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Survey of Analgesic Plants Used by Tradipractitioners in Congo Brazzaville

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Abstract: A series of semi-structured interviews with traditional practitioners from the South of Congo Brazzaville allowed us to gather the names of 200 plants entering traditional preparations against pain. Some were already well studied for their analgesic and/or psychotropic properties but others were very little documented. We selected 51 plants, belonging to 32 families, which seemed promising but had not yet been studied in laboratory. For each plant, we collected the following data: used plant parts, modes of preparation and administration, as well as indications relating to the treatment when they were available. Around 150 traditional recipes were thus recorded. In analgesic as well as in psychotropic preparations, leaves are the most used part (43 and 40% of citations, respectively), followed by roots or root bark (17-13%), aerial part (11-6%), stem and trunk bark (20-11%). Decoction is the major mode of preparation and in most cases the preparation is drunk or applied locally (friction, massage). As a rule, plants used, dosage and length of the treatment shall vary depending to age, sex and general health condition of the patient. Self-medication can thus be very dangerous, all the more because some of the plants we studied are easily bought in the market places of Brazzaville or Pointe Noire.

Key words: Africa, Congo, plants, traditional medicine, analgesic, psychotropic

INTRODUCTION

Congo disposes of an important pharmacopoeia and like all Central African countries, of a rich flora, which gives us a great opportunity of studies and action for the promotion of pain-relieving compounds. As in most countries of the South, the Congolese population resorts essentially to medicinal plants for its health requirement. This may by choice for some persons, but it also reflects the lack of financial means for most people. It is the case for the treatment of pain, highlighted now because of the difficult socioeconomic conditions (armed conflicts, unemployment) and of the psychological and physical troubles that they generate (pain, psychoses, ulcer, mental diseases, etc.). In the traditional Congolese medicine, the well-being is perceived as holistic, meaning that pain relieving will both resort to analgesic and to psychoactive plants, in order to both heal the physical pain and allay the fears and anxieties of everyday life. This holistic conception of the health is common to all the countries of the Bantu area (Cocks and Moller, 2002; Akendengue *et al*., 2005). If these treatments are not supervised, they can turn out to be nocive to health or addictive. The growing practice in the towns of self-medication, without consultation of doctors or tradipractitioners (traditional practitioners) does not help. Koubouana *et al*. (2000) reported the death of young people in Congo Brazzaville by intoxication with *Datura fastuosa* and the survey of Maiga *et al*. (2005) showed that numerous toxic plants are sold in the markets in Mali and that without the indications of the tradipractitioners, people can easily get poisoned.

CERMA (Centre of Study and Research of Médecins d'Afrique) works to promote traditional medicine, in collaboration with an extended network of tradipractitioners in tropical Africa. We though urgent to start a vast program to study the potentialities of medicinal plants in pain relieving. Indeed, many Congolese plants commonly used by tradipractitioners for their pain-relieving activity have to this day never been

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studied, either in ethnobotany, pharmacology or chemistry. It was thus necessary to realize a systematic inventory of the information held by each tradipractitioner and to complete it by the data of the relevant literature, in order to dispose of accurate and coherent information. This collected information will be of use to tradipractitioners to enrich their practice thanks to the mutualisation of the knowledge. It will be also very useful for the actors of health who support tradipractitioners (as the Service of Traditional Medicine in Congo) and to the researchers, for the pharmacological validation of the traditional preparations and the isolation of the compounds responsible for the analgesic or psychotropic activity of these plants. We inventoried all the plants traditionally used by tradipractitioners (*Nganga*) of the south of Congo Brazzaville for pain-relieving. This systematic study was followed by a literature review to check whether the traditional activities had been validated in laboratory essays. In this article, we present 51 plants which stand out from the study as being at the same moment the most promising and the least studied.

MATERIALS AND METHODS

Study area: Besides the two main cities of Congo, Brazzaville and Pointe-Noire, the zone covered for our study stretches in the south of Congo, in the Pool region (Fig. 1). The two cities count about 2,000 000 inhabitants

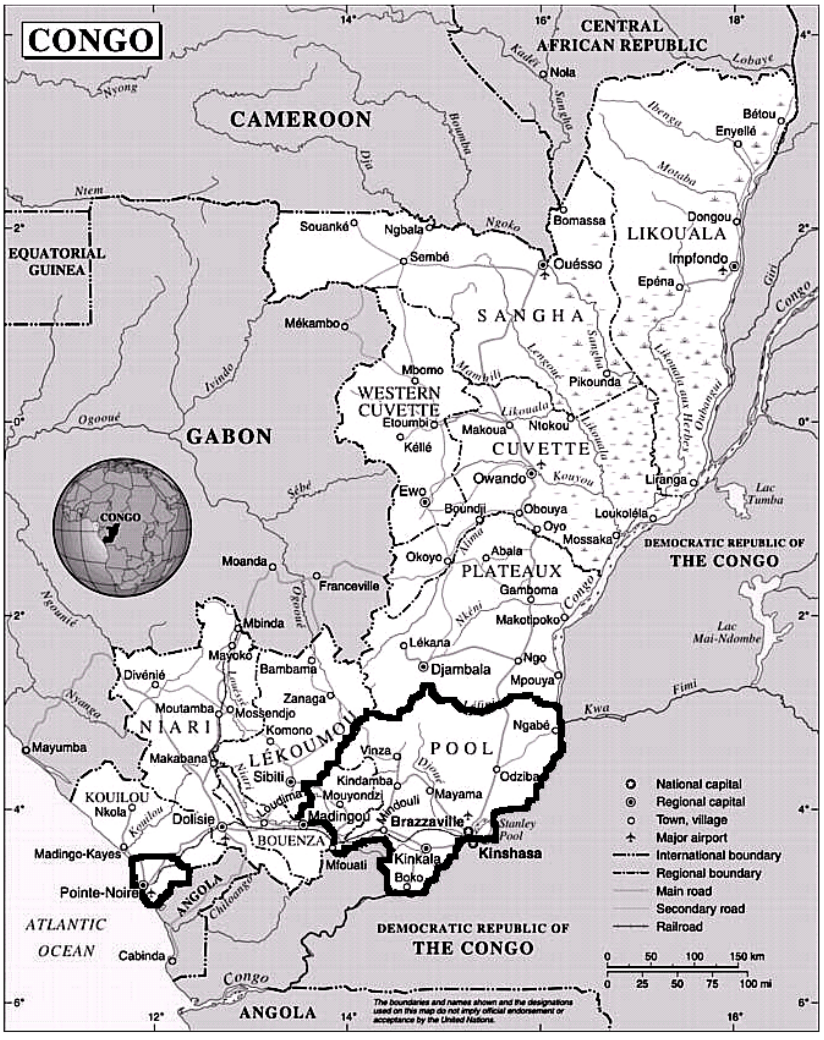

Fig. 1: Study area in the South of Congo

and the villages of the Pool add 240,000 inhabitants to that count, the total population of the country being of 3,500 000 inhabitants (data of 2004). Vegetation is most often savannah, with a few forest patches. The climate is of the «Guinean-forest» kind, as it is the case for the major part of the country. The average annual temperatures are tropical (between 23 and 27°C) and the annual rainfall is around 1200 mm, with dry seasons between May and September.

Method used for interviewing the tradipractitioners: A semi-structured interview form was designed to get information from the tradipractitioners' knowledge about the plants with analgesic and/or psychotropic indications. Interviewed tradipractitioners were either part of the network of Médecins d'Afrique or persons known to the members of this network and recommended by them. Makambila and Banzouzi conducted interviews during a period of 2 months, either in French or in *Kikongo* (a language in which most tradipractitioners of our study area expressed themselves more easily). Having ensured that the questioned tradipractitioners understood well the meaning of analgesic and psychotropic, the questionnaire was filled for every named plant. This questionnaire contained the contact details for interviewer and tradipractitioner, personal information about the tradipractitioner (age, sex, education level) and, for every plant, the following issues:

- Botanical information (family, genus and species, local names)
- Used part(s) of the plant
- Preparation, application and dosage of the remedies
- Evaluation of success
- Known side effects and contraindications

In total, 26 tradipractitioners were interviewed.

Plant material: We could not collect plant material of all the plants mentioned by the tradipractitioners during our study. We shall discuss in this paper only the plants which names were most often given and for which we could get a herbarium specimen. Botanical determination for each of these plants was checked by the botanists of CERVE and a voucher specimen was deposited at the herbarium of the CERVE (collection numbers: MKC001-051). These plants will serve later for tests.

RESULTS AND DISCUSSION

Information on tradipractitioners: The 26 tradipractitioners were generally persons aged from 40 to 60, with a little more men (15/26) than women (11/26). Their level of education varied a lot, but 18 of them have at least completed their college years (secondary education) and 3 have studied at University. Each could provide a list of 5 to 10 plants potentially interesting for present study.

Plants intervening in analgesic and/or psychotropic preparations: Interviews allowed us to record the names of 200 Congolese plants intervening in analgesic and/or psychotropic preparations. A bibliographic research in online databases allowed us to put aside those who had already made the object of numerous studies and whose activities were well documented, such as *Tabernanthe iboga*, *Datura stramonium*, *Cannabis sativa*, *Voacanga africana* or *Alchornea floribunda* (De Smet, 1996) to name only them. We kept only plants having made the object in our knowledge of less than 5 chemical studies and for which we could easily collect specimens. This way, we reduced the number of plants presented in this study to 51, divided in 32 families. Twelve plants had analgesic indications (A) only, 9 plants had psychotropic indications (P) only and 30 plants were mentioned for both activities (Table 1). Among these 51 plants, 13 plants were reported only once, 34 plants were reported 2 to 5 times and 4 plants were named 6 times or more, either as analgesic, or as psychotropic.

These last species, obviously the most used, are *Bryophyllum pinnatum* (Lam.) Oken (Crassulaceae), *Erythrophleum guineense* G.Don (Caesalpiniaceae), *Harungana madagascariensis* Lam. ex Poir. (Hypericaceae) and *Hymenocardia acida* Tul. (Euphorbiaceae). All 4 plants had both analgesic and psychotropic indications. It was noted that if *Elaeis guineensis* Jacq. (Arecaceae) was reported only 5 times as main plant in remedies, its oil often intervenes as adjuvant. This plant is therefore also one of the most used. Only 5 plants, *Bryophyllum pinnatum, Conyza sumatrensis*, *Culcasia scandens*, *Eleais guineensis* and *Lippia adoensis* have been studied previously for their analgesic activity. For *C. sumatrensis*, the analgesic activity is due to the presence of sesquiterpenoids and for *L. adoensis*, the analgesic activity is due to its essential oil. Psychotropic activity was studied for 7 plants, *Cola acuminata*, *Cola hispida*, *Mostuea hirsuta*, *Newbouldia laevis*, *Piper umbellatum*, *Strychnos aculeata* and *Voacanga bracteata*, but without identifying a particular compound, apart from alkaloids for *V. bracteata*. The references of the concerned studies are given in Table 1. For the 39 others plants, traditional activity remains to be confirmed scientifically. However, for some of these plants, other species of the same genus

Table 1: Traditional indications of selected plants and laboratory confirmations of their activity

Family	Plant	Local names	Collection number	No. of citations by tradipractitioners A	P	Previous studies
Acanthaceae	*Brillantaisia patula* T.Anders	Lelemba	MKC001	1	3	A: genus (1 study)
Acanthaceae	*Sclerochiton nitidus* (S.Moore) C.B.Clarke	Mbola	MKC002	1	0	0
Amaranthaceae	*Celosia trigyna* L.	Tieta	MKC003	1	1	0
Ampelidaceae	*Cissus aralioides* (Welw. Ex Bak.) Planch.	Mbye-mbyeke	MKC004	2	1	A : genus (1 study)
Annonaceae	*Anonidium mannii* (Oliv.) Engl. and Diels	Kindi	MKC005	1	1	0
Apocynaceae	*Voacanga bracteata* Stapf	Mpisi	MKC006	1	1	P: De Smet (1996) genus (3 studies)
Araceae	*Culcasia scandens* P. Beauv.	Vidinga, lunamu	MKC007	4	0	A: Okoli *et al.* (2003, 2004, 2006) Okali and Akah (2000, 2004)
Arecaceae	*Elaeis guineensis* Jacq.	Ba	MKC008	5	0	A: Kweifio-Okai (1991)
Asteraceae	*Conyza sumatrensis* (Retz.) E.K. Walker	Fumu dia mbombo	MKC009	3	2	A: Asongalem *et al.* (2004), De las Heras *et al.* (1998) genus (3 studies)
Asteraceae	*Dichrocephala integrifolia* (L.f.) O. Ktze	Kituto (teke)	MKC010	1	3	0
Asteraceae	*Microglossa pyrifolia* (Lam.) O. Ktze.	Kiwundi	MKC011	1	3	0
Asteraceae	*Spilanthes uliginosa* Sw.	Mbudika	MKC012	1	0	A: Santi (1939) genus (3 studies)
Bignoniaceae	*Newbouldia laevis* (P.Beauv.) Seeman ex Bureau	Mumeni	MKC013	0	2	P: Amos *et al.* (2002)
Caesalpiniaceae	*Erythrophleum guineense* G.Don	Nkasa	MKC014	4	3	A: genus (1 study)
Combretaceae	*Combretum racemosum* P.Beauv.	Mususumbi wa sangi	MKC015	1	0	A: genus (1 study)
Combretaceae	*Quisqualis heinsii* (Engl. and Diels) Exell	Mususumbi wa makanga	MKC016	1	0	0
Connaraceae	*Cnestis ferruginea* DC.	Mukubi	MKC017	1	0	0
Crassulaceae	*Bryophyllum pinnatum* (Lam.) Oken	Yuyuka	MKC018	2	5	A: Ojewole (2005) P: Pal *et al.* (1999)
Cucurbitaceae	*Cogniauxia podolaena* Baill.	Nkozia	MKC019	0	1	0
Euphorbiaceae	*Hymenocardia acida* Tul.	Muhete	MKC020	5	3	0
Euphorbiaceae	*Hymenocardia ulmoïdes* Oliv.	Nsanga	MKC021	0	1	0
Euphorbiaceae	*Phyllanthus discoideus* (Baill.) Muell. Arg.	Mukanga	MKC022	2	2	A: genus (20 studies)
Euphorbiaceae	*Sapium cornutum* Pax	Ntiti	MKC023	1	0	A: genus (3 studies)
Fabaceae	*Crotalaria retusa* L.	Bimpota	MKC024	0	2	A: genus (2 studies)
Fabaceae	*Eriosema psoraleoides* (Lam.) G. Don	Nzeenzeke wa makanga	MKC025	1	0	0
Fabaceae	*Millettia laurentii* De Wild.	Ntoko	MKC026	1	2	A: genus (6 studies)
Hypericaceae	*Harungana madagascariensis* Lam. ex Poir.	Mutunu	MKC027	2	5	0
Lamiaceae	*Leonotis nepetifolia* (L.) W.T.Aiton	Nti wa lemba	MKC028	1	2	A: genus (1 study)
Loganiaceae	*Mostuea hirsuta* (T.Anders) Baillon	Mbaka	MKC029	0	1	P: De Smet (1996)
Loganiaceae	*Strychnos aculeata* Solered	Wumi	MKC030	1	1	A: genus (3 studies) P: Delaude and Delaude (1997)
Meliaceae	*Carapa procera* DC.	Mubila nkumi	MKC031	1	1	A: genus (4 studies)
Mimosaceae	*Dichrostachys glomerata* (Forssk.) Chiov.	Nsende mpanga	MKC032	2	2	0
Moraceae	*Ficus exasperata* Vahl.	Yakasa	MKC033	1	0	A: genus (3 studies)
Moraceae	*Ficus mucuso* Welw ex. Fic.	Kimbele	MKC034	1	0	A: genus (3 studies)
Moraceae	*Ficus thonningii* Blume	Nsanda	MKC035	2	2	A: genus (3 studies)
Moraceae	*Musanga smithii* R.Br.	Musenga	MKC036	2	1	A: genus (2 studies)
Moraceae	*Myrianthus arboreus* P.Beauv.	Nsongoti	MKC037	2	0	0
Oxalidaceae	*Biophytum petersianum* Klotz	Kuta kuta	MKC038	0	2	0
Piperaceae	*Piper umbellatum* L.	Lemba ntoko	MKC039	2	2	A: Akendengue *et al.* (2005) genus (8 studies) P: Bioka and Abena (1990) genus (10 studies)
Poaceae	*Cymbopogon densiflorus* (Steud.) Stapf	Lualuangu	MKC040	1	2	A: genus (5 studies)
Ranunculaceae	*Clematis simensis* Fres.	Monikia	MKC041	2	1	A: genus (5 studies)
Rubiaceae	*Crossopteryx febrifuga* (Afzel. ex G.Don.) Benth.	Mfilu, nguala	MKC042	2	3	A: Foresta *et al.* (1998) (patent)
Rubiaceae	*Diodia scandens* Sw.	Lukaya lua lota	MKC043	1	2	0
Rubiaceae	*Gardenia jovis-tonantis* (Welw.) Hiern.	Kilemba nzau	MKC044	5	0	A: genus (2 studies)
Solanaceae	*Schwenckia americana* L.	Mudanda nzila	MKC045	2	2	0
Sterculiaceae	*Cola acuminata* (P.Beauv.) Schott and Endl.	Kazu	MKC046	0	3	P: De Smet (1998)
Sterculiaceae	*Cola hispida* Brenan et Kay	Kuluku	MKC047	0	1	P: De Smet, 1998
Tiliaceae	*Triumfetta cordifolia* A.Rich.	Mpunga	MKC048	1	1	A: genus (1 study)
Tiliaceae	*Triumfetta rhomboidea* Jacq.	Binkampula	MKC049	1	1	A: genus (1 study)
Verbenaceae	*Lippia adoensis* Hochst.	Ngadi	MKC050	1	3	A: Makonnen *et al.* (2003), Debella *et al.* (2003), Debell *et al.* (2005) genus (4 studies); P : genus (1 study)
Zingiberaceae	*Aframomum melegueta* K. Schum.	Nzo za nungu	MKC051	2	1	A: Umukoro and Ashorobi (2007)

have been studied, providing a source of information and it has been pointed out in Table 1 when a genus had been studied for the activities which interest.

Traditional analgesic and psychotropic preparations: We collected 155 preparations utilizing our plants. They are shown in Table 2, with indication of alleged activity (A for analgesic and P for psychotropic). The majority of these preparations used a single plant and most often only one plant part, 23 preparations only used combinations of plants. In psychotropic preparations as well as in analgesic ones, leaves are the most used part, representing 40 and 43% of citations, respectively. Other used plant parts are roots or root bark (13-17%), aerial part

Table 2: Analgesic and psychotropic preparations with the studied plants

Plant	A	P	Used part	Preparation	Associated plants	Mode of taking
Aframomum melegueta	1	0	Seeds and leaves	Crushed seeds and leaves	None	Scarifications
Aframomum melegueta	1	0	Seeds	Puree	*Cyperus articulatus* (aerial part)	Local application
Aframomum melegueta	0	1	Fruit	Hydro-alcoholic extraction (palm wine)	None	Orally
Anonidium mannii	1	0	Stem bark	Softening in fire	None	Poultice
Anonidium mannii	0	1	Stem, twig, trunk bark	Crushing	None	Orally
Biophytum petersianum	0	1	Leaves	Puree, mixed with water	None	Orally
Biophytum petersianum	0	1	Stem with leaves	Hydro-alcoholic extraction (palm wine)	*Micrococca mercurialis* (aerial part)	Orally
Brillantaisia patula	1	0	Leaves	Squeezed juice	*Piper umbellatum* (leaves)	Orally (adult 1 cup morning and evening; child ½ cup morning and evening)
Brillantaisia patula	0	1	Leaves	Squeezed juice	None	Orally, nasal instilment
Brillantaisia patula	0	1	Roots	Decoction	None	Lotion + steam bath
Brillantaisia patula	0	1	Stem and Leaves	Decoction	None	Orally
Bryophyllum pinnatum	1	0	Leaves	Decoction	None	Local application
Bryophyllum pinnatum	0	1	Leaves	Squeezed sap after heating	None	Instilment
Bryophyllum pinnatum	0	1	Leaves	Decoction	None	Enema
Bryophyllum pinnatum	0	1	Leaves	Boiled	*Tabernanthe iboga*	Ocular instilment
Carapa procera	1	0	Whole plant	Calcination	*Tapinanthus* sp.	Friction
Carapa procera	1	0	Bark	Decoction	None	Orally or enema
Carapa procera	0	1	Seeds	Oil extraction	None	Local application
Celosia trigyna	1	0	Leaves	Pulp extraction	None	Local application
Celosia trigyna	0	1	Leaves	Decoction	None	Enema (child)
Cissus aralioides	1	0	Stem without leaves	Decoction	None	Orally
Cissus aralioides	1	0	Leaves	Squeezed juice	None	Friction + orally
Cissus aralioides	0	1	Leaves	Decoction	None	Orally
Clematis simensis	1	0	Leaves	Puree	None	Inhalation
Clematis simensis	1	0	Leaves	Squeezed sap	None	Nasal instilment
Clematis simensis	1	0	Leaves	Drying and crushing	None	Smoke
Clematis simensis	1	0	Leaves	Squeezed sap	None	Local application
Clematis simensis	0	1	Aerial part	Squeezed	None	Orally
Cnestis ferruginea	1	0	Leaves	Decoction	None	Orally
Cnestis ferruginea	1	0	Fruits	Crushing and heating	None	Local application
Cogniauxia podolaena	0	1	Roots	Decoction	None	Orally, 1 tea spoon twice a day
Cola acuminata	1	0	Trunk bark	Hydro-alcoholic decoction (palm wine)	None	Orally, doses divided in day
Cola acuminata	0	1	Ripe Fruit	Chewing	None	Orally
Cola acuminata	0	1	Seeds	Decoction	None	Orally
Cola hispida	1	0	Leaves	Decoction	None	Orally (adult 1 cup morning and evening during 6 days; child 1 spoon morning and evening during 6 days)
Cola hispida	0	1	Seeds	Decoction	None	Orally
Combretum racemosum	1	0	Leaves	Decoction	None	Orally
Combretum racemosum	1	0	Bark and leaves	Decoction	None	Orally
Conyza sumatrensis	1	0	Stem anf leaves	Aqueous extraction	None	Local application
Conyza sumatrensis	1	0	Leaves	Squeezed juice	None	Frictions + nasal and ocular instilments
Conyza sumatrensis	1	0	Flowering tops	Decoction	None	Orally
Conyza sumatrensis	0	1	Leaves	Decoction	None	Orally
Conyza sumatrensis	0	1	Leaves	Squeezed juice	None	Nasal instilment
Crossopteryx febrifuga	1	0	Roots and stem bark	Drying and crushing	None	Orally
Crossopteryx febrifuga	1	0	Roots	Juice mixed with water	None	Local application
Crossopteryx febrifuga	0	1	Leaves	Infusion	None	Orally

Table 2: Continued

Plant	A	P	Used part	Preparation	Associated plants	Mode of taking
Crossopteryx febrifuga	0	1	Leaves	Infusion	None	Orally
Crossopteryx febrifuga	0	1	Bark	Decoction	None	Orally
Crotalaria retusa	0	1	Seeds	Crushing	None	Orally
Crotalaria retusa	0	1	Leaves	Squeezed juice	None	Orally
Culcasia scandens	1	0	Leaves	Pulp extraction	None	Friction
Culcasia scandens	1	0	Leaves	Aqueous extraction	None	Local application
Culcasia scandens	1	0	Whole plant	Calcination	None	Snuffing powder
Cymbopogon densiflorus	1	0	Leaves (essential oil)	Infusion	None	Orally
Cymbopogon densiflorus	0	1	Flowers	Smoked	*Nicotiana tabacum*	Inhalation
Cymbopogon densiflorus	0	1	Whole plant	Squeezed juice	*Brillantaisia patula* (leaves)	Orally
Dichrocephala integrifolia	1	0	Stem and leaves	Decoction	None	Orally
Dichrocephala integrifolia	0	1	Leaves	Decoction	None	Orally
Dichrocephala integrifolia	0	1	Stem and leaves	Decoction	None	Orally
Dichrostachys glomerata	1	0	Leaves	Roasting and crushing	None	Local application
Dichrostachys glomerata	1	0	Leaves	Decoction	*Schwenckia americana* (leaves)	Orally (adult ¼ cup morning and evening)
Dichrostachys glomerata	1	0	Roots	Decoction	None	Orally
Dichrostachys glomerata	0	1	Root bark	Crushing	None	Snuffing powder
Diodia scandens	1	0	Leaves	Squeezed juice	*Achyranthes aspera* (leaves), *Pavetta ternifolia* (leaves and roots)	Local application
Diodia scandens	0	1	Aerial part	Squeezing	None	Local application
Diodia scandens	0	1	Whole plant	Squeezed juice	*Elaeis guineensis* (oil) + tukula (red loam)	Massage
Dorstenia barteri	1	0	Stem and leaves	Decoction	None	Orally
Eleais guineensis	1	0	Roots	Decoction	None	Orally
Eleais guineensis	1	0	Roots	Decoction	None	Orally
Eleais guineensis	1	0	Nut without pericarp	Decoction	*Alstonia boonei* *Rauvolfia vomitoria* (root bark)	Orally
Eleais guineensis	1	0	Seeds	Oil	None	Massage
Eriosema psoraleoides	1	0	Leaves	Decoction	None	Local application
Eriosema psoraleoides	1	0	Leaves	Squeezing	None	Orally (adult 1 cup morning and evening; child ½ cup morning and evening)
Erythrophleum guineense	1	0	Root bark	Decoction	None	Bath
Erythrophleum guineense	1	0	Stem bark	Decoction	None	Bath
Erythrophleum guineense	1	0	Bark (fresh)	Decoction	None	Bath
Erythrophleum guineense	1	0	Bark (dried)	Crushing	None	Smoked
Erythrophleum guineense	0	1	Bark	Crushing	None	Smoked
Erythrophleum guineense	0	1	Flowers	Crushing	None	Smoked
Erythrophleum guineense	0	1	Root bark	Decoction	None	Orally
Ficus exasperata	1	0	Leaves	Squeezed pulp	*Elaeis guineensis* (oil)	Local application
Ficus mucuso	1	0	Bark	Squeezed pulp	None	Massage
Ficus thonningii	1	0	Sap	None	None	Local application
Ficus thonningii	1	0	Trunk bark	Maceration	None	Orally
Ficus thonningii	0	1	Leaves	Decoction	None	Orally
Ficus thonningii	0	1	Roots	Decoction	None	Orally, twice a day
Gardenia jovis-tonantis	1	0	Leaves	Decoction	None	Orally
Gardenia jovis-tonantis	1	0	Dried fruits	Crusched in water	None	Orally
Gardenia jovis-tonantis	1	0	Roots	Hydro-alcoholic maceration (palm wine)	None	Orally, 2-3 cups a day
Gardenia jovis-tonantis	1	0	Trunk or root bark	Squeezed pulp	None	Poultice
Gardenia jovis-tonantis	1	0	Trunk or root bark	Squeezed juice	None	Ocular instilment
Harungana madagascariensis	1	0	Leaves	Decoction	None	Orally
Harungana madagascariensis	1	0	Stem and leaves	Decoction	None	Orally
Harungana madagascariensis	0	1	Bark, stem	Squeezing	None	Orally
Harungana madagascariensis	0	1	Stem, leaves	Decoction	None	Orally
Harungana madagascariensis	0	1	Bark, stem	Squeezing	None	Orally
Hymenocardia acida	1	0	Leaves	Puree	*Spilanthes acmella*, *Alchornea cordifolia*	Local application
Hymenocardia acida	1	0	Bark	Crushed pulp	None	Orally
Hymenocardia acida	1	0	Bark	Decoction	None	Orally
Hymenocardia acida	1	0	Roots	Squeezed sap	None	Local application
Hymenocardia acida	0	1	Bark	Decoction	None	Local application
Hymenocardia ulmoides	1	0	Leaves	Decoction	None	Orally
Hymenocardia ulmoides	1	0	Trunk bark	Decoction	None	Orally

Table 2: Continued

Plant	A	P	Used part	Preparation	Associated plants	Mode of taking
Leonotis nepetifolia	1	0	Leaves and Roots	Infusion	None	Orally
Leonotis nepetifolia	0	1	Stem and Leaves	Decoction	None	Orally
Leonotis nepetifolia	0	1	Whole plant	Crushing	*Cymbopogon densiflorus* (roots)	Orally
Leonotis nepetifolia	0	1	Flowering tops and leaves	Crushing	None	Smoked
Lippia adoensis	1	0	Leaves	Decoction (essential oil)	None	Orally
Lippia adoensis	1	0	Whole plant	Aqueous or hydro-alcoholic (plam wine) decoction	None	Orally
Lippia adoensis	0	1	Stem and leaves	Decoction	None	Enema
Lippia adoensis	0	1	Leaves	Decoction	None	Bath
Microglossa pyrifolia	1	0	Leaves	Decoction	None	Orally
Microglossa pyrifolia	0	1	Root bark	Decoction	None	Orally
Microglossa pyrifolia	0	1	Roots with bark	Decoction	None	Orally
Microglossa pyrifolia	0	1	Leaves	Decoction	*Brillantaisia patula* (leaves and stem), *Clematis simensis* (leaves)	Orally + enema
Millettia laurentii	1	0	Bark	Crushing	*Bryophyllum pinnatum* (leaf soften in fire)	Poultice
Millettia laurentii	1	0	Leaves	Crushing	None	Local application
Millettia laurentii	0	1	Root bark	Aqueous maceration	None	Local application
Millettia laurentii	0	1	Bark	Mixed in water to get a foam	None	Bath, steam bath
Mostuea hirsuta	1	0	Leaves or roots	Decoction	None	Orally + massage
Mostuea hirsuta	0	1	Roots and leaves	Crushing	None	Orally
Musanga smithii	1	0	Pulp	Juice extraction	None	Instilment
Musanga smithii	1	0	Roots	Sap extraction	None	Orally
Musanga smithii	0	1	Apical bud	Crushing	None	Orally
Myrianthus arboreus	1	0	Seeds	Oil extraction	None	Local application
Myrianthus arboreus	1	0	Young leaves and apical bud	Squeezed sap	None	Local application
Newbouldia laevis	0	1	Stem bark	Decoction	None	Orally
Newbouldia laevis	0	1	Leaves	Decoction	*Ocimum canum*, *Capsicum frutescens*	Orally
Phyllanthus discoideus	1	0	Leaves	Decoction	None	Orally
Phyllanthus discoideus	0	1	Roots	Decoction	None	Orally
Phyllanthus discoideus	0	1	Stem	Crushed, mixed with palm oil	None	Scarifications, friction
Piper umbellatum	1	0	Leaves	Decoction	None	Orally
Piper umbellatum	1	0	Leaves	Squeezed sap	None	Orally
Piper umbellatum	1	0	Leaves	Squeezed sap	*Brillantaisia patula* (leaves)	Orally (adult 1 cup morning and evening; child ½ cup morning and evening)
Piper umbellatum	0	1	Leaves	Decoction	None	Orally
Quisqualis heinsii	1	0	Leaves	Decoction	None	Orally
Quisqualis heinsii	1	0	Bark and leaves	Decoction	None	Orally
Sapium cornutum	1	0	Leaves	Decoction	None	Local application
Sapium cornutum	1	0	Leaves	Decoction	None	Local application
Schwenckia americana	1	0	Whole plant	Decoction	None	Orally
Schwenckia americana	1	0	Whole plant	Puree with lemon juice	*Citrus* sp. (juice)	Poultice
Schwenckia americana	0	1	Stem and leaves, ripe fruit	Calcination	*Striga hermontheca*, *Dissotis rotundifolia*, *Capsicum frutescens*	Scarifications
Schwenckia americana	0	1	Whole plant and roots	Decoction	None	Orally
Sclerochiton nitidus	1	0	Stem and leaves	Puree and heating	None	Poultice
Spilanthes uliginosa	1	0	Whole plant	Decoction	None	Orally + local application
Strychnos aculeata	1	0	Leaves	Decoction	None	Orally
Strychnos aculeata	0	1	Bark	Decoction	None	Orally
Triumfetta cordifolia	1	0	Stem wood	Decoction	None	Orally (+ sugar)
Triumfetta cordifolia	0	1	Leaves	Decoction	*Ficus exasperata*, *Ocimum gratissimum* (leaves)	Aspersion
Triumfetta cordifolia	0	1	Leaves	Decoction	None	Orally
Triumfetta rhomboidea	1	0	Leaves	Decoction	*Spondias mombin*, *Hymenocardia acida*, *Ocimum gratissimum* (leaves)	Local application
Triumfetta rhomboidea	1	0	Leaves	Puree	Palm oil	Local application
Triumfetta rhomboidea	0	1	Leaves	Squeezed pulp	*Elaeis guineensis* (oil)	Friction
Voacanga bracteata	1	0	Roots	Pulp	None	Friction
Voacanga bracteata	0	1	Root Bark	Decoction	None	Orally

(6-11%), stem and trunk bark (11-20%). According to plants, between 1 and 4 different parts can be used for the same type of indication. For 20 plants out of 51, tradipractitioners agree about the active part. So, there are the leaves of *Bryophyllum pinnatum*, *Clematis simensis*, *Crossopteryx febrifuga*, *Dichrocephala integrifolia* and *Piper umbellatum* that are systematically reported. For other plants as *Anonidium mannii*, this is the stem bark. In the case of *Cnestis ferruginea* or *Ficus mucuso*, there are the fruits. For 23 other plants, tradipractitioners use 2 parts, among which in general leaves. Finally, for the 8 remaining plants, by cross-checking all the information, between 3 and 4 parts are recommended. In some cases, there is a net separation between the plant parts used in analgesic preparations and in psychotropic ones, as for instance for *Cola acuminata* (bark analgesic, fruits and seeds psychotropic), *Cola hispida* (leaves analgesic, seeds psychotropic), *Crossopteryx febrifuga* (roots analgesic, leaves psychotropic) or *Triumfetta cordifolia* (wood analgesic, leaves psychotropic). However, in most cases, one or more parts of the same plant are used in both kinds of preparation.

Modes of preparations are consistent with what is generally reported in Congolese traditional medicine (Hirt and Bindanda, 1993; Hagenbucher-Sacripanti, 1989; Adjanohoun *et al*., 1988; Bouquet, 1969): about 60% of plants are treated as aqueous decoction and 26% are simply squeezed to extract sap or pulp. Infusion arrives far behind (4%) and aqueous or hydro-alcoholic maceration (using palm wine) represents in total only 2% of reported modes of preparation. An original mode of preparation, calcination, was reported for 5% of recipes. In general, plants are used fresh and remedies are processed according to patients' requirements when they arrive and almost never beforehand.

Dosage of the remedies, application and duration of the treatments: The privileged mode of taking is the oral way (50%), followed by local application, friction and massages (20% in total), inhalation (8%) and by ocular or nasal instilment (6%). These modes of administration can be combined, as for instance oral way and local application for a decoction of *Spilanthes uliginosa* or then oral way, inhalation and enema for a decoction of *Piper umbellatum* leaves. We could not always understand the definite reasons of these combinations. The opinion of tradipractitioners is that they allow to hasten the expected effect of treatments. Dosage for the remedies and length of treatments were seldom given accurately (only for 10% of the preparations). When this information was available, we recorded it in Table 2. Some preparations are specifically designed for children, such as *Celosia trigyna* in enema. Tradipractitioners also pay a special attention to side effects and contraindications of preparation. For instance, they avoid the use of the abortive *Gardenia jovis-tonantis* when the patient is a pregnant woman. As a rule, plants used, dosage and length of the treatment shall vary depending to age, sex and general health condition of the patient.

Some plants included in our study are freely sold on the markets of Brazzaville and Pointe-Noire, the two main cities of Congo, which we visited. We can report *Aframomum melegueta* (fruits), *Biophytum petersianum* (whole plant), *Brillantaisia patula* (leaves), *Cola acuminata* (seeds and bark), *Elaeis guineensis* (fruits, seeds, stem, sap), *Piper guineense* (fruits). There were also other plants even more known and not included in our list, such as *Cola nitida* (seeds), *Tabernanthe iboga* (resins). And, in self-medication, these plants can be dangerous if preparations and dosage are not adapted to the patient. That is why, agreeing with tradipractitioners, we estimate urgent and necessary the systematic study of the analgesic and psychotropic plants which they know, with the intention of rationalize their utilization and have a toxicological assessment of all these plants.

CONCLUSION

Our field study with Congolese tradipractitioners enabled us to discover how much knowledge they have on the subject of analgesic and psychotropic plants, since they gave us about 200 plant names. There is therefore room for a better promotion of these plants. According to us, the first field study gave us a list of 51 plants interesting enough to be studied further. Each tradipractitioner has his favorite plants to treat the patients who come to consult him, but about 5 plants distinguish themselves because at least 7 of 26 questioned tradipractitioners use them. The big number of used plants can be explained to the fact that every tradipractitioner is interested in remedies used by the others and does not hesitate to learn from them to enlarge his knowledge. In most cases, a given remedy is specifically processed for a patient and will be changed for another one. Few remedies are prepared beforehand. The most frequent modes of preparations of remedies reported in this study are in accordance with those usually reported in Congolese traditional medicine: fresh leaves or roots, in decoction and most often drunk or locally applied. Present study raised the interest of tradipractitioners and they are very eager for this type of studies, from which they expect a mutualisation and therefore an enhancement of their knowledge. The following stage for us is a pharmacological screening

(tests *in vivo* and *in vitro*) and studies of toxicity to estimate the cytotoxicity of preparations. In effect, to this day, only 14 plants on 51 have been studied in laboratory and a patent has been written for the triterpene saponins of *Crossopteryx febrifuga*. This work, important because request is strong from tradipractitioners and Community Health Centres such as those managed by Médecins d'Afrique, is under way. It is conducted by Mrs. Makambila, member of the CERVE and will make the object of a thesis at University Marien Ngouabi of Brazzaville.

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