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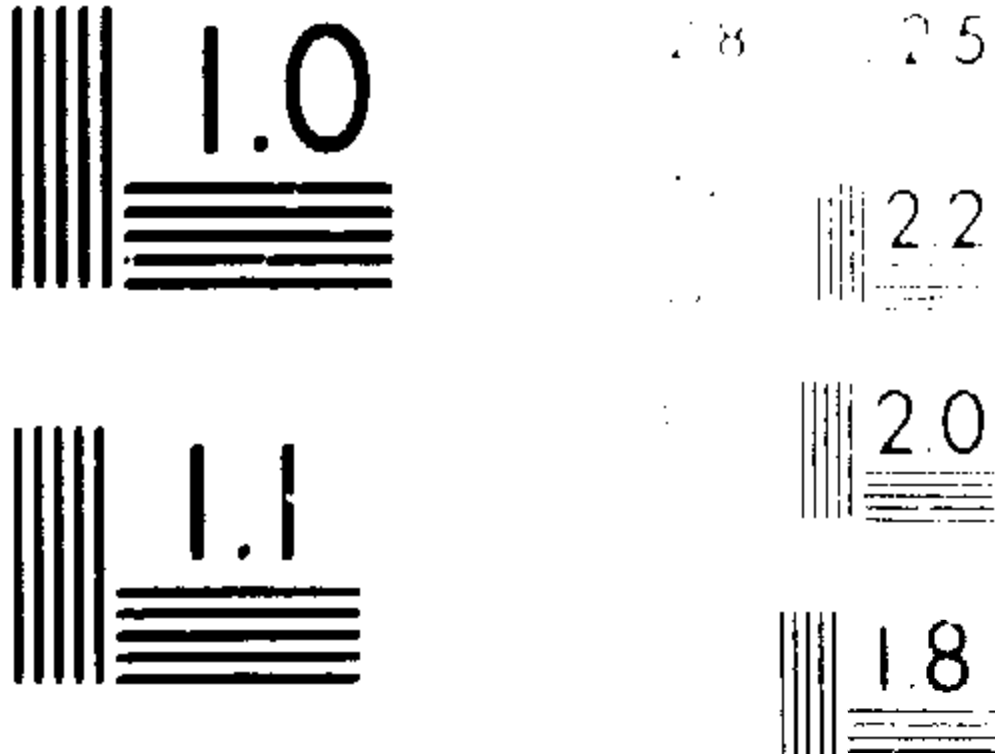
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EXPERT ON MEDICINAL PLANTS - PHASE I

SI/GBS/79/801

GUINEA-BISSAU

Terminal report *

Prepared for the Government of Guinea-Bissau
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Jean-Louis Pousset and Modou Lo,
medicinal plant experts

United Nations Industrial Development Organization
Vienna

* This document has been translated from an unedited original.

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Brief description of Guinea-Bissau

I. Geography

Guinea-Bissau, with an area of 36,125 km^2, is one of the smallest countries in Africa.

The western half of the country consists of coastal plains deeply indented by wide "rias" or fjords, which are tidal up to a distance of 100 km from the coast. Inland, the country is made up of low plateaux with a maximum height of 300 m in the foothills of the Fouta-Djalon mountain range.

The population is well over 800,000 and has a growth rate of around 2 per cent.

Agriculture is the livelihood of 90 per cent of the population and in 1977 accounted for 80 per cent of the value of exports. It is based on rice and natural palm groves on the coast and on millet and groundnut inland. Settled animal husbandry is only of minor economic importance.

The cultivated area amounts to 0.5 h per inhabitant and the average agricultural income is about $100 per person.

Difficult communications, which are due to the geography of the country, are a hindrance to the development of links between the various regions.

II. Climatic factors

The climate of Guinea-Bissau, which is situated midway between the Equator and the Tropic of Cancer, is affected by the maritime and continental trade winds, which come together in the inter-tropical convergence zone. The main features of the climate are:

A short rainy season (June to October) with high average rainfall alternating with a long dry season lasting seven months (November to May);

High average temperatures (26 °C) and narrow temperature ranges;

Fairly high humidity because of the maritime influence and the amount of water.

1. Rainfall

Rainfall increases from the north-west to the south-east. Three major climatic regions can be distinguished by their rainfall, namely:

The south, Tombali, Bolama, Buba, with a rainfall of more than 2,000 mm;

The extreme east of the country above the Gabu-Farim line, with an average rainfall of less than 1,400 mm;

The remainder of the country, where the rainfall varies from 1,400 to 1,300 mm.

The rainy season is concentrated in the five months from June to October, with August receiving 30 per cent of the annual total. In the coastal region the dry season is mitigated by lower evaporation.

The alternation of dry and rainy seasons of virtually the same duration throughout the country makes the climate of Guinea-Bissau very consistent. There is a gradual change from a maritime Guinean climate to a Sudano-Guinean climate above the Gabu-Farim line.

2. Soil

Most of Guinea-Bissau is covered by tropical ferralitic or ferruginous soils which have a sandy-clay texture and are deep enough for cultivation of the annual and perennial crops suited to the climate.

Hydromorphic soils fill most of the alluvial depressions and make it possible to grow rice in the flooded parts and cultivate perennial crops (palm groves) in the parts which are not flooded but where roots have access to a water table.

The soils associated with mangroves make up more than 10 per cent of the area and are present in considerable quantities throughout the country's coastline.

III. Vegetation

1. The Sudano-Guinean sector

The forest stock consists of medium-sized trees of from 10 to 20 m rising over an undergrowth of from 3 to 5 m.

The vegetation looks like a forest savanna when there is more undergrowth than tree cover, and like a park forest when the trees are predominant.

The main species represented are as follows:

Afzelia africana
Bombax costatum
Cordyla pinnata
Daniella oliveri
Khaya senegalensis
Lophira lanceolata
Parinari curatellifolia
Erythrophleum africanum
Parkia biglobosa
Prosopis africanum
Pterocarpus ericaneus
Schreberia chevalieri
Sterculia tragacantha
Terminalia glaucescens
Terminalia laxiflora

Unfortunately, there are periodic forest fires, which considerably limit the possibility of making use of the trees.

The main feature of the Sudano-Guinean sector is a complex of thin or failing forests and tree savannas.

2. The Guinean sector

The vegetation is a two-stage forest, the dominant stage consisting of Parinari excelsa, Erythrophleum guineense and Detarium senegalense.

The following are also found:

Antiaris africana
Chlorophora regia
Dialum guineense
Afzelia africana
Albizzia adianthifolia
Ceiba pentandra
Dianella ogea

The Guinean forest is very susceptible to outbreaks of fire in the dry season. The undergrowth does not recover easily, but thins out, and is then replaced by ligneous plants and graminaceae.

The Guinean forest is gradually changing into a savanna similar to the Sudano-Guinean one.

3. The humid Guinean sector

Trees are taller, some of them measuring more than 35 m in height, and the Sudano-Guinean species have disappeared. Ligneous undergrowth is dense and devoid of gramineae and is virtually incombustible. After ground clearance the tendency is for a thin forest of Daniella oliveri and Parkia biglobosa to develop.

A maritime Guinean subsector can be distinguished, marked by the extension of oil palms on ferralitic plateaux and some marine terraces.

IV. Population

The upheavals in the country from 1966 until independence, with substantial emigration to neighbouring countries (Senegal and the Democratic Republic of Guinea-Conakry) and the return of some of these emigrants after independence, made it difficult to establish the present population of Guinea-Bissau accurately.

A population census was carried out from 16 to 30 April 1979, and the first results have just been published.

The census shows that the total population is 777,214 inhabitants, 402,188 being women and 375,026 men, giving a male percentage of 48.25 per cent.

Men	375,026 (48.25 per cent)
Women	402,188 (51.75 per cent)
Total	777,214

The data published so far, which are provisional figures, are only for the total population, broken down by region.

In view of the fact that the breakdown of the population by age groups has still not been published, the following table shows what had been calculated before the census by the Ministry of Health and Social Affairs, and since the difference between the estimate and the census count for the total population is so slight (779,630 and 777,214 respectively), we shall stick to the table figures until new ones are issued.

Table 1

Population distribution and percentage by regions

Regions	Population	km ^{2}	Density	% of the population
Bafata	117 202	6 003.00	19.52	15.08
Biombo	57 724	787.50	212.33	7.45
Bissau	109 486			14.09
Bolama-Bijagos	25 715	2 593.50	9.91	3.31
Buba	35 360	3 575.00	9.89	4.55
Cacheu	134 108	4 828.00	27.78	17.25
Gabu	105 500	8 775.50	18.02	13.57
Oio	157 595	5 125.00	26.85	7.70
Tombali	54 526	4 437.50	12.29	7.02
Total	777 214	36 125.00	21.51	100.00

Source: Provisional data from the 1979 census.

Nature of the population

Guinea-Bissau is a mosaic of 21 ethnic groups, the Balantas being the largest.

Balantas	32%
Bulas	20%
Manjacos	13%
Mandingas	13%
Papeis	7%
Bijagos	2%

The distribution of population between urban centres and rural areas is known in general terms. On this question too, the general population census we referred to will provide the details necessary to establish an exact picture.

The Oio region has the highest population in the country (137,214 inhabitants), followed by the Cacheu area with 134,108 inhabitants. If we except the regional and sectoral capitals, we can say that the population

of Guinea-Bissau is mostly rural. More than 80 per cent live in villages with an average population of about 200. There is also a semi-nomadic minority moving from one area to another in search of watering places and pasture for their stock.

The official language is Portuguese although the various ethnic groups use their own vernacular languages. Creole developed from archaic Portuguese with local words added is the main common language, particularly in urban centres.

A majority of the population (55 per cent) hold animist beliefs, and there are also a large number of converts to Islam (41 per cent). Only 3 per cent are Christians.

Eighty-five per cent of the population work in agriculture, the rest being fishermen, craftsmen or tradesmen or persons employed in small-scale industry or government.

V. Health situation

Little is known of the country's health situation up till 1979, owing to the difficulty of obtaining reliable statistics under the prevailing conditions.

Data for the situation before independence are also incomplete, and we were unable to find the morbidity records for certain communicable diseases for particular years.

With the establishment of a statistics department in the Ministry of Health and Social Affairs it will be possible in future to have a better idea of the most important diseases and their case fatality rates.

Since 1977, the Ministry has had little precise information because of inadequate quantitative analysis, owing to the lack of qualified personnel for data acquisition.

Data on notifiable diseases are collected monthly in the African region.

Information on the country's health situation from 1946 to 1979 is summarized in the tables below, in so far as we were able to establish figures, partly on the basis of official documents found in the archives of the former "Missão de Sono", and partly from statistics collected since 1977 through the chain of institutions dependent on the Ministry of Health (see table below).

Table 2

Estimated vital statistics

Indicators	Rate per 1,000 inhabitants
Gross birth rate	42
Infant mortality rate	280-300
Child mortality rate (0-5 years)	400
Maternal mortality rate	7.2
Gross mortality rate	20-21

Without underestimating the importance of conventional curative institutions, the Ministry of Health and Social Affairs has paid particular attention since 1977 to the activities of peripheral units with a view to adapting them to present objectives and ensuring that the people's first contact will be with a new type of institution capable of meeting their desire for better health.

With this in mind, despite efforts to provide better equipment and staff in hospitals at all levels, the Ministry has also been looking for the best means of tackling the problem of disease and adopting a different approach to health welfare and promotion.

Taking a realistic view, we can see clearly that it is impossible to envisage establishing a hospital, a health centre, a doctor or even a nurse in each sector, section or village in the land in the foreseeable future.

The Ministry cannot stand idle for years in the hope of eventually setting up a conventional medical assistance network like those in industrialized countries without running the risk of seeing morbidity and mortality rates rise still further.

The experience of other countries, even the richest, has shown quite clearly that hospitals, medicines, doctors and conventionally trained nurses will never manage in countries like Guinea-Bissau to reverse the direction of the curves which indicate a steady deterioration in health indicators.

The Ministry has therefore decided, on the basis of critical appreciation of policies which have proved fruitful in other countries, that over the next ten years it will:

1. Give priority to peripheral and ultra-peripheral institutions.

1.1. Build and equip 20-bed sector hospitals, one unit for two sectors, rather than set up large institutions in the regional capitals which still do not have them.

1.2. Build a health centre in each district in urban areas and in each section in rural areas.

1.3. Mobilize people in the villages to help set up local facilities which will provide on the spot the services needed to make them self-sufficient in basic health care (1. Campaigns against the most common diseases: malaria, diarrhoea, disease of the upper respiratory tracts, ophthalmic infections, etc. 2. Education in disease prevention and health promotion at the higher level, food hygiene, water hygiene and maternal and child health care).

2. Review the question of on-the-spot training of middle-level health workers, the only ones that can be trained in Guinea-Bissau at present.

The basic aim here is to train health workers whose chief function is to prevent sickness and promote health among the masses, although they will still be concerned with curative medicine.

In this new programme, which is at the planning stage, the school will be separate from the hospital and located in a small town 15 km from Bissau. The students will pass out as community nurses capable of working in comprehensive health centres. The nurses who are to go into hospital work will then spend a period training in hospitals.

3. Work in co-ordination with certain State departments such as Agriculture, Public Works, Water and Education with a view to establishing the necessary basis to improve the quality of life of the most deprived sectors, with the willing participation of the communities involved.

We are sure that a rational concerted effort to improve the three fundamentals of human life in Guinea-Bissau (food, water and housing) can do much more for people's health than hospitals and medicines by themselves.

With this aim, a community development project was set up two years ago in villages in two pilot regions. The project uses multidisciplinary teams consisting of a nurse, a general social worker, a midwife and a horticultural adviser. The teams live in the villages for three to five months, long enough to train a counterpart team capable of ensuring that

the project is gradually expanded and making the village population self-sufficient in health (village dispensaries), mother and child welfare (retraining traditional midwives), environmental hygiene (water, refuse, etc.) and appropriate improvement of the diet (vegetable plots, small-scale animal husbandry) etc.

4. The basic health care project

In line with PAIGC's policies, it was only to be expected that as soon as the country achieved independence, it would fall in with new ideas about health care for all, with the aim of closing the gap between the elite and the deprived, between urban and rural areas, between town centres and the poorer districts.

So, for two years, special attention has been paid to peripheral activities with a view to finding the best answer to the problem. Our present aim is to prepare the basic elements needed to guarantee the success of the project, training staff, establishing a health centre network and mobilizing the mass of the people.

4.1. Training

Only middle-level health staff can be trained in Guinea-Bissau at present.

The country now trains state nurses, auxiliary nurses, general social workers and microscopists. Auxiliary nurses, who are former first-aid workers retrained, will all be sent to hospitals, where in spite of their elementary level of training they will be able to work under the leadership of doctors and experienced nurses.

The others, state nurses, general social workers and microscopists will form teams to work at health centres in either town districts or country sectors.

The general social workers and state nurses will form the basis of the new type of health centre. These nurses will work under the permanent supervision of their superiors and will have to be capable of making the most likely diagnosis on the basis of the symptoms shown by the patient and deciding on the most suitable treatment or transferring the sick person to the appropriate institution at a higher level.

These staff will be trained under a new programme in a residential school completely independent of the hospital. Practical training will be given at health centres.

The residential system is necessary so that each region can send its quota of candidates and get them back once they are trained. This will cut down the upheavals caused at present by transfers of staff, the great majority of candidates having always been recruited from Bissau.

The general social workers will have a large part to play, particularly at rural centres, where they will share responsibility with the nurses for health education and the mobilization of the population for community development.

4.2. The health centres

Under the new system for basic health care, the "old" health posts, which provided almost exclusively curative medicine, will be gradually renovated as resources become available (equipment and trained staff). This applies to their architectural design, equipment and staffing, and especially to their field of action, which must be extended towards preventive and educational activities to promote the health of the people.

With this in view, the health posts will gradually become "health centres" under the guidance of a team comprising nurses, social workers and a microscopist.

The health centres will cover the following activities:

General consultation including emergencies:

- First aid and treatment of the most common diseases in the community served;
- Referral of pregnant women for pre-natal consultations and children for health inspections and advice on diet;
- Group health education in the waiting room.

Mother and child health consultations.

Sickness prevention activities:

- Immunization against diseases which respond to this prophylactic method;

Education of parents in chemoprophylaxis against malaria, compulsory at least for children under five years old;

Home visits for systematic detection of the main endemic diseases (tuberculosis, leprosy, trypanosomiasis, etc.) and State checks, cleaning up the environment (wells, latrines, refuse, etc.).

Training and supervision:

Traditional midwives will be retrained to teach them better methods, especially in pre-natal consultation to distinguish normal pregnancies from pregnancies at risk which should be referred as soon as possible to the health centres;

All health officers will have to spend a training period at the health centres in Bissau, the capital of the country, before being sent to their final postings.

Selection:

Patients suffering from serious illness or requiring further care are to be referred by the health centre nurses to the appropriate institutions at higher levels (sectoral, regional or national hospitals);

There will be two categories of health centres: urban health centres and rural health centres. The essential differences are as follows:

- An urban health centre will be located in each densely-populated urban district while a rural health centre will serve a population spread over a number of villages (about 10 to 25) several kilometres apart (up to two hours' walk or more).

- The urban health centre will be the first link in the referral chain between the people in the districts and the hospital, while for those who do not live in the village where the centre is located, the rural institution will already be the second link, the first being a dispensary in each village of the section, manned by villagers (basic health workers, traditional midwives and social workers) previously trained by the same Ministry of Health officials who direct the health centre of the rural section concerned.

- The urban health centre officers will divide their district into sectors, each under the responsibility of a nurse, while each of the four nurses at the rural centres will be responsible in a group of villages in the centre's section for home visits, supervision and support for the village health workers whom he will have helped to train or retrain.

- Finally, bearing in mind the difficult living conditions in rural areas, the plan to construct health centres in those areas must include accommodation for the staff posted there, namely, four nurses (two specialists in obstetrics and pediatrics and two in general medicine and minor surgery), a microscopist and two general social workers, while in the town the State has no plans for providing staff housing.

In both urban and rural areas, the staff will be regularly supervised by senior health officers and will have the right to periodical retraining with the aim of improving the quality of service they provide. The State will be responsible for constructing, equipping, staffing and supplying the centres.

5. Mobilization of local people

Under Guinea-Bissau's national health plan, health services are to be decentralized, so as to make each administrative region increasingly

autonomous in health affairs and ensure a steady improvement in the quality of care.

This decentralized system comprises the following levels: national, regional sector, rural section, urban district and village. The lower the level, the simpler the unit, ranging from the national hospital centre in Bissau, designed up to international standards, to the village dispensary planned to meet the basic health needs of the rural population, as described in the previous chapter. The State is responsible for the cost of infrastructure, equipment, staff, supply and operation of all units down to the section and district level.

At the ultra-peripheral or village dispensary level, the construction, management, supervision and future reconstruction of pharmacies is left to the responsibility of the village community. At this level, the only State commitment is to provide, with international aid, the basic dispensary equipment, local training of village health workers chosen by the community itself (basic health workers, traditional midwives and general social workers) and the constitution of stocks of essential medicines at the beginning of each project. Although a certain amount of work with the local population is necessary at the district level to lay the basis of relationships between the people and the health centre workers, it is particularly at the village level that this work is most important and demanding and requires great care to achieve intelligent mobilization of the peasant masses and to make them understand and take an interest in participating in this health development effort aimed at improving the quality of life in rural areas and thus raising the health levels of the local population. This is more difficult than it appears at first glance. It requires a great deal of time, patience and intelligence, as well as trained workers. Multidisciplinary community development teams have to be found made up of people who are convinced that this is the right approach and who will agree to live for as long as necessary in the most outlying and deprived communities, among peasants. It is a long and difficult task, but we believe that it is the only way to make the idea bear fruit and establish the roots needed for progressive self-development, even when the team leaves, having trained a corresponding team of village people.

This project has begun by forming multidisciplinary community development teams consisting of nurses, general social workers and a midwife, and we hope next year to have a horticultural and stock-raising adviser, and possibly a literacy teacher if this proves essential in the short term.

These young people, who are almost all from the towns, follow theory courses in Bissau during the rainy season and go out into the villages in the dry season when the peasants are accessible and available because they have finished their work in the fields.

In addition to their vocational training, the young trainees learn to try to understand the problems of the village as seen by the villagers themselves so as to be able to start a dialogue with a view to finding appropriate solutions. This dialogue is a difficult art in such a context. It needs a very open mind to promote a real exchange of ideas, that is, a conscious willingness to give and take, to inform and be informed, to teach and learn with the masses.

The great difficulty in Guinea-Bissau is to set up enough teams to cover the 3,000 or so villages in the country. For the moment there are eight teams, and it is proposed to set up 16 next year, but the Ministry of Finance has put a block on new expenditure in the immediate future. The continued training of nurses alone is still assured, but not that of general social workers.

Although we can count on bilateral or multilateral international aid to build and equip the health centres (or even luxurious hospitals), no aid agency will agree to finance operating costs (salaries, day-to-day expenditure, etc.). The 3,000 villages will require 150 teams. If we estimate an average of 20 villages per section, that would mean 600 to 300 general social workers and 150 microscopists, for the rural area alone. The literacy workers and horticultural and stock-raising advisers would not need to remain permanently in the sections.

In the rural areas, each team would go round all the villages of the section in turn and, after a period of between two and four months, would leave a counterpart team of villagers in each one, and at the end of the process the original team would take its place in the integrated basic health care system, not only to give the sick treatment and guidance, but also and especially to maintain permanent supervisory contact and support for the activities of the dispensaries set up in the villages.

At the moment, alternatives and variations of this policy are being studied in order to speed up the integration of the villages into the health development process, but there is no way of reducing the number of

key personnel needed. This means that either a way must be found to finance their training and salaries, or we must go slowly, too slowly to have a sizeable impact on the country's morbidity and mortality rates.

Of course, when we talk of salaries we are thinking of State employees, that is, down to the level of the health centres. The basic health workers, midwives and others working in the village dispensaries will earn only what the village people wish to give them for the services they provide to their fellows on a part-time basis; if really necessary, the State might, within the limits of its capacity, provide the material for work overalls (already requested by some village basic health workers) and possibly other small facilities.

6. Medicines in Guinea-Bissau

6.1. National pharmacopoeia

This lists the medicines used by the Guinea-Bissau health services. It is based on the WHO list of essential medicines, with the addition of a list of products intended for sale only in commercial pharmacies. This pharmacopoeia is annexed to the draft legislation which has been submitted to the State legal services and will be placed before the Government very soon. The legislation lays down procedures for subsequent amendments to the list.

It will be possible to add medicines from the traditional pharmacopoeia to the national pharmacopoeia in specified circumstances without scientific determination of the chief active constituents always being a prerequisite.

Although the law has not yet been passed, the national pharmacopoeia has been in use for several years by the pharmaceutical services of the Ministry of Health, and since 1981 imports have been virtually restricted to medicines in the two pharmacopoeias.

6.2. Imports of medicines

A State commercial firm, Central Farmedi, which has autonomous status but is placed under the supervision of the Ministry of Health (MSAS), has a monopoly of imports of medicines. The Ministry of Health, however, imports directly products and equipment financed by multilateral or bilateral international aid (more than 60 per cent of the total consumed in the public sector).

6.3. Distribution of medicines

The Ministry of Health's central medicine store supplies hospitals, health centres (dispensaries run by nurses) and basic health centres

(primary health-care centres managed by the villagers and operating under the responsibility of basic health workers selected from among the villagers and trained in hospitals in the interior of the country).

For the health centres (dispensaries) a limitative list of about 60 medicines has been drawn up.

For basic health (primary health care) a list of 12 medicines has been drawn up:

Chloroquine tablets and syrup
Sulphonamide tablets, of the rapid-elimination type
Aspirin tablets
Multivitamin tablets
Ferrous salt tablets
Salts for oral re-hydration
Tetracyclic eye ointment
Antiseptic skin ointment
Iodized alcohol
Benzalkonium solution
Potassium permanganate
Benzyl benzoate

The basic health centres are self-financed from subscriptions paid by the local people. Medicines are bought at the Ministry of Health's central medicine store, which draws up an annually revisable price-list based on the prices in the catalogues of UNICEF or other non-profit-making organizations.

6.4. Practical situation

Because of the inadequate budget allocated for the purchase of medicines, the supply of products for non-essential treatment of symptoms (such as cough medicines, laxatives and cholagogues) is always considerably less than the demand.

In spite of efforts to ensure equitable distribution of available products among the various regions of Guinea-Bissau, the town and sector of Bissau (with less than 20 per cent of the population) consumes more than 50 per cent of annual supplies.

MEDICINAL PLANTS OF GUINEA-BISSAU

I. Previous work

Two writers have made a particular study of the flora of Guinea-Bissau.

First, J. do Espirito Santo, who published a study on some medicinal plants used by the Guineans (1) and, above all, in 1963 an index of all the vernacular names, classified alphabetically in the first part and then under their Latin names with the corresponding vernacular names (2).

But the most important treatise was the one published in the Boletim geral do Ultramar between February 1956 and April 1957 by Dr. R. Alvaro Vieira, who describes more than 150 plants botanically and gives their uses in traditional medicine (3).

The most difficult problem in this type of work is to compare the chemistry and pharmacology so as to determine how to use these plants rationally. That is what we shall try to do in the second part.

II. Method followed in the survey

2.1. Aim of the project:

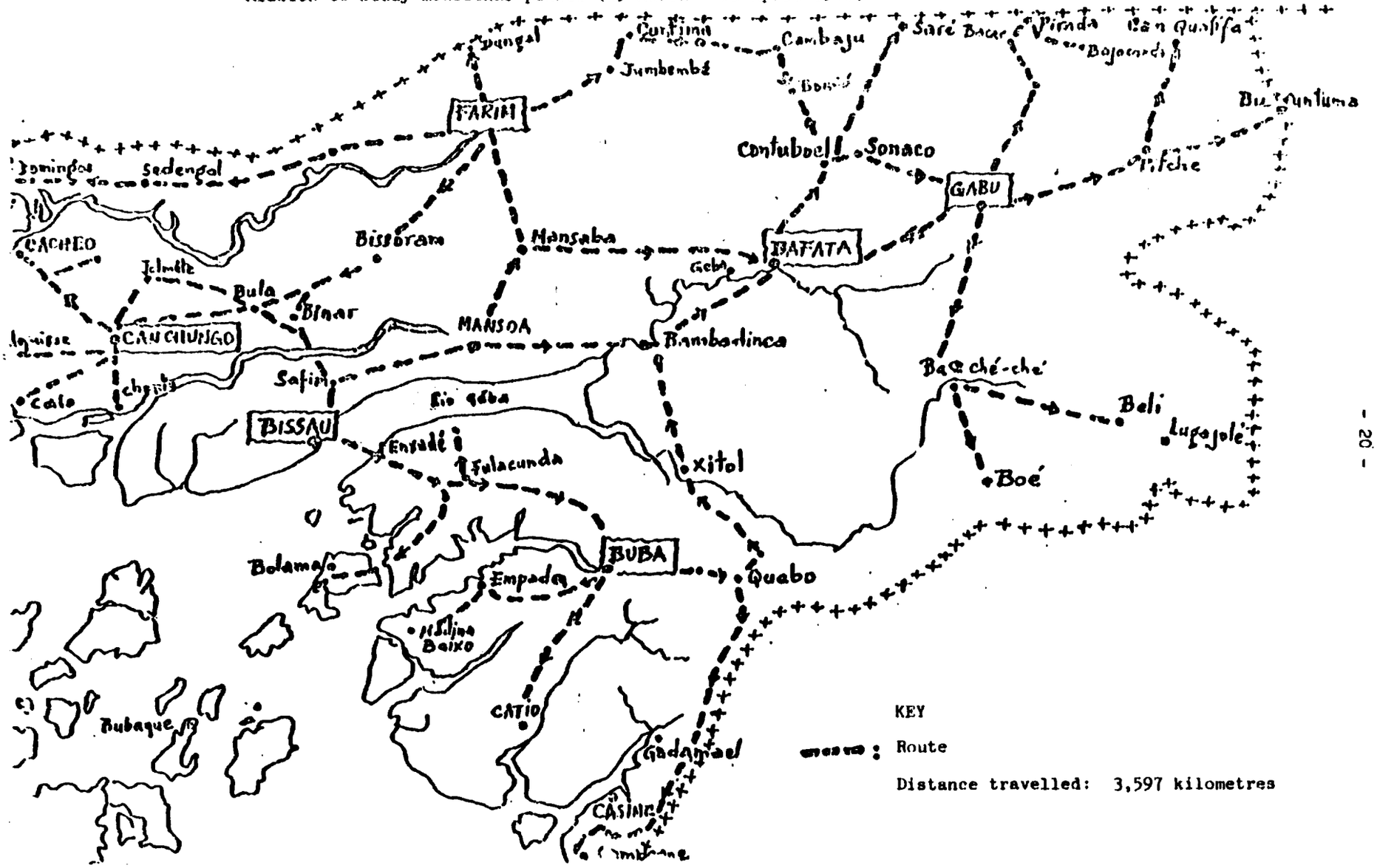
To use existing natural resources for the production of medicines as part of the national health programme or for the export of extracts of medicinal herbs to the international market.

2.2. Although our survey had been planned for more than a year, difficulties arose on arrival in Bissau because the Land Rover was not ready. Through the kind assistance of the Minister and all the staff of the Ministry of Health we managed to obtain a car after a week. The local UNDP supplied the equipment and petrol and the Ministry provided the driver and interpreter. In this way, Mr. Modou Lo was able to travel all over Guinea-Bissau for a month and to prepare maps showing the distribution of more than 150 plants used in traditional medicine.

2.3. Our journey of 3,597 kilometres was restricted to about 500 metres on either side of the road. We thus covered only a tenth of the territory of Guinea, and our survey of the vegetation is far from definitive. So this evaluation study of medicinal resources is no more than a rough preliminary operation, as 90 per cent of the territory was not covered.

ITINERARY

Mission to study medicinal plants (29 March - 22 April 1982)



KEY

Route

Distance travelled: 3,597 kilometres

The difficulties in making this survey were caused mainly by:

The state of the tracks: This prevented us from covering the Quebo-Madina de Boé and Cam Qualifa-Bruntuma routes.

Guinea-Bissau has just emerged from a war of independence and most of the tracks are unusable; in certain areas there are still live minefields.

The period of bush-fires and deforestation: At the end of the dry season there are always bush fires, which hampered our observations particularly in the northern parts of the country. Because of this, we were only able to identify certain tuberous plants such as Icacina senegalensis and some woody lianas such as:

Cryptolepis sanguinolenta
Smilax kraussiana
Asparagus africanus

It was noted that the hardy latex-bearing lianas of the Apocynaciae group:

Saba senegalensis
Landolphia, various

survive bush fires very well.

2.4. Survey of species by habitat

Our survey was restricted to an area of about 500 metres on either side of the road. We noted three classes of medicinal plants according to pedo-climatic criteria:

Plants near human habitation and by the wayside which are to be found more or less throughout the country close to towns and villages. Some grew in much greater profusion than others:

Mango and Cassia siamea
Various citrus
Pawpaw
Guava
Euphorbia hirta
Newbouldia laevis
Catharanthus
Thevetia peruviana
Adansonia digitata

Tamarindus indica

Ceiba pentandra

Datura and Solanum incanum,

to which can be added a few cornfield weeds: Hyptis, Cassia occidentalis, Cassia tora, Argemone mexicana, etc., Guiera, Chrozophora etc.

Plants from wet areas, riverbeds, paddy fields and marshes that are not too brackish

Borreria verticillata

Lonchocerpus sp.

Nauclea latifolia

Centella asiatica

Schultezia stenophylla

Alchornea cordifolia

Anthostema senegalense (drastic purgative)

Cassia alata

These are species which survive in the proximity of a shallow watertable and could reasonably be exploited in two-thirds of the territory of Guinea.

Plants of the tree savanna, dry or wet open forest, dense virgin forest or deteriorated forest, various small woods

Combretum glutinosum (North)

Combretum micranthum (common)

Strophanthus sarmentosus (common)

Strophanthus hispidus (common)

Rauwolfia vomitoria (South)

Voacanga (South)

Parkia biglobosa (common)

Vitellaria paradoxa (North)

Annona senegalensis (common)

Guiera senegalensis (common)

Alstonia boonei (2 sites)

Holarrhena floribunda (common)

Dioscorea

Cassia sieberiana (common)

Cordyla pinnata

Pterocarpus erinaceus

Khaya senegalensis
Parinari, various
Albizzia, various
Carapa procera
Daniellia oliveri
Erythrophleum
Sterculia setigera and S. tragacantha
Gardenia, various
Ximenia americana
Antiaris africana
Fagara xanthoxyloides
etc... Cochlospermum tinctorium

Distribution of most of these species is very local while others such as Pterocarpus or the Daniella genus are found in almost all phytogeographical sectors.

Plants of industrial value such as Voacanga or Rauwolfia and Fagara are strictly local to the maritime and subhumid sectors of Guinea outside the mangrove forests.

Khaya senegalensis is very common towards the centre of the country and there used to be large plantations of it along the roads.

Nowadays, this plant has become a symbol of the recent colonial past.

III. Itinerary

Week of 2 to 7 April 1982
Regions of Oio and Cacheu
Distance: 1,141 km
Routes

1st day: Bissau-Safim-Niacra-Mansoa-Mansaba-Farim-Dungal and back to Farim.

2nd day: Farim-Bijene-Baro-Infore-Bangere-Sedengal-San Domingos and back to Farim.

3rd day: Farim-Jumbembe-Kumbidia-Cuntima-Sitato-Sulkoko-Cambaju-Bonco and back.

4th day: Farim-Kapa 3-Olossato-Make-Bissoram-Binar-Buja-Canchungo-Cacheo.

5th day: Cacheo-Bachile-Badicpa-Canchungo-Calquisse-Kadior and back to Canchungo.

6th day: Canchungo-Cajugut-Caio-Kaniobo-Chanto-Canchungo-Pelundo-Jolvette-Capafa Bridge-Bula.

7th day: Bula-Bissau.

Week of 8 to 14 April 1982

Regions of Bafata and Gabu

Distance: 1,297 km

Routes

1st day: Bissau-Mansaba-Bandiara-Cumidia-Sare-Diobo-Cambass-Bafata.

2nd day: Bafata-Jabicunda-Contuboel-Kaniamina-Bonco and back.

3rd day: Bafata-Gikoye-Tabanani-Benigara-Sare-Bacar and back.

4th day: Bafata-Jabicunda-Sonaco-Niantire-Nemataba-Lingueto-Koyada-Gabu.

5th day: Gabu-Kumbangnor-Tabadian-Kanjufa-Sindian Sembel-Samajiba-Sore Lubak-Sindian Potie-Golere-Soncocunda-Pirada-Tabasse-Bajocunda and back.

6th day: Gabu-Balanca-Canjadudu-Bac Che-Che-Boe-Beli and back.

7th day: Gabu-Pitche-Camqualifa-Pitche-Burumtuma-Gabu.

Week of 15 to 22 April 1982

Regions of Quinara and Tombali and part of the Bijagos Islands (Bolama)

Distance: 1,123 km

Routes

1st day: Bissau-Enxude-Tite-Mania-Yerada-Farencuda-Kambacar-Sanjao.

2nd day: Sanjao-Bolama and back to the mainland-Brandao-Kandiatra-Fulacunda-Buba.

3rd day: Buba-Cufada-Fulacunda-Kumbambol-Bawa-Bignalo-Gandiawra-Gankecuta and back to Buba.

4th day: Buba-Tungal-Kambil-Haidara-Gandua-Timbo-Catio and back.

5th day: Buba-Kambil-Kaour-Farencunda-Empada-Bignal-Bubuya-Payounkou-Kandafa-Dares-Salam-Kanture-Madina de Baiyo and back.

6th day: Buba-Nyala-Samba Sabali-Sare Donia-Wano-Hampata-Quebo-Themara-Kadambel-Sinthu-Karamba-Bendugu-Bircama-Sankonia-Gadamael-Cacine-Campeane-Cacine.

7th day: Cacine-Quebo-Saltinho-Sindian-Bala-Xitol-Bambadinca-Bafata-Bambadinca.

8th day: Bambadinca-Mansoa-Bissau.

IV. Main plants catalogued

1.	Abrus canescens Welw.	Fabaceae
2.	" precatorius L.	"
3.	" pulchellus Welw.	"
4.	Acacia albida	Mimosaceae
5.	" arabica Wild	"
6.	" macrostachya Reich.	"
7.	" nilotica (L.) Willd var. adansonii O. Kze	"
8.	" sieberiana D.C.	"
9.	Acrocephalus buettneri Gürke	Lamiaceae
10.	Adansonia digitata L.	Bombacaceae
11.	Adenia lobata Engl.	Passifloraceae
12.	Afraegle paniculata (Sch. and Thon) Engl.	Rutaceae
13.	Aframomum melegueta K. Schum.	Zingiberaceae
14.	" sp = Amomum	"
	Afrormosia (see Pericopsis)	Fabaceae
15.	Afzelia africana Smith	Caesalpiniaceae
16.	Ageratum conyzoides L.	Asteraceae
17.	Albizzia adianthifolia W.F. Wight	Mimosaceae
18.	Albizzia zygia (D.C.) J.F. Macbr.	"
19.	Alchornea cordifolia Muell.	Euphorbiaceae
20.	Allophyllus africanus P. Beauv.	Sapindaceae
21.	Alstonia boonei De Willd.	Apocynaceae
22.	Anacardium occidentale L.	Anacardiaceae
23.	Ananas comosus Auct.	Bromeliaceae
24.	Ancistrophyllum secundiflorum Wendl	Arecaceae
25.	Annona senegalensis Pers.	Annonaceae
26.	Anthocleista nobilis G. Don	Loganiaceae
27.	" procera Lepr.	"
28.	Anthostema senegalense A. Juss.	Euphorbiaceae
29.	Antiaris africana Engl.	Moraceae
	Aphania (see Lepisanthes)	Sapindaceae
30.	Arachis hypogaea L.	Fabaceae
31.	Argemone mexicana L.	Papaveraceae
32.	Asparagus africanus Lam.	Liliaceae
33.	Avicennia africana (Jacq) P. Beauv.	Avicenniaceae
34	Azadirachta indica A. Juss	Meliaceae

35.	Bixa orellana L.	Bixaceae
36.	Boerhaavia diffuse L.	Nyctaginaceae
37.	Bombax costatum Pell. and Vuill.	Bombacaceae
38.	Borassus aethiopum Mart.	Arecaceae
39.	Borreria verticillata J.F. Mey	Rubiaceae
40.	Bridelia micrantha Baill.	Euphorbiaceae
41.	Caesalpinia bonduc (L.) Roxb.	Caesalpiniaceae
42.	Calotropis procera Ait	Asclepiadaceae
43.	Capsicum anuum L.	Sclanaceae
44.	" frutescens L.	"
45.	Carica papaya L.	Caricaceae
	Carpodinus (see Landolphia)	Apocynaceae
46.	Carpolobia alba G. Don	Polygalaceae
47.	Cassia alata L.	Caesalpiniaceae
48.	" nigricans Wahl	"
49.	" occidentalis L.	"
50.	" podocarpa Guill. and Perr.	"
51.	" siamea Lam.	"
52.	" sieberiana D.C.	"
53.	" tora L.	"
54.	Cassytha filiformis L.	Lauraceae
55.	Carapa procera D.C.	Meliaceae
56.	Catharanthus roseus (L.) G. Don	Apocynaceae
57.	Ceiba pentandra Gaertn.	Bombacaceae
58.	Celosia Trigyna L.	Amaranthaceae
59.	Centella asiatica (L.) Urban.	Daucaceae
60.	Chlorophora regia A. Chev.	Moraceae
61.	Chrozophora senegalense A. Juss.	Euphorbiaceae
62.	Chrysobalanus orbicularis Sch. and Thon.	Rosaceae
63.	Cissampelos mucronata A. Rich.	Menispermaceae
64.	Cissus araliοides Planch.	Vitaceae
65.	" quadrangularis L.	"
66.	" rubiginosa Planch.	"
67.	Citrus auranthium L.	Rutaceae
68.	Cnestis ferruginea D.C.	Connaraceae
69.	Cochlospermum tinctorium A. Rich.	Cochlospermaceae
70.	Coffe sp.	Rubiaceae
71.	Coix lacrima-jobi L.	Poaceae

72.	Cola acuminata Schtt.	Sterculiaceae
73.	" nitida A. Chev.	"
74.	Combretum glutinosum Perr. ex D.C.	Combretaceae
75.	" micranthum G. Don	"
76.	Connarus africanus Lam.	Connaraceae
77.	Connarus griffonianus Baill.	"
78.	Conopharyngia penduliflora Stapf.	Apocynaceae
79.	Corchorus olitorius L.	Tiliaceae
80.	Cordia myxa	Boraginaceae
81.	Cordyla pinnata (Lepr.) Milne-Redh.	Caesalpiniaceae
82.	Costus afer Ker.	Zingiberaceae
83.	Craterisperma laurinum Benth.	Rubiaceae
84.	Cremaspora trifolia Hutch.-Dalz	"
85.	Crescentia cujete L.	Bignoniaceae
86.	Crossopteryx febrifuga (Afz.) Benth.	Rubiaceae
87.	Cryptolepis sanguinolenta Schltz.	Asclepiadaceae
88.	Cymbopogon citratus (D.C.) Stapf.	
88.	Cucurbita pepo	Cucurbitaceae
89.	Cymbopogon citratus (D.C.) Stapf.	Poaceae
90.	Cymbopogon giganteus Chiov.	"
91.	Cynodon dactylon Pers.	"
92.	Cyperus articulatus L.	Cyperaceae
93.	Cyrtosperma senegalense Engl.	Araceae
94.	Dalbergia sp.	Fabaceae
95.	" saxatilis Hook.	"
96.	Daniellia ogea (Harms) Rolfe	Caesalpiniaceae
97.	" oliveri (Rolfe) Hutch. Dalz.	"
98.	Datine fastuosa L.	Solanaceae
99.	" metel L.	"
100.	" stramonium L.	"
101.	Detarium microcarpum Guill. and Perr.	Caesalpiniaceae
102.	" senegalense J.F. Gmel.	"
103.	Dialium guineense Willd.	"
104.	Dichrostachys cinerea (L.) Wight and Arn	Mimosaceae
105.	Dioscorea sp.	Dioscoreaceae
106.	Diospyros mespiliformis Hochst.	Ebenaceae
107.	Dissotis capitata Hook	Melastomataceae
108.	Dodonea viscosa L.	Sapindaceae

109.	Dombeya quinqueseta var. senegalense (Planch.) Keay	Sterculiaceae
110.	Drepanocarpus lunatus J.F. Mey	Fabaceae
111.	Eclipta prostrata L.	Asteraceae
112.	Elaeis guineensis Jacq.	Arecaceae
113.	Entada africana Guill. and Perr.	Mimosaceae
114.	" gigas Fawcet and Rendle	"
115.	Erythrina senegalensis D.C.	Fabaceae
116.	Erythrophleum africanum Harms	Caesalpiniaceae
117.	Erythrophleum guineense G. Don	"
118.	Euphorbia drupifera Stapf.	Euphorbiaceae
119.	" hirta L.	"
120.	Fagara xanthoxyloides L.	Rutaceae
121.	" leprieurii Engl.	"
122.	Ficus sp.	
123.	" exasperata Vahl	Moraceae
124.	Fleminga faginea (Guill. and Perr.) Bak.	Fabaceae
125.	Garcinia polyantha Oli.	Guttiferae
126.	Gardenia sp.	Rubiaceae
127.	Gloriosa superba L.	Liliaceae
128.	Guiere senegalensis Lam.	Combretaceae
129.	Guibourtia copallifera Benn.	Caesalpiniaceae
130.	Haemanthus multiflora Mart.	Amaryllidaceae
131.	Hannoa undulata (Guill. and Perr.)	Simaroubaceae
132.	Harungana madagascariensis Lam.	Hypericaceae
133.	Heliotropium indicum L.	Boraginaceae
134.	Hibiscus abelmoschus L.	Malvaceae
135.	" sabdariffa L.	"
136.	Holarrhena floribunda (G. Don) Dur. and Schinz	Apocynaceae
137.	Hoslundia opposita Vahl	
138.	Hygrophila spinosa A. Anders.	Acanthaceae
139.	Hymenocardia acida Tul.	Euphorbiaceae
140.	Hyptis spicigera Lam.	Lamiaceae
141.	" suaveolens Poir.	"
142.	Icacina senegalensis A. Juss.	Icacinaceae
143.	Indigofera arrecta Hochst.	Fabaceae
144.	Indigofera tinctoria L.	"
145.	" sp.	"
146.	Ipomoea asarifolia (Desr.) Roem.	Convolvulaceae

147.	Ipomoea brasiliensis (L.) Sweet	Convolvulaceae
148.	Ixora radiata Hiern.	Rubiaceae
149.	Jatropha curcas L.	Euphorbiaceae
150.	Kaempferia aethiopica Solms	Zingiberaceae
151.	Khaya senegalensis A. Juss	Meliaceae
152.	Lagenaria vulgaris Ser.	Cucurbitaceae
153.	Landol hia dulcis (R. Br.) Pichon	Apocynaceae
154.	" heudelotii D.C.	"
155.	" owariensis P. Beauv.	"
156.	Lannea acida A. Rich.	Anacardiaceae
157.	" microcarpa Engl.	"
158.	" velutina A. Rich.	"
159.	Lepisenthes senegalensis (Juss and Perr.) Jeanh	Sapindaceae
160.	Leptadenia hastata (Pers.) Decne	Asclepiadaceae
161.	Lippia chevalieri Moldenke	Verbenaceae
162.	Lonchocarpus cyanescens (Sch. and Th.) Benth.	Fabaceae
163.	" sericeus (Poir.) H.B. and K.	"
164.	Lophira lanceolata Van Tiegh	Ochnaceae
165.	Mangifera indica L.	Anacardiaceae
166.	Markamia tomentosa (Benth.) K. Schum.	Bignoniaceae
167.	Melia azedarach L.	Beliaceae
168.	Mezoneuron benthamianum Baill.	Caesalpiniaceae
169.	Mikania scandens Willd.	Asteraceae
170.	Mitracarpus scaber Zucc.	Rubiaceae
171.	Mitragynpustipulosa O. Kuntze	"
172.	Momordica charantia L.	Cucurbitaceae
173.	Monodora myristica Dun.	Annonaceae
174.	Morinda geminata D.C.	Rubiaceae
175.	" morindoides (Bak.) Milne-Redh.	"
176.	Moringa oleifera Lam.	Moringaceae
177.	Mucuna pruriens D.C.	Fabaceae
178.	Nasslsaphantimilia Art.	Musaceae
179.	Nauclea latifolia Afz.	Rubiaceae
180.	Newbouldia laevis Seem	Bignoniaceae
181.	Nicotiana tabacum L.	Solanaceae
182.	Nymphaea lotus L.	Nymphaeaceae
183.	Ocimum basilicum L.	Lamiaceae
184.	" viride Willd.	"

185.	Opilia celtidifolia Endl.	Opiliaceae
186.	Parinari curatellifolia Planch.	Rosaceae
187.	" excelsa Sabine	"
188.	" macrophylla Sabine	"
189.	Parkia biglobosa Benth.	Mimosaceae
190.	Passiflora foetida L.	Passifloraceae
191.	Paullinia pinnata L.	Sapindaceae
192.	Pentaclethra macrophylla Benth.	Mimosaceae
192 bis	Pericopsis laxiflora (Benth.) Van Meeuwen	Fabaceae
193.	Physalis micrantha Link.	Solanaceae
194.	Piliostigma reticulatum (D.C.) Hochst.	Caesalpiniaceae
195.	" thonningii (Schum.) Milne-Redh.	"
196.	Piper guineense Schum	Piperaceae
197.	Pistia stratioides L.	Araceae
198.	Polygala rarifolia D.C.	Polygalaceae
199.	Portulaca oleracea L.	Portulacaceae
200.	Prosopis africana (Guill. and Perr.) Taub	Mimosaceae
201.	Psidium guajava L.	Myrtaceae
202.	Psophocarpus palustris Desv.	Fabaceae
203.	Psorospermum corymbiferum Hochr.	Hypericaceae
204.	" senegalenses Spach.	"
205.	Pterocarpus erinaceus Poir	Fabaceae
206.	Pycnanthus kombo Warb.	Myristicaceae
207.	Rauwolfia vomitoria Afz.	Apocynaceae
208.	Ricinus communis L.	Euphorbiaceae
209.	Ritchiea capparoides (Andr.) Britten.	Capparidaceae
210.	Salacia senegalensis (Lam.) D.C.	Celastraceae
211.	Salix subserrata Willd	Salicaceae
212.	Schultesia stenophylla var. latifolia Mart.	Gentianaceae
213.	Schwenkia americana L.	Solanaceae
214.	Sclerocarya birrea (A. Rich.) Hochst	Anacardiaceae
215.	Scoparia dulcis L.	Scrophulariaceae
216.	Securidaca longepedunculata Fres.	Polygalaceae
217.	Securinega virosa (Roxb.) Baill.	Euphorbiaceae
218.	Sida rhombifolia L.	Malvaceae
219.	" stipulata Cav.	"
220.	Smilax kraussiana Meisn	Smilacaceae
221.	Spathodea campanulata P. Beauv.	Bignoniaceae

222.	Spondias mombin L.	Anacardiaceae
223.	Solanum incanum L.	Solanaceae
224.	Sterulia setigera Del.	Sterculiaceae
225.	" tragacantha Lindl	"
226.	Stereospermum kunthianum Cham.	Bignoniaceae
227.	Strophanthus hispidus D.C.	Apocynaceae
228.	" sarmentosus Franch.	"
229.	Strychnos spinosa Lam.	Lognaniaceae
230.	Syzygium guineense D.C.	Myrtaceae
230 bis	Tamarindus indica L.	Caelsalpiniaceae
231.	Tephrosia lupinifolia D.C.	Fabaceae
232.	" vogelli Hook	"
233.	Terminalia avicennioides Guill. and Perr.	Combretaceae
234.	" laxiflora Engl.	"
235.	" macroptera Guill. and Perr.	"
236.	Tetrapleura tetraptera Taub.	Mimosaceae
237.	Thevetia peruviana (Juss. Pers.) Merr.	Apocynaceae
238.	Treculia africana Decne	Moraceae
239.	Trema orientalis (L.) Blume	Ulmaceae
240.	Trichilia emetica Vahl	Meliaceae
241.	Trichilia prieuriana A. Juss.	"
242.	Urena lobata L.	Malvaceae
243.	Uvaria chamae P. Beauv.	Annonaceae
244.	Vernonia amygdalina Delile.	Asteraceae
245.	" nigritana Oliv.	"
246.	Vitellaria paradoxa Gaertn.	Sapotaceae
247.	Vitex cuneata Sch. and Thonn.	Verbenaceae
248.	" doniana Sch.	"
249.	" madiensis Oliv.	"
250.	Voacanga africana Stapf	Apocynaceae
251.	" thouarsii Roem	"
252.	Waltheria indica L.	Sterculiaceae
253.	Ximenia americana L.	Olacaceae
254.	Xylopia aethiopica A. Rich.	Annonaceae
255.	Ziziphus mauritiana Lam.	Rhamnaceae

Plants sold in the markets of Bissau

1. Aframomum sp (root)
2. Cassia sieberiana (root)
3. Combretum micranthum (leaves)
4. Diospyros mespiliformis (leaves)
5. Fagara xanthoxyloides (root)
6. Flemingea faginea (leaves)
7. Guiera senegalensis (leaves + branches)
8. Hymenocardia acida ? (leeves)
9. Morinda geminata (leaves)
10. Terminalia laxiflora (leaves)
11. " macroptera (leaves) = "massiti"
12. Ipomoea asarifolia (leaves)
13. " stolonifera (leaves)
14. Nauclea latifolia (root)

POSSIBLE APPLICATIONS OF MEDICINAL PLANTS

I. Selection of plants

The selection of plants which can be used in health centres will depend:

On the presence of natural sources in the vicinity of the health centres. A species such as Khaya senegalensis, for example, is present only in the Sudano-Guinean zone and is not to be found in the Guinean humid zone.

On the selection made by the staff of the health centres. Where two substances are of similar potency, the one which is easier to prepare or more familiar to the population could be selected.

Finally, on the proof of the potency and non-toxicity of the plants used. Of the 250 plants about 30 have a proven potency and the active ingredient is known so that they can be used by the population without risk.

In order to facilitate use of these medicinal plants index-cards have been prepared for each one: these give a simple botanical description, a sketch, the dosage and bibliographical references.

There are a number of possible applications for these plants.

1.1. Use by basic health services without processing, the plants being gathered as required and as selected by the units themselves. The plants could thus supplement the essential medicines bought by the basic health services and expand the scope of the activities of these units. The samples could be gathered by the villagers themselves or purchased from a picker at a modest price.

1.2. For health centres and hospitals packets could be produced containing a given quantity of plants with concise instructions for use, or, preferably, galenic preparations made from the same plants. A machine for producing the packets could be financed by an international body, while the plants could be harvested by a public or private harvesting company.

In order to make this report more practical we have classified the various plants of interest according to their effects, and we have prepared index cards which can be circulated to basic health centres.

II. Classification of index cards

2.1. Gastrodynamic agents

2.1.1. Stimulants to digestion:

Ocimum basilicum
Uppia chevalieri
Cymbopogon giganteus
Cymbopogon citratus

2.2. Agents modifying the biliary function

2.2.1. Cholagogue - depurant:

Combretum micranthum
Cassia occidentalis

2.2.2. Antiicterics:

Carica papaya
Cochlospermum tinctorium

2.3. Agents affecting the intestinal canal

2.3.1. Laxatives:

Tamarindus indica
Cassia sieberiana

2.3.2. Antidiarrhoeic

Euphorbia hirta
Acacia nilotica
Psidium guajava
Adansonia digitata
Guiera senegalensis

2.4. Agents modifying respiration

Euphorbia hirta
Combretum glutinosum
Guiera senegalensis
Datura metel

2.5. Anti-inflammation and antifebrile agents

Azadirachta indica

Khaya senegalensis

Securidaca longepedunculata

Piliostigma thonningii

2.6. Antihelminthic - antiamoebic agents

Cucurbita pepo

Holarrhena floribunda

Euphorbia hirta

2.7. Antihypertension agent

Catharanthus roseus

Combretum glutinosum

2.8. Hypoglycemiant

Anacardium occidentale

2.9. Anti-infection - antimycosis agent

Carica papaya

Borreria verticillata

Mitracarpus scaber

Hibiscus sabdariffa

2.10. Tonic

Cola nitida

OCIMUM BASILICUM

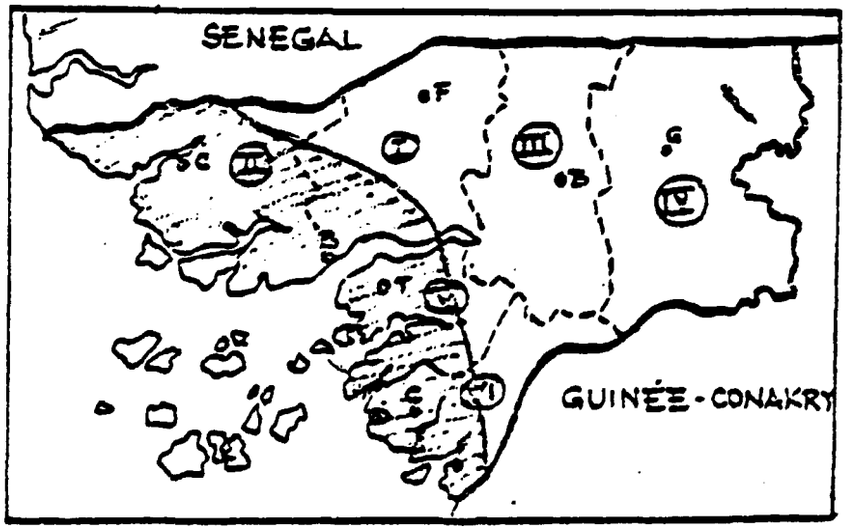
LAMIACEAE

Vernacular names

Creole Doreda

Botanical description: Plant 40 cm high with square stem. Slender oval leaves. White terminal flowers.

Distribution in Guinea-Bissau



Part used: Whole plant.

Preparation: Infuse the fresh or dried plant in water, allowing 15 g per litre. Prepare as with tea.

Dosage: Drink one cup after meals

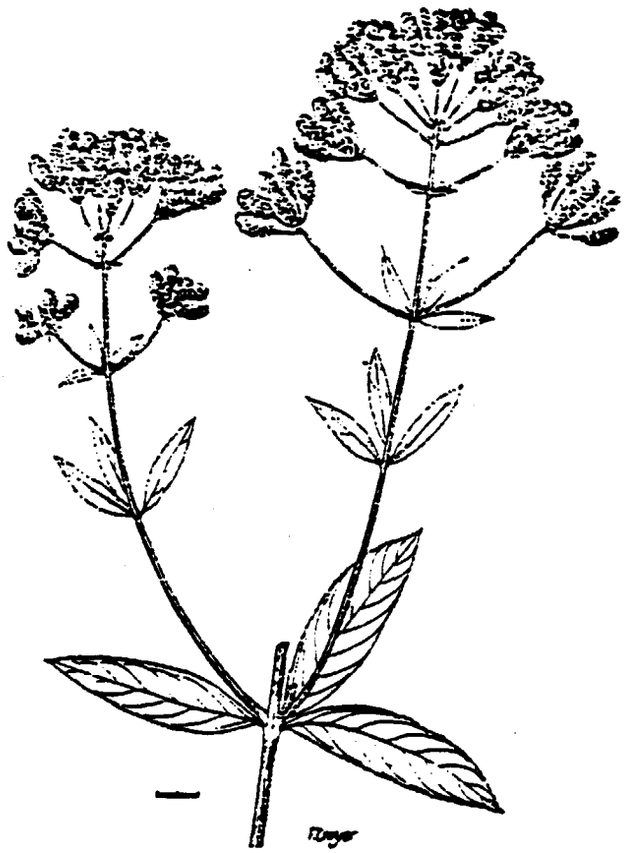
Active ingredients: Essential oils: estragol, eugenol, cineol.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

STIMULANT TO DIGESTION

LIPPIA CHEVALIERI

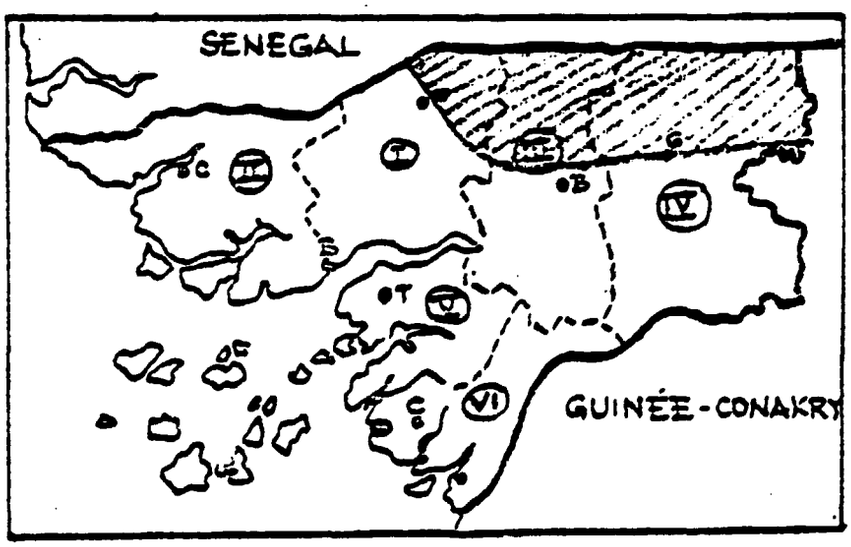
VERBENACEAE



Vernacular names

Botanical description: Upright plant (attaining 2.5 m in height). Whorled leaves in clusters of 4 or 3. White flower spikes.

Distribution in Guinea-Bissau



Part used: Flowering tops

Preparation: Infuse the fresh or dried plant, allowing 15 g per litre of water. Prepare as with tea.

Dosage: Drink one cup after meals

Active ingredients: Essential oils: camphor, cineol, borneol.

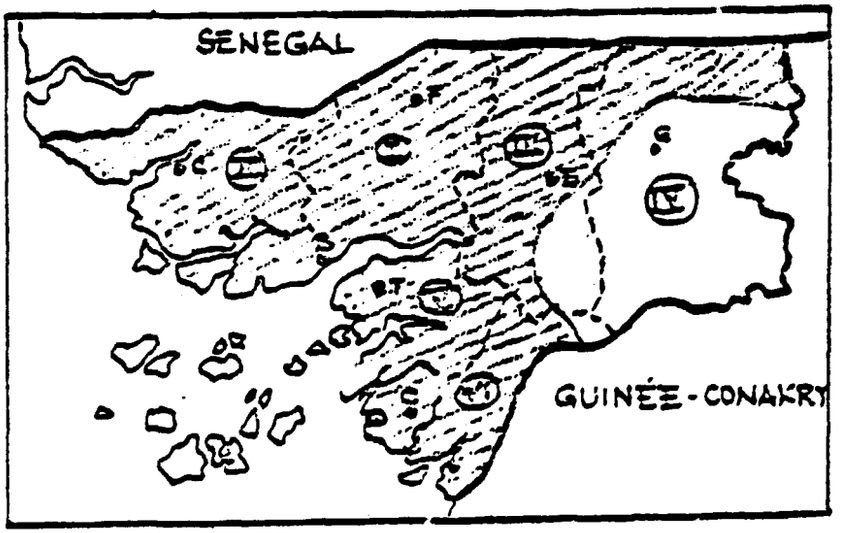
Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

CYMBOPOGON GIGANTEUS

POACEAE

Botanical description: Hardy, upright plant which may attain 2.50 m in height. Very long leaves. Inflorescences in straight spikes. Bush plant.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Infuse the dried or fresh plant, allowing 15 g per litre of water. Prepare as with tea.

Dosage: Drink one cup after meals.

Active ingredients: Essential oils: isomenthone, carvone, citronellol.

Other uses: Pulmonary complaints; keeps mosquitoes away.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

STIMULANT TO DIGESTION

CYMBOPOGON CITRATUS

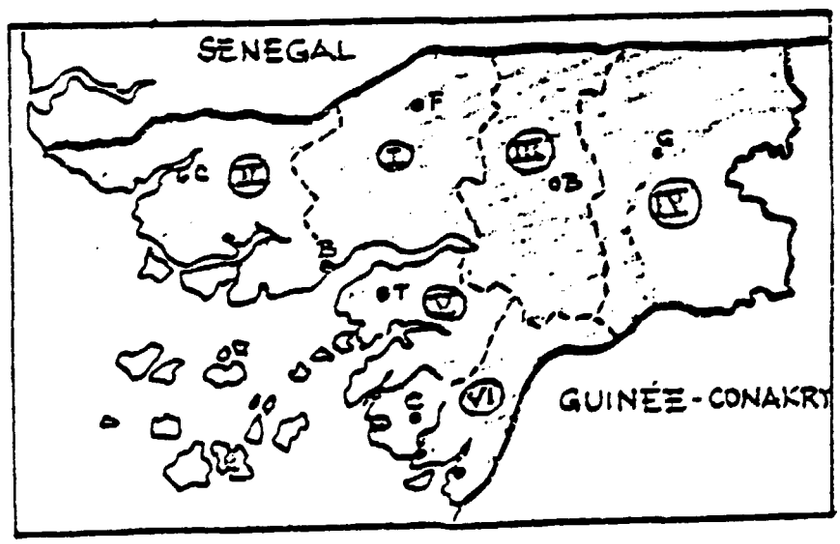
Poaceae

Vernacular names

Creole Belgata

Botanical description: Hardy plant. Leaves forming compact clusters attaining 1 m in height. Fragrant, tapering leaves. Garden plant.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Infuse the fresh or dried plant, allowing 15 g per litre of water. Prepare as with tea.

Dosage: Drink one cup after meals.

Active ingredients: Essential oil: cirrose

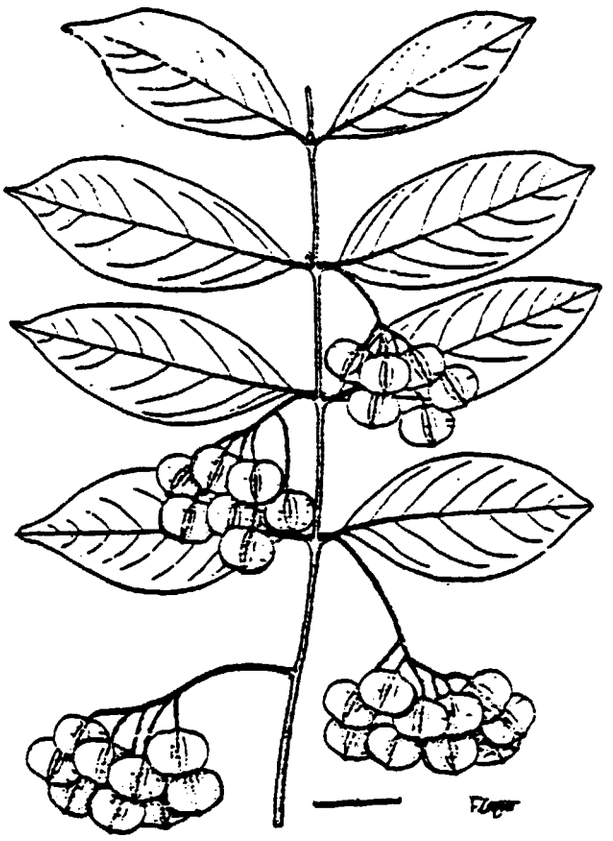
Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

HEPATIC STIMULANT

CHOLAGOGUE - CHOLERETIC

COMBRETUM MICRANTHUM (KINKELIBA)

COMBRETACEAE

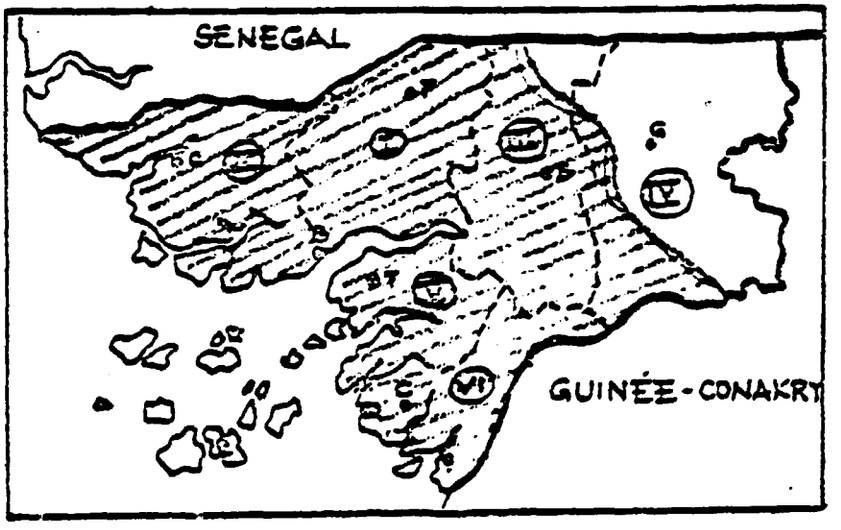


Vernacular names

Creole	Buco
Pepel	Bueco
Fula	Tade
Fula and Manding	Cancaliba
Bijogo	Upatocuma
Manding	Barcolomõ

Botanical description: Shrub which can attain 15 to 20 m in height. Opposite oval green leaves turning red with maturity. Fruit with four wings.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Boil 20 g per litre for half an hour. Strain.

Dosage: Drink one litre daily at intervals throughout the day.

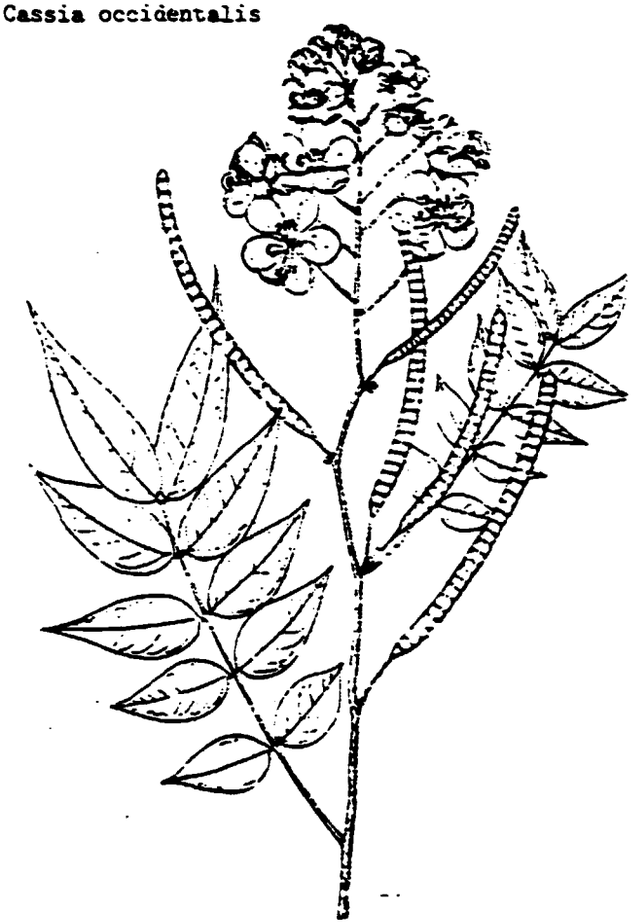
Other uses: Diuretic.

Active ingredients: Flavonoids, choline, sorbitol, inositol, stachydrine, potassium nitrate.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963); Dea de E. Bassene, Contribution à l'étude des glucides de Combretum micranthum (Dakar, 1980); E. Bassene and J.L. Pousset, "Plantes médicinales africaines VII. Etude des alcaloïdes de Combretum micranthum", Médecine d'Afrique Noire, July 1982.

Cassia occidentalis

DEPURANT-CHOLAGOGUE

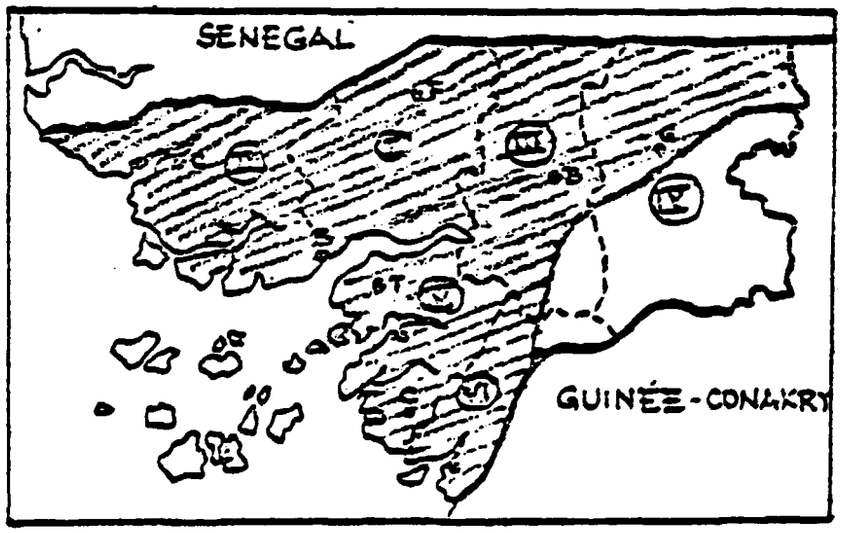


Vernacular names

Creole	padja santa
Balante	méta
Fula	cunaláti
Mandyako	Beco-tinhale

Botanical description: Plant 1 m in height. Composite imparipinnate leaves. Short yellow racemes. Narrow pods containing 10 to 25 seeds.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Soak 30 g of the leaves in one litre of water.

Dosage: Drink one glass before going to sleep.

Active ingredients: Anthracene derivatives.

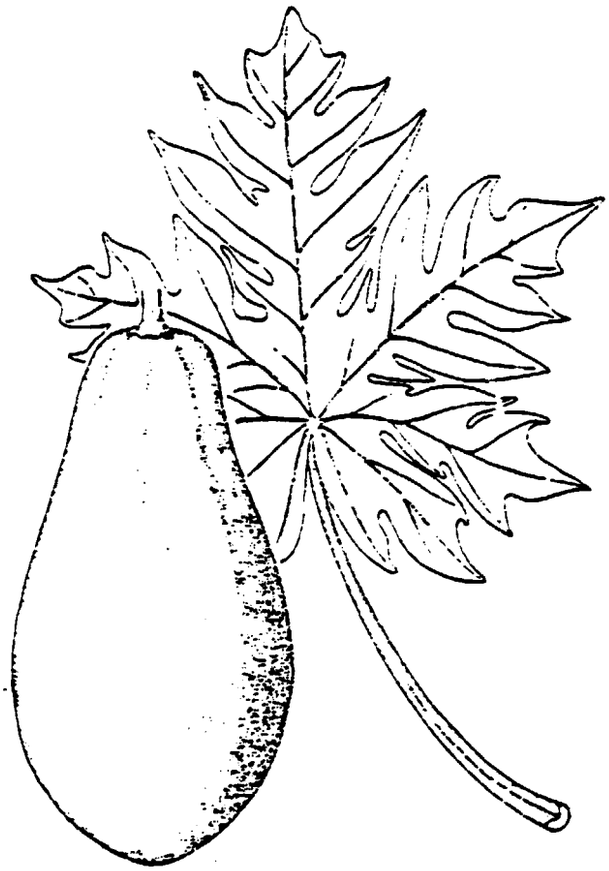
Adverse effects: On pregnant women.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 370, p.83.

ANTIDIARRHOEIC

CARICA PAPAYA

CARICACEAE

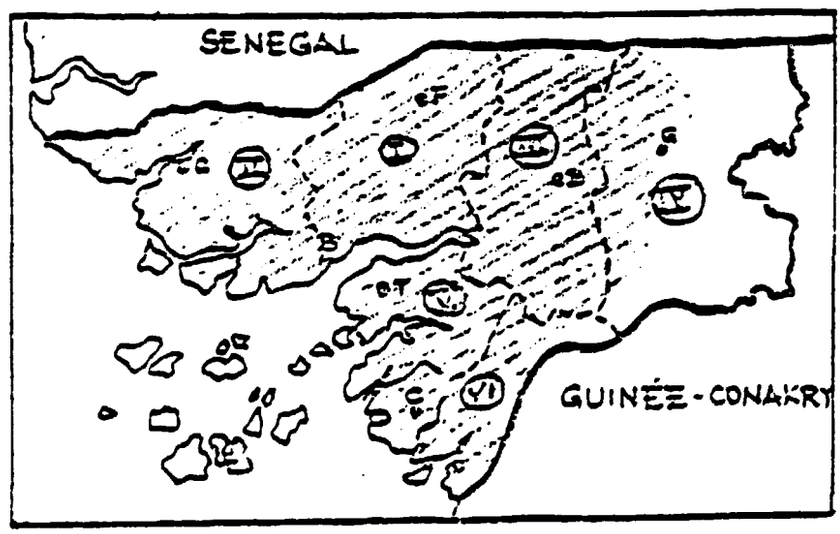


Vernacular names

Futa-fula	Budibaga
Mandyako	Pupa
Brame	Pedum-hal
Bijogo	Umpanda
Creole	papaia
Balante	pace
Fula	papae
Mandyako	bepaia
Manding	papoia
Mancagne	bedon albabo

Botanical description: Fruit-bearing tree 4 to 5 m in height. Divided leaves. Dioecious tree. Fruit with yellow pulp and many seeds.

Distribution in Guinea-Bissau



Part used: Bark

Preparation: Boil 30 g of the bark in one litre of water for half an hour.

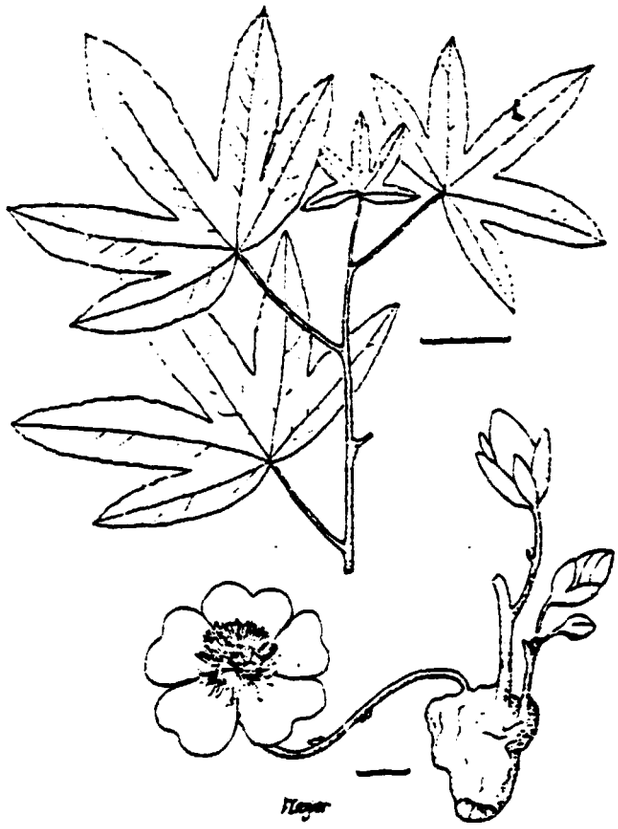
Dosage: Drink one litre per day.

Active ingredients: Alditols.

Bibliography: J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963); R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 371; B. Boum, A. Cave and J.L. Pousset, "Action antihémolytique du xylitol isolé des écorces de Carica papaya", Planta medica, 1981, XLI, 1, 40-47.

COCHLOSPERMUM TINCTORIUM

COCHLOSPERMACEAE

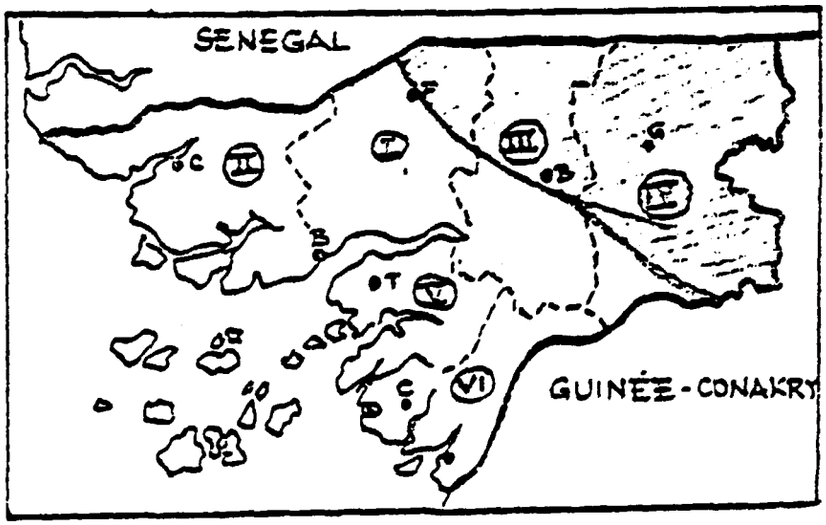


Vernacular names

Fula	Djandere
Futa-fula	Djarundje

Botanical description: Plant not exceeding 50 cm in height. Palmatilobate leaves. Yellow flowers appearing at ground level after bush-fires. Root with yellow tissue.

Distribution in Guinea-Bissau



Part used: Roots

Preparation: Soak 30 g of the chopped roots in one litre of water.

Dosage: Drink one litre daily.

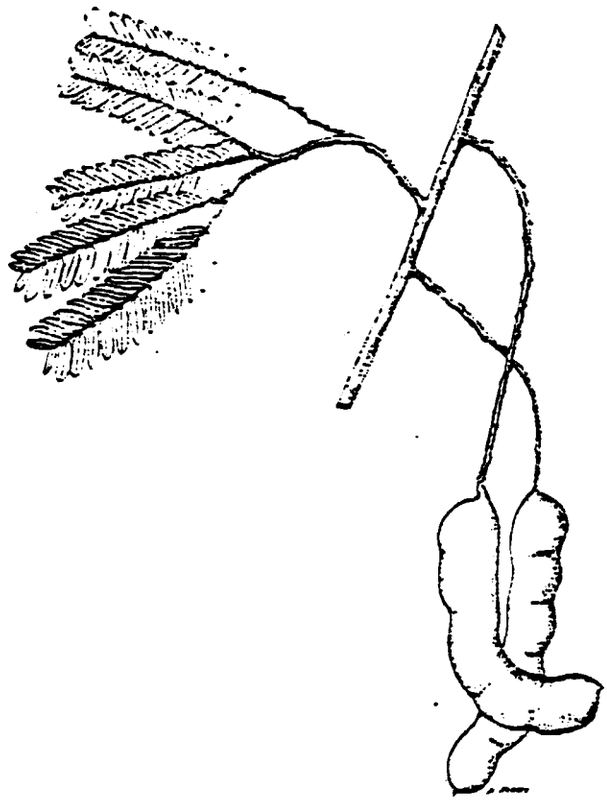
Active ingredients: Unknown.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, (in) Boletim cultural da Guiné Portugesa, 1948, 10, 395.

MILD LAXATIVE

TAMARINDUS INDICA

CAESALPINIACEAE

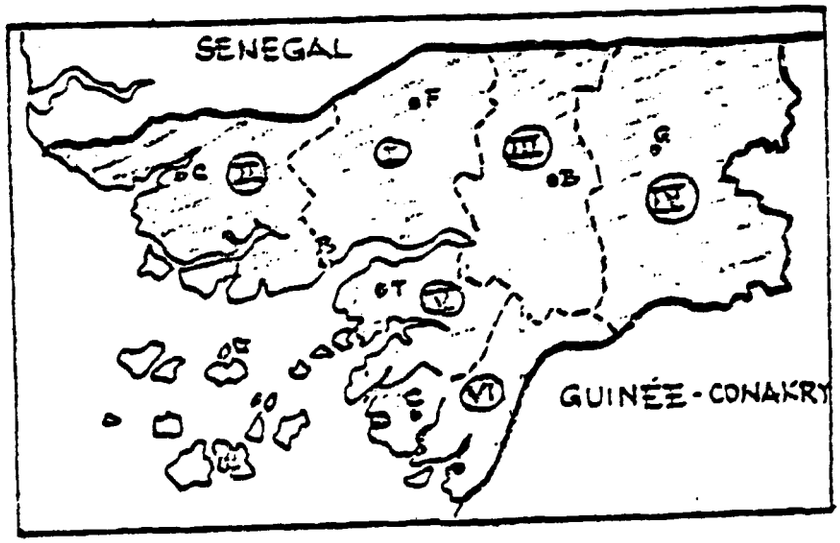


Vernacular names

Creole	Tambarina
Fula	djábe
Balante	Massepame

Botanical description: Tree 12 to 15 m in height. Oval paripinnate leaves. Yellowish terminal flowers. Woody pods 10 cm in length.

Distribution in Guinea-Bissau



Part used: Fruit

Preparation and dosage: One fruit, with the husk and seeds removed, is crushed in a motar and drunk with water or milk.

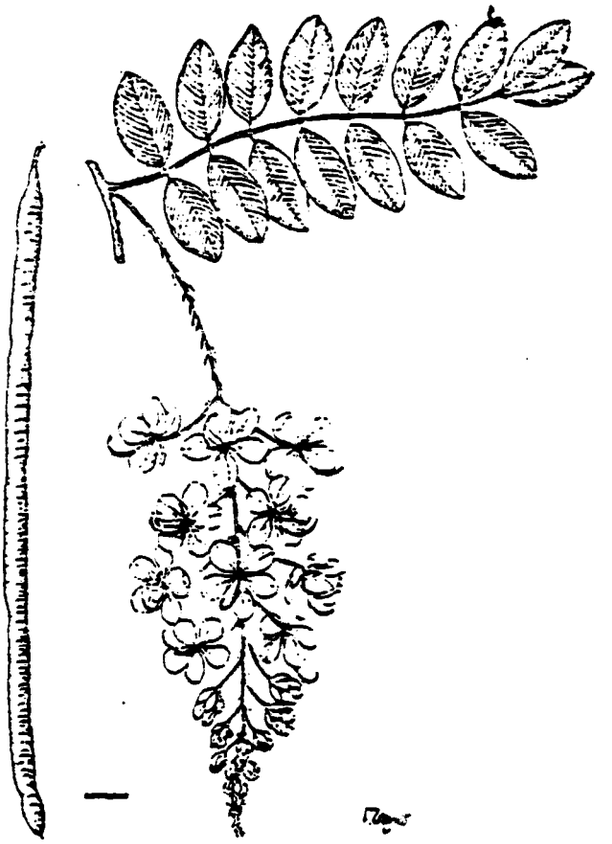
Active ingredients: Tartaric acid, pectin, cellulose.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

LAXATIVE - DIURETIC

CASSIA SIEBERIANA

CAESALPINIACEAE

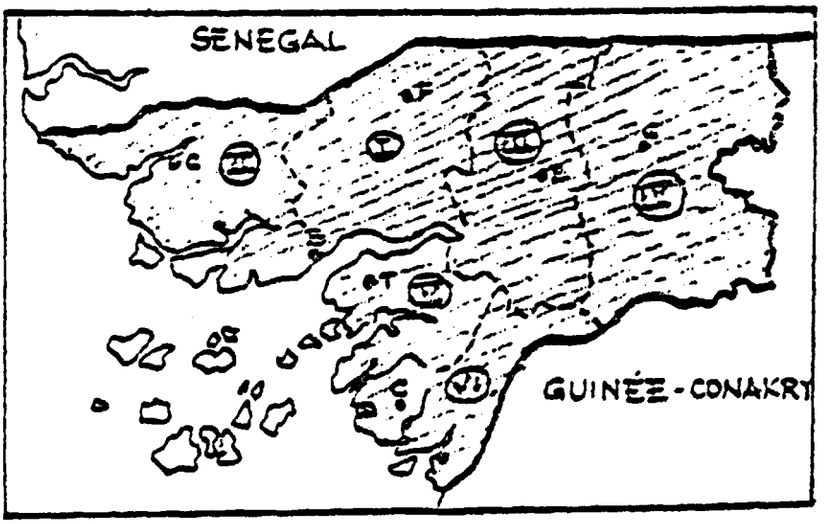


Vernacular names

Pepel	Betame
Biafada	Bissindje
Manding	Sindjam-ô
Fula	Sambassinhame
	Sandjoné
Creole	Canafistula
Mandyako	Untame, Bentape

Botanical description: Decumbent tree or shrub 4 to 10 m in height. Pennate leaves. Yellow-gold flowers in broad panicles. The fruit is a cylindrical pod 30 to 60 cm in length.

Distribution in Guinea-Bissau



Part used: Leaves or roots

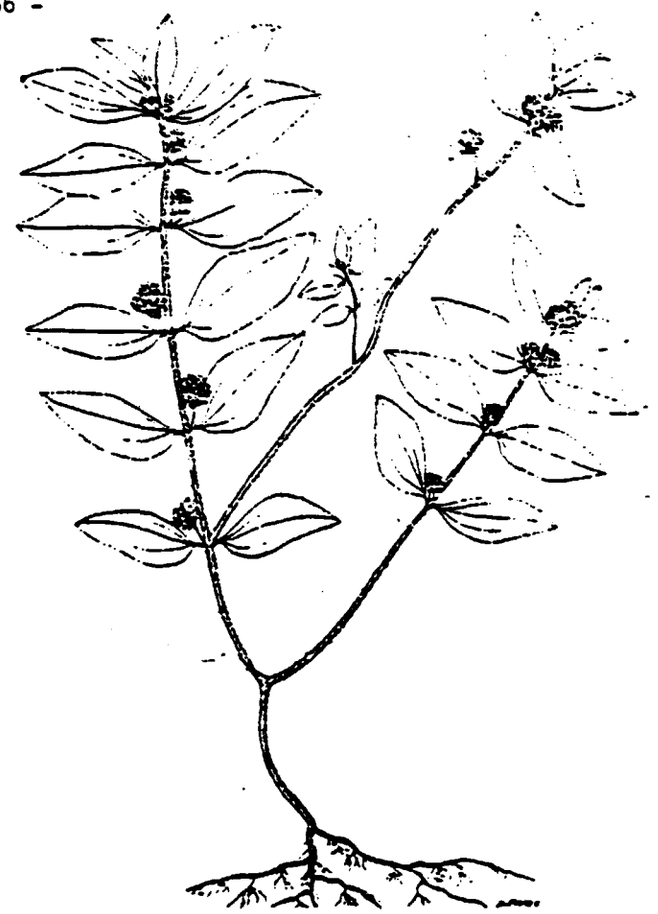
Preparation and dosage: Grate 100 g of the roots and soak in one litre of water for 24 hours. Drink one glass in the evening after dinner.

Active ingredients: Anthracene derivates.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

EUPHORBIA HIRTA

EUPHORBIACEAE

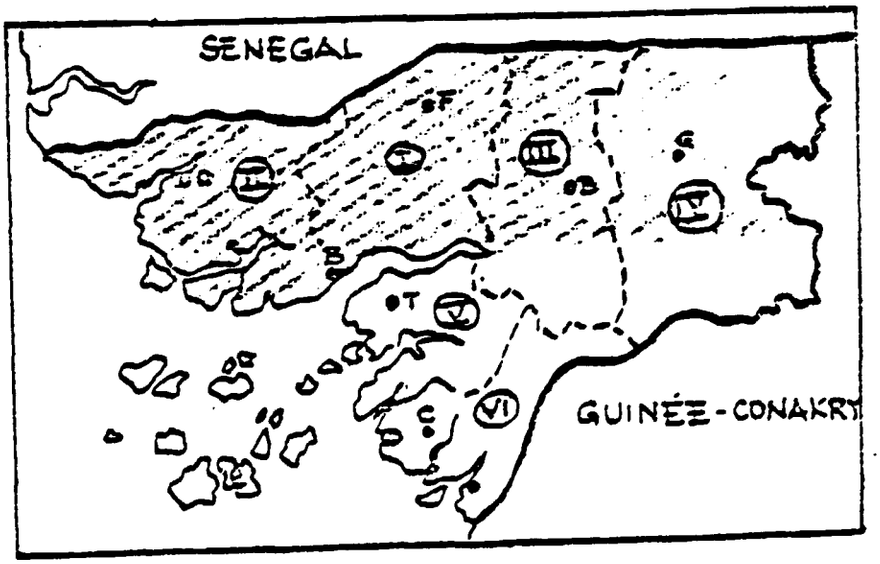


Vernacular names

Fula Taquelpôlhe

Botanical description: Upright plant which can attain 40 cm in length. Greenish or reddish leaves.

Distribution in Guinea-Bissau



Part used: Whole plant

Preparation: Boil 100 g of the fresh plant or 30 g of the dried plant in one litre of water.

Dosage: Two to three litres per day.

Active ingredients: Gallic acid, shikimic acid.

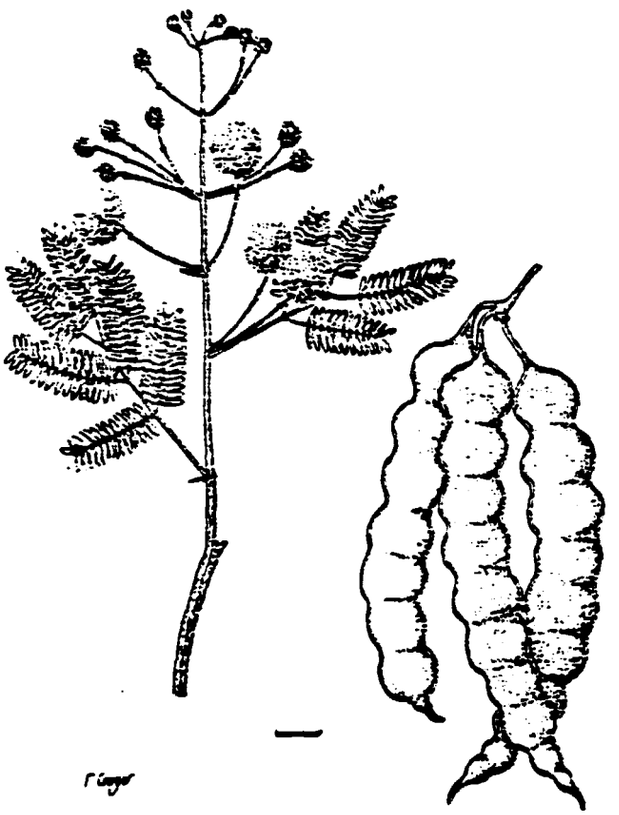
Bibliography: R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 373, p.75; O. Ndir and J.L. Pousset, "Plantes médicinales africaines V. Mise au point d'un test in vitro pour vérifier l'action amoebicide d'Euphorbia hirta", Plantes médicinales et phytothérapie, 1981, XV, 2, 113.

ACACIA NILOTICA var. ADANSONII

MIMOSACEAE

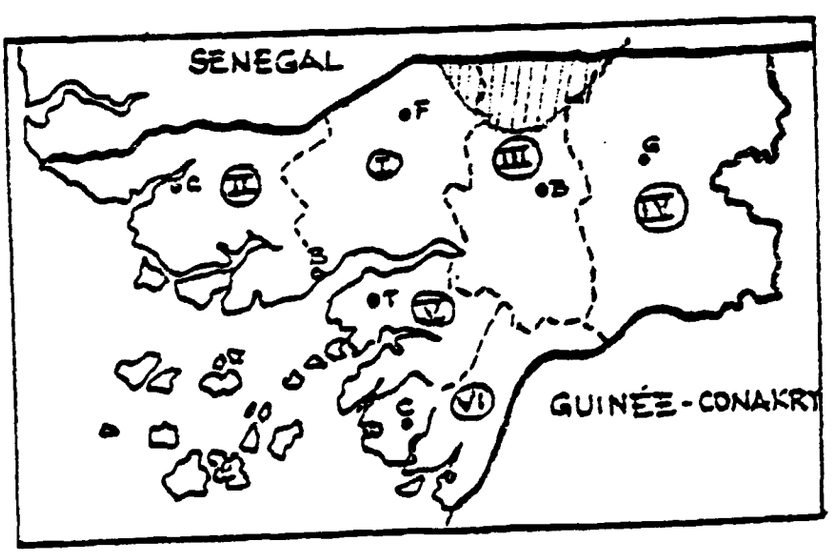
Vernacular names

Futa-fula	Gaudé
Manding	Banô
Fula	Guiḍe



Botanical description: Tree 10 to 12 m in height with straight trunk. Bipennate leaves. Glomerules of yellow flowers. Bulbous pods 16 cm in length.

Distribution in Guinea-Bissau



Part used: Fruit and seeds

Preparation: Make a powder from the fruit and seeds.

Dosage: 1 to 5 g of the powder according to the severity of the diarrhoea.

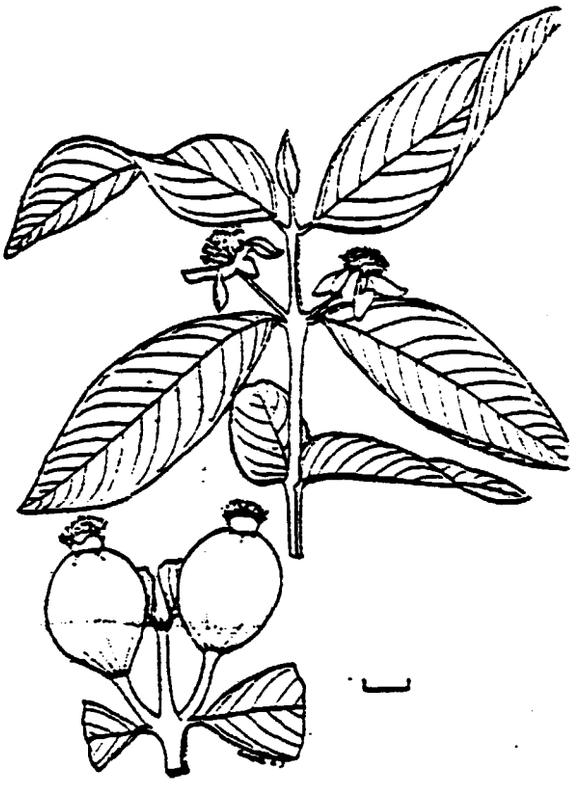
Active ingredients: Tannins, gallic acid.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

ANTIDIARRHOEIC

PSIDIUM GUAJAVA

MYRTACEAE

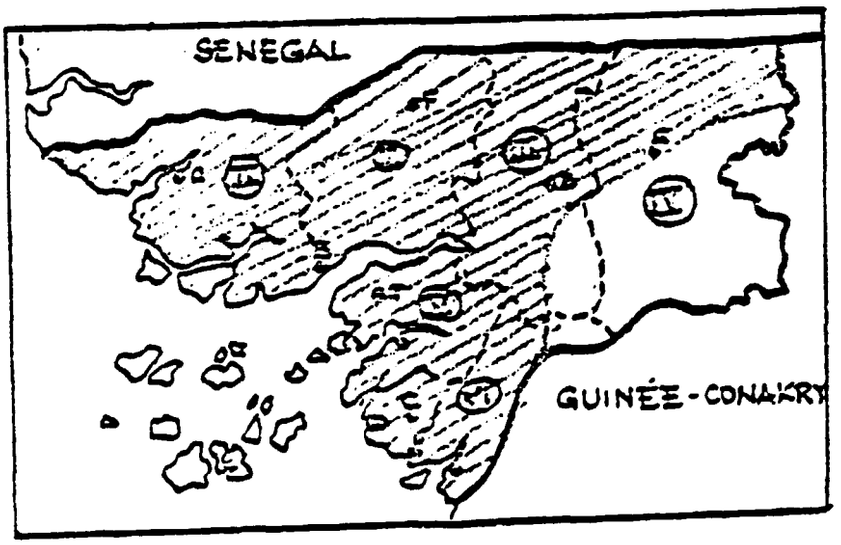


Vernacular names

Creole Guaiaba

Botanical description: Shrub 3 to 4 m in height. Opposite oval leaves. Spherical berries with pink flesh containing numerous seeds.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Boil 15 g of the leaves in one litre of water. Allow to cool.

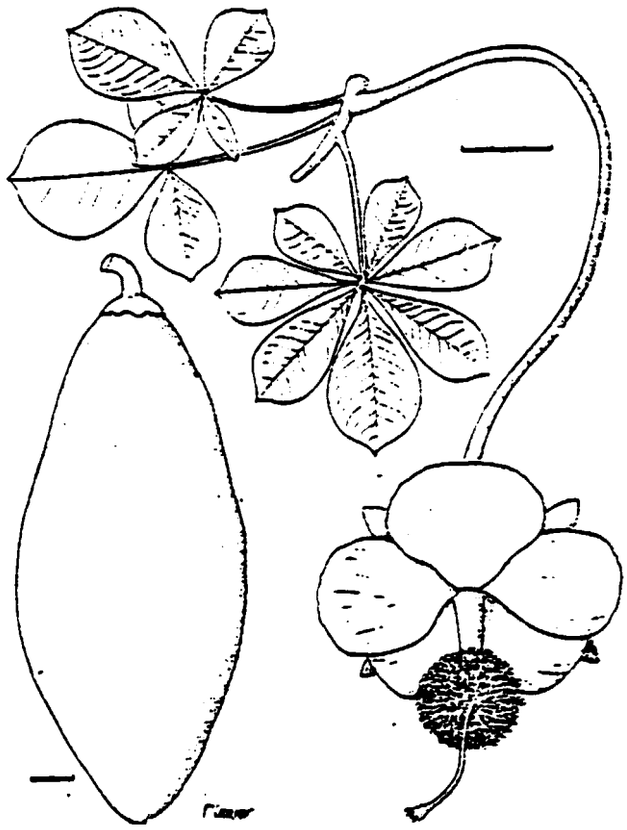
Dosage: Drink one litre per day.

Active ingredients: Tannins, ellagic acid.

Bibliography: J. do Espirito Santo, Nomes vernaculos de algumas plantes da Guiné Portugesa (Lisbon, 1963); J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

ADANSONIA DIGITATA

BOMBACACEAE

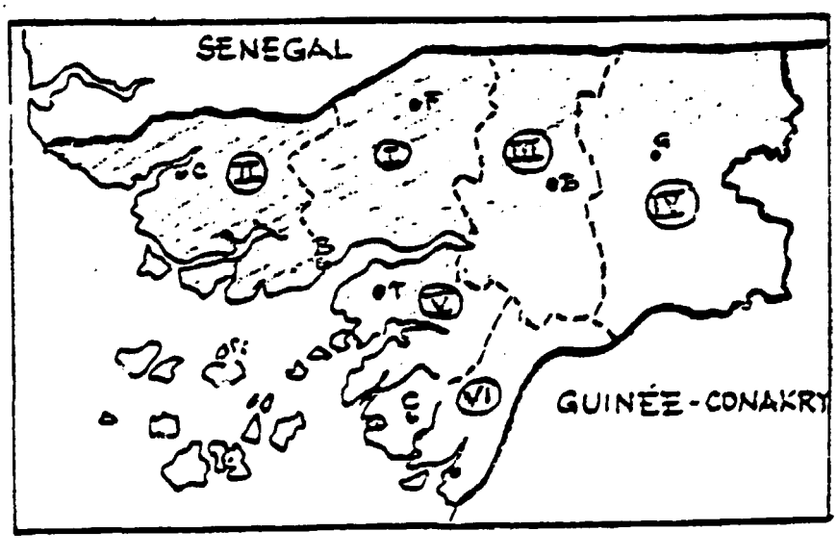


Vernacular names

Creole	Cabacera
Fula	Boe
Pepel	Burungule
Balante	Láté
Manding	Citô
Mancagne	Burungule-burunque
Bijogo	Uâto

Botanical description: Tree with enormous trunk. Spreading branches. Composite leaves. Ovoid fruit 15 cm in length.

Distribution in Guinea-Bissau



Part used: Pulp of the fruit separated from the seeds.

Preparation: 20 g in one litre of water or milk.

Dosage: Half a litre per day until diarrhoea ceases. If the diarrhoea persists form more than 48 hours, consult nurse or doctor again.

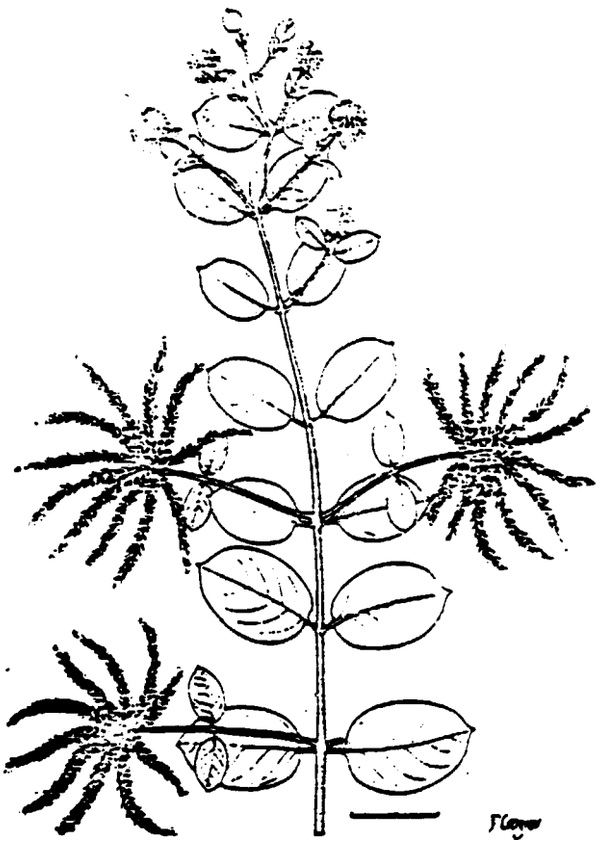
Active ingredients: Various acids, protein sugars.

Bibliography: A. Sallet, D. Vincent, I. Sero, "De l'emploi thérapeutique du baobab", Presse médicale, 1946, 24, 353; J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

ANTIDIARRHOEIC Guiera senedalensis

GUIERA SENEGALENSIS

COMBRETACEAE

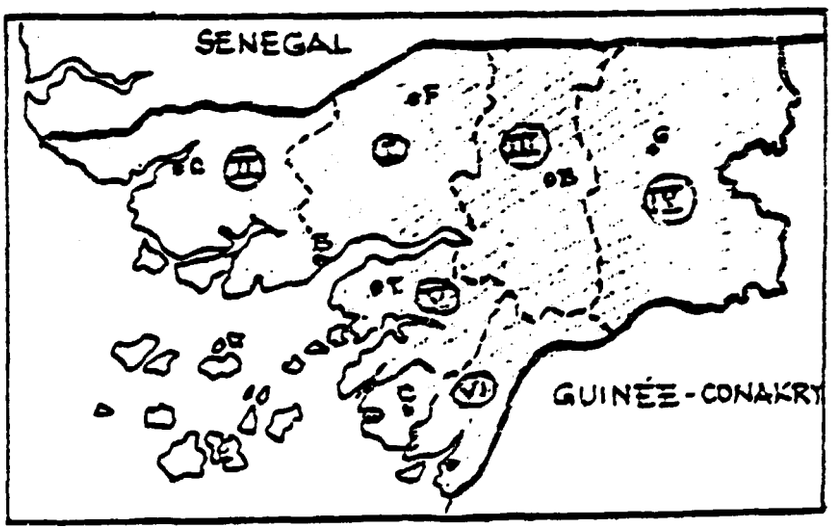


Vernacular names

Fula	Guelodi
Mandyako	Heloco
~~Mandyako and~~	~~Bissilintche~~
Brame	Bissem-antchom
Creole	Bitchiante
Balante	Badossêsso
	Badosdôce
	Bioce ou iuci

Botanical description: Shrub which can reach 3 m in height. Opposite leaves with white down, which gives them a silvery tint. Inflorescences with axillary capitula.

Distribution in Guinea-Bissau



Part used: Leaves.

Preparation: Pour one litre of boiling water (infusion) over 30 g of dried Guiera senegalensis leaves. Allow to stand for 10 minutes.

Dosage: Drink one to two litres per day.

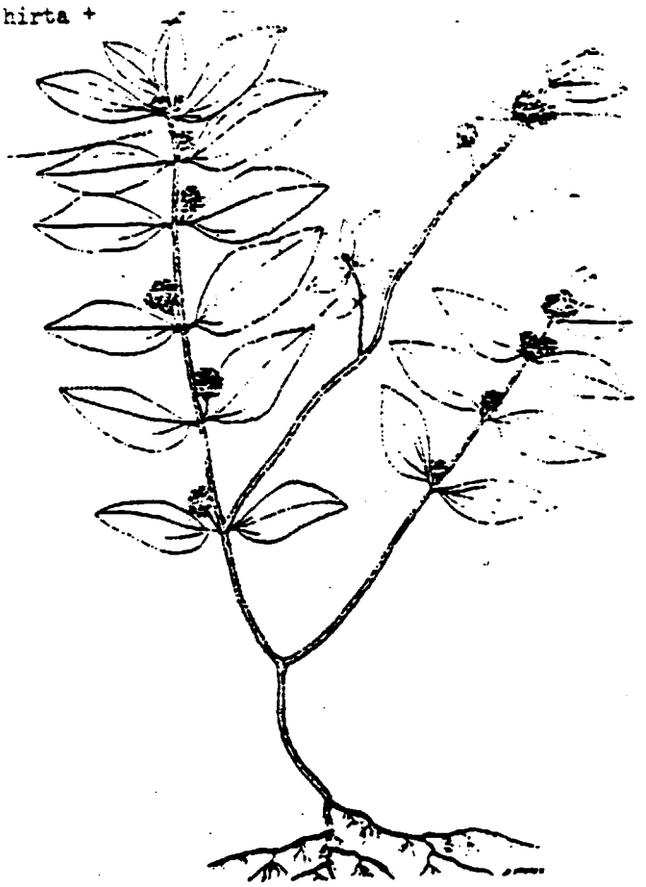
Active ingredients: Tannins, gallic acid.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Vigot, 1974); R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 372, 75; M. Koumare, Contribution à l'étude pharmacologique du Guier (Doctoral thesis in pharmacology, Toulouse, 1968).

ANTIASTHMATIC
EUPHORBIA HIRTA

EUPHORBIACEAE

Euphorbia hirta +

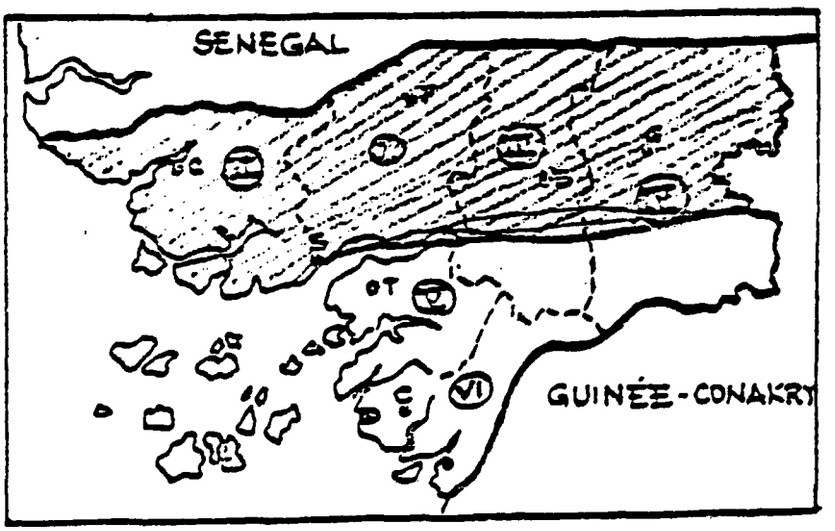


Vernacular names

Fula Taquelpõlhe

Botanical description: Upright plant which can attain 40 cm in length. Greenish or reddish leaves.

Distribution in Guinea-Bissau



Part used: Whole plant

Preparation: Boil 100 g of the fresh plant or 30 g of the dried plant in one litre of water.

Dosage: Two to three litres per day.

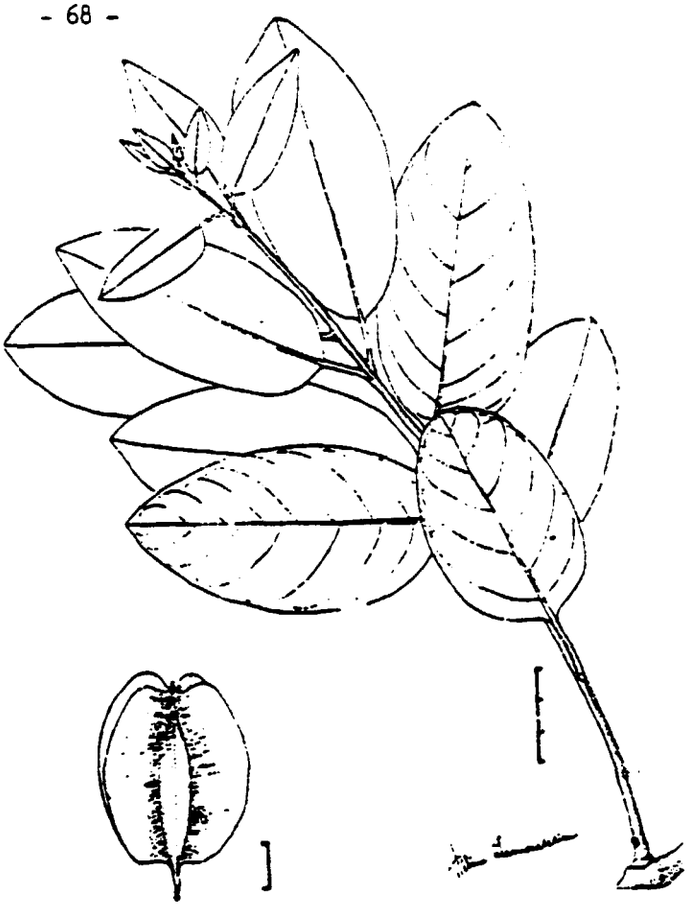
Active ingredients: Shikimic acid.

Bibliography: R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, XXXII, 373, p. 75.

COMBRETUM GLUTINOSUM

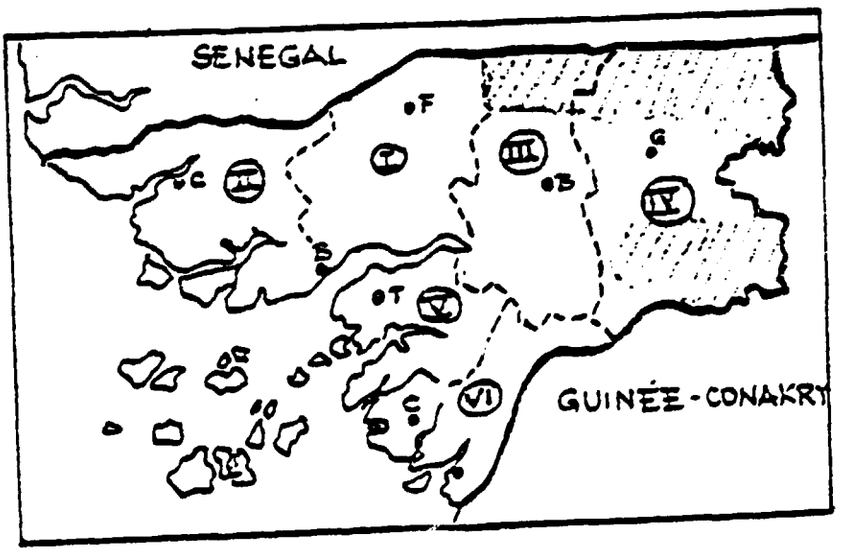
COMBRETACEAE

Vernacular names



Botanical description: Bush 8 to 10 m in height. Alternate leaves. Yellow-cream flower spikes. Fruit with four wings.

Distribution in Guinea-Bissau



Part used: Leaves.

Preparation: Boil 80 g of dried leaves in one litre of water for half an hour. Strain.

Dosage: Adults: Swallow by the soupspoonful as required for the cough. Children under 5 years of age: Swallow by the teaspoonful.

Active ingredients: Gallic acid, flavonoids, tannins, ellagic acid.

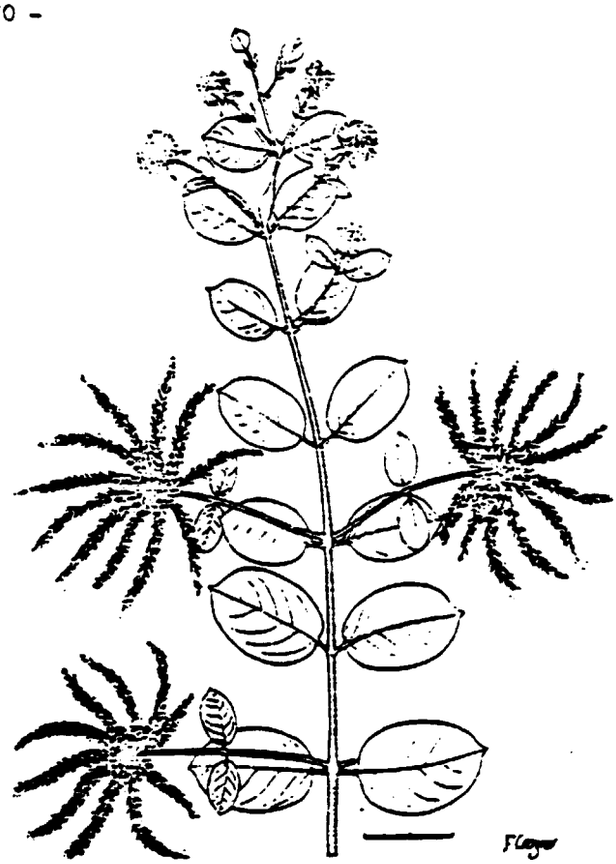
Other uses: Diuretic, mild hypotensor.

Bibliography: J. Ngaba, D. Olschwang, H. Giono-Barber, J.L. Pousset, "Plantes médicinales africaines III. Etude de l'action antitussive du Combretum glutinosum", Ann. pharm. françaises, 1980, 38, 6, 529.

ANTITUSSIVE

GUIERA SENEGALENSIS

COMBRETACEAE

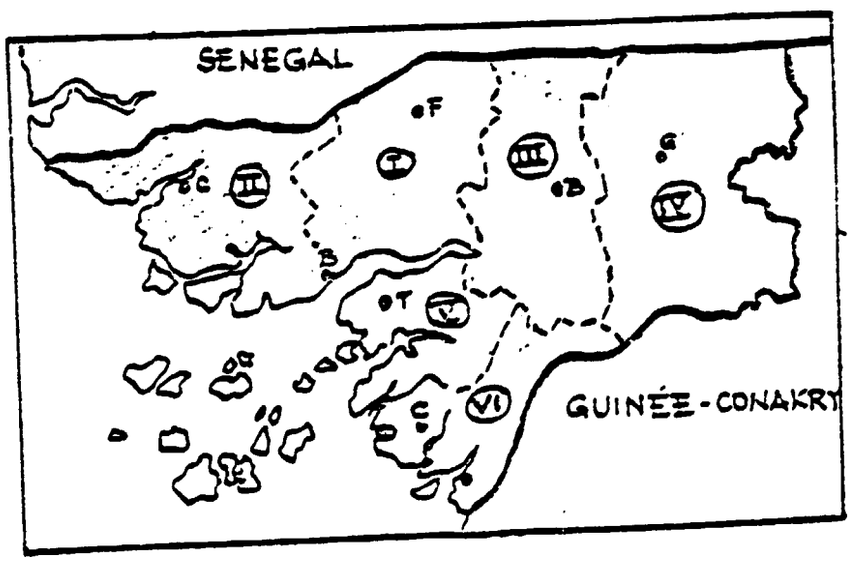


Vernacular names

Fula	Guelodi
Mandyako	Heloco
Mandyako and Brame	Bissilintche Bissem-ant-chom
Creole badosdôce	Bitchiante
Balante	Badassôsso Biôce ou cuci

Botanical description: Shrub which can attain 3 m in height. Opposite leaves with white down, which gives them a silvery tint. Inflorescénces with axillary capitula.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Boil 80 g of dried leaves in one litre of water. Strain.

Dosage: Adults: Swallow by the soupspoonful as required for the cough. Children under 5 years of age: Swallow by the teaspoonful.

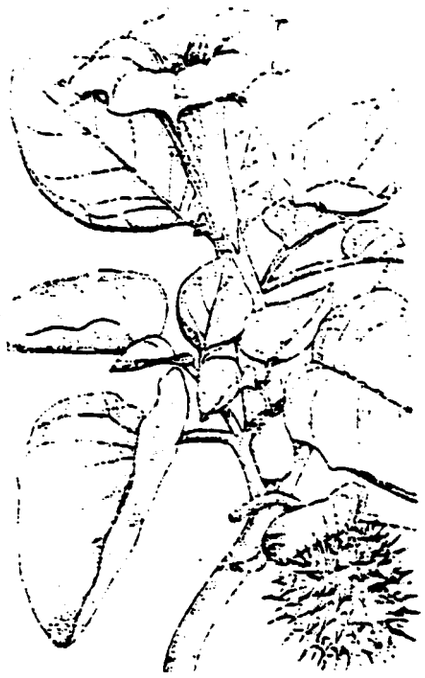
Active ingredients: Gallic acid, Flavonoids, tannins, ellagic acid.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Vigot, 1974); R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 372, 75; M. Koumare, Contribution à l'étude pharmacologique du Guier (Doctoral thesis in pharmacology, Toulouse, 1968); O. Faye, D. Olschwang, H. Giono-Barber and J.L. Pousset, "Plantes médicinales africaines II. Action antitussive d'un extrait lyophilisé de Guiera senegalensis, Dakar medical 1980, 25, 4, 285.

ANTIASTHMATIC

DATURA METEL

SOLANACEAE

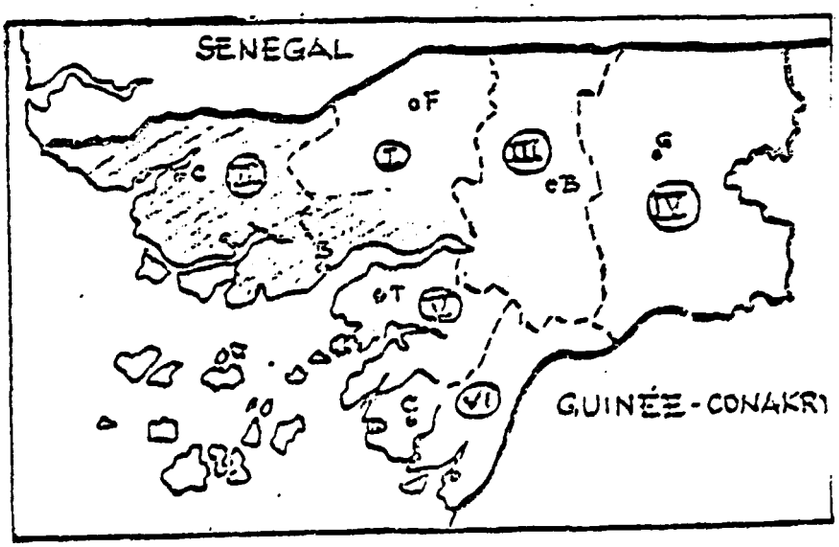


Vernacular names

Mandyako	Bucuo
Creole	Burbuiaca
Manding	Falerô-djambo
	Timbôfarerô

Botanical description: Plant 1 m high. Broad oval leaves 20 x 14 cm. Large white flowers with tubular calyx. Capsules.

Distribution in Guinea-Bissau



Part used: leaves

Preparation and dosage: Use dried leaves, cut them into strips and make them into cigarettes. Smoke one cigarette in the event of asthma attacks.

Active ingredients: Atropine, hyoscyamine, scopolamine.

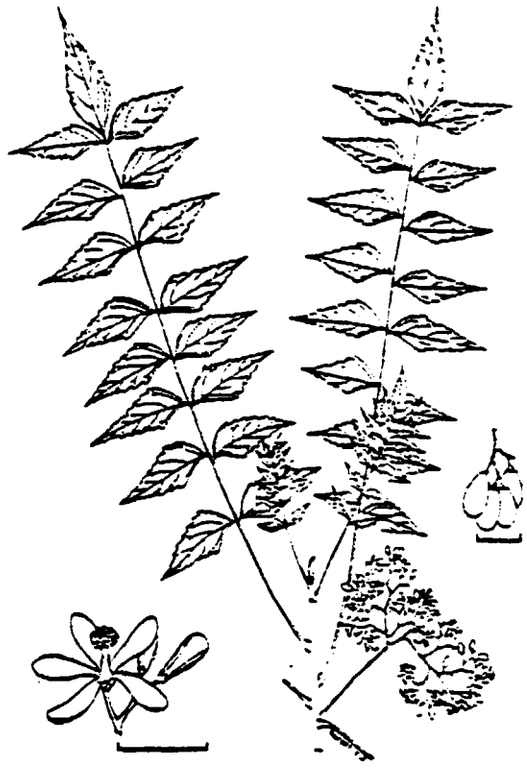
Toxicity: Datura intoxication manifests itself in abnormal dilation of the pupil of the eye; no further cigarettes should be allowed while the pupil is dilated.

Bibliography: J. do Espirito Santo, Nomes vernaculos de algumas plantas Guiné Portugesa (Lisbon, 1963); P. Boiteau, Précis de matiére médicale malgache (La Librairie de Madagascar, 1979).

ANTIFEBRILE - ANTI-INFLAMMATION AGENT Azadirachta indica

AZADIRACHTA INDICA

MELIACEAE

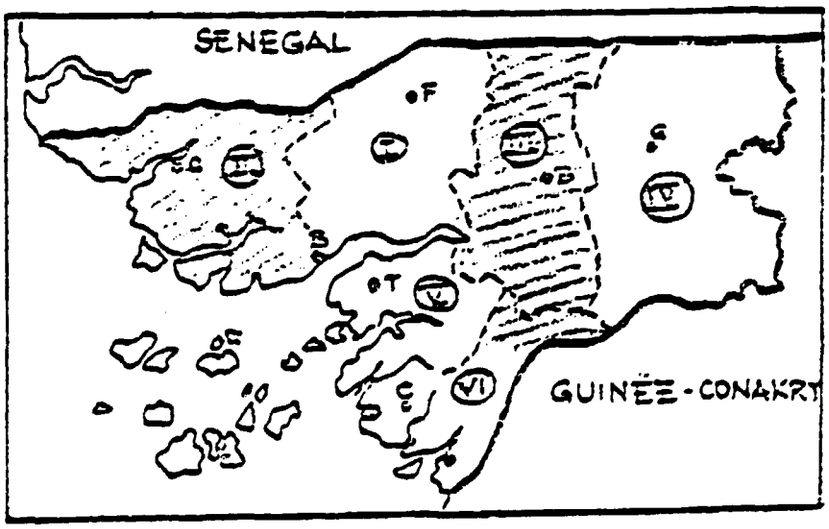


Vernacular names

Neem

Botanical description: Trees 10 to 15 m in height. Alternate dentate leaves. Axillary panicles of white flowers. Yellow drupes containing one seed when mature.

Distribution in Guinea-Bissau



Part used: Leaves

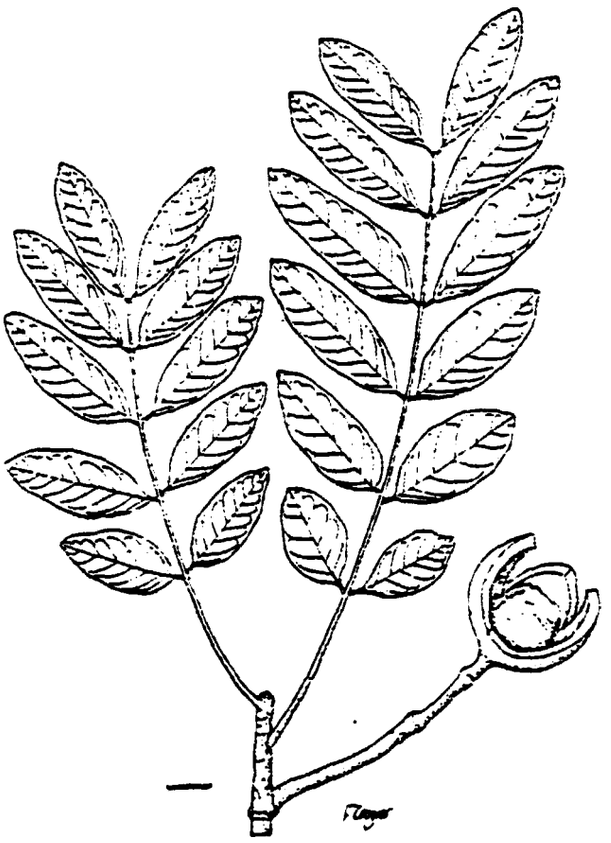
Preparation: Boil 30 g of the leaves in one litre of water. Strain.

Dosage: Drink one litre per day.

Active ingredients: B-sitosterol, aliphatic alcohols, tetranortriterpenoids.

Bibliography: J. Kerharo, La pharmacopée sénégalaise traditionnelle; M. Tidjani, Etude pharmacologique et chimique de Azadirachta indica (thesis for the Diplôme d'Etudes Approfondies in the chemistry and biochemistry of natural substances, defended at Dakar on 2 June 1982).

KHAYA SENEGALENSIS

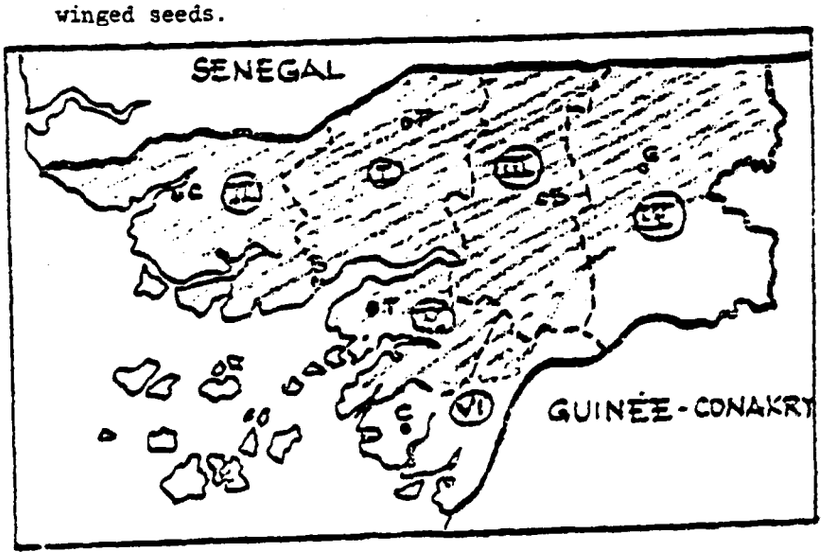


Vernacular names

Mandyako	Bentia, Betone, Bentiene
Creole	Bissilom
Futa and	Futa-fula Cai
Pepel	Utime, Embale
Balante	Iacume, Taminii, Fame
Manding	Djalo
Bijogo	Unchronô
Brame	Biaiérre

Botanical description: Large tree 25 to 30 m in height. Greyish bark. Leaves clustered towards the ends of the branches. Capsules with four valves 5 cm in diameter containing numerous winged seeds.

Distribution in Guinea-Bissau



Part used: Bark

Preparation: Boil 30 g of the bark in one litre of water for a quarter of an hour. Strain.

Dosage: One litre per day.

Active ingredients: B-sitosterol, bitter constituents.

Other uses: Tonic.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

ANTI-INFLAMMATION AGENT

SECURIDACA LONGEPEDUNCULATA

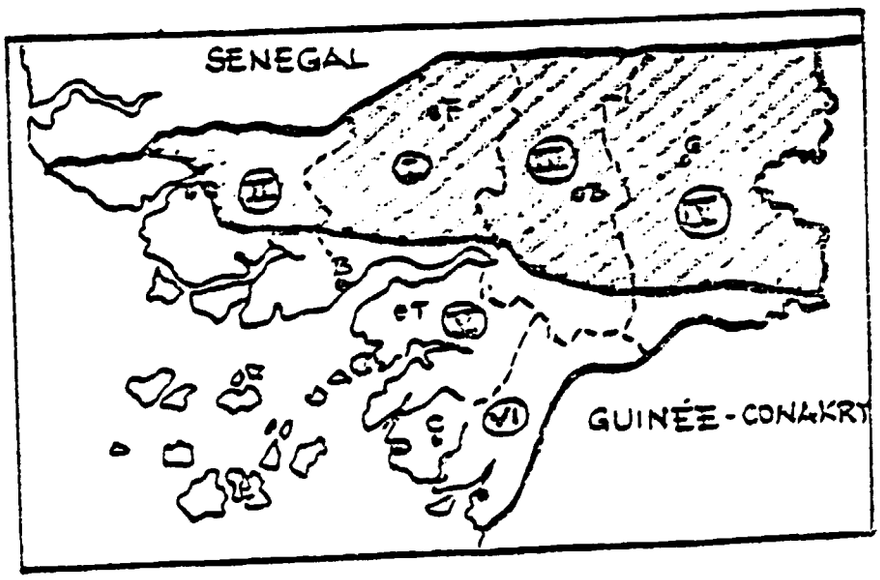
POLYGALACEAE

Vernacular names

Manding	Djuró
Creole	Jurtú

Botanical description: Shrub 1 to 4 m in height. Alternate leaves rounded at the top. Violet terminal flowers.

Distribution in Guinea-Bissau



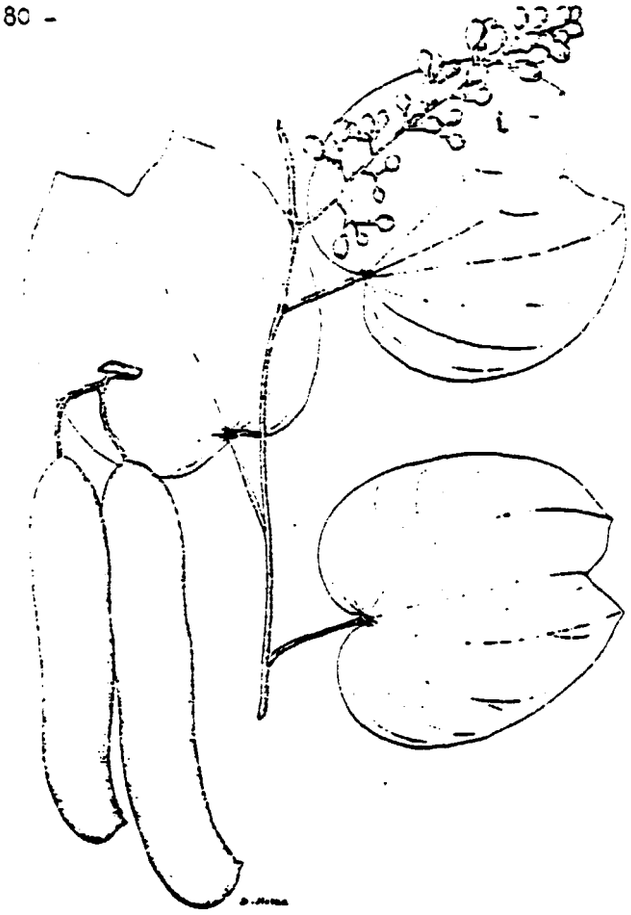
Part used: Fresh root

Preparation and dosage: Rub the affected part of the body with the crushed fresh root three times daily.

Active ingredients: Methyl salicylate.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

PILIOSTIGMA THONNINGII
CAESALPINIACEAE

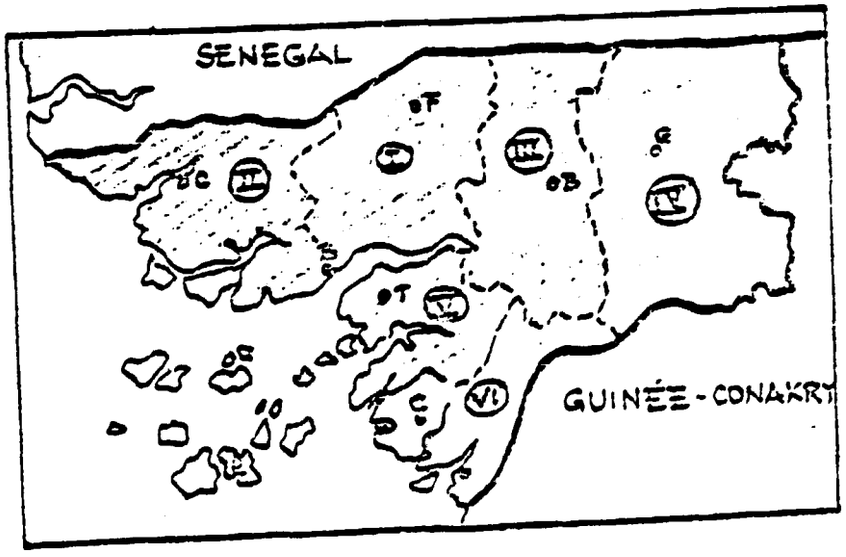


Vernacular names

Pepel	N'toncre
Manding	Fara
Bijogo	Canná, Epamámbo
Fula	Bárque
Balante	Pouúnqué

Botanical description: Small tree 8 to 9 m in height. Thick, coriaceous leaves. Branching panicles of white flowers.

Distribution in Guinea-Bissau



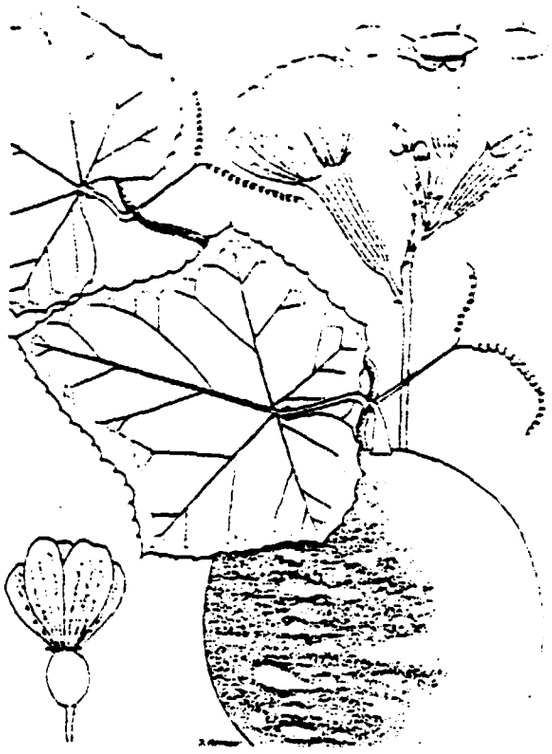
Preparation and dosage: Boil 30 g of the leaves in one litre of water for a quarter of an hour. For toothache, gargle with the solution several times a day.

Active ingredients: Unknown

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

CUCURBISTA PEPO

CUCURBITACEAE

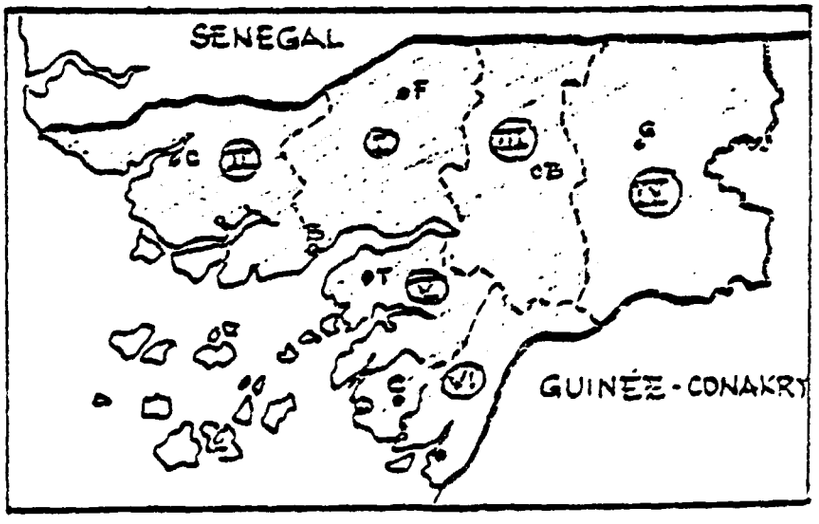


Vernacular names

Brame	Umbógre
Mayak	Ussanufo
Futa-fula	Büdi.
Balante	Blelessim
Bijogo	Cartbáe

Botanical description: Annual plant trailing stems attaining 4 to 5 m in length. Deeply lobed leaves. Large yellow flowers. Ovoid fruit. Seeds distinctly thicker at the edges.

Distribution in Guinea-Bissau



Part used: Seeds

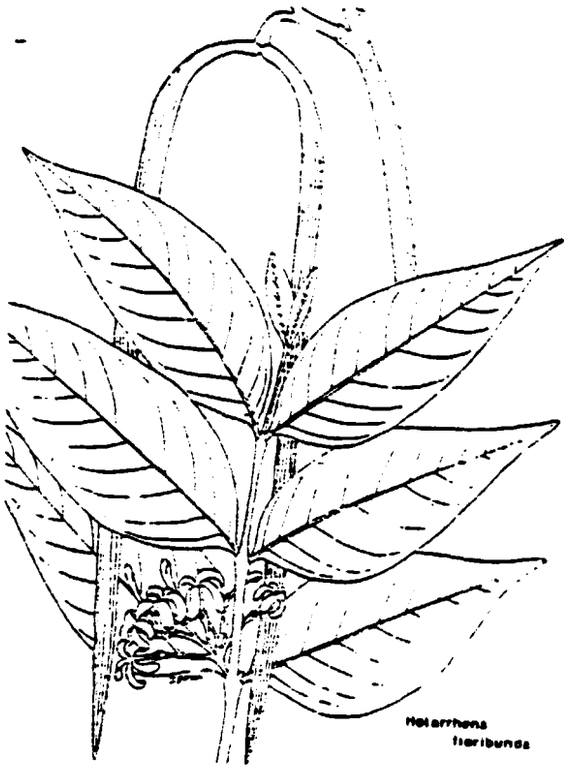
Preparation: Children: 30 to 50 g of the seeds are crushed and mixed with honey.
Adults: 50 to 60 g.of the seeds are crushed and mixed with honey.
Administer an oily purgative 4 to 5 hours after ingestion.

Active ingredients: Cucurbitine

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

ANTIDIARRHOEIC - ANTIDYSENTERIC
ANTIEMETIC - ANTIPYRETIC - ANTIASIS AGENT

HOLARRHENA FLORIBUNDA
APOCYNACEAE

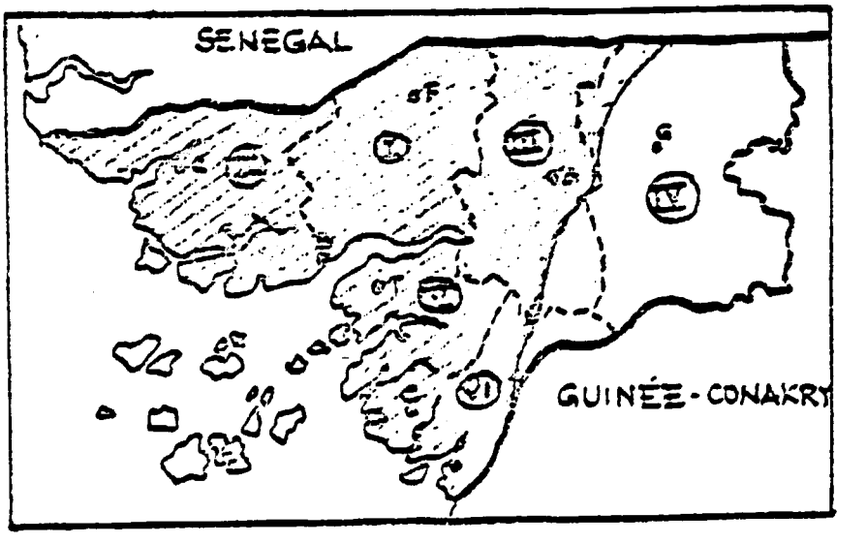


Vernacular names

Fula	Tchoráqui
Bijogo	Ete-éri

Botanical description: Small tree attaining 15 m. Lanceolate leaves. Closely-set white flowers. Pods hanging down in pairs.

Distribution in Guinea-Bissau



Part used: Bark of the roots and of the trunk

Preparation: Boil [illegible] g (2 pinches) of the powdered bark in a cup of water.

Dosage: Drink 2 cups per day, one in the morning and one at night, for one week.

The decoction can also be used externally to treat trichomonadal vaginitis.

Drawbacks: Side effects: dizziness, insomnia, agitation, but only in the case of those who are indisposed.

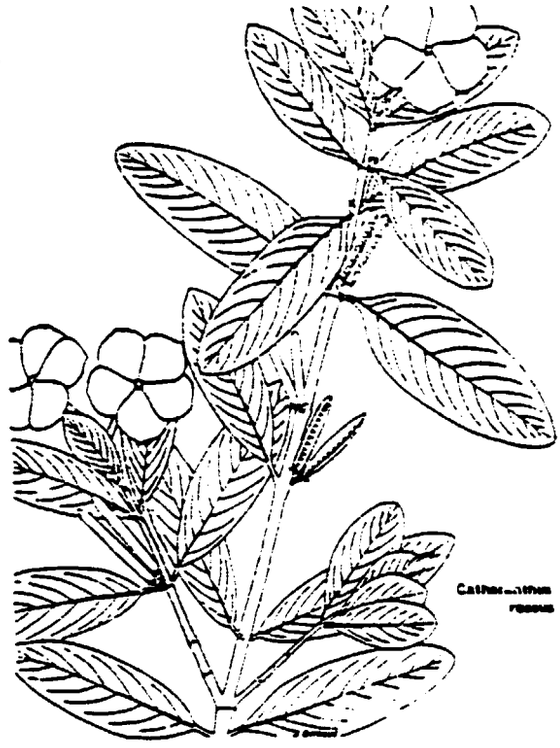
Active ingredients: Conessine.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

ANTIHYPERTENSION AGENT

CATHARANTHUS ROSEUS

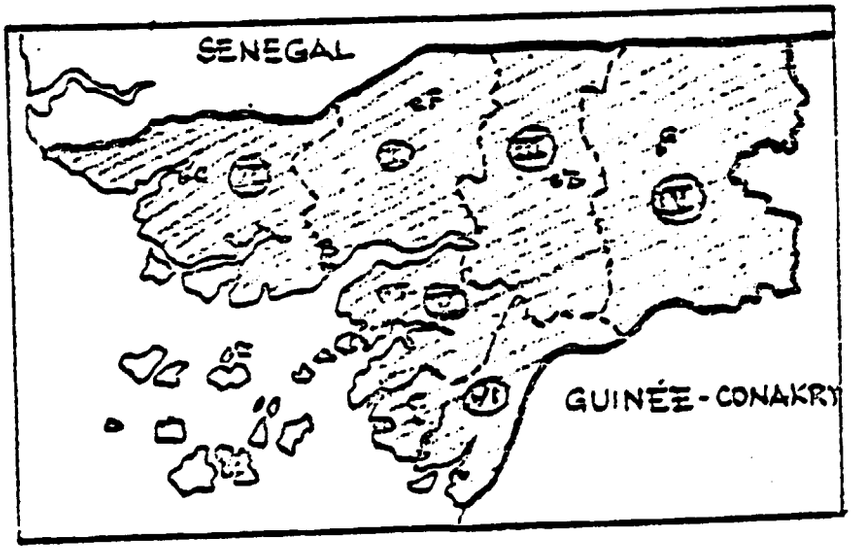
APOCYNACEAE



Vernacular names

Botanical description: Sub-shrub of approximately 0.50 m with pink and white flowers. Ornamental plant.

Distribution in Guinea-Bissau



Part used: Roots

Preparation: 5 g (a pinch) to a cup of water. Boil for 10 minutes. Strain.

Dosage: Drink one cup daily in the morning on an empty stomach. Monitor pressure.

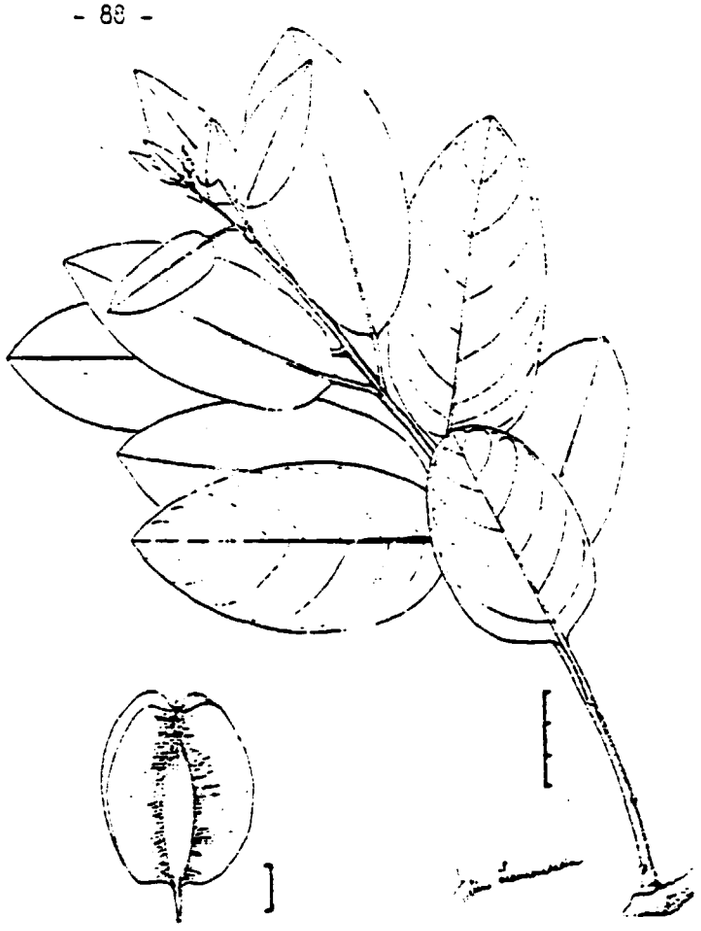
Active ingredients: Ajmalicine

Bibliography: P. Boiteau, Précis de matière médicale malgache (La Librairie de Madagascar, 1979).

COMBRETUM GLUTINOSUM

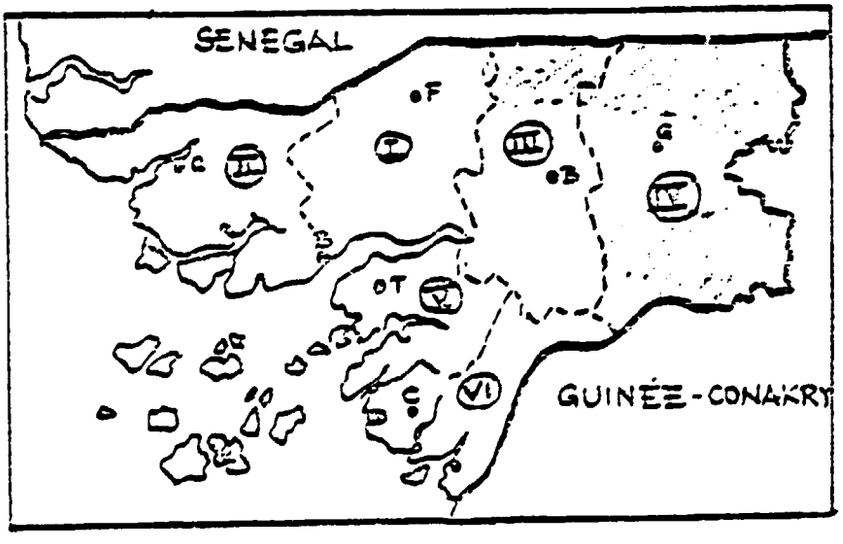
COMBRETACEAE

Vernacular names



Botanical description: Bush 8 to 10 m in height. Alternate leaves. Yellow-cream flower spikes. Fruit with four wings.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Boil 20 g of the leaves in one litre of water for half an hour. Strain.

Dosage: 1.5 litres per day

Active ingredients: Flavonoids, potassium nitrate.

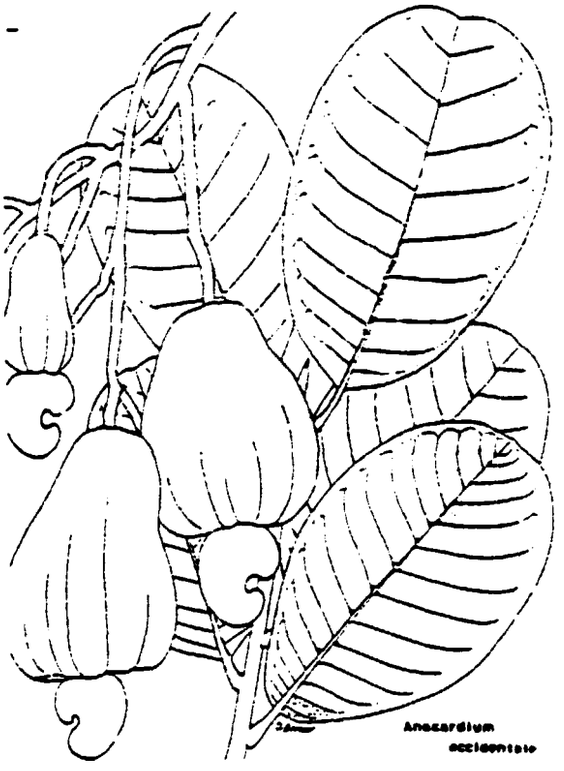
Other uses: Antitussive.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

HYPOGLYCEMIANT

ANACARDIUM OCCIDENTALE

ANACARDIACEAE

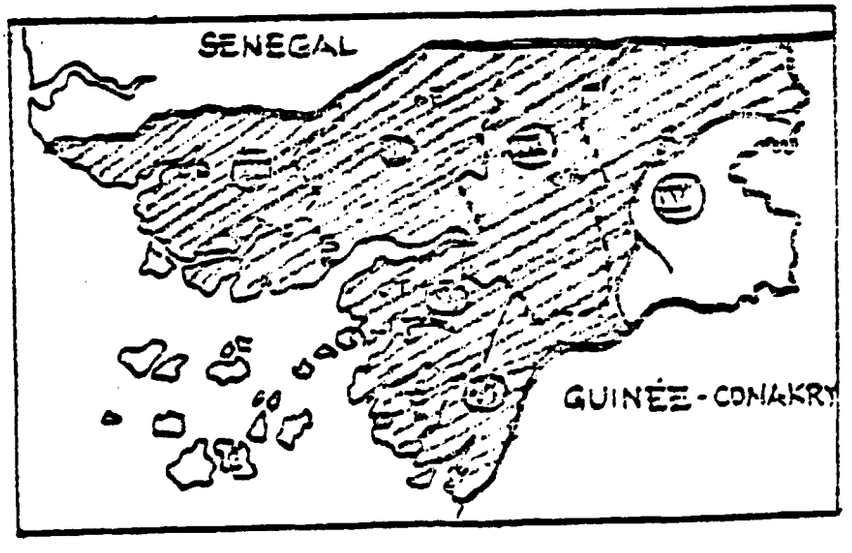


Vernacular names

Creole	Cadju
Futa-fula	Ialaguei

Botanical description: Tree 8 to 10 m in height. Oval leaves rounded at the top. Fleshy stalk culminating in fruit containing a single seed.

Distribution in Guinea-Bissau



Part used: Bark

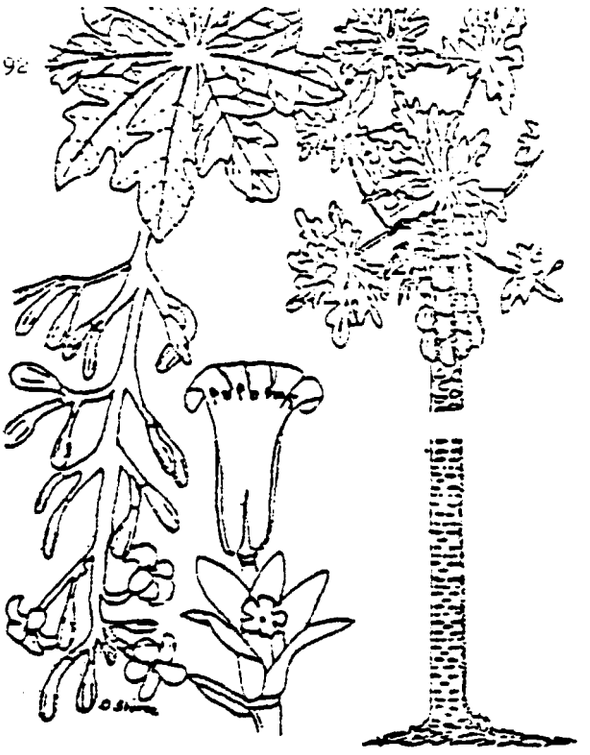
Preparation: Boil 40 g of the bark in one litre for half an hour. Strain.

Dosage: Drink one litre per day

Active ingredients: Unknown.

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); P. Boiteau, Précis de matière médicale malgache (La Librairie de Madagascar, 1979).

Against ANTHRAX and BOILS



CARICA PAPAYA

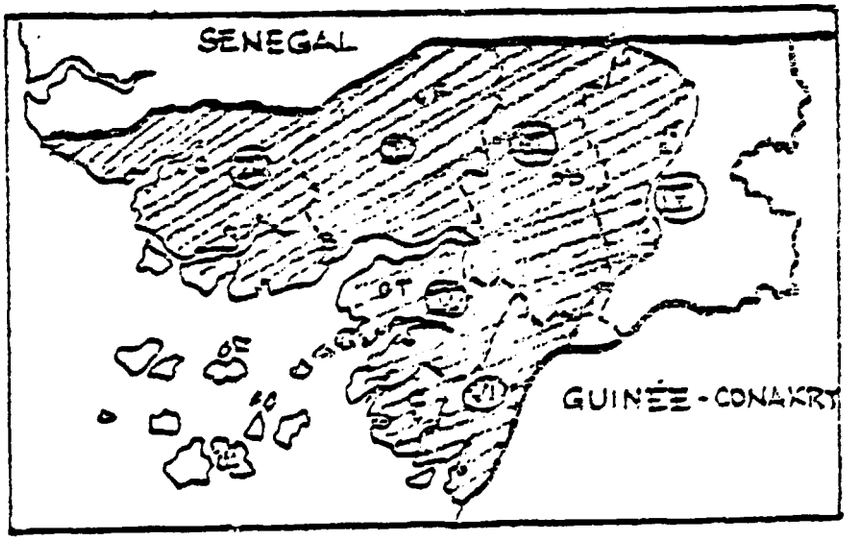
CARICACEAE

Vernacular names

Futa-fula	Budibaga
Mandyako	Pupa
Erame	Pedum-hal
Bijogo	Umpanda
Creole	Papaia
Balante	Face
Fula	Papae
Mandyako	Bepaia
Manding	Papoia
Mancagne	Bedon albabo

Botanical description: Fruit tree 2 to 5 m in height. Divided leaves. Dioecious tree. Fruit with yellow pulp and many seeds.

Distribution in Guinea-Bissau



Part used: Unripe fruit

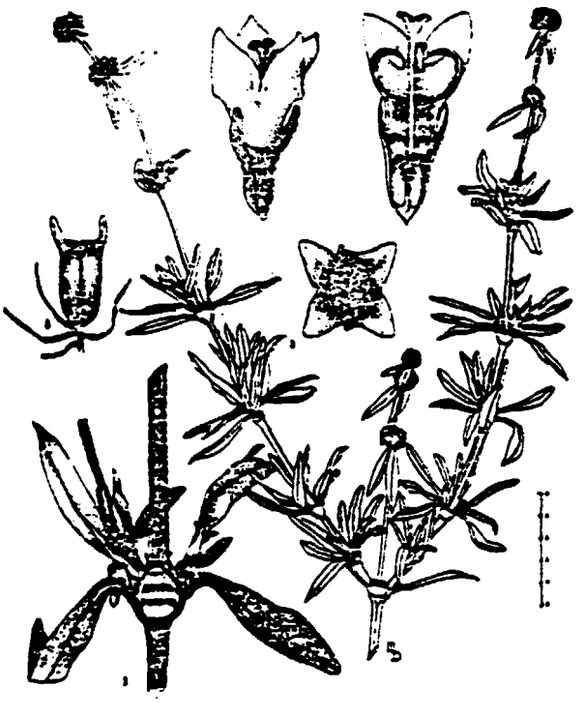
Preparation: Make an incision in the unripe fruit and apply locally to the boil. Leave in contact as long as possible.

Active ingredients: Latex containing proteolytic papain enzyme

Bibliography: J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974); J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963); R. Alvaro Vieira, "Subsidio para o estudo da flora medicinal da Guiné Portugesa", Boletim geral do Ultramar, 1956, XXXII, 371, 81.

BORRERIA VERTICILLATA

RUBIACEAE

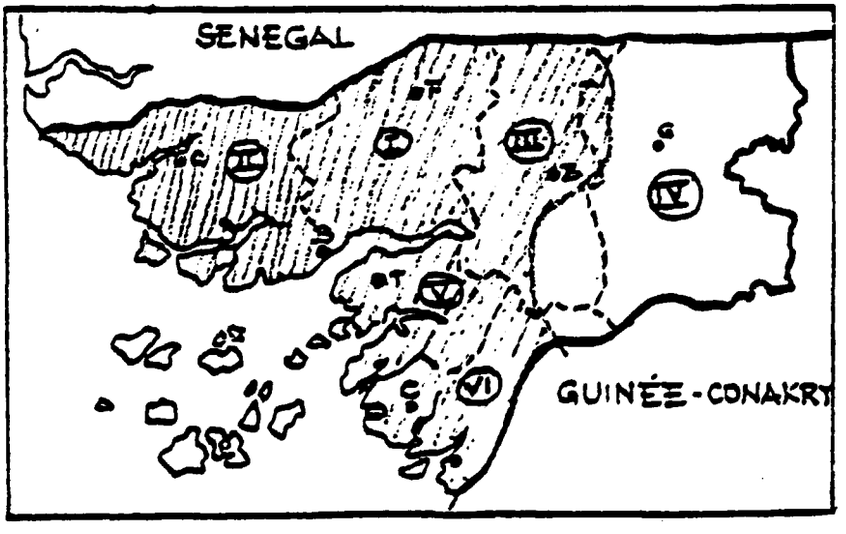


Vernacular names

Manding Kéré Kada
Komu soro
Timing timingh'o

Botanical description: Hardy sub-shrub attaining 1 m in height. Terminal inflorescences and compact axillaries.

Distribution in Guinea-Bissau

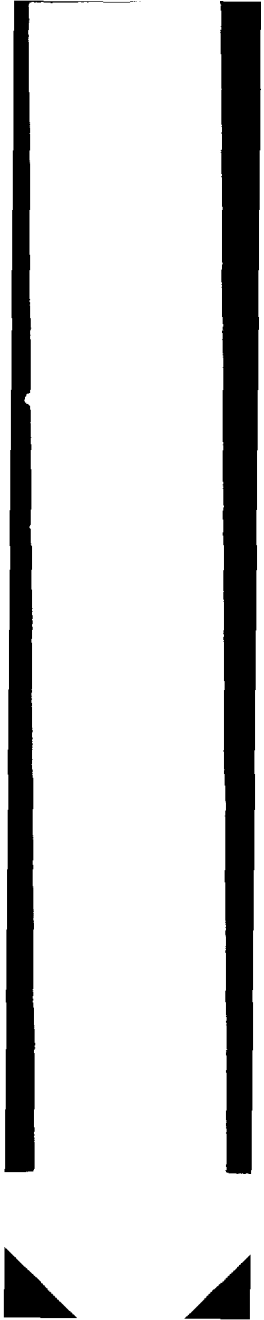


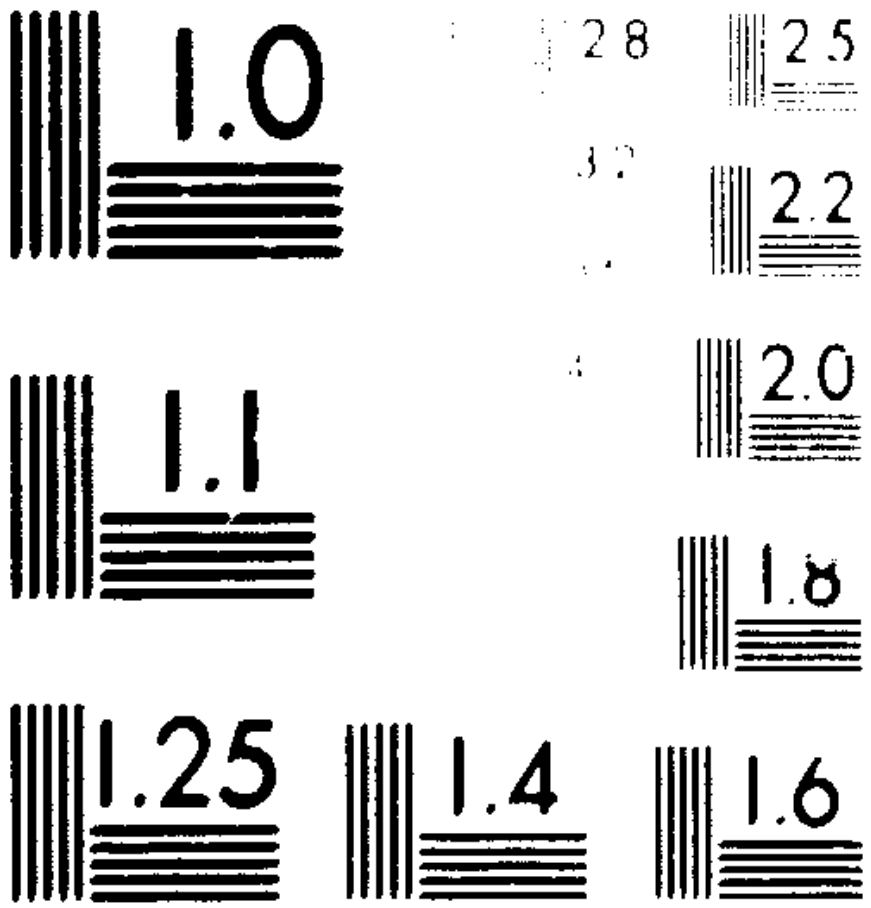
Part used: Whole plant

Preparation and dosage: After extracting juice from the crushed leaves and squeezing it into a tissue apply locally to infected wounds.

Active ingredients: Borreverine

Bibliography: Contribution à l'étude d'une plante spontanée sénégalaise utilisée en médecine traditionnelle locale Borreria verticillata Rubiaceae (thesis for the degree of Doctor of Pharmaceutical Science, 1980).



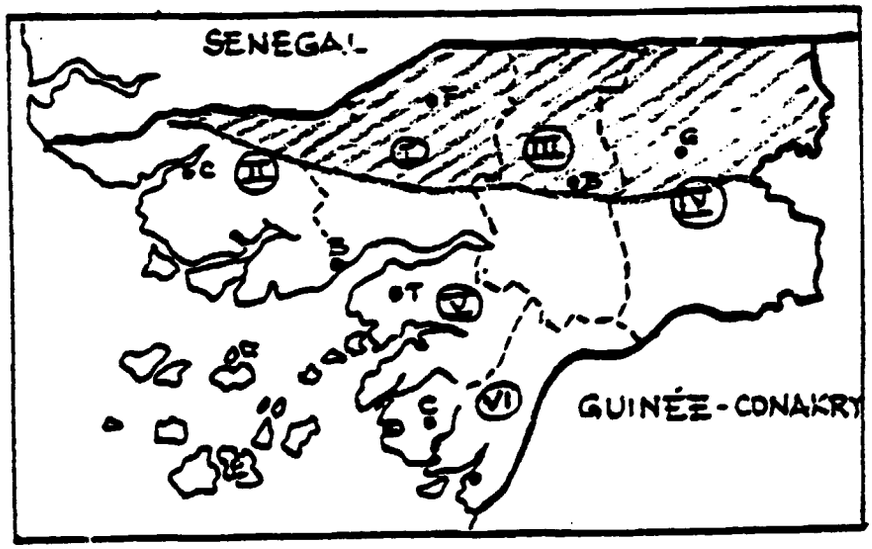

1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

ANTI-INFECTION AGENT FOR
EXTERNAL USE ANTIDERMATOSIS
AGENT
MITRACARPUS SCABER
RUBIACEAE

Vernacular names:
Creole Bafuria

Botanical description: Annual cornfield plant attaining 80 cm with opposite stipulate leaves. Dense white inflorescent flowers.

Distribution in Guinea-Bissau



Part used: Leaves

Preparation: Coarsely grind the leaves. Squeeze juice through a cloth.

Dosage: Spread the juice over the wound or dermatosis three times daily.

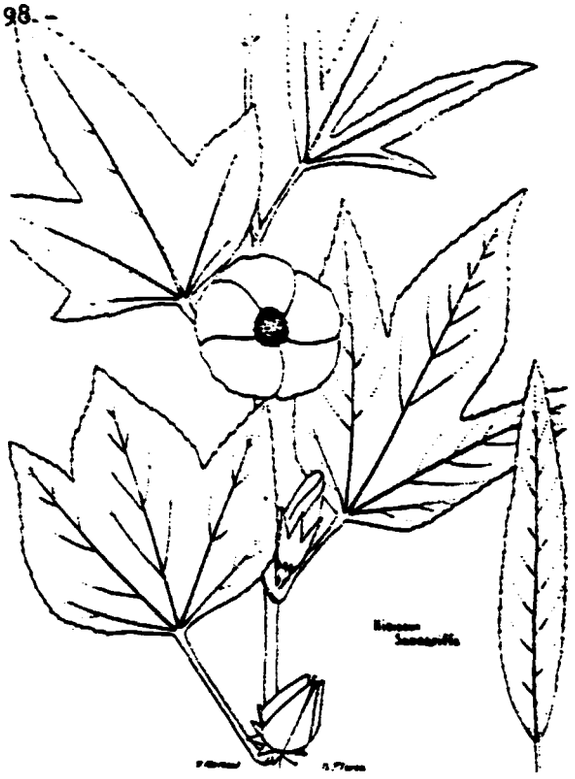
Active ingredients: Phenol acids?

Bibliography: G. Maynart, S. Mboup, B. Ndiaye and J.L. Pousset, "Plantes médicinales africaines IX. Contribution à l'étude d'une plante spontanée sénégalaise Mitracarpus scaber", Médecine d'Afrique Noire, July 1982; J. Kerharo and J.G. Adam, La pharmacopée sénégalaise traditionnelle (Paris, Vigot, 1974).

URINARY ACIDIFIER

HIBISCUS SABDARIFFA

MALVACEAE

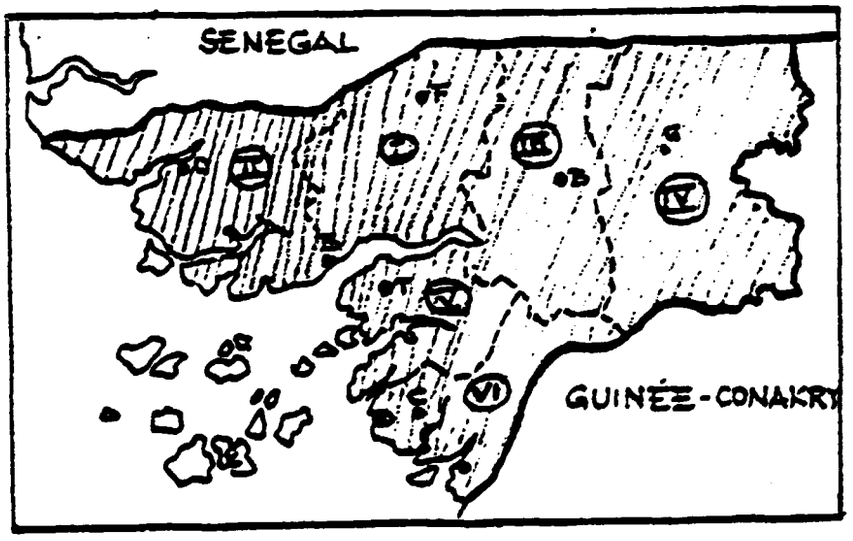


Vernacular names

Creole	Baguitche
Manding	Cutcha
Fula	Folere
Pepel	Otésse
Balante	N'batu

Botanical description: Annual plant attaining 1 m in height. Flowers with red green sepals according to the variety. When fully grown the fruit is surrounded by the indeciduous fleshy calyx.

Distribution in Guinea-Bissau



Part used: Red or green fleshy calyx

Preparation: Boil 30 g of calyces of the red or white variety for half an hour in one litre of water.

Dosage: Drink one litre per day.

Active ingredients: Citric, tartaric and malic acid.

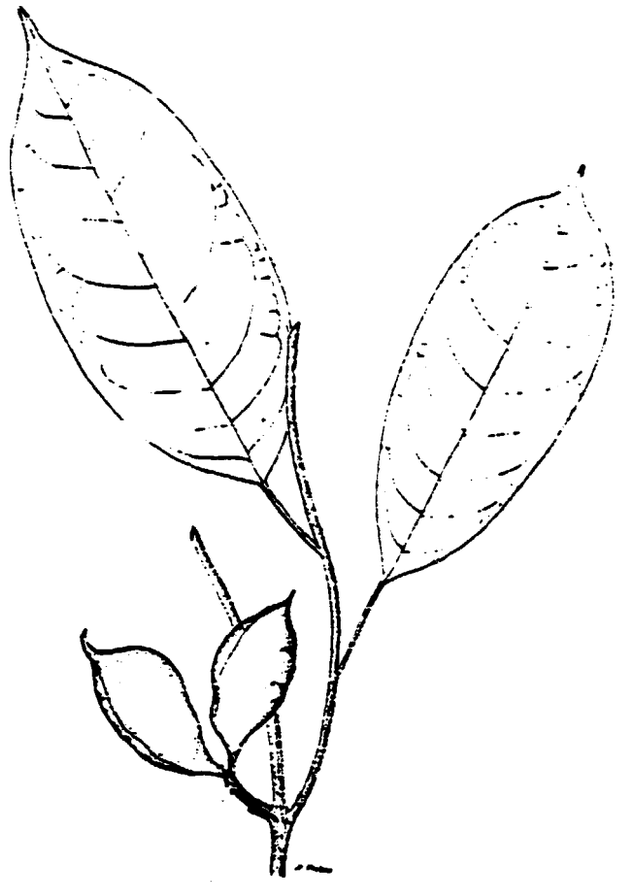
Bibliography: A. Sharaf, A. Geneidi and S. Negm, "Further study on the antibacterial effect of Hibiscus sabdariffa", Path. microbiol., Switzerland, 1966, 29, 1, 120; J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

COLA NITIDA

and

COLA ACUMINATA

STERCULIACEAE

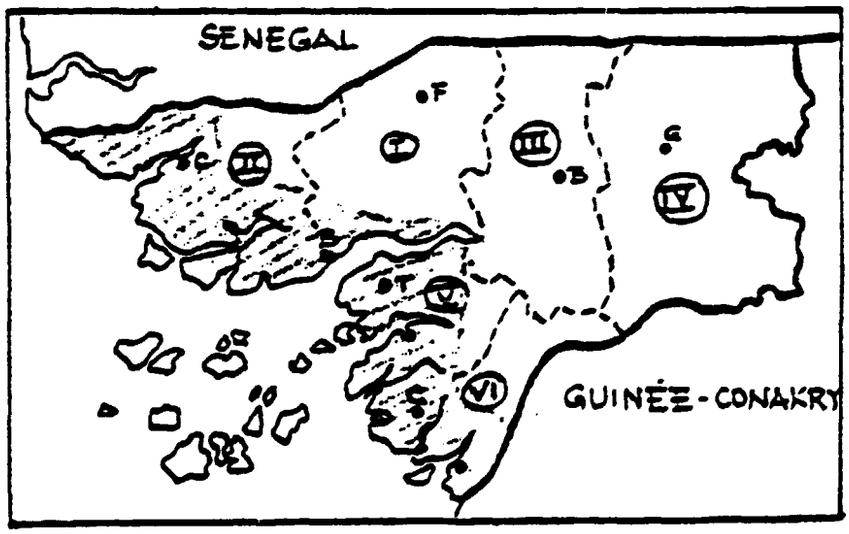


Vernacular names

Creole	Cola
Fula	Gòró
Manding	Cúró
Balante	Uncurame

Botanical description: Tree 10 to 15 m in height. Alternate oval leaves. Yellow or cream male or female flowers. Fruit containing 4 to 5 seeds in a star shape and known as cola nuts.

Distribution in Guinea-Bissau



Part used: Seeds

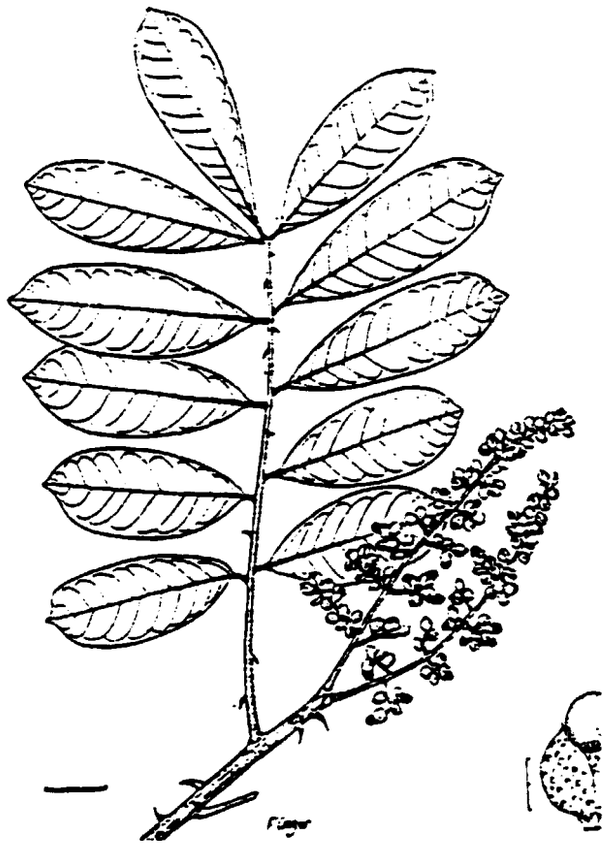
Dosage: 1 seed in the event of physical or mental fatigue. Do not abuse.

Active ingredients: Caffeine, catechic tannins.

Bibliography: J. do Espirito Santo, Nomes vernaculos de algumas plantas da Guiné Portugesa (Lisbon, 1963).

FAGARA XANTHOXYLOIDES

RUTACEAE

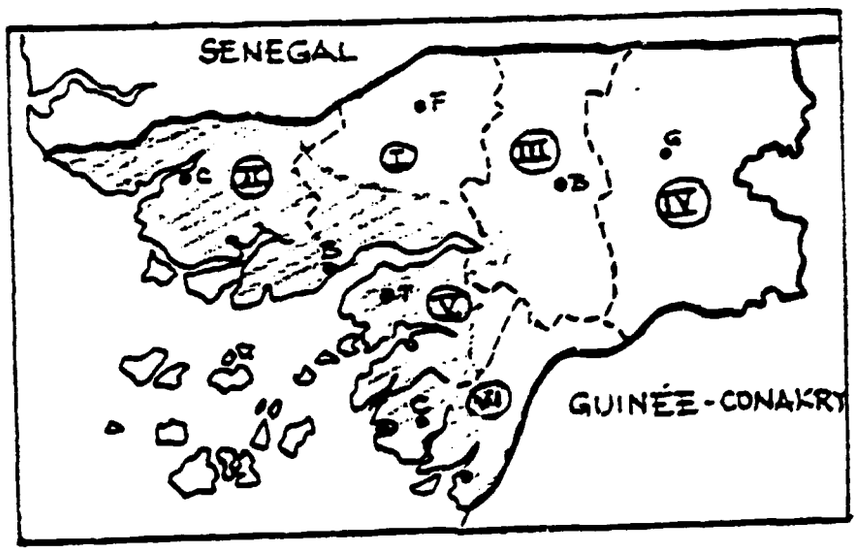


Vernacular names

Creole	Butanque or bitonque
Felupe	Buchandjabo
Bijogo	Aranhe
Fula	Djábi, Djabi-fóro,
Manding	Bulé-barquele, Lequi
Balante	Ierim-ô
	Mantchu or mantcho

Botanical description: Shrub or small tree 6 to 7 m in height. Alternate composite leaves. Panicles of small white flowers. Spherical capsules.

Distribution in Guinea-Bissau



Part used: Roots

Preparation: Use for cleaning teeth at least three times daily.

Active ingredients: p-hydroxy benzoic and 2-hydroxymethyl benzoic acids, vanillic acid.

Bibliography: E.A. Sofowora, "Fagara xanthoxyloides root in treatment of sickle cell anaemia", Second CAU/STRC Inter-African Symposium on the Traditional African Pharmacopoeia and African Medicinal Plants, 7-12 July 1975.

INDUSTRIAL MEDICINAL PLANTS

A number of plants can be processed industrially. In view of the fact that there is no substantial industry in Guinea-Bissau it would be preferable to think in terms of exporting these plants to more industrialized countries.

We will consider, in turn, the possible use of Voacanga, Landolphia, Sterculia setigera and Gloriosa superba.

I. Voacanga

Two species, Voacanga africana and Voacanga thouarsii, grow in the Sudano-Guinean regions (see map showing distribution).

These shrubs are 2 to 6 m in height, with opposite leaves and fragrant white flowers; the fruit is green, turning yellow later when ripe, and usually grouped in pairs.

The two trees fruit at different times, Voacanga africana in October after the rainy season, Voacanga thouarsii in January-February. The fruit then opens and the seeds fall to the ground.

Various indolic alkaloids exist in all parts of the plant but the most significant is a single alkaloid, tabersonine, which is present in the seeds.

Tabersonine is found in quantities of between 2 and 2.6 per cent in the seeds of Voacanga africana and up to 3.5 per cent in the seeds of Voacanga thouarsii.

Tabersonine has become important since the publication of findings indicating that it can be processed, by means of hemisynthesis, into vincamine, an alkaloid used as a cerebral oxygenate and hypotensor in the treatment of old people (see diagram).

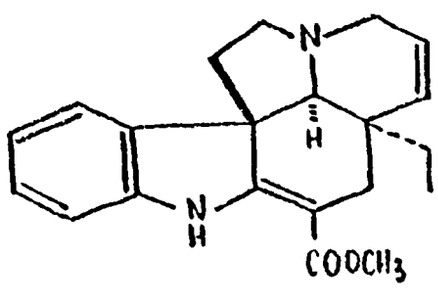
Voacanga seeds sell abroad at around 1000 francs per kilogram, and they could therefore be exported to the industrialized countries.

II. Landolphia heudelotii

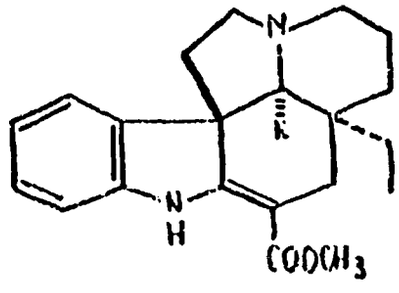
This is a liana with numerous slender downy branches whose terminal tendrils intertwine with the branches of other trees. The leaves are a deep green, the fruit a berry.

Sometimes this plant takes the form of a shrub 2 - 5 metres high. Both varieties, the liana and the shrub, are found in Guinea-Bissau.

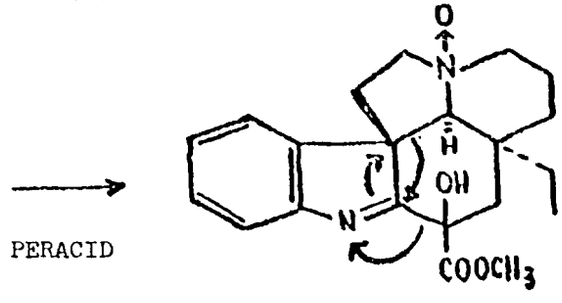
(G. Hugel, J. Levy, J. Le Men)



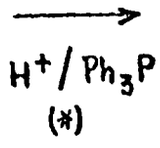
(-) TABERSONINE

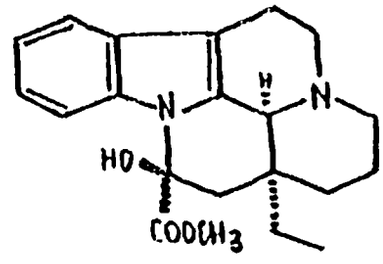


(-) VINCADIFFORMINE



HYDROXY-16 INDOLENINE





(+) VINCAMINE

(*) The rearrangement shown probably takes place in several stages.

The triphenylphosphine serves to reduce the N-oxide function.

Commercial exploitation of the latex content of Landolphia was started as long ago as the beginning of the present century, but later dropped. In a thesis recently defended at Dakar, C. Kirsche [1/] re-examined the value of the latex from this shrub. Dissolving the latex in toluene and precipitating it out with acetone yields a very good rubber, entirely comparable with that from Hevea Manufacture of inner tubes from Landolphia is under study by the SAFCAC rubber research organization in Senegal.

The price of the latex harvest must of course still be fixed, and the yield improved, for example by cultivation.

III. Sterculia setigera and Sterculia tragacantha

These are trees 15 m high with alternate leaves. The fruits are pods. Their trunks exude two kinds of gum, Mbep gum and tragacanth, both of which are commercially valuable. They are used in emulsions and suspensions for preparing food products and cosmetics and in the textile industry.

IV. Gloriosa superba

An annual twining plant 1 - 2 m high with opposite leaves. Its characteristic red flowers come out at the end of the rainy season. The fruits contain a large number of seeds.

The seeds and bulbs yield the alkaloid colchicine, which is much used for preparing anti-mitotic substances.

This plant could be cultivated on a large scale with a view to exporting the seeds.

There are other plants, such as Datura metel, Cola acuminata, etc. that might be the subject of a production and harvesting study.

Recommendations

The authors of this report travelled through Guinea-Bissau for a month with a view to evaluating the resources of medicinal plants and plants that could be exploited industrially.

1/ C. Kirsche, Mise en évidence de certains constituants poly-isoprèniques dans le latex de: Euphorbia balsamifera (Euphorbiacées), Landolphia heudelotii (Apocynacées). Thesis for State Doctorate in Pharmacy, Dakar, 15 May 1982.

As a result, they propose that:

(1) A fairly long list of medicinal plants should be added to the two medicines of the basic health services, in particular at least a cough medicine, a laxative and a mechanical anti-diarrhoea preparation for each basic health service unit.

If the main plants usable for this purpose are described on index cards, the nurse will be able to select the plants available in his region. As scientific research on the plants progresses, other cards could be prepared in the future, thus widening the range of treatment in the various regions.

(2) A small-scale industry should be set up at Bissau for putting the main plants up in packets for distribution to the health centres and regional and central hospitals.

Instructions for preparation and dosage would have to be given on the packets.

For this purpose it would be necessary to train a competent botanist who could recognize the usable plants without difficulty.

A vehicle for collecting the herbs and a machine for putting up the packets would be required.

There are many suppliers of packaging equipment in the market. As just one example, we might mention Pacunion, 102, rue Carnot, F-93100 Montreuil, which supplies Japanese and German machines.

(3) A public or private company should be established to handle the harvesting of the main industrial plants that might be exported, i.e. Voacanga, Landolphia, Sterculia and Gloriosa.

This company would need to investigate the opportunities for selling the plants abroad and look into the international market. Substantial earnings of foreign currency might be expected from this project.

Equipment required:

Land Rover for collecting and harvesting	10 million CFA
Crusher	2 million CFA
Packaging machine	25 million CFA

Training:

A botanist might take a six-month training course at the University of Dakar under the direction of Mr. Guy Maynart, who is in charge of the botany course at the Department of Medicine and Pharmacy.

Geographical distribution of the species collected in Guinea-Bissau

I. Warning

On an expedition as short as this one, the prospecting botanist can only collect what chance puts in his way, though that is no excuse for only seeing what is obvious. To get a more accurate view of the situation therefore, it is necessary to consult the results of previous surveys (e.g. Espírito Santo) or, if time permits, to try to make further surveys at the most favourable times of the year.

II. System for indicating distribution

The system takes into account the phytogeographical area where the plant collected is found, its location by administrative region and its rate of occurrence or prevalence in the country.

Example: "2/AB"

Here the figure denotes the abundance of the species in the region surveyed, while the capital letter A or B indicates the phytogeographical area of the collections (see annexed maps): A = the Sudan region, B = the Guinea region.

Examples:

1/A: Species found in isolation in the Sudan region.

1/B: Species found in isolation in the Guinea region.

0 ?: Species not found on this expedition but probably present.

Rates of occurrence:

1 = Isolated species

2 = Fairly common species

3 = Very common species

LOCATION AND GEOGRAPHICAL DISTRIBUTION OF THE SPECIES COLLECTED IN GUINEA-BISSAU

	Regions					
	OIO	CA-CHEU	BAFATA	GABU	QUI-NARA	TOM-BALI
	I	II	III	IV	V	VI
1 - Abrus canescens		0 ?				
2 - " precatorius		0?/B				
3 - " pulchellus		1/B			1/B	2/B
4 - Acacia albida	2/AB	3/AB	2/A	1/B	2/B	
5 - " arabica						
6 - " macrostachya	2/AB	2/AB	2/AB	2/AB		
7 - " nilotica L. var. adansonii						
8 - " sieberiana			1/A	1/A		
9 - Acrocephalus buettneri						
10 - Adansonia digitata						
11 - Adenia lobata						
12 - Afraegle paniculata				1/A		
13 - Aframomum melegueta						
14 - " sp = Amonu		2/B			2/B	2/B
- Afrormosia (see Pericopsis)						
15 - Afzelia africana	2/AB	1/AB	2/A	1/AB	1/B	1/B
16 - Ageratum conyzoides	1/A	2/AB	2/A		2/B	
17 - Albizzia adianthifolia	1/B	1/B			2/B	2/B
18 - " zygia			2/AB	1/AB		
19 - Alchornea cordifolia	2/AB	2/AB	1/AB	1/AB	1/B	3/B
20 - Allophyllus africanus					1/B	2/B
21 - Alstonia boonei			2/A	2/AB	3/B	3/B
22 - Anacardium occidentale	2/AB	2/AB	2/AB	3A	2/B	
23 - Ananas comosus	2/A					3/B
24 - Ancistrophyllum secundiflorum						
25 - Annona senegalensis	2/AB	2/AB	2/AB	2/AB	2/B	2/B
26 - Anthocleista nobilis)	1/AB	2/AB			2/B	2/B
27 - " procera)						
28 - Anthostema senegalense	2/AB	2/AB	2/AB	2/AB	2/B	2/B

	I	II	III	IV	V	VI
29 - Antiaris africana	I/AB	2/AB	I/A		I/B	2/B
- Aphania (see Lepisanthes)						
30 - Arachis hypogaea	Cultivated in all regions					
31 - Argemone mexicana			1/A	1/A		
32 - Asparagus africanus				1/A	1/B	1/B
33 - Avicennia africana	2/AB	1/AB	1/B		2/B	1/B
34 - Azadirachta indica						
35 - Bixa orellana						
36 - Boerhavia diffusa	1/B	1/B	1/B			2/B
37 - Bombax costatum	2/AB	2/AB	2/A			
38 - Borassus aethiopum	2/A	2/AB			2/B	1/B
39 - Borreria verticillata						
40 - Bridelia micrantha		2/B			2/B	1/B
41 - Caesalpinia bonduc						
42 - Calotropis procera	2/AB	1/AB	2/A	2/A		
43 - Capsicum anuum						
44 - " frutescens						
45 - Carica papaya						
- Carpodinus (see Landolphia)						
46 - Carpolobia alba						
47 - Cassia alata			2/A	2/A		2/B
48 - " nigricans	1/A		1/A			
49 - " occidentalis						
50 - " podocarpa	1/B	2/AB	1/A	1/A	1/B	2/B
51 - " siamea	1/AB	1/AB	1/AB	1/A	1/B	2/B
52 - " Sieberiana						
53 - " tora						
54 - Cassytha filiformis	1/AB	2/AB				
55 - Carapa procera		3/AB			2/B	3/B
56 - Catharanthus roseus						
57 - Ceiba pentandra	1/AB	1/AB	1/AB	1/AB	2/B	2/B
58 - Celosia trigyna						
59 - Centella asiatica	2/A	2/AB				
60 - Chlorophora regia	1/B	1/B			1/B	1/B
61 - " senegalense	2/AB	1/AB	1/AB	1/AB		
62 - Chrysobalanus orbicularis						

	I	II	III	IV	V	VI
63 - Cissampelos mucronata	1/AB	1/AB	1/AB	2/A	1/B	1/B
64 - Cissus aralioides	0 ?	1/B			0 ?	
65 - " quadrangularis			0 ?	0?/B		
66 - " rubiginosa					0 ?	0 ?
67 - Citrus aurantium	1/AB	2/AB	1/AB		2/B	2/B
68 - Cnestis ferruginea	1/AB	2/AB			3/B	3/B
69 - Cochlospermum tinctorium						
70 - Coffea sp.			BOLAMA			
71 - Coix lacrima-jobi	0 ?				0 ?	0 ?
72 - Cola acuminata)	1/B				2/B	3/B
73 - " nitida)						
74 - Combretum glutinosum						
75 - " micranthum						
76 - Connarus africanus		0 ?			0 ?	0 ?
77 - " griffonianus					0 ?	0 ?
78 - Conopharyngia penduliflora					0 ?	0 ?
79 - Corchorus olitorius			cultivated			
80 - Cordia myxa						
81 - Cordyla pinnata	1/A		2/AB	3/AB		
82 - Costus afer				0?/B	0 ?	0 ?
83 - Craterisperma laurinum						0 ?
84 - Cremaspora trifolia						0 ?
85 - Crescentia cujete			1/B			1/B
86 - Crossopteryx febrifuga		2/B				
87 - Cryptolepis sanguinolenta					2/B	1/B
88 - Cucurbita pepo			cultivated			
89 - Cymbopogon giganteus						
- " citratus						
90 - Cynodon dactylon		?/AB				
91 - Cyperus articulatus						
92 - Cyrtosperma senegalense		0?/B			0 ?	0 ?
93 - Dalbergia sp.		0?				2/B
94 - " saxatilis		0?			0 ?	0 ?
95 - Daniellia ogea)	3/AB	2/AB	1/A	1/A	2/B	2/B
96 - " oliveri)						
97 - Datura fastuosa	cultivated at BOLAMA					

	I	II	III	IV	V	VI
98 - Datura metel						
99 - " stramonium						
100 - Detarium microcarpum		1/AB	2/A			
101 - " senegalense						
102 - Dialium guineense	1/AB	3/AB			3/B	3/B
103 - Dichrostachys cinerea	2/AB	2/AB			2/B	2/B
104 - Dioscorea sp.	2/AB	2/AB			2/B	2/B
105 - Diospyros mespiliformis	1/A	1/AB		0 ?		
106 - Dissotis capitata	0 ?	0 ?				
107 - Dodnea viscosa						
108 - Dombeya quinqueseta		2/B			2/B	3/B
109 - Drepanocarpus lunatus	2/A	2/AB	2/AB	2/B		
110 - Eclipta prostrata						
111 - Elaeis guineensis	2/AB	3/AB	1/AB		2/B	3/B
112 - Entada africana				3/AB		
113 - " gigas					0 ?	0 ?
114 - Erythrina senegalensis	2/AB	2/AB		1/A	2/B	2/B
115 - Erythrophleum africanum	1/A		1/AB	2/AB	1/B	
116 - " guineense	2/AB	2/AB	1/AB	1/AB	2/B	2/B
117 - Euphorbia drupifera						
118 - " hirta						
119 - Fagara xanthoxyloides						
120 - " leprieurii						
121 - Ficus sp.						
122 - " exasperata						
123 - Flemingia faginea	2/A	3/AB	2/A	2/B		
124 - Garcinia polyantha						
125 - Gardenia sp.	1/A	2/B	2/A	2/B	3/B	2/B
126 - Gloriosa superba						
127 - Guiera senegalensis						
128 - Guibourtia copallifera	0 ?	0 ?				
129 - Haemanthus multiflora	0 ?	0 ?	0 ?	0 ?	0 ?	0 ?
130 - Hannoa undulata	2/AB	1/AB	1/AB		1/B	2/B
131 - Harungana madagascariensis					0 ?	0 ?
132 - Heliotropium indicum		2/B	2/AB	1/B		
133 - Hibiscus abelmoschus						

	I	II	III	IV	V	VI
134 - Hibiscus sabdariffa						
135 - Holarrhena floribunda						
136 - Hoslundia opposita						
137 - Hygrophila spinosa		3/AB				
138 - Hymenocardia acida	1/A	1/A	1/A		3/B	2/B
139 - Hyptis spicigera	2/A	2/A	2/A		2/B	
140 - " suaveolens	2/AB	2/AB			2/B	
141 - Icacina senegalensis	3/AB	2/AB	2/AB	3/AB	2/B	2/B
142 - Indigofera arrecta						
143 - " tinctoria						
144 - " sp.						
145 - Ipomoea asarifolia	2/A	2/AB	2/A	2/A		
146 - " brasiliensis		2/B			2/B	2/B
147 - Ixora radiata						
148 - Jatropha curcas		planted in the villages				
149 - Kaemperia aethiopica		3/AB			3/B	3/B
150 - Khaya senegalensis						
151 - Lagenaria vulgaris						
152 - Landolphia dulois	2/AB	3/AB	2/AB		3/B	3/B
153 - " heudelotii	2/AB	2/AB			2/B	2/B
154 - " owariensis		0 ?			0 ?	0 ?
155 - Lannes acida						
156 - " microcarpa			2/AB	2/AB		
157 - " velutina			2/AB	2/AB		
158 - Lepisanthes senegalensis	1/B					
159 - Leptadenia hastata			2/AB	2/AB		
160 - Lippia chevalieri			2/A	2/A		
161 - Lonchocarpus cyanescens						
162 - " sericeus	1/A		1/A	1/AB		
163 - Lophira lanceolata		3/B	1/A	2/AB	2/B	2/B
164 - Mangifera indica		cultivated in the towns and villages				
165 - Markhamia tomentosa						
166 - Melia azedarach			1/A			
167 - Mezoneuron benthamianum		2/B	1/A		3/B	3/B
168 - Mikania scandens						
169 - Mitracarpus scaber	2/A	2/AB	2/A		2/B	2/B

	I	II	III	IV	V	VI
170 - Mitragyna stipulosa	2/AB	2/AB	2/A		2/B	2/B
171 - Momordica charantia	I/B					
172 - Monodora myristica						
173 - Morinda geminata	1/AB	1/AB	1/AB			
174 - " morindoïdes					1/B	1/B
175 - Moringa oleifera	1/AB	1/AB				1/B
176 - Mucuna pruriens	1/AB				3/B	3/B
177 - Musa sapientum		cultivated in the villages				
178 - Nauclea latifolia	2/AB	3/AB	1/AB	1/AB	2/B	2/B
179 - Newbouldia laevis	2/AB	2/AB	1/AB	1/AB	2/B	3/B
180 - Nicotiana tabacum						
181 - Nymphaea lotus						
182 - Ocimum basilicum	2/B	2/B			1/B	1/B
183 - " viride		0 ?			0 ?	
184 - Opilia celtidifolia			1/A	1/A		
185 - Parinari curatellifolia						
186 - " excelsa	1/AB	2/AB	1/AB		3/B	3/B
187 - " macrophylla		2/B				3/B
187 bis - Parkia biglobosa	3/AB	2/AB	2/AB	2/AB	2/B	1/B
188 - Passiflora foetida						
189 - Paullinia pinnata	1/AB	2/AB			3/B	3/B
190 - Pentaclethra macrophylla						
bis - Pericopsis laxiflora				2/AB	1/B	1/B
191 - Physalis micrantha		1/B				
192 - Piliostigma reticulatum	1/A	1/A	1/A	1/A		
193 - " thonningii	2/AB	2/AB	2/AB	2/AB	2/B	2/B
194 - Piper guineense						
195 - Pistia stratioides			3/A			
196 - Polygala rarifolia						
197 - Portulaca oleracea						
198 - Prosopis africana	2/AB	3/AB	1/AB	1/AB	2/B	1/B
199 - Psidium guajava			cultivated			
200 - Psophocarpus palustris					2/B	
201 - Psorospermum corymbiferum					2/B	
202 - " senegalensis	2/AB	1/B	2/A			
203 - Pterocarpus erinaceus	3/AB	3/AB	2/AB	2/AB	3/B	3/B
204 - Pycnanthus kombo						

	I	II	III	IV	V	VI
205 - Rauwolfia vomitora	1/B	1/B			3/B	3/B
206 - Ricinus communis	2/A	2/AB	1/A		1/B	1/B
207 - Ritchiea capparoides		1/B			0 ?	2/B
208 - Salacia senegalensis					2/B	
209 - Salix subserrata				2/AB		
210 - Schulteria stenophylla var. latifolia		1/AB			2/B	
211 - Schwenkia americana						
212 - Selerocarya birrea			2/A	2/A		
213 - Scoparia dulcis	2/AB	2/AB		2/B	2/B	2/B
214 - Securidaca longepedunculata	2/A	2/A	3/AB	3/AB		
215 - Securinega virosa			1/A	1/A		
216 - Sida rhombifolia		0 ?			2/B	0 ?
217 - " stipulata	2/AB	2/AB	2/AB	2/AB	2/B	2/B
218 - Smilax kraussiana		2/B			3/B	3/B
219 - Spathodea campanulata	1/A		planted			
220 - Spondias mombin L.			1/A			
221 - Solanum incanum	1/A	2/AB	1/A		2/B	2/B
222 - Sterculia setigera	1/A		2/A	2/A		
223 - " tragacantha	2/B	2/AB				
224 - Stereospermum kunthianum				1/A		
225 - Strophanthus hispidus	2/AB	2/AB	1/B	1/B	3/B	3/B
226 - " sarmentosus	2/AB	2/AB	2/B	3/B	2/B	2/B
227 - Strychnos spinosa	1/AB	2/AB		2/B	2/B	3/B
228 - Syzygium guineense	2/A	2/B	2/A	2/AB		
229 - Tamarindus indica	1/AB	1/AB	1/AB	1/AB	1/B	1/B
230 - Tephrosia lupinifolia			2/A	2/A		
231 - " vogelli						
232 - Terminalia avicennioides			2/A	2/AB	2/B	1/B
233 - " laxiflora			1/A	2/A	2/B	2/B
234 - " macroptera	2/A	2/AB	2/A	2/A		1/B
235 - Tetrapleura tetraptera		1/B			2/B	2/B
236 - Thevetia peruviana		cultivated in gardens				
237 - Treculia africana		1/B			2/B	2/B
238 - Trema orientalis			2/AB	2/B	2/B	2/B

	I	II	III	IV	V	VI
239 - Trichilia emetica			1/A	1/A		
240 - Trichilia prieuriana					0 ?	0 ?
241 - Urena lobata	2/AB	2/AB			2/B	2/B
242 - Uvaria chemae	2/B	3/B			2/B	2/B
243 - Vernonia amygdalina						
244 - Vernonia nigritana		1/B	1/A		0 ?	0 ?
245 - Vitellaria paradoxa				2/A		
246 - Vitex cuneata						
247 - " doniana	1/AB	1/AB	1/A	1/A	1/B	1/B
248 - " madiensis				2/AB	2/B	1/B
249 - Voacanga africana	2/B	3/AB		2/B	2/B	2/B
250 - " thouarsii		2/AB		1/B	2/B	2/B
251 - Waltheria indica	2/AB	2/AB	0 ?	0 ?	2/B	2/B
252 - Ximenia americana		1/B	3/AB	3/AB	2/B	3/B
253 - Xylopia aethiopica		1/AB			2/B	2/B
254 - Ziziphus mauritiana			1/A