24- Cousteix JP. Art and Pharmacopeia healers. Ewondo (Yaounde Region). Yaoundé : Research and Studies Cameroon; 1961.
- 25- Eso J, Lobe G, Nkongo OB, de Rosny E. Traditional Pharmacopoeia Douala. Douala: Cahiers du Male Ma Makom 1 ; 1987.
- 26- Kingue KN, Nkongo OB, Tongo ES, Moussongo A, Ouea NA, de Rosny E. Traditional medicines Douala. Douala: Cahiers du Male Ma Makom II; 1994.
- 27- Adjanohoun JE, Aboubakar N, Dramane K, Ebot ME, Ekpere JR, Enow et al. Traditional medicine and pharmacopoeia. Contribution ethnobotanical and floristic studies in Cameroon. Addis-abéba: Organisation of Africa Unity, Scientific Technical and Research Commission (OUA/STRC); 1996.
- 28- Zhu S. Waist circumference and obesity associated risk factors among whites in the third National Health and Nutrition Examination Survey: clinical action thresholds. American Journal of Clinical Nutrition. 2002 ; 76(4) : 743-749.
- 29- Kucuk O. Effect of lycopene supplementation in patients with localized prostate cancer. Experimental Biology and medicine 2002; 227(10): 881-885.
- 30- Carbin E. Treatment by curcubicin in benign prostatic hyperplasia. Swed J Bot Med 1989; 2: 7-9.

31- Noumi E, Anguessin B. Insecticides and ethnomedicine of HIV/AIDS at Tokombéré (Far North Cameroon). *Indian Journal of Traditional Knowledge* 2010; 9(4): 730-735.
 32- Kausik B, Ishita C, Ranajit K, Banerjee, Uday B. Biological activities and medicinal properties of neem (*Azadirachta indica*). *Current Science* 2002; 82(11): 1336-1345.
 33- Ekoumou C. Etude phytochimique et pharmacologique de 5 recettes traditionnelles utilisées dans le traitement des infections

urinaires et de la cystite. Bamako : Thèse de doctorat en pharmacie de l'Université de Bamako ; 2003.
 34- Treben M. La santé à la pharmacie du bon Dieu, 45ème édit. Steyr : Edit Ennsthaler ; 1995.
 35- Audras R-P, Guedes M. Les bienfaits des plantes. Neuilly-sur-Seine : Edit. Dargaud;1977

Table 1: Plants used to treat prostate diseases at Maroua with their families, the percentage of quotation, local name and recipes in which they are mixed

Families	scientific names [percentage of quotations with respect to 151]	Local names and [voucher specimen number]	Total quotations	Recipes
Agavaceae	<i>Sansevieria senegambica</i> Bak [7.9]	Komor (Tupuri) [Kolaïpla 78]	12	6, 11, 13
Arecaceae	<i>Hyphaene thebaica</i> Mart. [2.6]	Gelleehi (Fufuldé) [Kolaïpla 80]	4	8
Asclepiadaceae	<i>Marsdenia sylvestri</i> [1.9]	Furgna (Tupuri) [Kolaïpla 72]	3	10
Balanitaceae	<i>Balanites aegyptiaca</i> (L.) Del. [2.6]	Tanni (Fufuldé) [Kolaïpla 24]	4	16
Bombacaceae	<i>Andersonia digitata</i> L. [2.6]	Bokki (Fufuldé) [Kolaïpla 45]	4	16
Caesalpiniaceae	<i>Cassia mimosoides</i> L. [1.9]	Sonhron (Tupuri) [Kolaïpla 52]	3	1
Fabaceae	<i>Tamarindus indica</i> [9.9]	Ja'b'bi (Fufuldé) [Kolaïpla 25]	15	7, 10, 12, 14
	<i>Acacia albida</i> (Del.) A. Chev. [6.6]	Caski (Fufuldé) [Kolaïpla 97]	10	3, 15
Lamiaceae	<i>Ocimum basilicum</i> L. [2.6]	Jambal djoï (Fufuldé) [Kolaïpla 64]	4	18
Liliaceae	<i>Alium sativum</i> L. [5.9]	Albaché (Fufuldé) [Kolaïpla 28]	9	15, 17
	<i>Aloe barteri</i> Bak. [2.6]	[Kolaïpla 29]	4	4
Malvaceae	<i>Hibiscus sabdariffa</i> L. [2.6]	Folléré (Fufuldé) [Kolaïpla 77]	4	7
Meliaceae	<i>Azadirachta indica</i> A. Juss. [11.9]	Gannyi (Fufuldé) [Kolaïpla 65]	18	5, 6, 15, 17
	<i>Khaya senegalensis</i> Desr. [5.3]	Daaleehi (Fufuldé) [Kolaïpla33]	8	17, 18
Mimosaceae	<i>Prosopis africana</i> (Guill et Perr) Taub. [5.3]	Wah (Tupuri) [Kolaïpla 58]	8	8, 12
Moringaceae	<i>Moringa oleifera</i> Lam. [8.6]	Gliganjaahi (Fufuldé) [Kolaïpla 62]	13	3, 5, 11
Piperaceae	<i>Piper guineensis</i> Shum. & Thonn. [2.6]	Tita mosoro (Fufuldé) [Kolaïpla 37]	4	18
Poaceae	<i>Sorghum bicolor</i> (L.) Moench [1.9]	Digari (Fufuldé) [Kolaïpla 39]	3	13
	<i>Hyparrhenia nyassae</i> (Rendle) Stapf. [1.9]	Toktor (Tupuri) [Kolaïpla 40]	3	9
	<i>Thelepogon elegans</i> Roem. & chult. [1.9]	Maclarga (Tupuri) [Kolaïpla 59]	3	9
Rhamnaceae	<i>Ziziphus mauritania</i> Lam. [1.9]	Jaa'bi (Fufuldé) [Kolaïpla 70]	3	2
Rutaceae	<i>Citrus lemon</i> L. [5.3]	Lèmon (Fufuldé) [Kolaïpla89]	8	4, 16
Zingiberaceae	<i>Zingiber officinale</i> Roscoe [2.6]	Tita yaadi (Fufuldé) [Kolaïpla 48]	4	14
			151	

Table 2: Data on the medicinal elements and the returns used in the treatment of prostatic diseases at Maroua (Province of Far North, Cameroon)

Recipes	Plant species: part plant(s) used (eventually)	Method of preparation of remedies and mode of use [number of citations]
Total recipes = 18	Number of informants (phytotherapists) = 27 Total plants species = 23	Total of medicinal preparations = 18; total quotations of preparations = 70 average citation per informant = 70/27 = 2.6. Average Medicinal Preparation per plant (AMP) = 18/23 = 0.78. value of therapeutic uses per plant (1.16) = 38/18 = 2.1 Monospecific recipes, 2; bispecific, 12; trispecific, 4. Mains methods of preparations : decoction 94.4% , mode of administration : oral route: 100%
1	- <i>Cassia mimosoides</i> : 4 mature plants chopped up	The ingredients are boiled in 4 L of water for 15 min and the cooled solution drunk: 1 glassful 2 times a day for 15 days [3]
2	- <i>Ziziphus mauritania</i> : 200 g of roots chopped up -Rock salt : 10 g	Roots and rock salt are boiled in 2 L of water for 15 min and the cooled decoction drunk: 1 glassful 3 times a day for 10 days. [3] <u>Nota bene.</u> Consumption of alcohol is prohibited during treatment period, and hard work should be avoided.
3	- <i>Acacia albida</i> : 200 g of stem bark - <i>Moringa oleifera</i> : 200 g of roots chopped up	the stem barks are boiled in 5 L of water for 10 min; the roots are added for 5 min of boiling ; the cooled solution is drunk : 250 mL 2 times a day for 10 days. [5] <u>Nota bene.</u> consumption of is alcohol prohibited during treatment period.
4	- <i>Aloe barteri</i> : 5 mature leaves - <i>Citrus lemon</i> : juice of 4 fruits * Honey : 250 mL	spines are removed and the leaves of <i>Aloe barteri</i> ground into paste and the paste is macerated in 2 L of water. Honey and fruit juice are added to the mixture. The preparation is kept cool and drunk : 2 teaspoonfuls 2 twice a day for 15 days. [4]
5	- <i>Azadirachta indica</i> : 200 g of roots - <i>Moringa oleifera</i> : 100 g of ground seeds	roots are boiled in 3 L of water for 10 min, the seed paste is added for at new 5 min of boiling. The cooled solution is drunk : 250 mL per day for 7 days. [4]
6	- <i>Azadirachta indica</i> : 200 g of roots - <i>Sansevieria senegambica</i> : 5 roots chopped up *Honey : 100 mL	The plant elements are boiled in 5 L of water for 15 min. Honey is added and the cooled solution is drunk: 1 glassful 2 times a day for 2 weeks. [5]
7	- <i>Hibiscus sabdariffa</i> : 100 g of dried roots powdered - <i>Tamarindus indica</i> : 80 g of fruit pulp	The fruit pulp is boiled in 2 L of water and the powdered roots are infused in the decoction. The solution is drunk: 250 mL 2 times a day for 10 days. [4]
8	- <i>Hyphaene thebaica</i> : pulp of 10 fruits grated - <i>Prosopis africana</i> :500 g of stem bark	The stem barks are boiled in 4 L of water for 15 min. The grated fruit pulp is infused in the decoction and the sieved mixture is drunk: 250 mL twice a day for 7 days. [4] <u>Nota bene.</u> consumption of alcohol is prohibited during treatment period.
9	- <i>Hyparrhenia nyassae</i> : roots of 5 individuals. - <i>Thelepogon elegans</i> ; 10 individuals	The pounded ingredients are boiled in 3 L of water for 15 min and the cooled decoction drunk : 1 glassful 2 times a day for 14 days. [3] <u>Nota bene.</u> consumption of alcohol prohibited.

10	- <i>Marsdenia sylvestri</i> : 250 g of powdered roots - <i>Tamarindus indica</i> : 500 g of stem bark	The stem barks are boiled in 5 L of water for 15 min. The powdered roots are added to the decoction and the mixture drunk: 1 glassful 2 times a day for 10 days. [3]
11	- <i>Moringa oleifera</i> : 1 handful of ground seeds - <i>Sansevieria senegambica</i> : 5 roots chopped up	the ingredients are boiled in 3 L of water for 10-15 min and the cooled solution drunk : 250 mL 2 times a day for 7 days. [4] <u>Nota bene.</u> consumption of alcohol and sexual intercourse are prohibited during treatment period.
12	- <i>Propolis africana</i> : 100 g of dried roots - <i>Tamarindus indica</i> : 50 g of dried stem bark	The ingredients are transformed into powder form and the mixture is consumed : 1 teaspoon in a cup of pap or milk twice daily for 7 days [4] <u>Nota bene.</u> consumption of alcohol is prohibited during treatment period
13	- <i>Sansevieria senegambica</i> : 500 g of roots - <i>Sorghum bicolor</i> : 2 kg of grains	Dried seeds of are reduced into a powder. The powder and the roots are boiled in 5 L of water for 30 min and the cooled solution is drunk: 1 glass morning and evening for one week. [3] <u>Nota bene.</u> consumption of alcohol is prohibited during treatment period
14	- <i>Tamarindus indica</i> : 100 g of stem bark - <i>Zingiber officinale</i> : 2 handfuls of rhizome	The ingredients are chopped up and boiled in 2 L in 10 – 15 min and the cooled decoction is drunk: 1 glass before each meal for one week[4]
15	- <i>Acacia albida</i> : 200 g of stem bark - <i>Allium sativum</i> : 10 cloves of garlic ground - <i>Azadirachta indica</i> : 200 g of roots	The ingredients are boiled in 5 L of water for 15 min and the cooled solution drunk : 250 mL 2 times a day for 21 days. [5] <u>Nota bene.</u> consumption of alcohol, pepper and sugar prohibited during treatment period.
16	- <i>Adansonia digitata</i> : 200 g of fruit pulp - <i>Balanites aegyptiaca</i> : 200 g of stem bark - <i>Citrus lemon</i> : 5 fruits chopped up	The ingredients are boiled in 5L of water for 15 min and the cooled solution drunk : 250 mL 3 times a day after meal, for 10 days. [4] <u>Nota bene.</u> consumption of alcohol prohibited during treatment period.
17	- <i>Allium sativum</i> : 4 cloves of garlic ground - <i>Azadirachta indica</i> ; 50 mL of seed oil - <i>Khaya senegalensis</i> 200 g of stem bark	The stem bark are boiled in 2 L of water for 20 min. the paste of cloves of garlic and the seed oil of <i>Azadirachta indica</i> are added to the decoction as a drinkable mixture : 125mL 3 times a day after meal, for 7 days. [4] <u>Nota bene.</u> Ne pas consommer de l'alcool pendant le traitement.
18	- <i>Khaya senegalensis</i> : 500 g of pounded stem bark - <i>Ocimum basilicum</i> : 200 g of leaves - <i>Piper guineensis</i> : 200 g of grains crushed	The ingredients are boiled in 5L of water for 10 min and the cooled decoction drunk: 1 glassful 2 times a day for 1 week. [4]

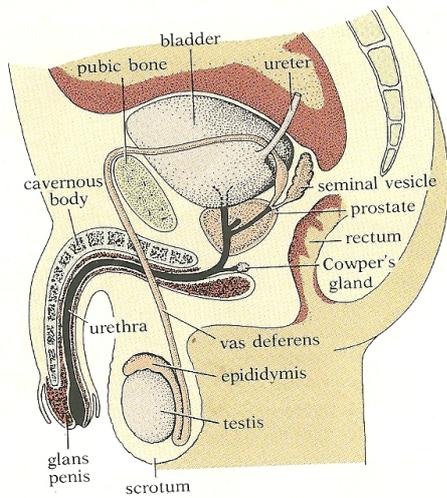


Fig.1: Position of the prostate in the male reproductive tract; lateral view¹⁰.

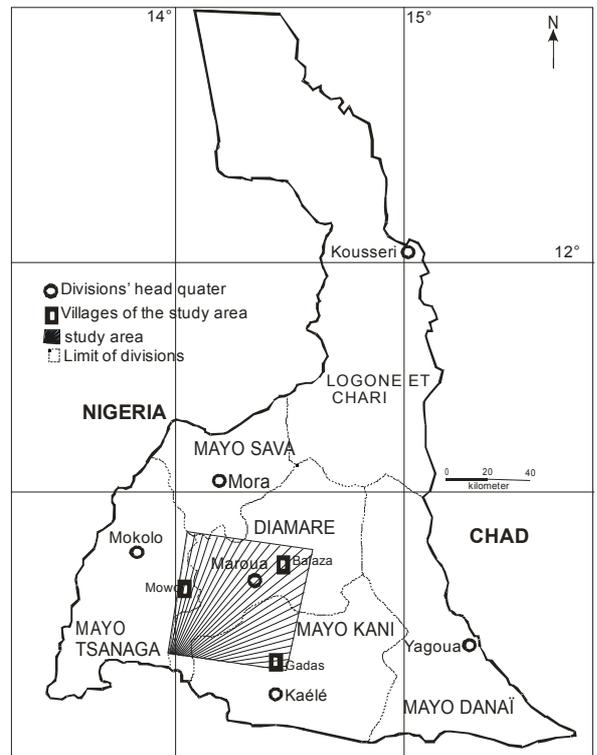


Fig. 2: Geographical localization of the city of Maroua¹²

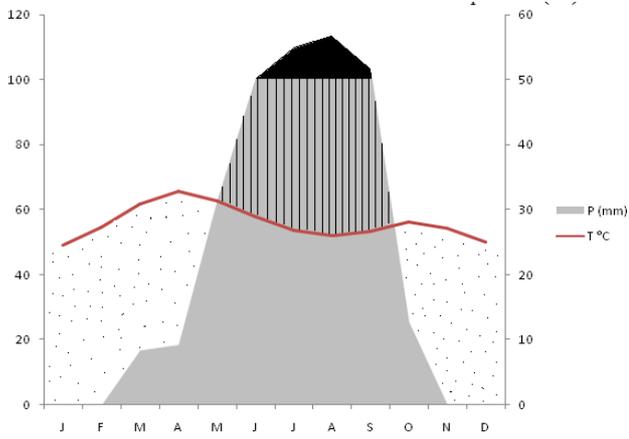


Fig. 3: Ombrothermic diagram of the region of Maroua (Maroua (2000-2009). Source: meteorological station of Maroua-salak

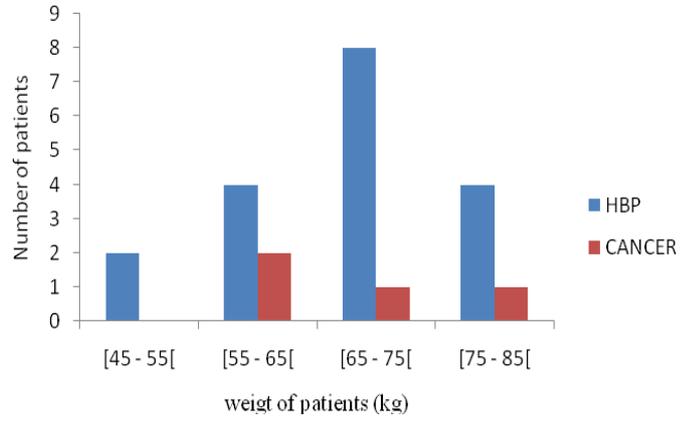


Fig. 6: Distribution of patients of prostatic illness according to their weights. (HBP = BPH: benign prostatic hyperplasia)

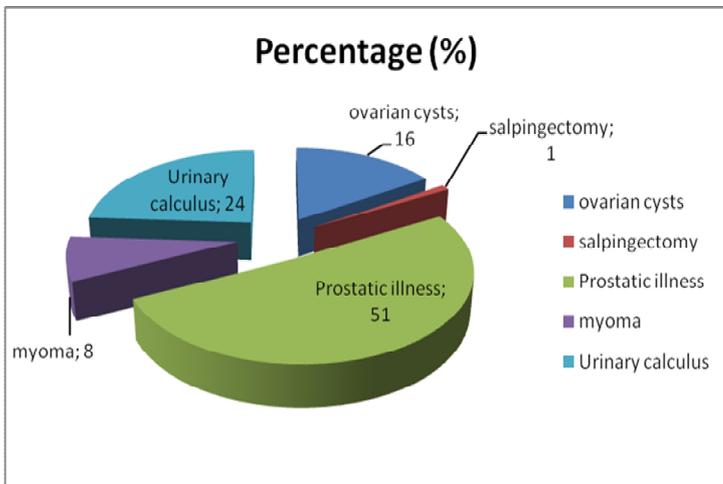


Fig. 4: Distribution of urogenital surgical intervention cases at the Maroua regional Hospital (2007-2009).

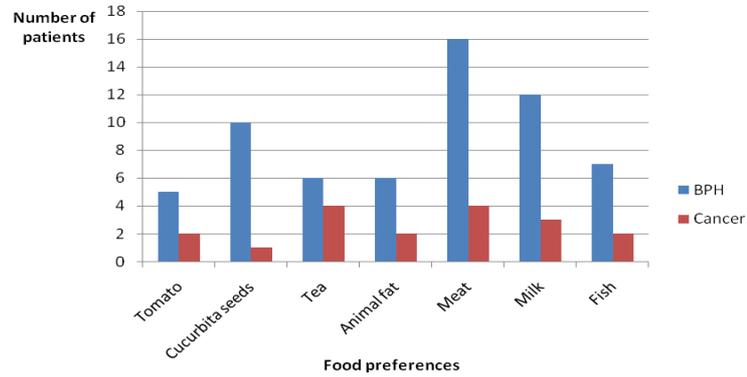


Fig. 7: Presentation of the food preferences of the patients of prostate. (HBP = BPH: benign prostatic hyperplasia)

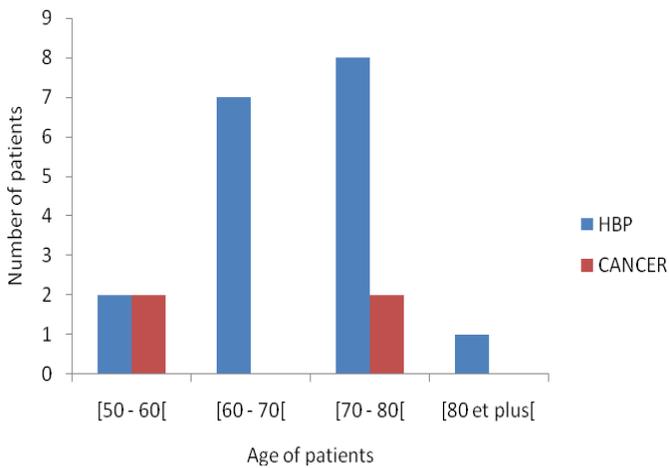


Fig. 5: Distribution of prostatic troubles cases according to the age bracket of patients. (HBP = BPH: benign prostatic hyperplasia)



Fig. 8. Leaves and fruits of *Azadirachta indica*



Fig. 9: Branches and fruits of *Tamarindus indica*



Fig. 12: Branches and fruit of *Prosopis africana*

Percentage of quotations

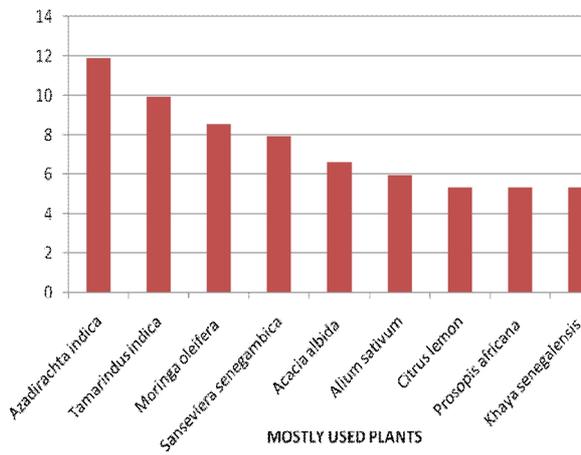


Fig. 10: Presentation of some plants mostly used in the recipes.



Fig. 13: Branches and fruits of *Ziziphus mauritania*



Fig. 11: Palms and fruits of *Hyphaene thebaica*