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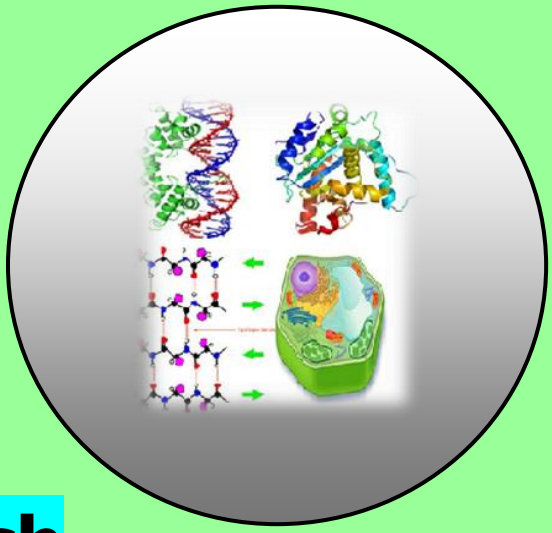
ISSN 2319-3077 Online/Electronic
ISSN 0970-4973 Print

Journal Impact Factor: 4.275
Global Impact factor of Journal: 0.876
Scientific Journals Impact Factor: 3.285
InfoBase Impact Factor: 3.66
Index Copernicus International Value
IC Value of Journal 47.86 Poland, Europe

J. Biol. Chem. Research
Volume 33 (1) 2016 Pages No. 496-509



Journal of Biological and Chemical Research

An International Peer Reviewed / Referred Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 33, No. 1: 496-509, 2016
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 33/2/26/2016

ISSN 0970-4973 (Print)
ISSN 2319-3077 (Online/Electronic)

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RESEARCH PAPER

Received: 03/05/2016 **Revised: 18/05/2016** **Accepted: 19/05/2016**

Ethnopharmacological and Ethnomedical Study of Anti-Epileptic Plants used in Traditional Medicine in Yaounde and its Surroundings Areas (Cameroon)

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ABSTRACT

***Ethnopharmacological relevance:** Epilepsy, called "Awa" in Bamileke tribe, is a neurogical chronic affection more frequent in Cameroon and especially in Yaounde and its neighborhoods. Several medicinal plants are used in Cameroon to treat epilepsy and convulsions. So far, no studies have investigated the ethnomedical follow up epileptic patients to establish the efficiency of these plants and the ethnopharmacological preparation of herbal remedies used by them.*

***The aim** of this study was to investigate the control of epilepsy by 21 potential Cameroonian medicinal plants.*

***Ethnobotanical** and ethnomedical surveys on traditional habits in the treatment of 3 mains types of epilepsy (general epilepsy, partial epilepsy and atonic epilepsy), were carried out in Yaounde and its surroundings areas.*

***The results** show that 21 plants have contributed to the ethnopharmacological preparation of 16 herbal remedies used by 38 epileptic patients. Six of them were improved by the household traditional medicine treatment and 10 by the treatment of traditional healers.*

Two of four patients of atonic epilepsy encountered were recovered. Four/four patients of local epilepsy treated were recovered. Ten/thirty patients of generalized epilepsy were healthier. Previous pharmacological studies show that 14/21 plants possess anti-epileptic effects like antihypertensive and tranquilizing properties, depressive action on nervous system and maintain of electroencephalogram, inhibition of the transmission of sympathic nervous influx.

Sixteen/38 of epileptic patients followed up by a physician and who were taken herbal remedies were recovered. Therefore plants can control epilepsy. The future investigation for the development of new antiepileptic drugs derived from these medicinal plants is therefore encouraging.

Key words: Ethnopharmacology, Ethnomedicine, Epileptic Patients and Treatment Evaluation.

INTRODUCTION

Epilepsy, called "Awa, Kanda, Essesee, Nti mem and Ekpogho Mbui" respectively in Bamileke, Ewondo, Boulou, Bayangi and Ejagam tribes, is a disorder that affects about 40 million people worldwide (Njamnshi et al. 2010). In Africa countries epilepsy is very frequent. It estimates that 8 persons over 1000 are epileptic and 30 to 50 individuals over 100000 become epileptic patients (Ouazzani 1997). The prevalence in sub-Saharan Africa is estimated to be two or three time highest than the rate in developed world (Ngounou 2007). In Cameroon, some epidemiological studies have shown that, the prevalence of epilepsy is estimated to vary from 5-136/1000. The highest prevalence is reported in some villages of Central Region located in the Sanaga and Mbam River Valley (Nchojii and Tioko 1989 ; Dongmo et al. 2000 ; Preux et al. 2000 ; Boussines 2002 ; Kamgno et al. 2003 ; Dongmo et al. 2004 and Prischich et al. 2008). Cameroon is one of the most affected countries by epilepsy in Africa. Thus, epilepsy is among the major public health problems in Cameroon. In Africa and in Cameroon particularly, phytotherapy in traditional medicine still plays an important role in the management of diseases, mainly among populations with very low income (Geoffrey and Kirby 1996).Traditional healers know very well some of its manifestations. But this disease is subject of numerous preconceptions. For examples people consider that epilepsy is a mystic disease that comes from witchcraft, maledictions and bad spirits. For these reasons they consult previously traditional healers which start the treatment by many sacrifices to ancestors, false gods and people. These practices conduce to the lateness of efficient treatment, the aggravation of patients' condition and their social exclusion like the case of some complications of diabetes (Tsabang (2008). Nevertheless epilepsy is a chronic affection caused by the unexpected and simultaneous repetition of activation abnormally intense of a great number of cerebral neurons, called paroxysms. Clinically these paroxysms are manifested by epileptic seizures that are unforeseen, sudden and brief. They start and end briskly. There are 3 main types of epileptic seizures that correspond to 3 mains types of epilepsy naming general epilepsy, partial epilepsy and atonic epilepsy. All traditional healers don't distinguish all these types and don't know their manifestations.

In the first type the patient is struck down by seizures, convulses, urinates, dribbles and bites one's tongue and lips.

He is a victim of neuro-vegetative perturbations like tachycardia, hypertension, etc. In the second type, the seizure strikes only one part of the body like muscle, organ of sense or viscera (intestinal organs). Previous to these manifestations the patient develops sticking, pricking or tingling. In the thirst type the patient is conscious during the tonic and chronic contractions of a part of the body like face or member. In this type the epileptic seizure starts by a brief suppression of the consciousness, a loss of muscular tonus of posture, following by the fall down. The patient falls down, stays passive and unconscious for few minutes. In Yaounde area and its surroundings several epileptic patients used plants of familial traditional medicine and by consulting the traditional healers in surreptitious because of their social exclusion. Numerous questions can be addressed for such treatments. Is it the diagnostic in traditional medicine truth? Do the epileptic patients discover really their health? Do the traditional healers recognize the 3 main types of epilepsy? To response to all these questions we carry out an ethnomedical and an ethnobotanical survey that include epileptic patients and traditional healers living in Yaounde and its surrounding areas.

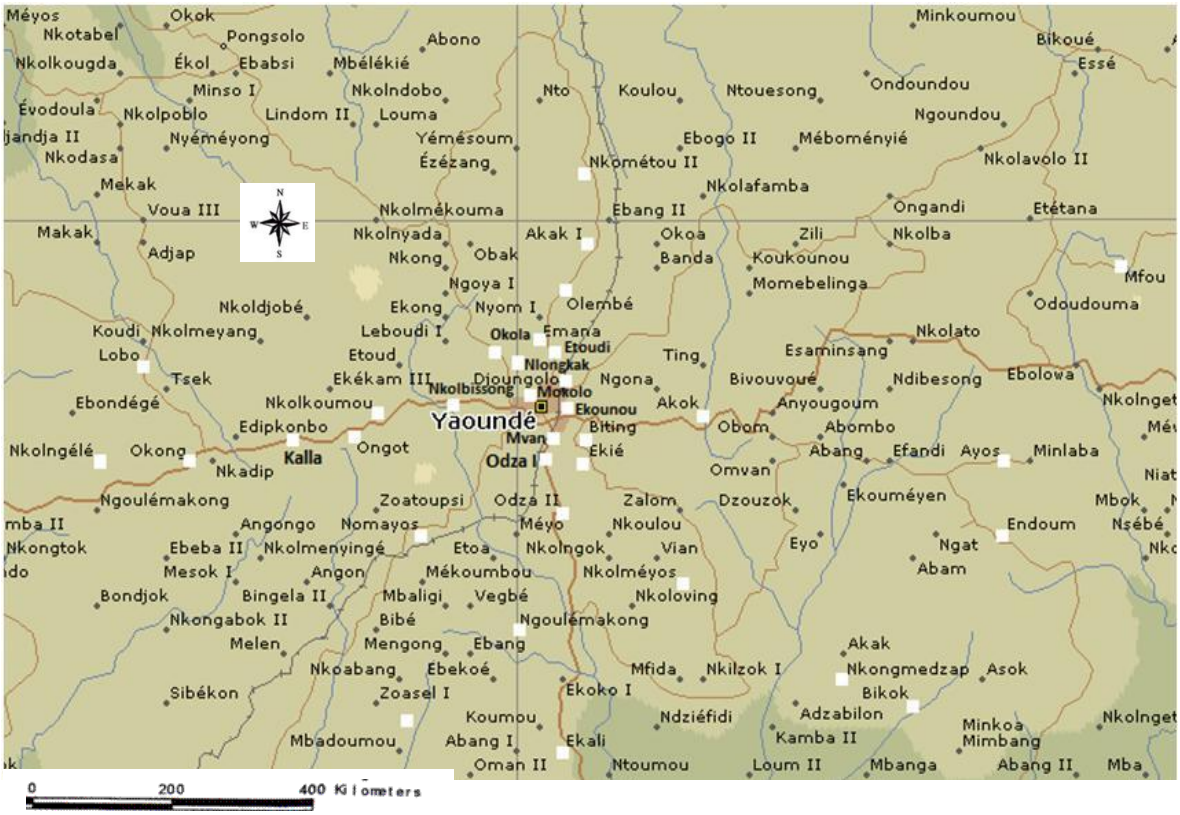
Keywords: Epilepsy, Traditional healers, householders, herbal remedies, plants, Yaounde and its surroundings areas

MATERIALS AND METHODS

Ethnobotanical surveys

Population sampling

To achieve the goal, we selected a sample of 30 traditional healers and 8 householders belonging to 33 villages or quarters (map 1)



Map 1. Distribution of traditional healers and householders in 33 villages or quarters of Yaounde and its neighbourhoods.

The survey team

In each time, a team made up of an ethnobotanist and a physician carried out the interview.

The survey method

Ethnobotanical and ethnomedicine surveys were conducted with traditional healers and householders in the Yaounde and its surrounding areas using a semi-structured questionnaire.

The anti-epileptic plants used were identified with their scientific and vernacular names and confirmed in the National Herbarium of Cameroon. Plant specimens were collected, water evaporated, mounted, and a botanical vouched was prepared. The plant vouched and photographs of plants were preserved and kept in the Institute of Medical Research and Studies of Medicinal Plants.

Ethnopharmacological research

Description of herbal remedies

The following points were taken in consideration during the description of herbal remedies:

- method of preparation;
- dosages;
- toxic effects.

Determination of bioactive plants

Bioactive plants were determined through chemical, clinical and pharmacology bibliographic research in the Institute of Medical Research and Medicinal Plant Studies.

Ethnomedicine research

Identification of the types of epileptic patients

The epilepsy were identified with it vernacular names. The physician, from the symptoms presented by epileptic patients during the seizure, classified them in 3 categories: patients of general epilepsy, patients of partial epilepsy and patients of atomic epilepsy. These patients were in treatment at traditional healers' or were used plants of household traditional medicine. The manifestations like convulsion, urination, dribbling and biting the tongue and the lips are recognized by many traditional healers. We worked with a selected traditional healers and householders who know many of these manifestations and different types of epilepsy. The efficiency of the herbal remedies used for the treatment was also evaluated by the clinical following up of the epileptic patients. The successful herbal treatments were appreciated by four parameters:

- reduction of the frequency of seizures;
- reduction of the violence of seizures;
- educational and socio-family insertion;
- and tolerance in treatment.

The durations of treatments were also reported. This methodology conducted to collect efficient plants used to treat epilepsy in Yaounde town and surroundings areas.

RESULTS

Plants used and ethnopharmacological preparation of herbal remedies.

To better put across the particularity of plant species, details on ethnopharmacological preparation of herbal remedies from each plant were presented in a table 1.

Ethnomedicine: Identification of the types of epileptic patients and recovered patients during the treatment

Table 1. Detailed description of all recipes

Scientific names of **Plants, families, Common names, Vernacular names and dialect, Types of plants and Morphological type of plant**	**Part used**	**Route of administra-tion**	**Methods of preparation of recipes, Posology, duration of treatment and secondary effects**
1- Main plant: ***Moringa oleiracea*** Lam. Synonym: ***M. pterogosperma*** Gaernt (Moringaceae); Drumstick tree, oil of Ben tree, Horse radish tree (English), Ben aile (French); Habbah ghaliah (Tokoto), Zogallagandi (Haoussa); Shrub in mountain forests, Small introduced Tree in Cameroon.	Leaves	Internal External	1- Boil of 50 g of fresh leaves of ***Moringa oleiracea*** and 50 g of fresh back of ***Voacanga africana*** in 3 liters of water for 20 mn. Drink 250 ml of the decoction three times a day. 2- The pasta obtained from pounded handful fresh leaves of ***Moringa oleiracea*** is used to massage the elbow, knees and feet every two days until the patient recovers*. No secondary or undesirable effect was revealed for the two herbal remedies.
2-Associated plant: ***Voacanga africana*** (Apocynaceae); Eyolla njongi (Douala)	Bark		
3- ***Morinda lucida*** Benth(Rubiaceae); Brimstone tree; Ikeng tek (Bassa), Akeng (Ewondo); secondary forests tree.	Leaves	Oral Oral	3- Boil 100 g of fresh leaves in 3 liters of water. Drink 250 ml of the decoction three times a day* 4- Boil 150 g of the stem bark in 3 liters of water. Drink 250 ml of the decoction three times a day* No secondary or undesirable effect was revealed.
4- ***Centella coreacea*** Nannfd Sy nonymes: ***Centela asiatica*** (L.) Urban, ***Hydrocotyle asiatica*** L. *H. lunata* Lam. (Apiaceae or Umbilliferae); Indian Pennylwort, Marsh pepperwort; herb.	Leaves	Oral	5- Squeeze a handful of leaves in 1 liter of water. Drink 250 ml of the maceration two times per day until the patient recovers*
5- ***Trema orientalis*** (Lin.) Blume Syn. ***Trema guineensis*** (Schum. et Thonn.). Filcaho. (1984) (Ulmaceae); Pigeon wood, Charcoal-tree; Teuki (Peul), Evesec (Fang), Eyousak (Bety),	Fresh stem barks Fresh leaves	Oral Oral	6- Boil 200 g of fresh stem bark in 3 l of water during 20 min. Take orally 250 ml of decoction two times per day*. 7- Boil 100 g of fresh leaves in

Fafa (Bamoun), Tafang (Bamileke) ; Pioneer tree of young secondary forest or old fallow lands.	Dry leaves	Oral	3 liters of water for 20 min. Drink 250 ml of the decoction 2 times daily*. 8- Boil 40 g of dry leaves in 2 liters of water for 15 min. Drink 250 ml of the decoction 2 times daily*. These recipes are also used for the treatment of cough (25), childhood convulsion and intestinal worms (26).
6- Main plan: ***Bryophyllum pinnatum*** *(*Lam.) Oken. (Crassulaceae); Resurrection plant, Djoudjou (Bamileke), Malagari gabo (Fufulde), Nedgera (Mankon); Herb.	Root	Oral	9- Macerate 100 g of roots of ***Bryophyllum pinnatum*** and 100 g of bark of ***Celtis integrefolia*** in 4 liters of water. Take 100 ml of maceration one time a day. Bitterness is an undesirable effect reported. No toxic effect was reported
7- Associated plant: ***Celtis integrefolia*** (*Ulmaceae*); African nettle tree, False elm; Ganki the tree; Wanko the leaves (Fulani);	Bark		
8- ***Kalanchoe cranata*** (Andr.) Haw (Crassulaceae); Resurrection plant; Joujou (Bamileke) Ejome **(**Bakossi**)**, Elualuoc (Bakweri), Ebin (Bouda), Edandi (Douala); Herb.	Leafy stems or leaves	Nasal Oral Oral	10- Instillate two drops of the leaf juice by nostrils 3 times daily. The leaf must be soft by the fire before the triturating*. 11- Infusion of 100 g of roots in 2 liters of water. Take 50 ml one time a day* 12- Macerate 100 g of roots in 2 liters of water. Take 50 ml one time a day*. Bitterness is an undesirable effect recorded. No toxic effect was recorded.
9- **M**ain plant: ***Ocimum canum*** *Sims* Synonyme*:* ***Ocimum hispidulum*** *Schum & Thonn.* **(**Lamiaceae**);** Basil; Nsima (Bassa);	Leaves	Oral	13- Boil 50 g of dry leaves of *O*. ***canum*** and 100 g of roots of ***Maystenus senegalensis*** in 3 liters of water. Drink 250 ml of decoction one time a day. No undesirable effect was recorded. No toxic effect was recorded. **N.B.** For ***Maystenus senegalensis*** the stem bark can substitute the roots (28).
10- Associated plant: ***Maystenus senegalensis***; (Celastraceae); Tultulhi, plural Tultuld'e (Fulani); shrub of fallow lands.	Bark		

11- Main plan: ***Achyranthes aspera*** Linn. (Amaranthaceae); Ndouet teuc (Yemba Bamileke); Klits**,** Snakes'tooth; Herb.	Leaves	Oral	14- Macerate in 6 liters of water for 12 h, 50 g the leaves of ***Achyranthes aspera***, 50 g of the young twigs of ***Harungana madagascariensis***, 50 g of the leaves ***Psidium guajava***, 50 g of the leaves ***Alchornea floribunda***, 50 g of the leafy stems of ***Alchornea cordifolia***, 50 g of the young shots of ***Acanthus montanus***, 50 g of the leaves of ***Nicotiana tabacum*** and 50 g of young shots of ***Emilia praeternissia***. Drink 250 ml of the filtrate two times per day after eating. Avoid eating pork meat, cola nut, okro, Sugar cane and drinking beer (27). Bitterness is an undesirable effect recorded. Pallor or whiteness is a toxic effect recorded.
Associated plants: 12-***Harungana madagascariensis*** (Hypericaceae); Atondo (Ewondo); Dragon's blood tree of Portuguese; shrub or small tree in forest	Young swigs		
13- ***Psidium guajava*** (Myrtaceae); Afele (Ewondo);	Leaves		
14- ***Alchornea floribunda*** (Euphorbiaceae); Hou lok (Bana);	Leaves		
15-***Alchornea cordifolia*** (Euphorbiaceae); Aboué (Ewondo); Bondji, Dibobunji (Bakweri); Sadjodjo (Bafia), Bichii (Bangou, Haut-Plateau); Ebo (Eton), Kip-Tog, Ngouo-Toun (Bamiléké) ; Diboy-bonji (Douala), Bambemi (Haoussa), Abouc (Bafut), Mbienbie (Féfe, Haut-Nkam); Christmas bush; bushy shrub.	Leafy stems		
16- ***Acanthus montanus*** (Acanthaceae); Ndo (Eton); False thistle; herb.	Young shots		
17- ***Nicotiana tabacum*** (Solanaceae); Tia (Bamileke-Yemba); Tabacco; cultivate herb.	Leaves		
18- ***Emilia praeternissia*** (Asteraceae); Alomevou (Ewondo); Herb.	Young shots		
19- Main plant: ***Rauvolfia vomitoria*** *afzel* Synonymes: ***Rauvolfia senegambiae*** A.DC. ***Hylacium owariense*** P. Beauv. (Apocynaceae); Aton(Yemba-Bamileke), Mezanga-Mezanga (Bety); shrub.	Root bark	Oral	15- Boil 100 g of fresh root bark ***Rauvolfia vomitoria*** and 100 g of ***Mitragyna inermis*** stem bark in 3 liters of water for 20 mn. Drink 250 ml of the decoction 2 times daily. Bitterness is an undesirable effect recorded. No toxic effect was recorded.
20- Associated plant: *Mitragyna inermis* (Rubiaceae).	Stem bark		
21- ***Newbouldia laevis*** (P.	Stem	Orally	16- Prepare a tisane of 20 g of

Beauv.) Seemann ex Bureau **Synonymes** : ***Spathodea laevis*** P. Beauv. (1805), ***Bignonia glandulosa*** Schumach & Thonn. (1829), ***Spathodea adenantha*** G. Don (1838) (Bignoniaceae); Malkam (Eton), Mbikam (Boulou, Ewondo), hilend; Smooth Newbouldia; small tree of forests.	Bulb		root powder in 500 ml of water. Heat for 10 min. Allow to cool, filter and drink 250 ml of the decoction, once per day* Bitterness is an undesirable effect recorded. No toxic effect was recorded.

* Monospecific herbal remedies.

Table 2. Duration of treatment by herbal remedies and health and social conditions of treated epileptic patients.

Plants	Types of epileptic patients and herbal remedies used	Reduction of the frequency Number/day		Reduction of the violence of seizure	Educational or socio-family insertion	Tolerance in treatment	Duration of treatment	Observations
		Before treatment	After treatment					
1-Moringa oleiracea + *2-Voacanga Africana*	Atonic epilepsy 1	*2	0	Yes	Yes	-	6 months	3/9 patients recovered
		*1	0,25	-	No	-	3 months	
		0,25	0	-	Yes	-	3 months	
	Partial epilepsy 1	*0,25	0	Yes	Yes	-	3 months	
		*1	0,25	-	No	-	3 months	
		*1	0,25	-	No	-	3 months	
	Generalized epilepsy 1 and 2	*1	0,25	-	No	-	3 months	
		*1	0,25	-	No	-	3 months	
		2	0	Yes	Yes	-	6 months	
3- Morinda lucida	Generalized epilepsy 3 and 4	*2	0,25	Yes	No	Yes	6 months	3/4 patients recovered
		0,5	0	Yes	Yes	Yes	6 months	
		0,25	0	Yes	Yes	Yes	6 months	
		*0,25	0	Yes	Yes	Yes	6 months	
4-Centella coreacea	Generalized epilepsy 5	*0,25	0	Yes	Yes	Yes	3 months	2/5 patients recovered
		*1	0,25	-	No	-	3 months	
		*1	0,25	-	No	-	3 months	
		*1	0,25	-	No	-	3 months	
		*1	0	Yes	Yes	Yes	3 months	
5-Trema orientalis	Partial epilepsy 6, 7 or 8	*0,5	0,25	-	-	Yes	3 months	4 patients incompletely recovered
		*1	0,25	-	No	-	3 months	
		*2	0,25	-	No	-	6 months	
		1	0,25	-	No	-	3 months	
6-Bryophyllum pinnatum *7-Celtis integrefolia*	Partial epilepsy 9	*1	0,25	-	No	-	3 months	2 patients interrupted the treatment
		*0,25	0,125	-	No	Yes	5 months	
8 –Kalanchoe cranata	Partial epilepsy 10, 11 and 12	*0,2	0	Yes	Yes	Yes	3 months	1 patients recovered
9-Ocimum canum *10- Maystenus senegalensis*	Atonic epilepsy 13	*0,25	0,125	-	No	Yes	5 months	1 patient not recovered
11-Achyranthes aspera + *12-Harungana madagascariensi*	Partial epilepsy 14	*2	0	Yes	Yes	Yes	6 months	4/5 patients recovered
	Atonic	*0,5	0	Yes	Yes	Yes	6 months	

s **13-** ***Psidiumguajava*** **14-** ***Alchornea floribunda*** **14-** ***Alchornea cordifolia*** **15-*Acanthus montanus*** **17-*Nicotiana tabacum*** ***18-Emilia praeternissia***	**epilepsy 14**							
	Generalized epilepsy 14	***0,25**	**0**	**Yes**	**Yes**	**Yes**	**6 months**	
	Generalized epilepsy 14	***0,25**	**0,125**	**Yes**	**Yes**	**Yes**	**6 months**	
	Generalized epilepsy 14	***0,25**	**0**	**Yes**	**Yes**	**Yes**	**3 months**	
19-Rauvolfia vomitoria + ***20-Mitragyna inermis***	**Generalized epilepsy 15**	**1**	**0**	**Yes**	**No**	**-**	**3 months**	**3/4 patients recovered**
	Generalized epilepsy 15	**0,25**	**0**	**Yes**	**No**	**Yes**	**5 months**	
	Partial epilepsy 15	**0,2**	**0**	**Yes**	**Yes**	**Yes**	**3 months**	
	Atonic epilepsy 15	***0,25**	**0,10**	**Yes**	**No**	**Yes**	**5 months**	
21-Newbouldia laevis	**Generalizede pilepsy 16**	***0,25**	**0**	**Yes**	**Yes**	**-**	**3 months**	**1/3 patients recovered**
		***1**	**0,25**	**-**	**No**	**-**	**3 months**	
		1	**0,25**	**-**	**No**	**-**	**3 months**	

* Epileptic patients treated by traditional healers only. The others patients used plants of household traditional medicine; number in bold represent the number of herbal remedies described above.

The table 2 presents the health and the social conditions of epileptic patients treated by herbal remedies. Twenty-one plants were used in 16 herbal remedies. Eleven of them are monospecific, three with two plants and one multispecific. Those plants are distributed among 16 botanical families and 21 genera. Thirty-eight (38) epileptic patients accepted the clinical following up. Twenty-nine were treated by traditional healers and 9 by household traditional medicine. Six were improved by the household treatment and 10 by the treatment of traditional healers. A total of 16/38 (44, 44%) of patients were improved. Two of four patients of atonic epilepsy encountered were convalesced. Four/four patients of local epilepsy treated were improved. Ten/thirty patients of generalized epilepsy were healthier. All information was obtained after receiving an oral prior informed consent from the participants. With the aim of informant, plants were identified and vouchers of each plant were collected and stored in the herbarium of the Institute of Medical Research and Medicinal Plants Studies.

DISCUSSIONS

Interpretation

Previous pharmacological studies have shown that 14/21 plants possess anti-epileptic effects like antihypertensive and tranquilizing properties, general ability and behavioral pattern on mentally retarded children, vasodilatatory of coronaries, and depressive effect on nervous system and on smooth muscular contraction, maintain of electroencephalogram and stop of the transmission of sympathic nervous influx.

Despite these properties, only 44, 44% of patients were recovered. The treatment of epilepsy is daily, regular and continued. So the number of recovered patients must be increased by long time treatments or by good selection of plants and the practice of food control (OMS 1990). The intervention of a physician in the diagnostic of the epileptic seizures and the following up of the recovered epileptic patients, especially those using the monotherapy remedies, permit to believe the efficiency of the plants administered. Because of the chronic effect of epilepsy; the prolonging, the diminution or the end of the treatment must be achieved progressively. Some treatments, if promising may be regularly taken 2 to 5 years before the beginning of it progressive stopping. Obesity was more common in men than in women treated. But there were no associations between obesity and other disease characteristics such as epilepsy type, duration or etiology (Jaromir 2005 and Sirven 2013). These results have shown that plants can control epilepsy or some of its symptoms. Therefore according to Pedersen 2009, the pharmacological screening of the ethanolic extracts of 11 Malian medicinal plants that include ***Flueggea virosa*** and ***Psorospermum senegalense,*** in vitro, lead to the identification of several extracts with potential anticonvulsant properties like the inhibition of the spontaneous discharges in the mouse cortical. Bum et al. 2009, confirmed that six plants that include ***Acanthus montanus, Celtis integrifolia*** and ***Voacanga africana***, used in three different herbal remedies in this study, protected strongly mice against induced convulsion or exerted sedative activity by strongly increasing the total duration of sleep induced by diazepam. In this work, herbal recipes have been discussed with more emphasis on the research advancements of traditional or herbal anticonvulsants **(**Sachchidanand et al. 2016).

Bioactive plants

Moringinine has been shown to exhibit a sympathomimetic activity similar of that of adrenaline (Ewu, 1993). The compound has stimulant cardiac activity, as well as peripheral vasoconstriction and elevation of blood pressure. It has a depressive action on smooth muscle fibers, relaxes the bronchioles and inhibits the tone and the movement of the intestine in rabbits and guinea pigs (Bep 1986). Consequently it may worsen the disease. ***Voacanga africana*** the plant associated to ***Moringa oleracea***, protected 62.5% to 87.5% of mice against convulsions and turning behavior using animal models. These manifestations were induced by maximal electroshock, N-methyl-D-aspartate, pentylenetetrazol, isonicotinic hydrazide acid, picrotoxin, or strychnine (Bum, 2009). ***Voacanga africana*** also produce sedative activity by strongly increasing the total duration of sleep in mice treated by diazepam. It is diuretic, infant tonic and convulsion prophylaxis plant (Muazu, 1997**)**.

Therefore ***Voacanga africana*** may be used along because of its potential epileptic effects. The extract of leaves or stem bark produce a strong but short acting antihypertensive activity that may be due to its pronounced diuretic and tranquilizing properties that may be confirmed the improvement of some patients (Muazu and Kaita 2008). Due to its non-chronic toxicity the use of this plant can be tolerable (Nguelefack et al. 2006). In clinical trials, Bep 1986 found that in 30 min. mentally retarded children free from epilepsy and other neurological conditions had a significant improvement in both general ability and behavioral pattern when they were treated by ***Centella coreacea*** for a period of 12 weeks. ***Achyranthes aspera*** possesses hypotensive, depressive, cardiac, vasodialatatory and respiratory analeptic properties due to Achyranthine (Kerharo and Adam 1974).

These effects can be useful in the treatment of epilepsy. Despite the depressive effect on nervous system and on smooth muscular contraction of ***Nicotiana tabacum,*** this plant causes a strong human intoxication due to nicotine that may be responsible of the secondary effects observed by the healers. It was reported to have neurotoxic substances that may worsen the disease (Saba et al. 2012). ***Acanthus montanus*** protected 66.6% of mice against maximal electroshock, picrotoxin, and strychnine-induced convulsions and 83.3% of mice from pentylenetetrazol -induced convulsions (Bum 2009). The main constituents of *Celtis* ***integrifolia*** are proline, gamma amino butyric acid, sugars, gallic acid and leucocyanidin (Adjanohoun et al. 1988). Gamma amino butyric acid deficiency may lead to convulsions (Arvigo and Balick 1998). ***Mitragyna inermis*** has alkaloids structurally similar to clinically useful anticonvulsant. Many pharmacological properties including hypoglycemic, analgesic, anti-inflammatory, anti-plasmodic, diuretic, laxative, anti-convulsive, anti-helminthic, hypotensive, anti-sickle cell disease, anti-oxidant and anti-bacterial are known from ***Trema orientalis***. This compilation sustains strongly the idea that ***T. orientalis*** has profitable therapeutic properties (Muazu 1997). Camphor isolated from ***Ocimum canum*** is an excellent cardiac and respiratory analeptic and is also a general stimulant. This active component has sedative and antispasmodic effects. In East Africa the oil contains 16-25 % camphor (Muazu 1997). The methanol extract of ***Kalanchoe crenata*** significantly increased the latency period in seizures induced by Pentylenetetrazol and Strychnine and significantly reduced the duration of seizures induced by the two convulsing agents. The extract protected 20% of animals against death in seizures induced by Strychnine. These results suggest a peripheral and central analgesic activities as well as an anticonvulsant effect of the leaves of ***Kalanchoe crenata*** (Fozi 2000). ***Rauvolfia vomitoria*** possesses tranquilizing and sedative properties due to reserpine that also provokes least sleepiness and maintains electroencephalogram (Bep 1986; Saba et al. 2012). This substance stops the transmission of sympathic nervous influx by reacting on the subcortical chonoreactive centre. It is also influenced the metabolism of serotonin, noradrenalin and other catecholamine by keeping them in the tissues where they are in reserve (Bum, 2009). Four alkaloids which are indolic bases from which harmane was identified, have been isolated from the roots of ***Newbouldia laevis***. The properties of harmane and its derived components like harmol, harmine, harmaline are comparable to those of quinidine and other alkaloids of *Cinchona* spp. Harmane is also a dilatator of coronaries (Saulnier 1998).

CONCLUSION

In term of this study, a total of 16/38 of patients were improved for a percentage of 44, 44%. Two of four patients of atonic epilepsy encountered were convalesced. Four/four patients of local epilepsy treated were healthier. Ten/thirty patients of generalized epilepsy were healthier. Epilepsy is not a mystic disease. It can be controlled by plants. The present study revealed antiepileptic potential of some Cameroonian medicinal plants. These herbal remedies can render antiepileptic and its symptomatic treatments more rationale and the epileptic patient's responsive (Saba et al. 2012). The medicinal important plant species, listed in the present paper appear to be promissory sources of epileptic phytodrugs. The future investigation for the development of new antiepileptic drugs derived from these medicinal plants is therefore encouraging. However, further studies about the toxicity of plant extracts and phytodrugs are recommended as important approach to the treatment of epilepsy.

ACKNOWLEDGEMENTS

The authors express their gratitude to all traditional healers, epileptic patients and householders who answer out questionnaire during the survey. They also thank informants for the hospitality that they have developed during 20 years of survey.

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