



Traditional Medicinal Plants
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Ethnobotany and the medicinal plants of the Korup rainforest project area, Cameroon

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ABSTRACT

The Korup Rainforest of Southwestern Cameroon poses the twin challenges of high botanical and high ethnic diversity. Using innovative techniques, we have identified plants used in traditional medicine, that are a basis for both regional primary health care and raw material for pharmaceutical products.

Introduction

Project Background

The Korup Project in Southwestern Cameroon is a joint Cameroon World Wide Fund For Nature (WWF) venture that is aimed at combining rural development with nature conservation on one of Africa's most genetically diverse forests (WWF, 1987).

Two sites constitute the project area (Figure 1). The first is the 126,000 hectare, Korup National Park, where uses are limited to the protection and observation of the forest ecosystem, and the second is a 300,000 hectare area surrounding the park, where an integrated rural development activity takes place. In the second area a spatial approach has been adopted where the land is zoned for different classes of land use.

The project that has been operating since 1987 is very complex and uses a multi-disciplinary approach to attain its goal. The operations are grouped into Natural Resources Management projects and Support Activities that are concerned basically with infrastructural development. Natural Resources Management includes sustainable agricultural systems for the various ecological zones, appropriate agroforestry systems to meet the socio-economic and environmental needs of the area, and the investigation of the potential for sustainable harvesting of the diverse products of the forest, such as, medicinal plants, natural herbicides and pesticides, dyes, gums, resins, leaf proteins, nuts and fruits.

Ethnobotanical Background

In the past, tropical forests were commercially exploited for products, principally timber and little attention was given to the secondary products, though they provided the local people with food, medicines and materials for crafts and construction purposes (Thomas *et al.*, 1989).

The ethnobotanical study that we have undertaken is part of the inventory needed for sound forest management and rural development. The two background components to the study of ethnobotany, especially medicinal plants, are a knowledge of the vegetation, and an understanding of the culture.

Botanical Background

The plant species of the Korup Project area are fairly well known through the botanical inventory carried out by Duncan Thomas with the Missouri Botanical Garden and the Cameroon National Herbarium. The forest is thought to be richer in plants and animal species, perhaps than any other African forest.

This area is dominated by a closed canopy lowland forest with high alpha-diversity, and relatively low beta- diversity. Letouzey (1985) has divided the forest into two associations. The first is made of the Atlantic-Biafran forest, occurring on sandy clays at low attitude of up to 300 m. This is a species rich association, with many gregarious species of the *Caesalpinioideae*, like *Guilbertiodendron*. Also, *Oubanguia alata*, *Dichostemma glaucescens* and *Cola spp.* are abundant, especially *C. semecarpophylla*. The second is the Atlantic-Northwestern association, found on clay soils at higher altitudes 300- 700 m. It has fewer *Caesalpinioideae*, while *Terminalia* and *Entandrophragma* species and *Anonidium manii* are common. This is the most species - rich association in Cameroon and is also rich in endemics like *Medusandra mpomiana*. Forest on steep hill sides and ravines are distinctive. Unlike the two associations described above, they are relatively species - poor, but rich in gregarious Cluciaceae such as *Garcinia conrauna* and *G. nobilis*. The species *Grossera macrantha* as well as the rare endemic *Nopoleonea equertonii* are restricted to these hillside forests.

Ethnocultural Background

Much of the background information on the culture of the area has been drawn from the study of the Northern villages of Korup by Di Nola (1988), a forestry and agricultural visit by Ramshaw (1988) food survey of Mundemba town and Ndian Estate by Malleson (1987), forestry survey in the Korup project by Synnott (1989), a survey on the people of Korup by Devitt (1988), and from being familiar with most prevalent illness of the area and some treatments.

The Korup Project area is ethnically diverse since the boundary between the Bantu people of the Cameroon-Congo group and Semi-Bantu people of the Nigeria - Cameroon Cross River area runs through it (Figure 2). The main ethnic groups of the Cross River area are the Ekoi, the Ejagham, the Ibibio and the Korup, while those of the Cameroon-Congo Bantu Sector are the Uroko and Mbo tribes, to the east of the project area.

Methods

Data collection was preceded by extensive preliminary studies, so as to be familiar with all parts of the project area and design the field work around a viable timetable.

We defined a sampling site as a village. A minimum of two villages were sampled for each ethnic group in the area of study. The four major ethnic groups are the Ejagham, the Upper Balong, the Korup and the Okoko.

Two formal data sets were required for this study, together with a large quantity of information obtained in informal discussions. The data sets were collected in May, June and December 1988, and February to May 1989.

Show-and-tell methods

This was a method used for comparative ethnobotany study to obtain comparative information on plant names and uses.

A standard herbarium that could be examined by villagers as the centre piece of the study was collected from a wide range of habitats in the area. The herbarium contained 260 plant specimens, chosen to test a number of hypotheses concerning plant use in Korup. It enabled us to show all the important structures of plants, such as leaves, flowers and fruits.

By using a fixed set of species instead of a stochastic sub-set of the total flora, direct comparisons were made between data sets. Furthermore, by using an empirical approach where the same specimens were shown in each village, we obtained replicate data sets and built up an overall picture of the names and uses of each species and could easily spot in consistent results.

Walk-in-the woods method

Before the comparative study was carried out, information on plant names and uses was collected by walking around the village and nearby area with our traditional experts and guides. This exercise was known as the "walk in the woods".

This is a standard ethnobotany method used to obtain information through the study of living plants. This approach helped establish the credentials of our informants, identify any useful plants of the area not included in the comparative study, and improved the quality of the comparative data, by obtaining some names in advance that assisted identification of the herbarium specimens.

Traditional treatment and primary health care

Role and Tiers

In developing countries, a large number of people, especially children, die daily of preventable or curable diseases because of lack of simple health care. In most cases this is due to limited resources, poor communication, vast distances, poverty, lack of education etc. (Sofowora, 1982).

As a result of this, traditional medicine has become more accessible to most of the people in rural parts of Africa, where some 80 per cent of the population rely on indigenous forms of medicine. In Korup, where traditional skills exist and where natural resources and phytochemicals are extensively used, it is possible to achieve

rural development objectives in the area of primary health care. For example, filaria is widespread in the project area, including both river blindness and loa-loa. The *Simulium*, whose secondary host is the black fly, is common in all fast-flowing, unshaded streams. Ayong village is situated on the bank of a large stream and with abundant simulian host in the village. According to the villagers, blindness was not a serious problem and that worms in the eye were destroyed using eye drops from *Scleria boivinii*.

Two tiers of indigenous medicine have been identified in the Korup area. One is traditional medicine proper, that uses specialised skills in diagnosing, preventing or eliminating physical, social and mental diseases. The other, known as "folk" medicine, need not involve a specific medical system, but relates rather to use by traditional remedies by villagers, who do not derive their income from this source.

Although the two tiers are not very distinct and overlap to a considerable extent, folk medicine is regarded as part of the first tier of health care system. For serious illnesses, the patient may seek treatment in the second tier: a traditional practitioner, or a hospital.

Preparation of Herbal Remedies

We cannot adequately assess the importance of drug preparation and other aspects of treatment in Korup because our investigation was botanically oriented.

Although the preparation of individual medicines has not been studied in detail, many customs govern the preparation and administration of each remedy, and these vary from one village to another. Some preparation customs however, appear to be important, such as the condition and time of collection of the material, dose and method or form of administration.

The common forms of preparation are aqueous infusions or decoctions and pastes. The whole plants or plant parts are generally steeped in cold or hot water, or occasionally in cold palm wine or palm gin, locally known as "Afofo". Decoctions are usually prepared with boiling water. In the case of ointments and orally administered medicines, the plants are often ground to a paste with palm oil, and other ingredients like *Aframomum melegueta* seeds are added.

Infusions and decoctions are frequently drunk or used as enemas, while pastes are eaten, or used as poultices or as ointments. They may even be rubbed on, or put into shallow cuts in the skin, often seven in number. In some cases, medicines are first chewed, and then spat into wounds or incisions. The treatment of fevers is often accompanied by steam baths.

Treatment using plants

The term medicinal plants, when interpreted broadly, includes all plants whose usefulness is derived from specific phytochemicals produced as secondary derivatives of major metabolic pathways (Thomas and Mbenkum, 1987).

Classifications of medicinal plants are frequently based on the type of chemical action involved. We have not used this approach because the study involved neither chemical analysis nor an extensive literature search. Another approach involves the listing of plants under the illnesses or symptoms treated. We have tried to follow this plant as far as possible, despite confusion over what disease or problem the plant was actually treating. We have listed those plants used in traditional medicine, which are quite distinct from ceremonial and magical plants that we have left out.

Conclusion

Traditional medicine is very widely practised in the Korup area, where all villages have at least **one** traditional practitioner with considerable knowledge, while some remedies are known by most villagers. These treatments are most useful for primary health care and represent the equivalent of non-prescription drugs in orthodox medicine.

Research and extension work are the keys to integrating folk medicine into modern primary health care. The major objective should be to match safe, effective remedies to common illnesses, using local medicinal plants. The problem is that very little is known about folk medicine and traditional medicine proper, and it is impossible to say how effective they are without a lot more research.

In order to accomplish this integration, inventories of medicinal plants and the flora of the various regions must be carried out. This should be followed by consultations between medical doctors, pharmacologists and ethnobotanists, aimed at listing the diseases the villagers can identify and treat, along with the plants to be considered for treating them. Meanwhile, additional phytochemical and pharmacological research should be carried out on important medicinal plants to determine their chemical composition, biological activity, toxic effects and optimal doses. These studies could identify plants which could be used to manufacture medicines for the treatment of numerous common ailments of both humans and animals. These medicines could be used to reduce dependence on imports, and their manufacture would provide a domestic pharmaceutical industry, leading to the development of much local expertise in this field.

Preliminary studies by WWF and Cameroon scientists, have shown that many of the Korup forest plants contain useful chemicals that include fungicides, pesticides, dyes, and even natural contraceptives and aphrodisiac compounds. So far, over 90

substances have been isolated - 38 new to science, with potential commercial use in industry and medicine. Furthermore, one or two species we have identified, contain phytochemicals with anti-viral properties and could be researched as a possible treatment or control of *AIDS*. It is likely that more will be discovered since much of the flora has not yet been researched.

TREATMENT USING PLANTS OF KORUP

Group	Indications -	Plants	Part Used	Administration	
1. FILARIASIS	ONCHOCERCIASIS (River blindness)	<i>Scleria boivinii</i> (Cyperaceae)	Young shoots	Sap as eye drop	
		<i>Cleome rutidoesperma</i>	Aerial parts	Sap as eye drop	
		<i>Anchomanes difformis</i> (Araceae)	Root tubers	Juice as eye drop	
2. MYCOSIS	FUNGAL INFECTIONS	<i>Mangifera indica</i>	Leaves	Infusion as enema	
		<i>Cassia alata</i> (Caesalpinaceae)	Leaves	Mashed leave rubbed on skin	
		<i>Carica papaya</i>	Bark	Decoction for washing	
		<i>Ficus exasperate</i> (Moracere)	Aerial leaves	Latex, rubbed on skin	
3. BACTERIAL AND VIRAL INFECTIONS	EAR INFECTION	<i>Cylicomorphus solmsii</i>	Trunk	Water from holloro trunk as ear drop	
		<i>Cleome rutidosperma</i> (Capparidaceae)	Leaves	Mashed leaves squeezed to nuke ear drop	
	EYE INFECTION	<i>Antrocaryon klaineanum</i> (Anacardiaceae)	Fruits	Juice as eye drop	
		<i>Emilia coccinea</i> (Asteracere)	Inflorescence	Juice as eye drop	
		<i>Enantia Chlorantha</i>	Bark	Eye drop for conjonctivitis	
	TUBERCULOSIS		<i>Rhektophyllum mirabile</i>	Stem	Sap used as eye drop
			<i>R. Camerunense</i> (Araceae)		
		<i>Morinda lucida</i> (Rubiaceae)	Bark	Infusion drunk	

		<i>Treculia obovoidea</i> (Moraceae)	Bark and Leaves	Infusion drunk
	MEASLES	<i>Aframomum sp.</i> "tondo" (Zingiberaceae)	Fruits	Infusion used as enema
			Seeds	Ground seeds rubbed on skin.
	CHICKEN POX	<i>Citrus lemon</i> (Rutaceae)	Fruits	Fruits Juice rubbed all over body
			Leaves and Roots	Infusion used to wash skin
	TETANUS	<i>Anthonotha macrophylla</i>	Leaves	Mashed leaves with <i>Aframomum melegue ta</i> rubbed into cuts in jam to release muscle
4.	INTESTINAL	<i>Acanthus montanus</i> (Acanthaceae)	Leaf	Infusion as enema
PARASITES	WORMS	<i>Aframomum hanburyi</i> (Zingiberaceae)	Stem	Chewed
		<i>Afrostryra lepedophyllus</i> (Styracaceae)	Bark	Ground and eaten
		<i>Canthium manii</i> (Rubiaceae)	Bark	Ground and eaten
		<i>Dennettia tripetala</i> (Annonaceae)	Leaves	Chewed
		<i>Neoboutia glabescens</i> (Euphorbiaceae)	Root bark	Ground and chewed with "fu-fu", eaten between 3 and 7 times
		<i>Schumanniophyton magnificum</i> (Rubiaceae)	Bark	Infusion as enema
		<i>Telfaire occidentalis</i> (Cucurbitaceae)	Leaves	Chewed
	MALARIA	<i>Boehmeria platyphylla</i> (Urticaceae)	Leaves	Cold-water Infusion drunk
		<i>Enantia chlorantha</i> (Annonaceae)	Bark	Alcohol infusion drunk
		<i>Eupatorium odorathum</i> (Asteraceae)	Leaves	Decoction drunk
		<i>Harungana madagascariensis</i> (Hypericaceae)	Leaves	Infusion as enema
		<i>Morinda lucida</i> (Rubiaceae)	Root	Cold-water infusion drunk
	LICE	<i>Tephrosia vogelii</i> (Papillioideae)	Leaves	Rubbed

5. VENERAL DISEASES	SYPHYLIS	<i>Spilanthes uliginosus</i> (Asteraceae)	Plant	Rubbed
		<i>Cleome rutidosperma</i> (Capparidaceae)	Leaves	Rubbed
	GONORRHOEA	<i>Sjatrarbiza maccantha</i> (Menispermaceae)	Leaf	Infusion taken
		<i>Anthocleista schweinfurthii</i> (Loganiaceae)	Bark	Ground with red oil and eaten
		<i>Myrianthus arborus</i> (Moraceae)	Bark	Decoction drunk
	CYSITIS	<i>Nephrolepis undulate</i> (Pteridophyte)	Leaves	Mashed in palm wine and drunk
		<i>Bambusa vulgaris</i> (Poaceae)	Leaves	Infusion drunk often
	VAGINAL INFECTION	<i>Angylocalys tabbotii</i> (Papilionoideae)	Seeds	Decoction of ground seeds
		<i>Eribroma oblong</i> (Sterculiaceae)	Pods	Heated, ground to paste and applied
		<i>Mucana cochinchinesis</i> (Papilionoidae)	Seeds	Decoction used
	BED WETTING	<i>Barteria fistulosa</i> (Passifloraceae)	Bark	Decoction as anemia
	GROIN ABSCESS	<i>Baillonella toxisperma</i>	Bark	Decoction as anema
		<i>Clerodendron globuliflorum</i> (Verbenaceae)	Leaves	Poultice from heated leaves
	HERNIA	<i>Harungana madagascariensis</i> (Hypericaceae)	Latex	Rubbed and abcess
		<i>Afrostryax lepidophyllus</i> (Styracaceae)	Bark	Aqueous infusion as anema or drink
<i>Alstonia boonei</i> (Apocynaceae)		Bark	Extract	
<i>Amaranthus spinous</i> (Amaranthaceae)		Leaves	Purge	
<i>Ancistrocarpus densispinus</i> (Tiliaceae)		Roots	Aqueous infusion as enema	
<i>Celtis tessmanii</i> (Ulmaceae)		Bark	Aqueous infusion as enema	
	<i>Fagara macrophylla</i> (Rutaceae)	Bark	Aqueous infusion as enema	
	<i>Pycnanthus angolensis</i>	Aril	Used to treat hernia	

		(Myristicaceae)		
		<i>Schumanociophytumma gnificum</i>	Bark	Infusion as drink
		(Rubiaceae)		
6	MALE	<i>Angylocalyso tabbottii</i>	Seeds	Ground to improve erection
REPRODUCT	IMPOTENCE	(Papillioideae)		
ION				
		<i>Carpolobia lutes</i>	Bark	Ground or decoction
		(Polygalaceae)		
	FEMALE	<i>Anonidium manni</i>	Bark	Infusion as enema
	INFERTILITY	(Annonaceae)		
		<i>Jatrorhiza macrantha</i>	Leaves	Infusion as vaginal douche
		<i>Scyphocephalim manni</i>	Bark	Mashed with <i>aframomum melegueta</i> fruits as enema
		(Myristicaceae)		
		<i>Musanga cecropioides</i>	Bark	Mashed with <i>aframomum</i> as enema
		(Moraceae)		
	PREGNANCY	<i>Ancistrocarpus densispinosus</i>	Leaves	Juice drinks to ease delivery
	COMPLICATI	(Tiliaceae)		
	ON			
		<i>Cola acuminata</i>	Seed	Ground decoction as enema to cause abortion
		(Sterculiaceae)		
		<i>Cola lateritia</i>	Leaves	Infusion drunk to avoid miscarriage
		(Sterculiaceae)		
		<i>Cola pachycarpa</i>	Juice	Infusion + limestone anema to avoid miscarriage
		(Sterculiaceae)		
		<i>Musanga cecropioides</i>	Juice	Used to avoid miscarriage
		(Moraceae)		
		<i>Palisota tracteosa</i> "barteri"	Leaves	Infusion as enema to stop bleeding
		(Commelinaceae)		
		<i>Piper umballatum</i>	Leaves	Infusion as enema to stop bleeding
		(Piperaceae)		
		<i>Stachytarpheta indica</i>	Leaves	Use to stop miscarriage
		(Verbenaceae)		
	CHILD BIRTH	<i>Alchornea floribunda</i>	Roots	Decoction to ease Childbirth
		(Euphorbiaceae)		
		<i>Lola acuminata</i>	Bark	Decoction as enema kelp delivery for young mothers
		(Sterculiaceae)		
		<i>Laportea evalifolia</i>	leaves	Aqueous infusion to advance labour
		(Urticaceae)		
		<i>Megraphynium macrostachyum</i>	Fruits	Decoction as enema for delayed childbirth
		<i>Piper guineensi</i>	Seeds	Decoction as enema to

		<i>Piper umbellatum</i> (Piperaceae)		deliver placenta
		<i>Raphidophora africana</i> (Araceae)	Leaves	Infusion as enema stops bleeding after birth.
		<i>Tephrosia vogelii</i> (Papilionioideae)	Roots	Infusion as enema; accelerates labour
	TREATMENT OF NEWBORN	<i>Irvingia gabonensis</i> (Irvingiaceae)	Bark	Infusion rubbed on albino babies to stop bleeding
		<i>Massularia acuminata</i> (Rubiaceae)	Fruits	Decoction as enema to deduce umbilical hernia
	LACTATION	<i>Alstonia boonei</i> (Apocynaceae)	Bark	Decoction drunk to increase lactation
		<i>Angylocalyx tabbotii</i> (Papilionioi Deae)	Roots	Infusion drunk to increase lactation
		<i>Pycnanthus angolensis</i> (Myristicaceae)	Bark	Ground bark eaten in food to stimulate lactation
7. WOUNDS AND ACCIDENTS	WOUNDS	<i>Angylocalyx tabbotii</i> (Papilionioideae)	Bark	Ground bark as dressing
		<i>Bridelia micrantha</i> (Euphorbiaceae)	Bark	Powder as dressing stops bleeding
		<i>Aspillia africana</i> (Asteraceae)	Leaves	Juice stops wounds from bleeding
		<i>Tabernaemontana brachyantha</i> <i>Tabernaemontanacrassa</i>	Latex	Used to coagulate blood
	SORES	<i>Alchornea cordifolia</i> (Euphorbiaceae)	Bark	Powdered and put in sores and infected cuts
		<i>Dorstenia barteri</i>	Roots and fruits	Mashed and used as dressing
		<i>Paulinia pinnata</i> (Sapindaceae)	Leaves	Ground and applied to sores
		<i>Rauvolfia vomitaria</i> (Apocynaceae)	Root sap	Applied to infected wounds
	SNAKE BITE	<i>Diodia scandens</i> (Rubiaceae)	Leaves	Mashed with <i>Ageratum conyzoides</i> leaves and eaten
		<i>Pycnanthus angolensis</i> (Myristicaceae)	Bark	Chewed to get strength to get back home for treatment
8.GASTRO ENTEROLOGICAL	HEPATITIS JAUNDICE	<i>Cassia alata</i> (Caesalpiaceae)	Leaves	Hot-water infusion as enema

		<i>Harungenamadagascar iensis</i> (Hypericaceae)	Bark	Infusion as enema
		<i>Pentaclethra macrophylla</i> (Caesalpiaceae)	Bark	Infusion as enema for liver problems
	SPLEEN	<i>Massulania acuminata</i> (Rubiaceae)	Fruit	Decoction from mashed fruits
		<i>Portulaca oleracea</i> (Portulacaceae)	Plants	Infusion from mashed fruits
	STOMACH ABSCESS	<i>Fegara macrophylla</i> (Rutaceae)	Bark	Infusion as enema
	PILES	<i>Thonningia sanguinea</i> (Balanophoraceae)	Stem	Used to treat piles
9. PAIN	TOOTHACHE	<i>Alchornea cordifolia</i> (Euphorbiaceae)	Leaves	Chewed and juice retained in month
		<i>Anchomanes difformis</i> (Araceae)	Tuber	Paste rubbed around teeth to cure infected gums
		<i>Spilanthes uliginosus</i> (Asteraceae)	Flowers & Leaves	Chewed to reduce pain
	CHEST	<i>Acanthus montanus</i> (Acanthaceae)	Leaves	Mashed in red oil and eaten for breathing trouble
		<i>Dennettia tripetata</i> (Annonaceae)	Leaves	Chewed for chest pain
		<i>Mimosa pudica</i> (Mimosaceae)	Plant	Infusion drunk for chest pain
		<i>Petersianthus africanus</i> (Combretaceae)	Bark	Boiled, cooled and drunk for chest pain
	WAIST AND SIDE	<i>Albizia zygia</i> <i>Albizia feeruginea</i> (Mimosaceae)	Bark	Powdered, boiled and as enema for side pain
		<i>Glossocalyx brevipes</i> (Monimiaceae)	Leaves	Infusion as enema for waist pain
10. ABDOMINAL PROBLEMS	DIARRHOEA	<i>Alchornea floribunda</i> (Euphorbiaceae)	Leaves	Infusion drunk
		<i>Anthocleista vogeli</i> (Loganiaceae)	Bark	Decoction drunk
		<i>Bochmeria plathyphylla</i> (Urticaceae)	Leaves	Mashed and eaten
		<i>Lasianthers africana</i> (Icacinaceae)	Leaves	Infusion drunk
		<i>Trichilia rendelotii</i> (Meliaceae)	Root	Decoction as enema
	PURGATIVE	<i>Alstonia congensis</i>	Leaves	Used to purge

	(Apocynaceae)		
	<i>Struchiumsparagospho</i>	Leaves	Infusion as enema
	<i>ra</i>		
	(Asteraceae)		
	<i>Uapaca staudii</i>	Bark	Eaten
	(Euphorbiaceae)		with <i>Ricinodendron</i> fruits
EMETIC	<i>Baphia sp.</i>	Leaves	Infusion drunk
	(Papillioideae)		
	<i>Scoparia dulcio</i>	Plant	Infusion drunk
	(Scrophulariaceae)		